WHITE RIVER WATERSHED
ARKANSAS AND MISSOURI
WHITE RIVER
TABLE ROCK LAKE

MASTER PLAN FOR DEVELOPMENT AND MANAGEMENT OF TABLE ROCK LAKE

Revised: July 2013

PREFACE

The Master Plan for Table Rock Lake was first approved January 19, 1956. Subsequent revisions were prepared with the latest revision approved on December 23, 1976. The Master Plan is intended to serve as a guide for the orderly and coordinated development, management, and stewardship of all lands and water resources of the project. It presents data on existing conditions, anticipated recreational use and the type of facilities needed to service anticipated use, sensitive resources requiring protection, and an estimate of future requirements. Since the 1976 master plan revision, commercial and resort home development in the Table Rock Lake region has created new and unforeseen demands on the public lands and resources of the project. These new demands on project resources, as well as naturally occurring changes to the resources and new management procedures and directives within U. S, Army Corps of Engineers (USACE), has dictated the preparation of this Master Plan revision.

This revised Master Plan presents an inventory of land resources and how they are classified, existing park facilities, an analysis of resource use, anticipated influences on project operation and management, and an evaluation of future needs (required to provide a balanced management plan for cultivating the value of the land and water resources). Included in the revised Master Plan is an evaluation of expressed public opinion, new resource use objectives, and a new land classification system. The format utilized for this plan is outlined in Engineer Regulation/Engineer Pamphlet 1130-2-550 (dated 30 January 2013), which sets forth policy and procedure to be followed in preparation and revision of project Master Plans. This guidance is different from the original Master Plan format, which was a design memorandum. Table Rock Lake's original Master Plan can be found in design memorandum 17; a listing of all the previous Master Plan design memorandums and prior supplements can be found in Appendix C.

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

404(b)(1) – Water quality permit per CWA 77
902 limit - Maximum project cost per WRDA 86
905(b) – Reconnaissance Report per WRDA 86
AAE – Average Annual Equivalent
AAR –After Action Review
ADR – Alternative Dispute Resolution
AE – Architect-Engineer
AF – Acre Feet
AFB – Alternatives Formulation Briefing
AOR – Area of Responsibility
ARC – Annual Report to Congress
ASA(CW) – Assistant Secretary of the Army for Civil Works
ASAP – As Soon as Possible
ATR - Agency Technical Review
AWOL – Absent Without Leave
BC – Benefit Cost
BCR – Benefit Cost Ratio
BFE – Base Flood Elevation
BG – Brigadier General
BLUF – Bottom Line Up Front
BMP—Best Management Practice
BOD – Biological Oxygen Demand
BOY –Beginning of Year
BRAC – Base Realignment and Closure
BY – Budget Year
C - Construction
CADD – Computer Aided Design Drafting
CAP – Continuing Authorities Program
CCG – Consolidated Command Guidance
CDR - Commander
CE – Corps of Engineers
CEA – Cost Effectiveness Analysis
CEFMS – Corps of Engineers Financial Management System
CE/ICA – Cost Effectiveness/ Incremental Cost Analysis
CERC – Coastal Engineering Research Center
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
CI – Command Inspection
CMR – Command Management Review
COB – Close of Business/ Command Operating Budget
COL – Colonel
COLA – Cost of Living Adjustment
CONUS – Continental United States
COP – Community of Practice
COR – Contracting Officer's Representative
CP – Career Program
CPAC – Civilian Personnel Advisory Center
CRA – Continuing Resolution Authority
CRREL – Cold Regions Research and Engineering Laboratory
CSRA – Cost & Schedule Risk Analysis
CSRS – Civilian Service Retirement System
CVM – Contingent Value Method
CW – Civil Works
CWA – Clean Water Act, 1977
CWCCIS – Civil Works Construction Cost Index System
CWIS – Civil Works Information System
CX – Center of Expertise
CY – Cubic Yard/ Current Year
CZM – Coastal Zone Management
CZMA – Coastal Zone Management Act
DA – Department of Army
DC – District Commander/Division Commander
DCG – Deputy Commanding General
DCW – Director of Civil Works
DDC – Deputy District Commander

DDE – Deputy District Engineer
DDR – Design Documentation Report
DE – District Engineer/ Division Engineer
DEIS – Draft Environmental Impact Statement
DEMOB - Demobilization
DDN – Deep Draft Navigation
DIST – District
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
E&PW – Energy and Public Works (Senate)
EA—Environmental Assessment
EAB – Expected Annual Benefits
EAD – Expected Annual Damages
EC – Engineering Circular
EDR – Engineering Decision Report
EEO – Equal Employment Opportunity
EFT – Electronic Funds Transfer
EGM – Economics Guidance Memorandum
EIS – Environmental Impact Statement
EM – Engineering Memorandum
EO – Executive Order
EOC – Emergency Operations Center
EOY – End of Year
ENR – Engineering News Record
EP – Engineering Pamphlet
ER – Engineering Regulation
ERDC – Engineering Research & Design Center
EROC – Electronic Reporting Organization Code
EPA – Environmental Protection Agency
ESA Endangered Species Act
ESG – Executive Steering Group
EQ – Environmental Quality
ETL –Engineer Technical Letter
F&A – Finance and Accounting
FWL – Fish and Wildlife
FWS – Fish and Wildlife Service
FCA – Flood Control Act
FCCE – Flood Control and Coastal Emergencies
FCSA – Feasibility Cost Sharing Agreement
FEHB – Federal Employee Health Benefits
FEIS – Final Environmental Impact Statement
FEMA – Federal Emergency Management Agency
FERC – Federal Energy Regulatory Commission
FERS – Federal Employees Retirement System
FFE – First Floor Elevation/ Finished Floor Elevation
FOA – Field Operating Agency/Activity
FOI – Freedom of Information
FOIA – Freedom of Information Act
FONSI - Finding of No Significant Impact
FORCON – Force Configuration
FPMS – Floodplain Management Services
FR – Federal Register
FRC – Feasibility Review Conference
FRM – Flood Risk Management
FS – Feasibility Study
FSM – Feasibility Scoping Meeting
FTE – Full-time Equivalent
FUDS – Formerly Used Defense Site
FUSRAP – Formerly Utilized Sites Remedial Action Program
FY – Fiscal Year
FYI – For Your Information
FYSA- For Your Situational Awareness
G&A – General and Administrative
GAO – Government Accountability Office
GE – General Expense
GI – General Investigations
GIS - Geographic Information Systems
GIWW – Gulf Inter-Coastal Waterway
GNF – General Navigation Features

GOV – Government/ Government-owned Vehicle
GPO – Government Printing Office
GRR – General Reevaluation Report
GS – General Schedule
GSA – General Services Administration
H&H – Hydrology and Hydraulics
HAC – Hydropower Analysis Center
HAZMAT – Hazardous Materials
HD – House Document
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
HR – Human Resources/House of Representatives/House Resolution
HSDR – Hurricane and Storm Damage Reduction
HTIC – House Transportation & Infrastructure Committee
HTRW – Hazardous, Toxic, and Radioactive Wastes
HU – Habitat Unit
HUD – Housing and Urban Development
I - Investigations
IA – Initial Appraisal
IAG – Inter-agency Agreement
ICA – Intergovernmental Cooperation Act/Incremental Cost Analysis
IDC – Interest During Construction/Indefinite Delivery Contract
IDIQ – Indefinite Delivery, Indefinite Quantity
IEPR – Independent External Peer Review
IG – Inspector General
IN – Inland Navigation
IPA – Intergovernmental Personnel Act
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
IWUB – Inland Waterway User Board
JTR – Joint Travel Regulation
L&D – Lock and Dam
LCC –Life Cycle Cost
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
LRB – Buffalo District
LRC – Chicago District
LRD – Great Lakes & Ohio River Division (Cincinnati, OH)
LRE – Detroit District
LRH – Huntington District
LRL – Louisville District
LRN – Nashville District
LRP – Pittsburgh District
LRR – Limited Reevaluation Report
LSF – Local Service Facilities
LTC – Lieutenant Colonel
LWOP – Leave Without Pay
M&I – Municipal and Industrial
M&IE – Meals and Incidental Expenses
MACOM – Major Army Command
MARAD – Maritime Administration
MCACES – Micro-computer Aided Cost Engineering System
MCX – Mandatory Center of Expertise
MFR – Memorandum for Record
MG – Major General
MHHW – Mean Higher High Water
MHW – Mean High Water
MILCON – Military Construction
MIPR – Military Interdepartmental Purchase Request
MLW – Mean Low Water
MLLW – Mean Lower Low Water
MOA – Memorandum of Agreement
MOB – Mobilization
MOU – Memorandum of Understanding

MOY – Middle of Year
MR&T – Mississippi River and Tributaries
MRC – Mississippi River Commission
MSC – Major Subordinate Command
MSL – Mean Sea Level
MVD – Mississippi Valley Division (Vicksburg, MS)
MVK – Vicksburg District
MVM – Memphis District
MVN – New Orleans District
MVP – St. Paul District
MVR – Rock Island District
MVS – St. Louis District
NAB – Baltimore District
NAD – North Atlantic Division (New York, NY)
NAE – New England District
NAN – New York District
NAO – Norfolk District
NAP – Philadelphia District
NAS – National Academy of Sciences
NAV – Navigation
NDC – Navigation Data Center
NED – National Economic Development
NER – National Ecosystem Restoration
NEPA –National Environmental Protection Act
NFIP National Flood Insurance Program
NGO Nongovernmental Organization
NGVD – National Geodetic Vertical Datum
NHPA National Historic Preservation Act
NLT – No Later Than
NMFS – National Marine Fisheries Service
NOAA – National Oceanographic and Atmospheric Administration
NPS – National Park Service
NRHP –National Register of Historic Places
NTE –Not to Exceed
NTP – Notice to Proceed
NWD – Northwestern Division (Portland, OR)
NWK – Kansas City District
NWO – Omaha District
NWP – Portland District
NWS – Seattle District/ National Weather Service
NWW – Walla Walla District
O&M – Operations and Maintenance
OBE – Overcome by Events
OC – Office of Counsel
OEO – Outside Eligible Organization
OMB – Office of Management and Budget
OMRR&R – Operations, Maintenance, Repair, Replacement and Rehabilitation
OSA – Office of the Secretary of Army
OSD – Office of the Secretary of Defense
OSE – Other Social Effects
OSHA – Occupational Safety and Health Administration
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
PCS – Permanent Change of Station
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
PIR – Project Implementation Report
PL – Public Law
PM – Project Manager/Management
PMBP – Project Management Business Process
PMP – Project Management Plan
PMF – Probable Maximum Flood
POA – Alaska District
POC – Point of Contact
POD – Pacific Ocean Division (Honolulu, HI)
POH – Honolulu District
POTUS – President of the United States

POV – Privately-owned Vehicle/ Point of View
PPA – Project Partnership Agreement
PPE – Pay Period Ending
PR&C – Purchase Request and Commitment
PRB – Project Review Board
PRIP – Plant Replacement and Improvement Program
PROSPECT – Proponent Sponsored Engineer Corps Training
PRP – Potential Responsible Party
PTL – Planning Technical Lead
Q's & A's – Questions and Answers
QA/QC – Quality Assurance / Quality Control
QM – Quality Manual
QMP –Quality Management Plan
QMR – Quality Management Representative
QMS – Quality Management System
RA – Risk Analysis/ Risk Assessment/Remedial Action
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
RITA – Relocation Income Tax Adjustment
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
S&S – Savings and Slippage
SAC – Charleston District/ Senate Appropriations Committee
SAD – South Atlantic Division (Atlanta, GA)
SADBU – Small and Disadvantaged Business Utilization
SAJ – Jacksonville District
SAM – Mobile District
SAME – Society of American Military Engineers
SAR – Safety Assurance Review
SAS – Savannah District
SAW – Wilmington District
SBH – Small Boat Harbor
SCD – Service Computation Date
SCORP – State Comprehensive Outdoor Recreation Plan
SCOTUS – Supreme Court of the United States
SCS – Soil Conservation Service
SD – Senate Document
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
SMSA – Standard Metropolitan Statistical Area
SOP – Standard Operating Procedure
SOS – Scope of Services/Scope of Studies
SOW – Scope of Work
SPA - Albuquerque District
SPD – South Pacific Division (San Francisco, CA)
SPF – Standard Project Flood
SPK – Sacramento District
SPL – Los Angeles District
SPN – San Francisco District
SR – Senate Resolution
SWD – Southwestern Division (Dallas, TX)
SWF – Fort Worth District

SWG – Galveston District/ Senior Working Group
SWL – Little Rock District
SWT – Tulsa District
T&A – Time and Attendance
T&ES – Threatened and Endangered Species
T&I – Transportation and Infrastructure (House)
TAD – Transatlantic Division
TAPES – Total Army Performance Evaluation System
TBA – To be Announced
TBD – To be Determined
TCM – Travel Cost Method
TDY – Temporary Duty
TMDL -Total Maximum Daily Load
TRC – Technical Review Conference
TSP – Tentatively Selected Plan/ Thrift Savings Plan
TQSE – Temporary Quarters Subsistence Expenses
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
WBS – Work Breakdown Structure
WCSC - Waterborne Commerce Statistics Center
WFO –Work for Others
WQ – Water Quality
WRC – Water Resources Council
WRDA – Water Resources Development Act
WS – Water Supply
WTA – Willingness to Accept
WTP – Willingness to Pay

Chapter 1 Introduction

a. Project Authorization

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

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

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

Table Rock Lake project authorizations include the following:

- The Flood Control Act approved 28 June 1938 (Public Law No. 761, 75th Congress, 3rd Session) as modified by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session) to include the authorization of the project for flood control and generation of hydroelectric power.
- Section 4 of the Flood Control Act approved 22 December 1944 (58 stat 889), as amended by Section 4 of the Flood Control Act approved 24 July 1946 (60 stat 642), as amended by Section 209 of the Flood Control Act approved 3 September 1954, as further amended by Section 207 of the Flood Control Act Of 1962, as further amended by Section 2 of the Land and Water Conservation Fund Act of 1965;
- Section 210 of the Rivers and Harbors Flood Control Act of 1968 authorized the Chief of Engineers, under supervision of the Secretary of the Army, to provide for recreational development and use of the lake projects under his control.
- Public Law 86-93, 86th Congress, (s. 42, approved 17 July 1959) modified the authorization of the project to include, without reimbursement, 27,000 acre-feet of storage to provide water for operation of a fish hatchery by the State of Missouri.
- Section 6, Public Law 78-534. Under Section 6 of Public Law 78-534 (the 1944 Flood Control Act), the Secretary of the Army is authorized to enter into agreements for surplus water with states, municipalities, private concerns, or individuals at any reservoir under the control of the Department of the Army. The price and terms of the agreements may be

as the Secretary deems reasonable. These agreements may be for domestic, municipal, and industrial uses, but not for crop irrigation.

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

b. Project Purpose

Table Rock Lake is a multiple purpose water resource development project operated primarily for flood risk management and hydropower generation. Additional purposes include providing water storage to supply a fish hatchery (Public Law 86-93 of 1959), recreation, and fish and wildlife mitigation to the extent that those additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project (Flood Control Act of 1944 as amended in 1946, 1954, 1962, 1965 and 1968 and the Water Resources Act of 1996). Table Rock Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Missouri and Arkansas. Additional beneficial uses include increased power output of downstream power stations resulting from the regulated flow from the Table Rock Lake project.

c. Purpose and Scope of Master Plan

This revised Master Plan replaces Design Memorandum No. 17-E, Updated Master Plan for Development and Management of Table Rock Reservoir approved December 1976. The Master Plan is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. The Master Plan guides the efficient and cost-effective management, development, and use of project lands. It is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

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

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

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

d. Brief Watershed and Project Description

The project is located in the scenic Ozark Mountain region of southwest Missouri and northwest Arkansas. The total area contained in the Table Rock project, including both land and water surface, consists of 62,208 acres. Of this total, 2,576 acres are in flowage easement (Note: a small difference in acreage figures exist throughout this document due to using GIS/survey plats data which is more accurate and based on new technology versus the deed language which were done many years ago without the aid of technology). The region is characterized by narrow ridges between deeply cut valleys that are forested with deciduous trees and scattered pine and cedar. When the lake is at the top of the conservation pool, the water area comprises 42,560 acres and 742 miles of shoreline. The shoreline is irregular with topography ranging from steep bluffs to gentle slopes.

Construction of Table Rock Dam was initiated in November 1954. The dam was completed in August 1958, and the powerhouse and switchyard were completed in June 1959. Table Rock Lake was declared operational for public use in March 1960. There are 26 public use areas

around Table Rock Lake. There are 14 parks on the lake presently managed by the Corps of Engineers, eight of which are operated by the Ozarks Rivers Heritage Foundation through a partnership agreement. The U.S. Forest Service has developed one park which they maintain and operate. One State Park is located on Table Rock Lake and it is operated by the Department of Natural Resources. One park is operated by a commercial concessionaire. One Park is operated by the City of Beaver, Arkansas. There are eight other public use areas operated by the Corps around the lake. A more detailed description of these parks follows in Chapter 2.

e. Listing of Prior Design Memorandums

A listing of prior design memorandums and accompanying supplements are provided in a table listing in Appendix C.

f. Pertinent Project Information

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

Table Rock Dam is located at river mile 528.8 on the White River in Stone and Taney Counties, Missouri, about six miles southwest of Branson, Missouri. The lake extends westerly along the White River to Beaver Dam at mile 609.0 and comprises lands in Taney, Stone, and Barry Counties in Missouri and Boone and Carroll Counties in Arkansas. Table Rock Lake is one of a series of five lakes in the Upper White River Basin in northern Arkansas and southern Missouri. The other lakes in the series are Beaver, located upstream, Taneycomo and Bull Shoals located downstream on the White River, and Norfork on the North Fork River.

The Table Rock project includes a concrete gravity-type dam with embankment extensions and a hydro-electric generating plant. The dam is comprised of 1,602 feet of concrete gravity section and 4,821 feet of embankments at a height of 252 feet above the streambed. The spillway section, 531 feet long, is located above the river channel and is controlled by 10 tainter crest gates 37 feet high by 45 feet long. In the base of the concrete section are four, 4-foot by 9-foot conduits and four, 18-foot diameter power penstocks. The power generating plant consists of four 50,000 kilowatt generating units. Table 1-1 summarizes the pertinent engineering data on the project. Real estate acquisition limits are shown in Table 1-2.

Table Rock Lake Dam was determined to have a hydrologic deficiency because the existing, original spillway would not safely pass the Inflow Design Flood (IDF) and/or Probable Maximum Flood (PMF) as described in ER 1110-8-2. The PMF (1,435,000 cfs) was based on a basin average Probable Maximum Precipitation (PMP) of 22.5 inches (excess of 19.06 inches).

In December 1994, the Little Rock District produced a Dam Safety Assurance Program Evaluation Report discussing the hydrologic deficiencies at Table Rock Dam and outlined several alternatives to correct those deficiencies. The report initially recommended raising the existing dam by ten feet and providing a temporary traffic detour via a newly constructed

downstream bridge. Although approval of the project was granted by the Acting Assistant Secretary of the Army for Civil Works, the Little Rock District was encouraged to continue to seek other alternative methods for maintaining traffic to reduce the overall cost of the project. During the initial stages of design, an idea was presented to construct an alternative auxiliary gated spillway that would be located approximately 3,500 feet north of the existing concrete dam. This plan would allow for construction to take place in the dry without the need for a costly cofferdam. Advantages of this plan (over the dam raising option) included the following: a) a temporary detour would not be required since traffic could pass uninterrupted along the existing roadway while the new auxiliary spillway was being constructed; b) the design elevation of the lake would be reduced by ten feet to the original elevation of 942; c) the environmental issues associated with the detour road and bridge would be eliminated, and; d) the overall project cost would be reduced.

Based on the factors listed above, the auxiliary spillway alternative was adopted as the solution for correcting the existing hydrologic deficiencies. Approval of the new alternative was formally requested in March 1996, and concurrence was received from HQUSACE in August 1996.

In general, the auxiliary spillway includes a gated ogee spillway, earthen embankment, spillway bridge, roadway, training dike, approach channel, and control house. The auxiliary spillway has eight, 48 ft wide by 46.75 ft (14.75 meter wide by 14.257 meter) high tainter gates with seven-10 ft (3 meter) wide intermediate piers. The concrete ogee weir has a crest elevation of 896 ft (273.10 meter), which match the crest elevation of the existing dam. Overall, the spillway is approximately 459 ft (140 meters) wide. These new gates provide a spilling capacity of 400,000 cfs. This increases the total spilling capacity of Table Rock dam to 950,000 cfs.

The auxiliary gated spillway and embankment is located approximately 3,500 feet north of the existing dam. The auxiliary spillway was placed here because a natural draw occurs just upstream of the existing embankment at this location (former Moonshine Beach area) and because the existing embankment was more shallow in this area, thereby lessening the construction cost. Although the location of the auxiliary spillway would seem to be an imposing threat to the structures located immediately downstream (i.e. fish hatchery and powerhouse), it should be noted that both of these facilities would already be beneath approximately 20 feet of water during flood risk management operations before the auxiliary spillway is ever operated. This 20 feet of water would be due to the releases that had already been allowed to pass through the ten gates on the existing dam.

Operation of the project related to the storage in the pools is twofold. Conservation pool storage is designed for holding water to be used for authorized purposes, both during normal conditions or during an extended period of below normal rainfall. The flood pool zone is for the temporary impoundment of water to be released after downstream high water has receded. The hydroelectric power plant produces electricity which is marketed by the Southwestern Power Administration, U.S. Department of the Energy. The dam was designed with spillway capacity to pass inflow with a maximum pool elevation of 942 feet m.s.1. Under less than extreme conditions, the lake is operated for a nominal flood control pool elevation of 931 feet m.s.l. Withdrawals of storage for authorized conservation uses, can cause the lake elevation to fluctuate between 915 feet m.s.1., which is the top of the conservation pool, and 881 feet m.s.1., the

bottom of the conservation drawdown pool. Under prolonged extreme conditions of low rainfall and runoff, the reservoir may be drawn as low as the maximum probable drawdown, elevation 846 feet m.s.l. to meet the long-range hydro-electric power commitments. During flood conditions, the lake level may rise into the flood control pool and it is possible to exceed the top of the flood control pool by raising the tainter gates. The lake can exceed the top of the flood control pool by several feet when raising these gates in an operation known as an induced surcharge operation. A summary of the inflow to the lake for the 90-year period from 1922 to 2012 is shown in Table 1-3. The area-capacity data for various elevations are furnished on Figure 1-1.

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 probability of failure 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.

Currently, Table Rock Dam is classified as a DSAC Class IV. However, due to completion of a recent periodic assessment (PA), the DSAC rating is recommended for change to a DSAC III rating. This change is based upon the consequence of downstream impacts and not on the condition of the dam itself. The official change in rating is expected to be approved by the end

of calendar year 2013. Subsequent actions resulting from this rating change will likely center on improvements to public communication and emergency response.

For more information on USACE Dam Safety, please reference the following website:

http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx

TABLE 1-1

PERTINENT DATA OF THE DAM AND LAKE	
General Information	
Purpose Stream States	FC, P (1) White River Missouri & Arkansas
Drainage area, square miles	4,020
Average annual rainfall over the drainage area, inches, approximately	45.4
Dam	
Length in feet	6,423
Height, feet above streambed	252
Top of dam elevation, feet above mean sea level	947
Generators	
Main units, number	4
Rated capacity each unit, kilowatts	50,000
Station service units, number	2
Rated capacity each unit, kilowatts	700
Lake	
Nominal bottom of power drawdown Elevation, feet above mean sea level	881
Area, acres	27,300
Nominal top of conservation pool Elevation, feet above mean sea level	915
Area, acres	42,644
Length of shoreline, miles	758
Nominal top of flood-control pool Elevation, feet above mean sea level	931
Area, acres	51,291
Length of shoreline, miles	927
Five-Year frequency pool	
Elevation, feet above mean sea level (flood pool)	921
Elevation, feet above mean sea level (drawdown)	902
FC – flood control, P – power	

TABLE 1-2
REAL ESTATE ACQUISITION LIMITS*

Item	Design Data
Elevation contour for land acquisition:	
Fee, feet above mean sea level	923
Flowage easements, elevation, feet above m.s.l.	936

**Note: See Chapter 2, Section M for further Real Estate information*

TABLE 1-3

NATURAL FLOWS AT TABLE ROCK LAKE 1922-2012		
Item	Acre-feet	Average rate (c.f.s)
Average annual 37 years	3,061,409	4,236
Maximum annual (1927)	7,362,300	10,190
Minimum annual (1954)	528,100	730
Maximum month (April 1945)	2,290,400	38,560
Minimum month (August 1954)	3,150	51

Figure 1-1: Frequency of Lake Elevation

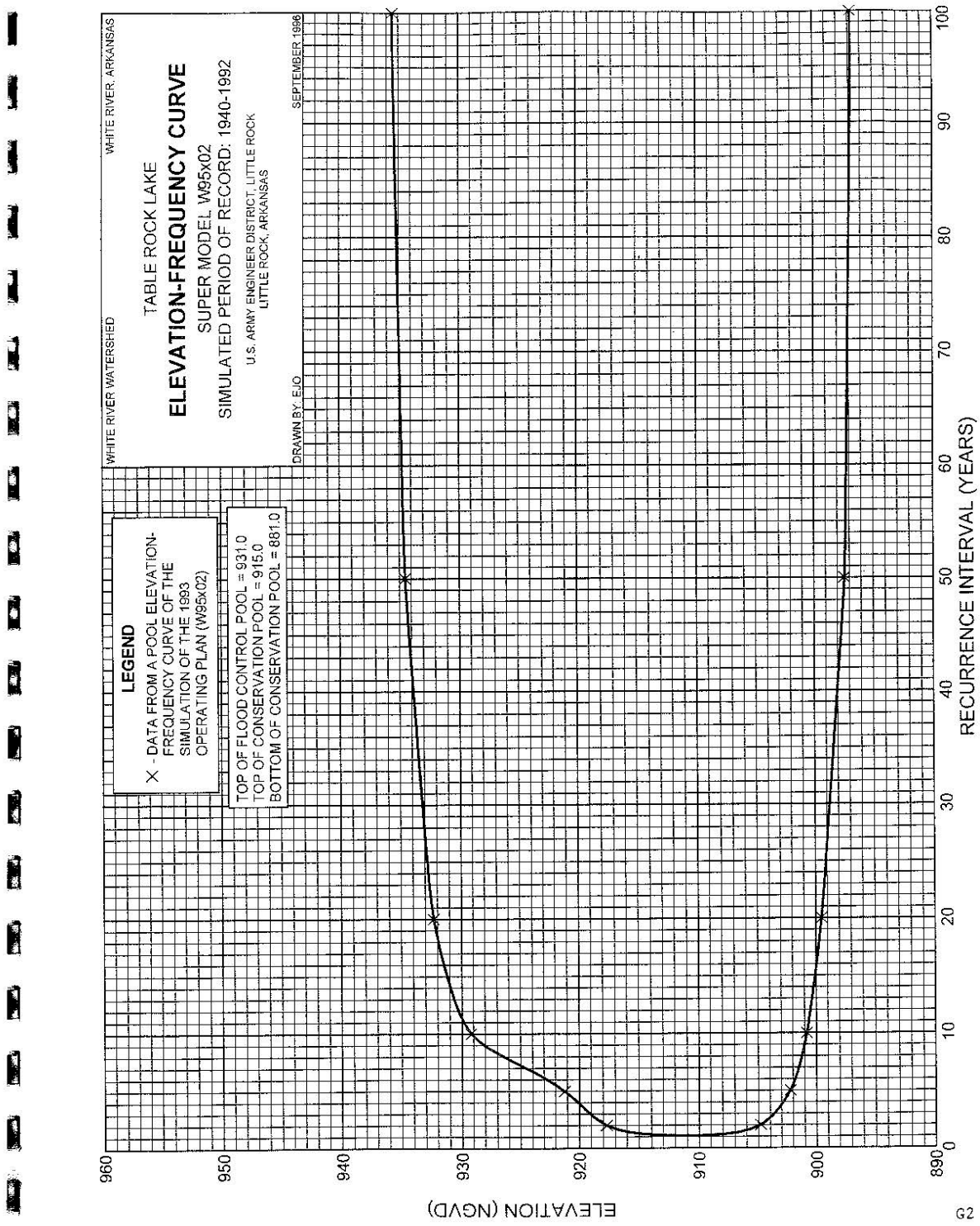

Figure 1-1: Frequency of Lake Elevation

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

a. Description of Reservoir

The project area is located in the heart of the Ozark Mountain region. Most of Table Rock Lake lies in southwestern Missouri with a very small portion of the lake in northwestern Arkansas. The waters of Table Rock Lake have become a playground for visitors from all over the nation. Table Rock Lake's water recreation and activities are as varied as the Ozark Mountain terrain that surrounds the lake.

With over 750 miles of shoreline, Table Rock's many coves and lake arms make boating and water recreation such as skiing, fishing, diving, and swimming especially popular. Commercial concessions like marinas and resorts are scattered throughout the lake and about 12 percent of the shoreline is made available for wet slip storage. Also scattered around the lake are public recreation areas that are known nationwide for camping, hiking, and other recreational uses.

Much of the shoreline has numerous subdivisions, as do the Branson and Kimberling City areas of the lake, which are highly developed. The predominate shoreline vegetation is an oak-hickory hard wood forest with pine and eastern red cedar scattered throughout. Numerous limestone bluffs are prominent landscape features found around the lake also. The Cow Creek area located on the south border in the central part of the lake remains relatively undeveloped.

The extent of Table Rock Lake and the striking landscape features, vistas, and water quality attract many visitors to the lake and surrounding area. The quality recreational and environmental resources of the project have greatly influenced the development of the entire region.

b. Hydrology and Groundwater

Three of the large springs of Missouri feed into Table Rock Lake. Reeds Spring is at the town of the same name in Stone County; Crystal Springs is one-half mile north of Cassville in Barry County; and Roaring River Spring is in Roaring River State Park, seven miles south of Cassville. A great many unnamed springs, both permanent and intermittent, are in the lake area, and all appear to derive their water from higher ground. Information from wells and small springs in the area indicates that the water table under the higher part of that portion of the lake rim is probably near elevation 900. Many impermeable zones exist which create perched water tables, and many of the shallow wells obtain their water from perched ground water pools. However, because of solution widened joints and structures in the rock, an interchange of water occurs between the formations that underlie the area and leaky aquifers which are common. Additionally, because of exposed fractured, weathered, permeable rock, percolation of surface water into the water table is common place.

The dam is located on the main stem of the White River with major tributaries being Kings River and Long Creek from the south and the James River from the north. The drainage is typically steep in the headwaters of the smaller streams and transitions to lesser slopes as they reach the main stem of the White River. These streams can experience flash flooding with intense rainfall. The area is primarily wooded and rural with the exception of the Highway 65 corridor from Branson to Springfield. The percent of the basin which is impervious has increased with the rapid development of the area, but still remains a small percentage of the overall watershed.

c. Sedimentation and Shoreline Erosion

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

Erosion of the residual soil containing cherts and clays accounts for the tumbled gravels found in streambeds of the watershed. Slopes can be as steep as 90 degrees and tend to be steeper in areas close to creeks or water bodies. Noticeable erosion can be found where gravel roadways lead up to boat launches and docks. Most of these embankments are steep and allow stormwater to pick up speed as it heads towards the lake. As gravel washes into Table Rock Lake it also carries smaller sediments and soils. Sediment is a large contributor to nutrient input into any water body.

d. Water Quality

Table Rock Lake has been listed by the Missouri Department of Natural Resources (MDNR) on Missouri's 303(d) list of impaired waters, approved by the Environmental Protection Agency (EPA), due to excessive nutrient concentrations, particularly nitrogen and phosphorus, since 2002. According to the Missouri's 303(d) list, these excessive nutrient concentrations occur most frequently in the James River, Kings River, and Long Creek arms of the lake. The upper portion of the White River is also listed as impaired for excessive chlorophyll and nitrogen. In the study by Jones et. al. (2008), it was shown that Table Rock Lake was an oligotrophic lake based on the samples taken near Table Rock Dam, while various arms or branches of the lake such as the James River mouth or Long Creek area receives water from these tributaries and shows tendencies toward being more eutrophic. Lake fluctuations associated with power production and flood control procedures produce changes in the environment along the shoreline of the lake. Turbidity adversely affects Table Rock Lake for short periods of time after heavy rains. During these periods of heavy runoff, urban areas and other parts of the terrain, especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. Table Rock, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. This naturally occurring phenomenon causes portions of the lake below the thermocline to be unfit for fish habitat because of low concentrations of dissolved oxygen. This undesirable water, when discharged downstream may cause some problems in the tailwaters. To

combat this problem, the dissolved oxygen content is monitored and various management measures are implemented to improve the dissolved oxygen concentration in the hydropower releases. A highly productive trout fishery has been established in Lake Taneycomo by the Missouri Department of Conservation because of the available discharge of cold water from the dam.

Water releases are generally made for power generation except in the case of flood control operation. SWPA markets power generated at this dam and other projects in the region. Four 50-MW generating units provide approximately 640,000 MWh annually. The typical peak flow for the hydro facility is 13,000 cfs. The maximum turbine discharge is 15,100 cfs.

Historically, Table Rock Lake experiences periods of up to five months (July-November) duration when dissolved oxygen (DO) concentrations are less than 4 mg/L near the turbine intakes. Accordingly, turbine release DO levels have been low enough to cause concern for downstream aquatic life.

During these low DO periods, there are various management measures that are implemented to improve the DO concentration in the hydropower releases that have been agreed-upon amongst the member agencies of the White River DO Committee and are described in the Table Rock Operational Action Plan developed and approved by the White River DO Committee prior to each low DO season. Turbine aeration modifications (vacuum breaker bypass, ring deflectors, hub holes, and booster baffles) were funded by Southwestern Power Administration (SWPA) and implemented at Table Rock in 1998, which provide for increase aeration of the hydropower releases when the turbine vents and bypass are blocked open (i.e. 'venting operation'), improving the DO concentration by as much as 3 mg/L. The turbine venting operation is the first management measure applied. Further DO concentration improvements can be achieved by SWPA voluntarily reducing the electrical output capacity of the generating unit, which allows for even greater entrainment of air in the hydropower releases. While the venting operation can improve release DO concentrations significantly, both of these measures can be costly due to efficiency losses. Additionally, reducing capacity hinders the plant's electrical peaking capability.

The venting operation can improve release DO concentrations significantly, but the plant derating is costly due to efficiency losses and loss of peaking capacity. In addition to using turbine venting and capacity reduction to increase DO, Table Rock is utilizing an existing oxygen system where oxygen is injected into the penstocks. The oxygen storage and injection system at Table Rock was installed in 1973 and has since been modernized for safety and increased liquid oxygen capacity. Currently, oxygen is injected into the penstock through two, ¾-inch piezometer taps around the lower perimeter of the penstock. The oxygen for this system is supplied from a liquid oxygen storage and supply facility consisting of two 52-ton (11,000-gallons each) liquid oxygen storage tanks and a set of water-cooled evaporators capable of producing at least 4,430 scfm of gaseous oxygen.

During the low DO season, electrical output capacity of the generating unit has been voluntarily limited by SWPA based on the Table Rock Operational Action Plan. The following is a quote out of the Table Rock Operational Action Plan for 2013 Low Dissolved Oxygen Season:

> Plan of Action: The operational objective is to sustain DO concentrations in the release at or above 6 mg/L as long as possible through use of the turbine venting systems improvements and to prevent DO concentrations from receding below 4 mg/L, if possible, through actions as outlined below. The plan to accomplish this consists of an oxygen monitoring program, improvements to the turbine venting systems, use of the oxygen injection system, and operational response actions scaled to the severity of DO depletions. Throughout the low DO season, all unit loadings by the powerhouse operator will take into consideration the turbine venting systems improvements to insure the release DO is as high as possible while meeting current electrical output requirements. When required generation combined with the use of the turbine venting systems improvements is insufficient to maintain DO concentrations at the first downstream monitor at or above 4 mg/L, then the use of the oxygen injection system and/or spillway releases will be used to maintain 4.0 mg/L in the downstream releases to the extent possible. (Table Rock Operational Action Plan 2013)

It should be noted that the inflow from Table Rock Lake watershed brings in nutrients, pollutants, and organic compounds that increase the oxygen demand within the lake and act to deplete the DO concentration. Therefore, future improvements to water quality in Table Rock Lake, through efforts addressing point and non-point sources of pollutants and nutrients in the watershed, will have a positive effect on the DO concentration in Table Rock Lake and subsequently on the hydropower releases.

In September 2010, the Tennessee Valley Authority (TVA) released a report ("Table Rock Project Forebay Oxygen Diffuser System Report Update, September 29, 2010") that presented an analysis of a 'Forebay Oxygen Diffuser System' at Table Rock Lake; this forebay oxygen diffuser system would work in conjunction with the existing venting operation and oxygen injection system to help alleviate the low DO concentrations Table Rock Lake experiences. It was decided at that time, however, that the new system was too costly to install, and that operation and maintenance costs would also be very high; as a result, the existing plan of action (use of the venting operation plus the existing oxygen injection system) would continue to be used and would attain the desired results needed during events of low DO concentrations.

e. Project Access

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

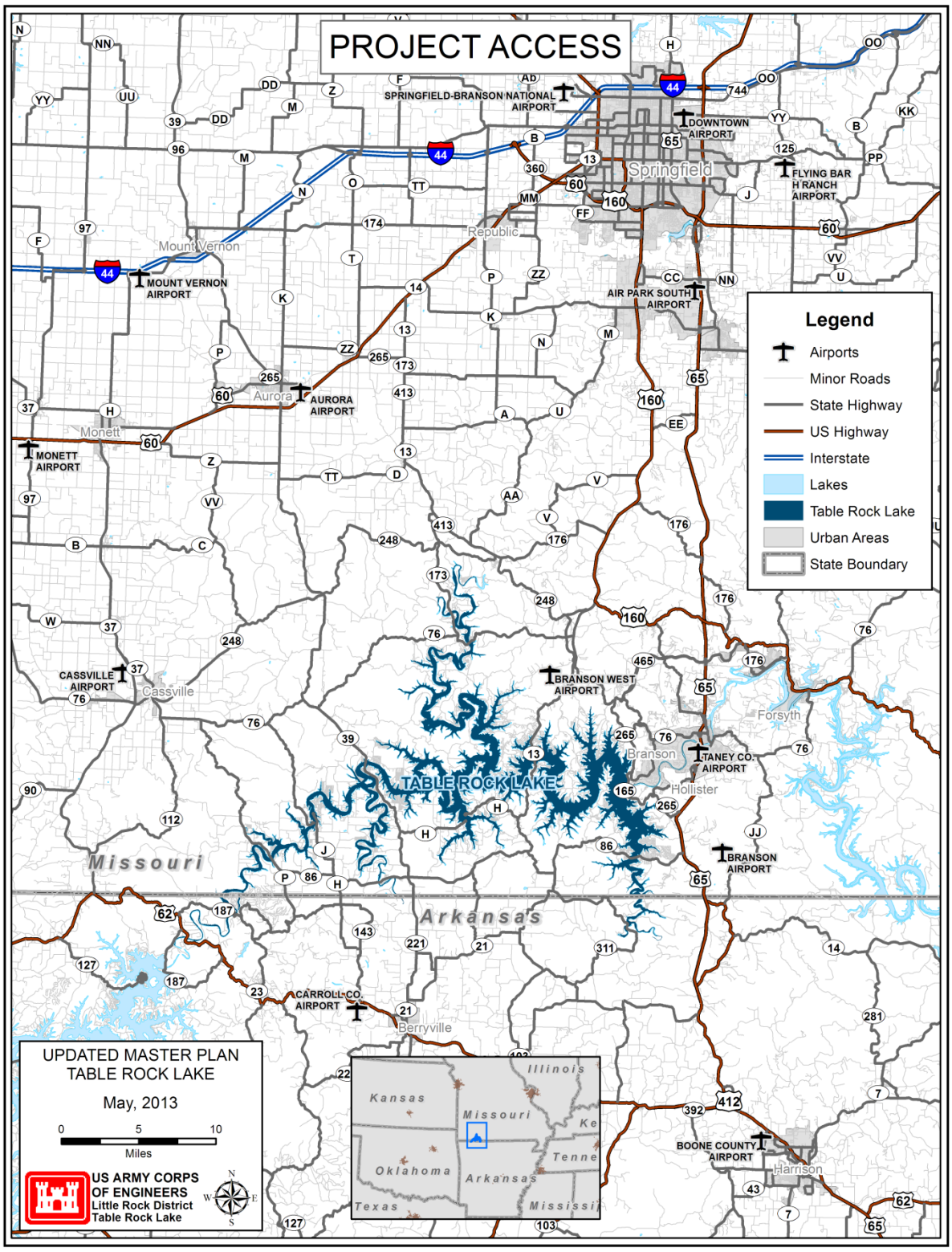

Figure 2-1 Table Rock Lake Project Access

f. Climate

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

g. Topography, Geology, and Soils

Table Rock Lake is on the southwest flank of the Ozark uplift, a structural and topographic high, which is often referred to as the Ozark Plateaus province. The plateau surfaces of this province are underlain by gently dipping, sedimentary bedrock. The highest ridges in the area surrounding the lake are a part of the Springfield Plateau, the middle level of the plateau province, which in this region rises to an elevation of about 1,400 feet. In this region the river and its tributaries have entrenched themselves about 700 feet below the plateau surface. As a result, the plateau has been deeply dissected by erosion and the original surface is present only as the tops of narrow steep ridges.

Bedrock strata exposed in the uplands bordering the lake are of Mississippian and Ordovician age. The formations of Mississippian age underlie the plateau surface and most of the higher slopes of the basin and in most areas are well away from the lake and associated lake shore developments. Strata of the Jefferson City-Cotter Formation of Ordovician age underlie the lake and the adjoining slopes. This formation is predominantly dolomite but contains subordinate amounts of chert, quartzite, sandstone, and shale. Most of the strata are more or less argillaceous, and several have been silicified in various degrees. Chert occurs as nodules, and in thin beds along with sandstone or quartzite. Shale occurs as material along partings, and as thin seams along bedding planes.

The strata about the lake appear to be nearly horizontal, but are warped gently over a large area by the Osage-Verona anticline, the crest of which is aligned over the Kings River arm of the lake. Two major faults are in the lake area (figure 2-2). These are very old and there are no indications of recent movement along them. One, a part of the Shell Knob - Eagle Rock structure crosses Roaring River where it empties into the lake. It trends about N. 37 E., and is downthrown on the east. It has no effect on the strata beyond the immediate vicinity of the fault. The other, Lampe fault crosses under the Highway 13 White River bridge. It trends N. 30 E., has a displacement of about 190 feet, and is downthrown on the east. Joints observed in rock along the lake are nearly vertical and do not carry through many beds. The strike of the most prominent set (primary) ranges from N. 5 E. to N. 10 W. A secondary, more poorly developed set intersects these at near right angles.

The region surrounding Table Rock Dam is subject to infrequent, mild, seismic shocks but not within recorded history are any shocks of sufficient intensity to damage structures or property.

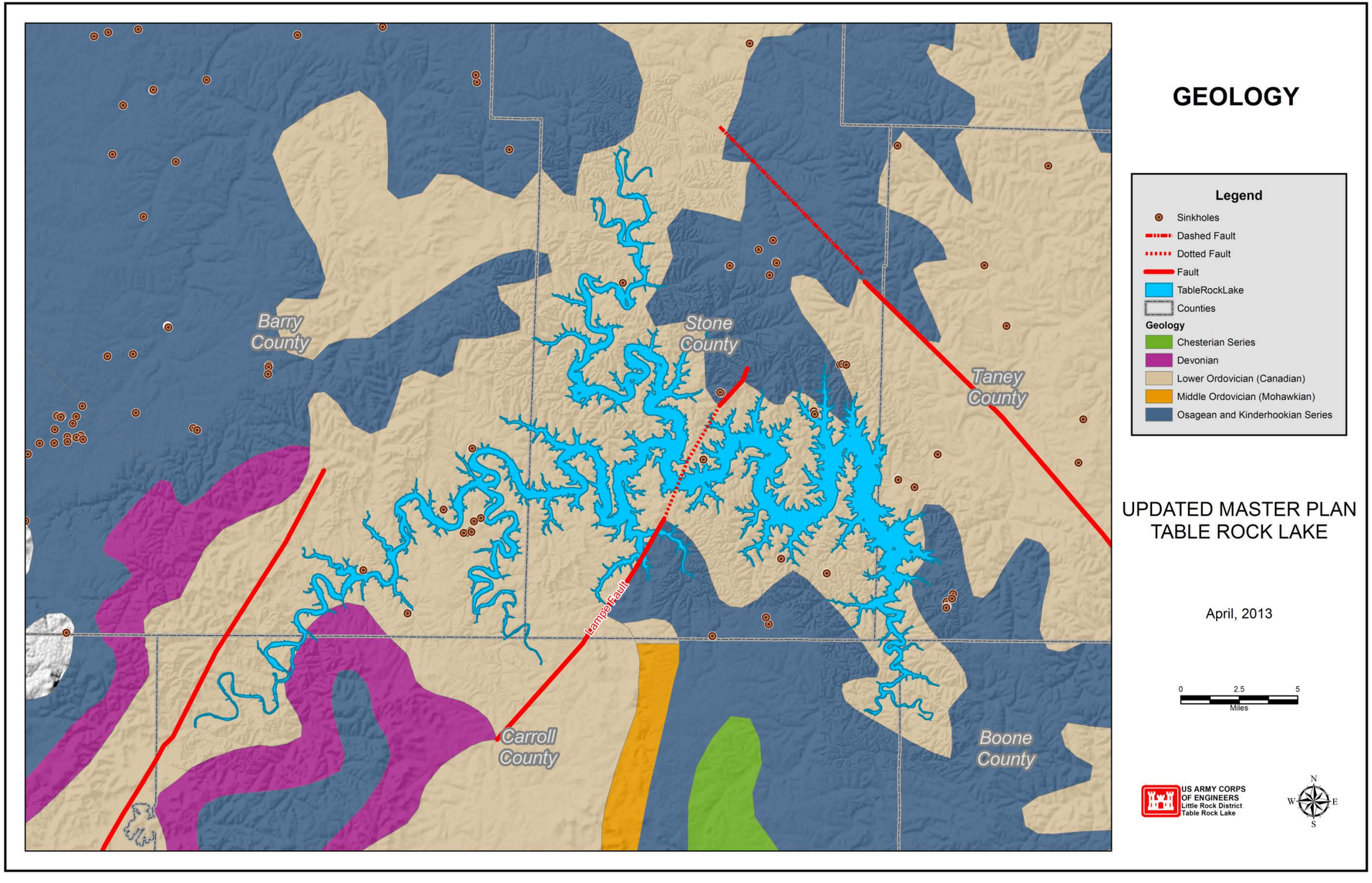

Figure 2-2Geology and Fault Lines of Table Rock Lake

Although the bedrock of the region is soluble, most of the basin where it is underlain by the dolomites of the Jefferson City-Cotter Formation is characterized by surface drainage. This is indicated by the scarcity of important sinks, the absence of large areas without surface drainage, and a well developed stream system with normal well-branched tributaries. Two caves, Marvel Cave and Fairy Cave, are operated commercially in the region of the lake. Both caves are in the Boone Formation and extend into the Jefferson City-Cotter Formation. However, it should be noted that over most of the area in the Jefferson City-Cotter Formation is not favorable to the extensive development of caves, and those noted in the formation are small.

The most significant factor limiting the development of project land is topography. The typical ruggedness of this area hampers intensive development in many locations, and limits the number of sites containing appropriate slopes and adequately-sized areas of land desirable for the location of water access recreation facilities. Extensive alteration of landforms is not acceptable under Corps of Engineers guidelines.

The geology of the area imposes no unusual restraints on construction. However, ground water pollution is a potentially severe problem because of the easy access of surface water into the water table and of the free interchange of water between rock formations. Soils around the lake, except in the flood plain, and terrace deposits along the streams, are principally residual material formed by decomposition of the dolomite beds. Generally, they are silty soil over clay subsoil, both containing chert fragments from sand size up to small boulders. The material is loose and friable near the surface but becomes harder and more compact with depth. Contacts of leached chert, disintegrated limestone, and plasticity also increase with depth. As much as 20 feet of residual soil has been encountered by borings, but at most places it is less than 8 feet thick and in some places it is entirely absent. Flood plain material consists of silt and sand over sandy, chert gravel at many places in stream channels. Most of the soils in the vicinity of the lake are low in fertility.

The following four soils associations are found in and around the Table Rock Project area: Clarksville-Noark, Captina-Nixa, Caydon-Pembroke-Sogn, and the Caydon-Sogn. Most of the soils found in the Table Rock project do have characteristics which must be considered in development. The ability of soils to withstand intensive use should be investigated prior to initiation of construction. Trampling on these sites may cause soil compaction, resulting in increased surface runoff and accelerated erosion. Also, vegetative cover may be affected because of the reduction of air and water holding capacity of the soil. It should be noted, however, that soil compaction on use sites is not now a major problem because most of the soils are stoney and resist compaction. Another factor in some areas is shoreline erosion resulting from wave action which may cause serious problems in maintenance and hamper development of water related facilities.

Detailed soil survey information can be found through the Natural Resources Conservation Service.

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 Resource 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). The OMP is a five-year management plan setting forth detailed information required to implement the concepts set forth in the master plan. 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

The impoundment of the White River and other tributary streams and rivers which form Table Rock Lake resulted in changes in the composition of the fish populations. Smallmouth bass was the principal game fish found in the White River prior to impoundment. MDC is the agency primarily responsible for managing the fishery and through their efforts a variety of fish species are well-established in the lake. Sport fish species currently found include: largemouth bass, spotted bass, smallmouth bass, white bass, walleye, flathead catfish, channel catfish, white crappie, black crappie and paddlefish. Due to the quality and diversity of the fishery, Table Rock Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

Table Rock Lake was first impounded in 1959. Since impoundment, the native forests that were submerged provided much structure and forage habitat for fish. This habitat has degraded over time and in 2007, the Table Rock Lake National Fish Habitat Initiative (NFHI) began with the primary objective to improve fish habitat within Table Rock Lake. Improved water quality, along with placement and monitoring of artificial structures are additional goals of this project. This project has developed a framework for a broader national habitat program. Since 2007, 2,096 fish habitat structures have been placed in Table Rock Lake. Structures include piles of hardwood and evergreen trees, stumps, and rocks.

The impoundment of Table Rock Lake caused environmental changes in the tailwater portion of the White River downstream from the dam. MDC realized that the cold water discharges from Table Rock Lake would necessitate a change in their fisheries management program for Lake Taneycomo, a 2,080 acre lake formed by the construction of Powersite Dam on the White River in Taney County, Missouri. Rainbow trout and brown trout were stocked in Lake Taneycomo to replace the warm-water fishery. This cold-water fishery is a success. However, because of various unfavorable environmental factors such as lack of suitable substrate, fluctuation of water temperatures and dissolved oxygen levels, and pulsation of water current and water level, trout reproduction is very limited. Shepherd of the Hills trout hatchery has been established

downstream from Table Rock Dam by the MDC. Public Law 86-93 provided that 27,000 acre-feet in the power drawdown storage not to exceed 22 cubic feet per second would be for the use of this hatchery. Approximately 700,000 rainbow and 10,000 brown trout from Shepherd of the Hills Hatchery and from hatcheries of the U.S. Fish and Wildlife Service are stocked in Taneycomo annually. The trout fishery has flourished and is now Missouri's largest and most popular trout fishing destination. Fishing effort has increased from approximately 25,000 fishing trips in 1959 to 140,000 fishing trips in 2009.

Paddlefish and walleye have been introduced into Table Rock Lake to add diversity to the fishery. Natural reproduction of paddlefish in Table Rock Lake is considered minimal. MDC stocks approximately 7,500 paddlefish in the James River Arm each year. Walleye have been stocked by both Arkansas Game and Fish Commission (AGFC) and MDC. MDC has stocked over 350,000 walleye in the James River Arm and these fish are now reproducing on their own .

White-tailed deer and eastern wild turkey are common game animals found and hunted in the Table Rock Lake area. Black bear have become more common in the area over the past few years though Missouri has yet to demonstrate that the black bear population is large enough to sustain hunting.

The principal small game species found in the Table Rock Lake area in open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas and are also popular for sportsmen. Habitat management that includes removal of exotic species and application of prescribed fire do much to benefit these populations.

The ringed-neck duck and lesser scaup are the predominant migratory waterfowl species visiting the Table Rock Lake area. Mallard ducks are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters discourage them from obtaining food from the deep, clear waters of Table Rock Lake. Migratory geese common to the area are lesser snow geese and Canada geese of the Eastern Prairie Population. Giant Canada geese were introduced to the area by the MDC in 1971 and 1972 and have become established as a resident population. Resident giant Canada geese are in fact so numerous in several coves that their presence has become a nuisance. Several egg and nest destruction permits are issued every year to limit local reproduction. Ring-billed gulls are seen frequently around the Table Rock Lake area. Greater and lesser yellow legs are also seen during their peak migration in the spring and fall. Table Rock is also one of the few places in Missouri where visitors can see both the turkey vulture and the black vulture at the same time in the winter.

Principal furbearing animals found in the Table Rock Lake area are mink, muskrat, beaver, and raccoon. In recent years, otters have become more prevalent around the lake.

(2) Vegetative Resources

The area surrounding the lake is mostly forested. Trees and shrubs around the lakeshore include persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, snowberry, sumac, and buttonbush. Frequent periods of inundation keep the thin strip of government owned lands

around the lake in early stages of succession. Red cedar, the principal evergreen, is dispersed throughout the region and is found in many large, scattered groups. Ground covers consist of green briar, sedge, and native grasses.

In 1999 a large tract of land was exchanged between the Corps of Engineers and the U.S. Forest Service in the Cow Creek area. The Corps gained a block of land that is approximately 3,300 acres. Land cover types in this area consist mainly of a deciduous forest. Evergreens consist of shortleaf pine that was planted by the U.S. Forest Service along the ridge tops and red cedar in the side slope glades. See figure 2-3 Cow Creek Block Land Cover.

Figure 2-3 Cow Creek Block Vegetation

(3) Threatened & Endangered Species

There are many species in the Ozarks that are considered either threatened or endangered. Species become imperiled for a variety of reasons including over-hunting, over fishing, and habitat loss as a result of human development and pollution; of these, habitat loss is the main contributor that imperils most species. A threatened species is one that is likely to become endangered within the foreseeable future. An endangered species is one in danger of extinction throughout all or a significant portion of its range. The bald eagle, Halieetus leucocephalus, is common during the winter months around Table Rock Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the Bald and Golden Eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. Black vultures, a species of conservation concern, also nest in the Table Rock area. Transient populations of gray bats, a federally endangered species are documented near the Table Rock dam area. The following species listed in Table 2-1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Missouri Natural Heritage data set which have been reported on project lands. There are other threatened and endangered species that are known to be in the area.

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

Common Name	Scientific Name	Federal/State Status	State/Global Rank
Bald Eagle	*Halieetus leucocephalus*	T/unknown	
Gray Bat	*Myotis grisescens*	E/E	S3/G3
Black Vulture	*Coragyps atratus*	-	S3/G5
Bush's Poppy Mallow	*Callirhoe bushii*	-	S2/G3

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

(4) Invasive species

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

every year. Table Rock Project is not protected from the spread of invasive species. Locally the project office works with its partners, MDC and United States Department of Agriculture, to help stop the spread of some of the Ozarks most unwanted species. These would include feral hogs (*Sus scrofa),* zebra mussels (*Dreissena polymorpha),* and the emerald ash borer (*Agrilus planipennis*). Project rangers post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Rangers also place emerald ash borer traps on project lands to monitor any infestations of this species.

(5) Ecological Setting

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

> *The Army Corps of Engineers is the steward of the lands and waters at Corps water resources projects. Its Natural Resource Management Mission is to manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations.*
>
> *In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance and restoration practices.*
>
> *The Corps manages for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.*
>
> *The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life.* (ER 1130-2-550 1996)

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

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

A large area that includes generally similar ecosystems and that has similar types, qualities, and quantities of environmental resources is known as an ecoregion. The purpose of ecological land classification is to provide information for research, assessment, monitoring, and management of ecosystems and ecosystem components. Federal agencies, state agencies, and nongovernmental organizations responsible for different types of resources within the same area use this

information to estimate ecosystem productivity, to determine probable responses to land management practices and other ecosystem disturbances, and to address environmental issues over large areas, such as air pollution, forest disease, or threats to biodiversity.

The ecoregion Table Rock Lake and surrounding areas fall under is labeled as the "Ozark Highlands". This ecoregion is defined as follows:

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

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

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

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

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

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

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

(6) Wetlands

Wetland areas are relatively limited on project lands and throughout the adjacent government property surrounding the lake. This is due to the steeply sloped terrain and thin, rocky soil layers overlying bedrock along the shoreline, both of which do not typically support wetland vegetation. The sparse wetland areas that occur within the lake surface area have mostly formed as mud flats within the upper reaches of the major tributaries to the lake. Additionally, a few coves on the lake have also established small wetland areas. This is due to sediment washing from streams and accumulating at the point where the stream bed enters the normal lake surface at the upper end of the cove. These areas can support emergent wetland vegetation at times depending on seasonal flooding and the controlled lake elevation.

Within the State of Missouri, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) indicates approximately 12 acres of wetlands occurring within the lake surface area and in adjacent floodplains. The NWI maps also indicate wetlands in the Arkansas portion of the lake, but approximate acreages are not included. The majority of this wetland acreage is classified as palustrine scrub/schrub, either seasonally or temporarily flooded. Further, there are some areas mapped as palustrine forested occurring within wooded floodplain areas along the upper reaches of the James River, Kings River, and Long Creek.

i. Cultural Resources

(1) Prehistoric

Evidence of human settlement in the Ozark region can be traced back about 14,000 years, coinciding with the end of the last ice age. Early Native Americans in the region were likely a mixture of hunter-gatherers, utilizing caves and bluffs seasonally for shelter near waterways. These nomadic tribes claimed territories, which they would use seasonally for hunting, fishing, and gathering. While the archeological record shows evidence of human settlement in the Ozarks, it is difficult to identify all tribes that made this region their home.

Prehistory is primarily divided into four periods: PaleoIndian (10,000-7,800 BC), Archaic (7,800-800 BC), Woodland (800-950 AD), and Mississippian (950-1600 AD). The PaleoIndian period marks the earliest evidence of habitations in the Ozark region. The emergence of the Archaic period witnesses an increase in populations and larger seasonal encampments on the bluffs along the White River, and its tributaries. The introduction of earthen pottery and the bow and arrow is generally recognized as the Woodland Period in the Ozarks. The Mississippian Culture emerges, flourishes, then declines in present-day. Mississippi River Valley and southeastern U.S. Burial mounds, domestic structures, agriculture, and more permanent settlements characterize this era. The Jenkins Cave, located near the head of Bull Creek, and Slow Drip Rockshelter in southern Stone County, contained evidence of a Mississippian component due to the presence of shell-tempered pottery and triangular arrow point. Oral and early written history and archeological evidence suggest some tribes known to have lived or hunted in the Ozarks include the Osage, Caddo, and Quapaw.

(2) Historic

Historically, Ozark country of southwestern Missouri and northwestern Arkansas had few, if any, white settlers before the nineteenth century. Henry Schoolcraft, the first traveler to document his excursions to the region, traveled this portion of the White and James Rivers in 1818 and 1819 while making a survey of lead mines in southwestern Missouri. The turbulent period of the Civil War was keenly felt in southwestern Missouri and northwestern Arkansas. Two of the major battles west of the Mississippi were fought in this part of the country: one in southwestern Missouri at Wilson's Creek and one in the northwestern corner of Arkansas, the Battle of Pea Ridge.

The areas surrounding Table Rock have several historical sites that are significant on the local and regional level. None of these sites have national significance. However, when combined with others like them across the country they record the theme of the American way of life. Marvel Cave, which is located at Silver Dollar City, Missouri, the largest privately owned commercial tourist attraction in the Table Rock Lake area, is listed on the *National Register of Natural Landmarks.*

In the southern portion of the Ozarks in Eureka Springs, Arkansas, much of the rich cultural heritage lies along an area that was once traversed by Native American people during the Trail of Tears. The Bluff Shelter at Blue Springs, which is listed on the *National Register of Historic Places*, is a small shelter that has evidence of prehistoric occupation that dates as far back as 8,000 BC. The small town of Beaver, Arkansas, has a rich historic significance. Beaver Park, which borders the little community of Beaver, was the home place of Squire Beaver, a legendary resident of the portion of the White River which is now the upper end of Table Rock Lake. Beaver Park is the only project property with any specific historical significance. The Beaver Bridge, which is listed on the *National Register of Historic Places* and on Table Rock Lake property, survives as one of three wire cable suspension bridges left in Arkansas and as an outstanding example of Early Transportaion Era (1903-1922) engineering. This entire portion of the Ozarks, however, represents a heritage of determined mountain dwellers who adapted to a rough way of life in order to survive. Examples of how dwellers of the Ozarks lived historically can be seen in some of the private tourist attractions within the Table Rock Lake region.

Previous Investigation in the Table Rock Lake Area

The waterways are so important archeologically that the major physiographic regions of the state were subdivided by stream drainages to facilitate the survey and excavation of the archeological resources. A survey of the Table Rock Lake area was conducted under the supervision of Carl Chapman, University of Missouri, in 1951, with additional excavations and testing being conducted by Chapman from 1955 through 1959 during the construction phase of Table Rock Dam. At the conclusion of the work in 1959, 872 sites had been identified in and around Table Rock Lake. Subsequent studies include “Archaeological Assessments Report No. 49, Cultural Resources Survey at Selected Locations, Table Rock Lake, Missouri and Arkansas, 1986”; “Archaeological Assessments Report No. 167, Archeological Investigations at 3CR238, 1993”.

Recorded Cultural Resources in the Lake Area

Today, Table Rock fee land is home to 1,076 archeological sites made up of open camp sites, shelter and cave sites, rock cairns, and earthen mound sites. Less than one percent of the known

sites within the lake area were investigated any further than documentation. However, Chapman concluded that a reasonable picture was obtained of the archeological potential in the lake area.

j. Demographics

Population and per capita income within the Table Rock Zone of Influence is projected to increase through the year 2040 as shown in Table 2-2. This zone includes the urban areas of Kansas City and St. Louis, Missouri, as well as Tulsa and Oklahoma City, Oklahoma; Little Rock, Arkansas; and Memphis, Tennessee. Other cities of significant size within the zone of influence include Springfield, Joplin, Jefferson City, and Columbia, Missouri; Fort Smith, Jonesboro, and Pine Bluff, Arkansas; and Muskogee, Oklahoma. The zone is further described in section l. (4).

Table 2-2

Population and Income Projections for the Table Rock Lake Zone of Influence

Year	Population	Per Capita Income
2000	11,625,921	$25,885
2010	12,719,370	$36,496
2020*	13,470,538	$49,316
2030*	14,385,042	$61,247
2040*	15,299,547	$73,177

*Data for these years are forecasted estimates based on historic rates of growth

Data from www.census.gov

Racial and ethnic information for the Table Rock Zone of Influence are shown in Table 2-3.

Table 2-3

Race and Ethnicity by State for the Table Rock Lake Zone of Influence, 2010 (percent)					
	Missouri	**Arkansas**	**Kansas**	**Oklahoma**	**Total in ZOI**
White	93.0	84.2	91.6	72.6	**85.4**
Black	3.9	12.5	3.3	4.1	**6.0**
American Indian or Alaska Native	0.6	0.9	1.5	15.5	**4.6**
Asian	0.7	0.8	1.0	0.8	**0.8**
Native Hawaiian or Other Pacific Islander	0.1	0.1	0.1	0.1	**0.1**
Two or More Races	1.7	1.6	2.6	6.9	**3.2**
Hispanic or Latin Origin	2.6	4.9	5.4	4.6	**4.4**
Not Hispanic, White Only	90.8	79.8	86.9	69.2	**81.7**

The tourism generated by Table Rock and its surrounding attractions is the basis for the economic and population growth of the immediate area of the lake.

Population density varies from 9,000 persons per square mile in St. Louis proper to only a few per square mile in many rural counties throughout the zone. Birth and mortality rates do not vary significantly from the average national rates. Population within the zone continues to grow with the most significant growth occurring in the cities. This is due to the younger people moving from rural to urban areas, and workers continuing to move from farming to industrial jobs.

Per capita income within the Table Rock Lake Zone of Influence is steadily increasing as it has for the past twenty years. The most rapid economic growth has occurred in Oklahoma where the per capita income increased about 50 percent during the 2000's. All four States within the zone are experiencing more economic contribution by industry. Kansas City and St. Louis, both within the zone are important trading centers for large regions. They rank among the foremost in the nation as grain and cattle markets. Food processing, aerospace, transportation equipment, pet foods, prefab houses, mobile homes, greeting cards, tires, paint, appliances, fuels, and chemical processing are among the types of manufacturing playing major roles in the economy of the zone. Agriculture makes a substantial contribution to the zone's economy with livestock, dairy, hogs, poultry, soybeans, cotton and rice production among the most influential. Tourism is

becoming increasingly important in Arkansas and Missouri with contributions of millions of dollars annually to each state's economy. Public education programs range from some of the worst in the nation to some of the best. All four states within the zone have advanced education programs with numerous state supported colleges and universities. Table 2-4 shows the rate of educational attainment within the Zone of Influence as well as a breakdown of the population's ages.

Table 2-4

Age and Education by State for the Table Rock Lake Zone of Influence, 2010 (percent)					
	Missouri	**Arkansas**	**Kansas**	**Oklahoma**	**Total in ZOI**
Under Age 5	6.2	6.2	6.3	6.5	**6.3**
Between Ages 5 and 18	23.3	23.3	23.8	24.2	**23.6**
Between Ages 18 and 65	53.7	53.6	53.4	53.4	**53.5**
Age 65 and over	16.8	17.0	16.5	15.9	**16.5**
Age 25 or up, High School Degree or Higher	82.7	79.7	89.0	83.6	**83.7**
Age 25 or up, Bachelor's Degree or Higher	16.2	14.3	21.6	17.3	**17.4**

Cultural opportunities vary within the Table Rock Zone of Influence, from Ozark folk culture found throughout northern Arkansas and southern Missouri to professional symphony and ballet companies as well as concert facilities, professional sports teams, museums, a world-class American art museum, and other such activities available in Kansas City and St. Louis.

k. Recreation Facilities, Activities and Needs

The recreational opportunities and potential of Table Rock Lake is considered to be of great importance to this Ozark Mountain region. The project offers many recreational activities such as swimming, SCUBA diving, boating, water skiing, fishing, picnicking, camping, as well as hiking and biking trails. There are 26 public use areas around Table Rock Lake. There are fourteen parks on the lake presently managed by the Corps of Engineers, eight of which are operated by the Ozarks Rivers Heritage Foundation through a partnership agreement. The U.S. Forest Service has developed 1one park which they maintain and operate. One State Park is located on Table Rock Lake and it is operated by the Department of Natural Resources. One Park is operated by a commercial concessionaire. One Park is operated by the City of Beaver, Arkansas. There are eight other public use areas operated by the Corps around the lake.

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

(1) Facility Information

The siting of facilities and development of parks should be of the highest quality, should be safe, and should promote the health, welfare, and aesthetic enjoyment of the public. The siting of each facility should result in the compromise between conservation of the natural environment and providing for public use. Only the most adaptable terrain should be used for siting of overall facilities with consideration given to the natural features so that the most scenic parts of the site may remain undeveloped for the enjoyment of visitors. Facility siting should be in harmony as much as feasible with the environment in which they are to be placed to avoid excessive grading and clearing for site preparation.

(2) Recreation Areas

Aunts Creek-This 59 acre park lies on the east shoreline of the Aunts Creek arm, a tributary of the James River, at the end of Missouri State Highway OO (Plate PM–1). Facilities include a park booth, 56 campsites, four picnic sites, one shower house with restrooms, two restrooms, swim beach, playground, group pavilion, two launch ramps, two courtesy docks, and a RV dump station. Water is supplied by one permitted well and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation.

***Future improvements include the following*:** Rehabilitation and modernization to campsites 1 – 31 and 32 – 56, including upgrading utilities to 50 amp electric service and water to each site.

Baxter- This 60 acre park is located on the east side of the Big Indian Creek arm at the end of Missouri State Highway H (Plate PM–2). Facilities include a park booth, 54 campsites, four picnic sites, one shower house with restrooms, two restrooms, swim beach, playground, launch ramp, courtesy dock, and an RV dump station. Water is supplied by one permitted well and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation. The park has a commercial marina concessionaire.

Future improvements include the following: Construct 12 new campsites on the southeast side of the park.

Beaver Town Campground (Concessionaire)- This seven acre park is operated by the town of Beaver under long-term contract with the U.S. Army Corps of Engineers and is located in the town of Beaver, Arkansas, on the White River between Beaver Lake and Table Rock Lake and is

seven miles NW of the Town of Eureka Springs (Plate PM–3). Facilities include a park booth, 44 RV sites, ten tent sites, five picnic sites, two shower houses (currently shut down), restrooms, swim beach and swim deck, playground, group pavilion, high and low water launch ramps, and an RV dump station. Water is supplied by one permitted well. A contractor periodically removes waste water and sludge. All sites have potable water and electricity. Fifteen RV sites are full hook up.

Future improvements include the following: Restoration of the swim beach and improving the walking trail by extending it across the old railroad bridge to Holiday Island to connect with their trail.

Big Bay (USFS)- Big Bay Recreation Area is set in a red cedar and hardwood forest on the shore of Table Rock Lake . The facility features the following: picnicking, vault toilet in picnic area, and a boat ramp with parking area near picnic area. In April 2013, an announcement was made by Mark Twain National Forest officials stating the campground portion of the park would be closing while the boat launch and picnic area would remain open. Visitors will need to bring their own water for drinking. Only a launch ramp, road, and parking are located on US Army Corps of Engineers property.

Big Indian - This 52 acre park is located on the west shoreline of Big Indian Creek arm of the lake at the end of State Highway H. Camping is currently prohibited. This park has a launch ramp, courtesy dock, and is only open for day use activities.

Big M- This 97 acre park is located on the north shore of the White River arm at the end of Missouri State Highway M (Plate PM–5). Facilities include a park booth, 60 campsites, seven picnic sites, two shower houses with restrooms, two restrooms, swim beach, playground, launch ramp, courtesy dock, and an RV dump station. Water is supplied by one permitted well, and sewage is disposed of by a non-permitted drip irrigation system. Wastewater and sludge is intermittently removed by a contractor. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 1 – 17 and 32 – 46, including upgrading utilities to 50 amp electric service and adding water to each site.

Campbell Point- This 110 acre park is located on the north shore of the White River arm five miles east of the town of Shell Knob, Missouri (Plate PM–6). Facilities include a park booth, 76 campsites, five picnic sites, two shower houses with restrooms, swim beach, playground, group pavilion, launch ramp, courtesy dock, and an RV dump station. Water is supplied by two permitted wells, and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 48 – 75, upgrading utilities to 50 amp electric service, and adding water to each site, and constructing a new road to service the marina, which would separate marina traffic from the campground traffic.

Cape Fair- This 77 acre park is located approximately one mile southwest of the town of Cape Fair, Missouri (Plate PM–7) . Facilities include a park booth, 81 campsites, four picnic sites, two shower houses with restrooms, two restrooms, two launch ramps, two courtesy docks, swim beach, playground, group pavilion, and RV dump station. Water is supplied by two permitted wells, and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation. The park has a commercial marina concessionaire**.**

Future improvements include the following: Rehabilitation and modernization to campsites 38 – 82, including upgrading utilities to 50 amp electric service and adding water to each site.

Coombs Ferry – (Plate PM-8) This 64 acre park is located at the end of Missouri State Hwy JJ on the south side of the lake. Camping is currently prohibited. This park has a launch ramp and is only open for day use activities.

Cow Creek – (Plate PM-9) This 63 acre park is located on the south side of the lake. Approximately 56 acres is leased to the Boy Scouts of America. The Boy Scout camp includes campsites, one shower house with restrooms, launch ramp, and a group pavilion. Water is supplied by a permitted well and sewage is disposed of through a permitted discharging system. Approximately seven acres is managed by the Corps of Engineers for a day use area with a launch ramp, parking, and courtesy dock.

Cricket Creek- This 57 acre park is located on the east shore of the Long Creek Arm of Arkansas (Plate PM–10). Facilities include a park booth, 36 campsites, eight picnic sites, one shower house with restrooms, one restroom, swim beach, playground, two launch ramps, courtesy dock, and RV dump station. Water is supplied by a municipal water source and sewage is removed by contract hauler. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 4 - 21, including upgrading utilities to 50 amp electric service, adding water to each site. Add one new site with electric and water in northeast corner of park.

Dewey Short Visitor Center and Project Office – (Plate PM-11) This 34 acre area is located on the south side of Table Rock Dam. Facilities include the Table Rock Project Office, Dewey Short Visitor Center, one restroom, one courtesy dock, three picnic sites, four volunteer campsites, and a trailhead for the 2.2 mile Table Rock Lakeshore Trail. Water is supplied by a permitted well, and sewage is disposed of by Taney County's municipal sewer system. Portions of this area are leased and operated through a partnership with the Ozarks Rivers Heritage Foundation.

Future improvements include the following: Construction of an eco-playground, outdoor classroom, amphitheatre, pavilion, Highway 165 pedestrian classroom to the overlook, fishing dock, observation platform, pedestrian pathways, wildlife observation blinds, and interpretive signage.

Eagle Rock- This 45 acre park is located on the north shore of the upper White River arm (Plate PM–12). Facilities include a park booth, 56 campsites, six picnic sites, one shower house with restrooms, one restroom, swim beach, playground, launch ramp, courtesy dock, RV dump station, and a cemetery. Water is supplied by a permitted well, and sewage is disposed by lateral field. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 1 - 35, including upgrading utilities to 50 amp electric service and adding water to each site. Construct a new camping loop with 8 electric and water sites, which includes 4 new sites and relocation of sites 1 - 4. Construct a group pavilion.

Indian Point- This 89 acre park is located on the east shore of the north Indian Creek arm (Plate PM–13). Facilities include a park booth, 78 campsites, group camp area, six picnic sites, two shower houses with restrooms, two restrooms, swim beach, playground, group pavilion, launch ramp, courtesy dock, and RV dump station. Water is supplied by two permitted wells, and sewage is disposed by drip field irrigation. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation. The park has a commercial marina concessionaire

Future improvements include the following: Rehabilitation and modernization to campsites10 – 27 and 30 - 47, including upgrading utilities to 50 amp electric service and adding water to each site. Construct new camping loop on the west side of the park. Construct a new camping loop on the north side of the park. Replace restroom near group camp to waterborne.

Joe Bald – (Plate PM-14) This 85 acre park is located on the north shore of the main body of the lake at the confluence of the James River and White River arms. Camping is currently prohibited. This park has a launch ramp and is only open for day use activities.

Port of Kimberling (Concessionaire) This 217 acre park is located in Kimberling City, Missouri (Plate PM–15). The park includes a campground store, 119 campsites, nine park model cabins, three shower houses with restrooms, three pit toilet restrooms, day use area, RV dump station, two launch ramps (one public, one customer only), two courtesy docks, two swimming areas (one public, one customer only), playground area, group pavilion, baseball field, volleyball court, tennis court, basketball court. Water is supplied by three permitted wells and sewage is disposed of through two permitted discharge systems as well as periodic sludge removal by a contractor. The park is operated by a concessionaire: Port of Kimberling Marina. The marina consists of 34 docks of varying sizes within the main lease area of varying sizes as well as 13 remote service docks in the Kimberling City Area. Additionally, the marina includes a dry stack storage facility for boats up to 35ft long. Port of Kimberling works with several sub-lessees and offers a full service fuel dock, pump-out facility, ski boat rental, fishing boat rental, pontoon rental, houseboat rental, wave runner rental, ski shop, boat towing service and a floating café.

Future improvements include the following*:* Expansion of the dry stack facility and modernization of the campground and marina facilities. This expansion has been planned through an environmental assessment.

Kings River – (Plate PM-16) This 38 acre park is located on the west shoreline of the Kings River Arm. Camping is currently prohibited. This park has a launch ramp and is only open for day use activities.

Long Creek- This 57 acre park is located on the east shore of the Long Creek arm (Plate PM–17). Facilities include a park booth, 47 campsites, six picnic sites, one shower house with restrooms, two restrooms, swim beach, playground, group pavilion, launch ramp, courtesy dock, and RV dump station. Water is supplied by one permitted well, and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 1-3, 8 – 19, and 29 - 47, including upgrading utilities to 50 amp electric service and adding water to each site.

Mill Creek- This 33 acre park is located on a peninsula on the south side of the lake at the end of State Highway RB in the Kimberling City area (Plate PM–18). Facilities include a park booth, 67 campsites, three picnic sites, one shower house with restrooms, two restrooms, swim beach, playground, group pavilion, launch ramp, courtesy dock, and RV dump station. Water is supplied by a municipal water source and sewage is disposed of by two separate lateral fields. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation.

Future improvements include the following: Construction of a fishing tournament weigh-in station. Replace restroom towards point with a restroom/showerhouse.

Moonshine Beach- This 38 acre recreation area is a day use park located north of the Table Rock Dam (Plate PM–19). Facilities include a sand swim beach, one shower house with restroom, one restroom, playground, launch ramp, courtesy dock, 12 picnic shelters with grills, and one pavilion. Water and sewer are provided by municipality. The park is operated thru a partnership with the Ozarks Rivers Heritage Foundation. The Ozarks Rivers Heritage Foundation provides concessions thru a sublease agreement.

Future improvements include the following: Expanding parking facilities, and installing a pavilion on the peninsula.

Old Hwy 86- This 57 acre park is located on the west side of the Long Creek arm of Table Rock Lake at the end of Missouri State Highway UU (Plate PM–20). Facilities include a park booth, 77 campsites, seven picnic sites, one shower house with restrooms, three restrooms, swim beach, playground, group pavilion, launch ramp, courtesy dock, and RV dump station. Water is supplied by one permitted well, and sewage is disposed by drip irrigation field. The park is operated through a partnership with the Ozarks Rivers Heritage Foundation.

Future improvements include the following: Construction of a new camping loop and restroom/shower house on the northwest side of the park. Construction of a turnaround road at sanitary dump station.

Overlook – (Plate PM-21) This 91 acre area is located on the south end and downstream side of Table Rock Dam. The area includes 1 parking lot for viewing Table Rock Dam, Shepherd of the Hills Fish Hatchery, and Lake Taneycomo. The area has 2 additional parking lots with access for fishing on Lake Taneycomo and a trailhead for the White River Valley Trail. The area contains part of the White River Valley Trail in a partnership with the Missouri Department of Natural Resources, Table Rock State Park.

Future improvements include the following: Construction of an observation platform and pedestrian pathways and trails.

Peninsula Observation Loop – (Plate PM-22) This 12 acre area consist of a loop road and parking areas for viewing the lake including Table Rock Dam and the Table Rock Auxiliary Spillway.

Future improvements include the following: Construction of an ADA accessible fishing dock and a restroom facility.

Table Rock State Park (Missouri Department of Natural Resources, MDNR)- This 325-acre park operated by MDNR, Division of State Parks is located on the eastern shore of Table Rock Lake one mile south of Table Rock Dam on Highway 165 (Plate PM–23) . Facilities include the following: a visitor contact station/park office; covered shelter house; sand volleyball court; 4 lane boat launch ramp; 21 picnic sites; three playgrounds; amphitheater for outdoor interpretive programs; two campgrounds with a total 157 campsites consisting of 50-amp and 30-amp campsites with electric/water/sewer and electric only hookups, basic campsites and family campsites with electricity; three shower houses with restrooms and laundry; three restrooms (one has showers and laundry for marina guests); two vault toilets; two park residences; 1.5 miles of paved multi-use trail; one mile of natural surface hiking trail and 11.75 miles of natural surface hiking/mountain biking trails. The park also has a commercial marina concessionaire. The park's infrastructure includes two permitted wells with a 52,000 gallon storage tank. The wastewater system is a mixture of gravity and force main lines with four wastewater lift stations. The wastewater is pumped into Taney County Sewer Districts lift station which is located within our licensed area, and pumped into the city of Hollister for treatment.

Future improvements include the following: Upgrading campsites to 50-amp electric/water/sewer and 50-amp electric only; constructing a new gated single entrance to the park and administrative complex; constructing camper cabins in the campgrounds; relocating the park residence and maintenance compound; and constructing housekeeping cabins.

Viney Creek- This 98 acre park is located on the south shore of the White River arm near Golden, MO (Plate PM–24). Facilities include a park booth, 46 campsites, three picnic sites, one shower house with restrooms, one restroom, swim beach, playground, launch ramp, courtesy dock, and RV dump station. Water is supplied by a permitted well and sewage is disposed of through a permitted discharging system. Wastewater and sludge is intermittently removed by a contractor.

Future improvements include the following: Rehabilitation and modernization to campsites 1-4, and 29 - 43, including upgrading utilities to 50 amp electric service and water to each site. Construct a group pavilion with day use parking.

Viola- This 34 acre park is located on the east shore of the Kings River arm (Plate PM–25). Facilities include a park booth, 53 campsites, one shower house with restrooms, two restrooms, swim beach, playground, launch ramp, courtesy dock, and dump station. Water is supplied by two permitted wells and sewage is disposed of by drip irrigation. The park has a commercial marina concessionaire.

Future improvements include the following: Rehabilitation and modernization to campsites 1-9, 25 - 32 and 54 - 58, including upgrading utilities to 50 amp electric service and adding water to each site; relocation of the existing swim beach with additional parking and path.

(3) Future Park Development Area

There are currently no project land areas classified for future park development and none has been added through this Master Plan revision. If future recreation development is needed, development will be accommodated within the existing High Density classified land areas.

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

(4) Zones of Influence

The Table Rock Lake Zone of Influence has been determined from visitor surveys to include those counties situated with at least 50 percent of their population within 250 highway miles of the lake. The zone includes counties in Missouri, Arkansas, Oklahoma, and Kansas, and reservation data for these counties are shown in Table 2-3. This zone represents the area in which approximately 90 percent of the day-use visitors and 85 percent of the overnight visitors to Table Rock reside. It therefore has a direct influence upon the use of the lake and its parks. Table Rock Lake, its public and commercial facilities, and the scenic qualities of the area are nationally advertised in vacation and sporting publications. The lake is well suited for the types of recreational development for which it is being utilized. Further project development as proposed will not adversely affect the integrity of the resource characteristics. Development plans and management practices will continue to be periodically evaluated to assure proper resource use as well as the validity of planning assumptions utilized in this plan. A number of diverse factors were studied in preparation of this Master Plan. The following is a discussion of those factors influencing planning and management of Table Rock Lake.

Table 2-3

2012 TABLE ROCK LAKE CORPS OF ENGINEERS
DISTRIBUTION OF RESERVATIONS BY COUNTY
2012

	Reservations	% of Total
CORE MARKETS	**8,298**	**59.6%**
BARRY MO	926	6.7%
CHRISTIAN MO	1,510	10.8%
GREENE MO	2,209	15.9%
JASPER MO	466	3.3%
LAWRENCE MO	954	6.9%
NEWTON MO	409	2.9%
OTHER	638	4.6%
STONE MO	629	4.5%
TANEY MO	557	4.0%
PRIMARY MARKETS	**1,922**	**13.8%**
CARROLL AR	481	3.5%
BOONE AR	402	2.9%
BENTON AR	191	1.4%
JACKSON MO	176	1.3%
WASHINGTON AR	153	1.1%
SAINT LOUIS MO	152	1.1%
JOHNSON KS	151	1.1%
FRANKLIN MO	110	0.8%
JEFFERSON MO	106	0.8%
OUTER MARKETS	**3,703**	**26.6%**
CASS MO	88	0.6%
CLAY MO	74	0.5%
COLE MO	62	0.4%
MADISON AR	61	0.4%
NEWTON AR	40	0.3%
OKLAHOMA OK	42	0.3%
SAINT CHARLES MO	74	0.5%
SEDGWICK KS	157	1.1%
SHAWNEE KS	50	0.4%
TULSA OK	58	0.4%
OTHER	2,997	21.5%
Total	**13,923**	**100.0%**

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(5) Visitation Profiles (OMBIL)

Table 2-4 shows visitation trends as tabulated by Corps personnel and recorded in the Corps' nationwide Operation and Maintenance Business Information Link (OMBIL) database. The methodology used to capture the information in the following table has varied over the period of record shown and should not be relied upon for precise enumeration.

TABLE 2-4
ANNUAL ATTENDANCE FROM 2003-2012

Visitation 2003-2012	
2003	4,261,976
2004	3,863,076
2005	5,456,374
2006	5,410,127
2007	4,612,001
2008	4,644,347
2009	5,247,953
2010	4,792,603
2011	4,152,762
2012	3,942,796

(6) Recreation Analysis

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

Arkansas SCORP Data (2008-2013):

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, jogging or walking for pleasure tops the list Burgeoning interest in healthy lifestyles helps hold this timeless activity at the top. For driving, higher gasoline prices may be one factor that influences driving habits, but this activity is still popular as a way to view and enjoy the beauty of the natural landscape (See Table 2-6).

Table 2-6
Popular Outdoor Activities

Recent Poll	1993	1984
Jogging or walking	Driving for pleasure	Walking for Pleasure
Swimming	Walking for Pleasure	Fishing
Nature Viewing and Outdoor Photography	Picnicking	Driving for Pleasure
Boating	Fishing	Picnicking
Picnicking	Swimming	Swimming
Visiting Historical and Ecological Sites	Visiting Historical Sites	Camping/Developed Sites
Camping	Wildlife Observation	Visiting Historical Sites
Bicycling	Short Hikes	Hunting
Playing Tennis	Pleasure Boating	Baseball/Softball
	Bicycling	Jogging/Running
	Camping/Developed Sites	Pleasure Boating
	Basketball	ORV Driving
	Jogging/Running	Bicycling
	Baseball/Softball	Canoeing/Floating
	Photography	Camping/Undeveloped Sites
	Hunting	Water Skiing
	Other Outdoor Games	Photography
	ORV Driving	Tennis
	Canoeing/Floating	Other Outdoor Games
	Camping/Undeveloped Sites	Horseback Riding

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

For a copy of the entire Arkansas SCORP it can be found at:
http://www.recpro.org/assets/Library/SCORPs/ar_scorp_2009.pdf

Missouri SCORP Data (2013-2017):
A telephone survey of Missouri residents was conducted in July 2011. A total of 768 surveys were completed, half in urban and half in rural regions of the state, providing a 95% (+/- 5%)confidence interval for each. Results were combined and weighted based on the 70%/30% urban/rural ratio of the state's population. The survey focused on residents who had participated in outdoor recreation at a public facility at least once in the past year; those who had not participated in the past year were screened out of the survey.

Availability of Outdoor Recreation

Available Activities

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

Available Facilities

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

Popularity of Outdoor Recreation

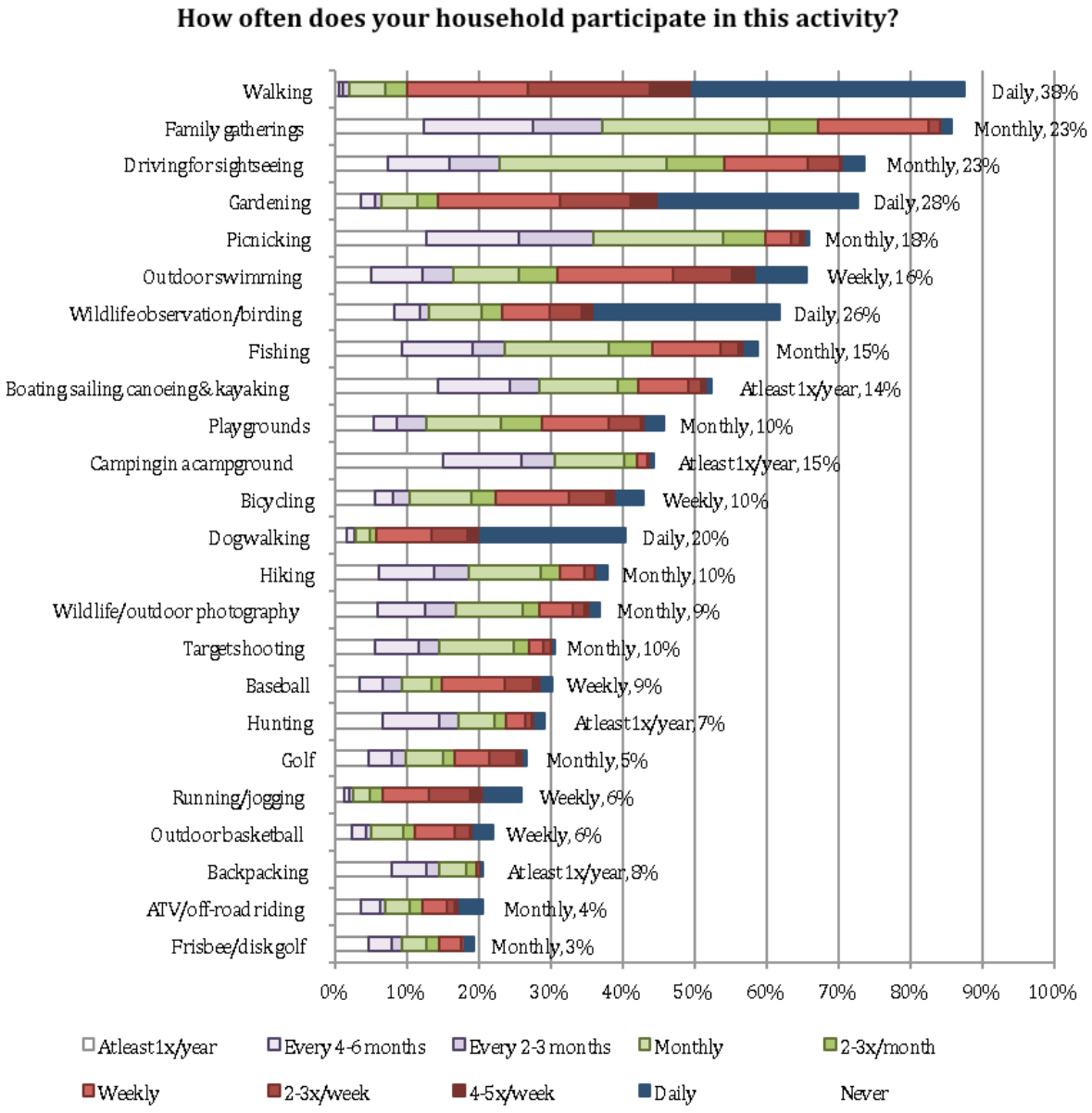
Popular Activities

The most popular outdoor recreation activity among Missourians is walking – more than a third of residents walk daily. More than one in five Missourians enjoy daily gardening, wildlife observation/birding and dog walking. Most Missouri residents walk for recreation, join in outdoor family gatherings, drive for sightseeing, visit local parks and garden at least once a year. More than half enjoy picnicking, outdoor swimming, visiting historic/education sites, wildlife observation/birding, fishing and boating at least annually .Walking, bicycling, playing baseball and playing golf are more popular among urban residents while rural Missourians are more likely to be fishing, boating, target shooting, hunting and ATV riding. Table 2-7 lists the most popular activities from the Missouri SCORP Data.

Popular Facilities

Walkable streets/sidewalks, local parks, gardens, fishing sites and outdoor swimming pools are the most popular facilities used by Missourians at least monthly. More than one in five residents visit playgrounds, lakes, trails, boat access sites, rivers, picnic areas and historic/education sites at least once a month. Three out of four Missourians use local parks and walkable streets/ sidewalks at least once a year. More than half of Missourians visit historic/education sites, lakes, gardens, picnic areas, and/or state parks annually or more often. A recent national study showed that people place a greater priority on having sidewalks and places to take walks than on living within walking distance of specific places in a community, such as stores and restaurants. Not surprisingly, urban residents are more likely to use walkable streets/ sidewalks and local parks while rural residents are more likely to use fishing sites, lakes and rivers.

Table 2-7



For a copy of the entire Missouri SCORP it can be found at:
https://recpro.memberclicks.net/assets/Library/SCORPs/mo_scorp_2013.pdf

(7) Recreational Carrying Capacity

Public Use Areas

Table 2-8

Table Rock Project Occupancy Percentage				
Park Name	**# of Sites**	**Year 2012**		
		# of Avail Nights	**Occupancy**	**Percent**
AUNTS CREEK	56	7728	2408	31.16%
BAXTER	54	7452	2488	33.39%
BIG M	62	7415	1584	21.36%
CAMPBELL POINT	75	13551	3184	23.50%
CAPE FAIR	83	15189	5518	36.33%
CRICKET CREEK	36	6008	2523	41.99%
EAGLE ROCK	57	7672	1728	22.52%
INDIAN POINT	86	14280	8881	62.19%
LONG CREEK	48	8016	2352	29.34%
MILL CREEK (MISSOURI)	68	12444	7695	61.84%
OLD HWY 86-Closed for Construction				
Viney Creek	46	6302	1556	24.69%
VIOLA	51	7929	2339	29.50%
Total:	**722**	**113986**	**42256**	**37.07%**

While the perception of occupancy percentage appears low, the national average for Corps facilities is at 29%. This table captures the entire week; many recreation areas are heavily occupied during weekends during the summer peak season.

Boating Use Survey

The purpose of this study was to assess boaters' ***perceptions*** and ***preferences*** for various managerial, social, and physical resource conditions on the lake and to determine boater capacity, density, crowding, and public safety concerns on the lake. In addition, it involved identifying the boaters' most important issues. The boater survey was conducted between May 25th and August 16th, 2009. There were five primary objectives:

- describe the recreational patterns of two boater groups (public launch ramp users and those who are marina slip renters, slip owners or shoreline residents);

- determine the boaters' perceptions of present and past natural, social, and managerial conditions including perceptions of crowding, congestion, and conflict;

- determine the boaters' preferences for natural, social, and managerial conditions;

- quantify the amount and character of recreational boating use occurring during the

primary boating season, and;

- test and refine the inventory procedures developed at other lakes.

Key Findings

The primary finding of this recreational boating study is that Class I and II compartments are areas of concern relative to boating safety, boating conflicts, and user enjoyment (see Figures 2-5 and 2-6). These findings are consistent with the higher accident/incident rates found in Class I and Class II management compartments where boaters expressed less concern about safety and conflict.

When viewing the management compartment classification maps for the 20 to 100% projected increases in average number of boats, it appears that, at a 60% increase in boats above the number of boats counted in this study, there is a threshold of crossing nearly half of Table Rock Lake's management compartments as being a Class I designation for density/conflict. Therefore, management should strive to conserve use levels to prevent these levels from exceeding this threshold. Without this type of management strategy, opportunities for other classes of experience on the lake will be eliminated and those boaters looking to fish, swim, or relax quietly will likely be displaced elsewhere to seek out their recreational experiences.

Problematic areas identified as areas to avoid and that are unsafe by boaters in these Class I compartments include Kimberling City, the dam area, the main channel, the state park, and Aunt's Creek among others. To mitigate the negative attributes cited by boaters for why they avoid those locations, management will need to consider increasing law enforcement strategies to curb unsafe boating behavior, illegal behaviors associated with alcohol consumption, enforce or post speed limits, and remove debris hazards from the water.

Class II management compartments were, generally, highly variable in their density and conflict levels. These management compartments such as Joe Bald, Lower White, Shell Knob- Campbell Point, Central White, and Holiday Island should be examined more closely to determine the cause of conflicts. For example, although Holiday Island had very low density, conflict levels were high. The reason for the high conflicts in this management compartment is related to the developed, resort setting of this small wooded island where activities such as smaller craft rentals are commonly conflicting with other boat traffic.

Visitors also cited crowding and boat traffic as primary reasons for avoiding the unsafe locations mentioned above. Social condition strategies to reduce crowding/density may include reducing parking, slips, leases, or concessions or other development near the above locations on the lake. Other strategies to mitigate the above social impacts that could be considered include dispersion strategies or temporary closures of areas to rehabilitate the resource and redirect traffic to other locations.

Despite having some select areas where boaters are raising safety and crowding concerns, the majority of boaters perceived that the ramps and lake were moderately to extremely safe. Therefore, the overall condition of law enforcement and regulations appear to be effective in providing perceptions of Table Rock Lake as a safe lake to boat. In fact, many of the

respondents listed the increased patrols and law enforcement as being very beneficial to their experience.

Mail-back survey respondents appear to be more sensitive than ramp users to social impacts as indicated by their relatively higher ratings of crowding and concerns for safety. In fact, the majority of mail-back survey respondents responded that the lake was at least moderately crowded to extremely crowded. Perhaps these boaters have more of a sense of ownership or investment in the resource both physically and financially causing them to perceive impacts more than ramp users.

Overall, crowding perceptions were lower than expected by the researchers of this study. The moderate crowding scores among ramp users are likely related to the fact that most ramp boaters on Table Rock Lake are in groups of three to four people already and come to TRL for the social setting and experience of watching other boaters, many of whom they might already know since local, regular boaters comprised the majority of the ramp user sample.

The comments to open-ended questions made by ramp users included multiple references to the lake having had an increase in "bigger boats," suggesting some negative concerns for the larger pontoon boats and other large vessels on TRL. Boats on Table Rock Lake did average 19.4 feet for ramp and 23.4 for mail-back survey respondents. Therefore, as the number of larger boats on the lake increases, negative concerns may heighten among those with smaller boats. Many negative references were made about the unsafe behavior of jet skiers (PWCs) as reported in the additional comments section of the surveys. Many boaters also noted negative changes in resources, such as increased traffic and dirtier water. Positive changes listed included comments about the clean water, little garbage and a very visible law enforcement presence.

With cruising being the primary activity of both ramp and mail-back survey respondents, it heightens the potential for future conflict and safety concerns since an increasing number of moving boats are always more intrusive and of more risk to swimmers, skiers, and fishermen. Furthermore, with mail-back survey respondents listing their secondary activity as relaxing, this group may be more sensitive to louder boats and the sheer number of boats as an interruption of this activity.

The high frequency of swimming on the lake among both ramp users and mail-back survey respondents suggests that water quality is high on the list of concern; many respondents' perceptions were that water quality has been improving and that it appears to be a lot cleaner than it once was. However, many respondents also mentioned a decrease in water quality, so there appears to be a split decision on the improvement of water quality.

Some locations were much more important to boaters such as Cape Fair, Cow Creek, Aunt's Creek, and Long Creek. Ramp users and mail-back survey respondents, as a majority, cited that their favorite location was close and familiar, provided solitude, was relaxing, provided good fishing, had good facilities, and included calm waters and beautiful scenery.. To manage for these qualities, it appears that these favorite locations should contain low speed or no wake zones to allow for calmer water, better fishing, and quieter solitude for relaxing.

A number of comments were made about the need to improve facilities; however, many boaters also listed negative concerns about increasing developments on the shoreline. The survey data

indicated that some additional boat ramps, campgrounds, and parking areas should be considered but it does not support other substantial developments, such as marinas.

Based on the above key findings, the researchers of the recreational boating study recommend the following to USACE management:

1. Preventing a substantial increase in existing use levels;
2. Preserving opportunities to escape existing heavy boat traffic and high wakes; and
3. Reducing conflicts through increased and improved boater education, on-water law enforcement and patrol, and by limiting density levels through dispersion or allocation strategies.

Table Rock Lake Management Compartment Classification Maps

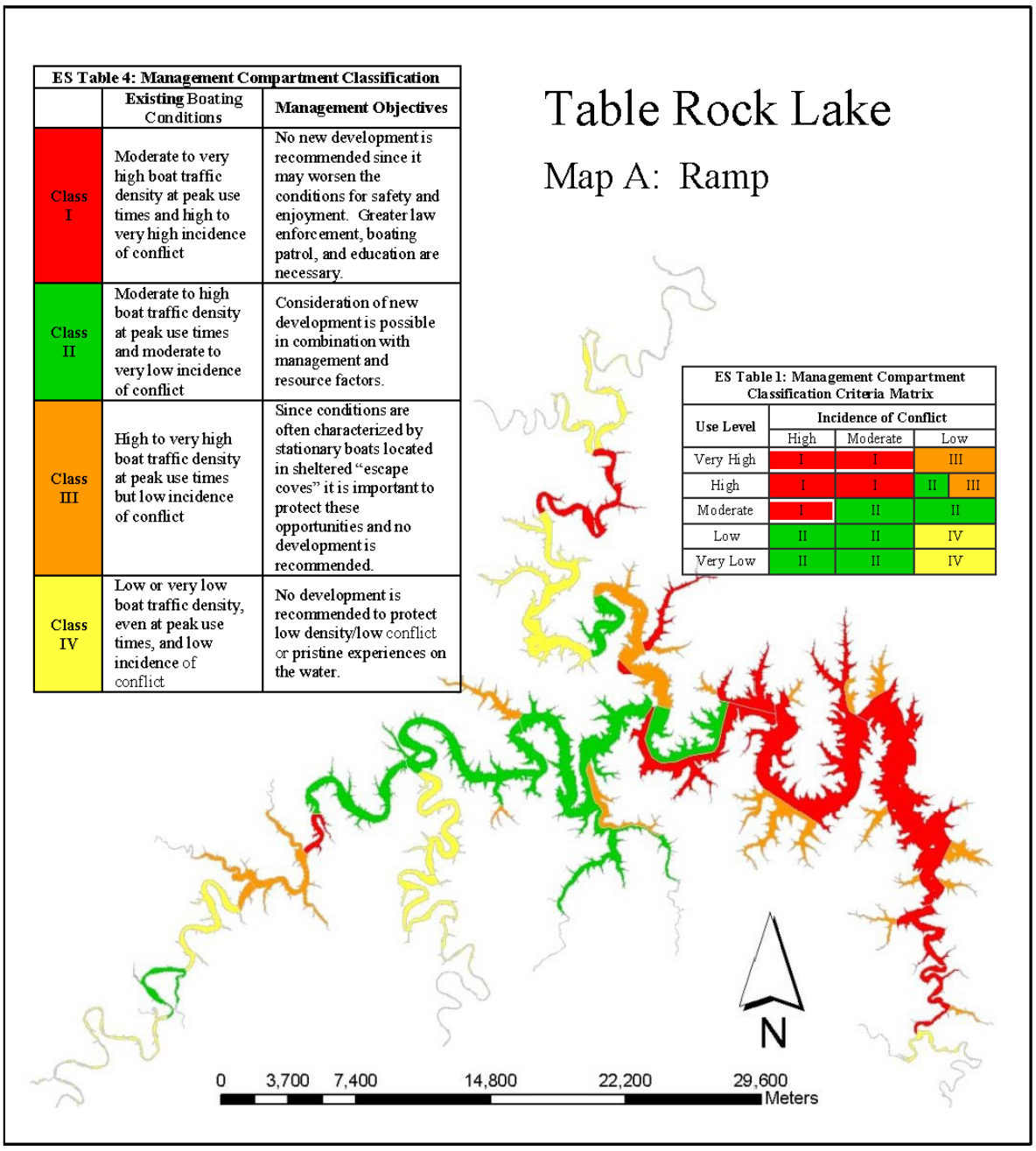


Figure 2-5. Table Rock Lake Management Compartment Classification for Ramp Boaters (Map A)

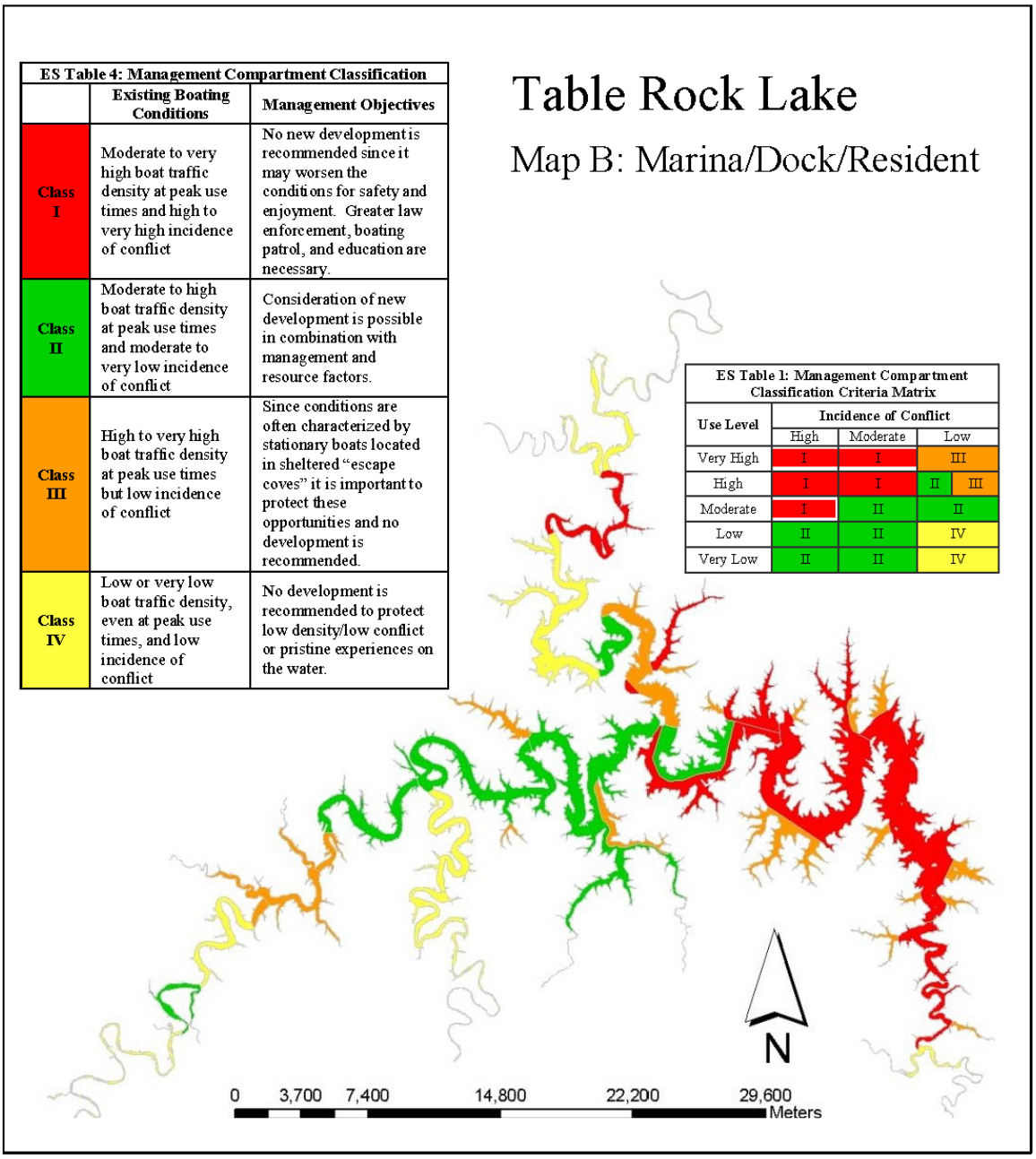


Figure 2-6. Table Rock Lake Management Compartment Classification for Marina, Dock and Resident Boaters (Map B)

l. Real Estate

(1) Acquisition Policy

The Flood Control Act of June 28, 1938, (Public Law No. 76, 75th Congress, 3rd Session) approved a comprehensive plan for flood control and other purposes in the White River Basin. This comprehensive plan was modified by the Flood Control Act of August 18, 1941 (Public Law 228, 77th Congress, 1st Session). A Design Memorandum was completed identifying all land and interests in land that would be necessary for the operation, maintenance and control of the reservoir. This report identified the "guide" elevation 936-foot contour necessary for this project. The authorized acquisition for land was to a minimum elevation of 923' msl. It was further identified that lands would be purchased by blocked out lines in increments of 5 and 2 ½ acre tracts along regular sectional subdivision breakdowns to encompass the guide contour for fee acquisition. In areas where the blocked-out line did not encompass lands needed for occasional flooding (elevation 936), an additional flowage easement was acquired between the fee acquisition line and elevation 936' msl. Additionally, areas were identified above elevation 936 for acquisition of lands to account for islands, inaccessible lands, steep ravines and bluffs and up to elevation 945 near the upstream reservoir limits, along with additional lands identified for public use and access areas. Acquisition by "blocking out" was authorized within the 1953 "Real Estate Land Acquisition Policy for Civil Works Projects," as revised. The Real Estate Design Memorandum outlining all lands identified above was submitted and approved through our Division Offices to Headquarters.

(2) Management and Disposal Policy

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

m. Pertinent Public Laws

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

Recreation
The policies and public laws listed below address development and management of recreational facilities on public lands and are pertinent to the Table Rock 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.
PL 104-303 (the Water Resources Development Act of 1996). Authorized recreation and fish and wildlife mitigation as purposes of the project, to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project.

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 Table Rock Lake:

PL 75-761, Flood Control Act of 1938 (28 June 1938), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.

PL 77-228, Flood Control Act of 1941(18 August 1941), amended the Flood Control Act of 1938 and appropriated $24M to support construction of multiple-purpose reservoir projects in the White River Basin.
PL 78-534, Flood Control Act of 1944 (22 December 1944), specifies the rights and interests of the states in water resources development and requires cooperation and consultation with State agencies in planning for flood risk management.
PL 79-14, Rivers and Harbors Act of 1945 specifies the rights and interests of the states in watershed development and water utilization and control, and the requirements for cooperation with state agencies in planning for flood control and navigation improvements.
PL 85-500, Water Supply Act of 1958 (3 July 1958), authorizes the USACE to include municipal and industrial water supply storage in multiple-purpose reservoir projects.
PL 87-88, Federal Water Pollution Control Act Amendments of 1961 (20 July 1961), requires Federal agencies to address the potential for pollution of interstate or navigable waters when planning a reservoir project.
PL 89-80, Water Resources Planning Act of 1965 (22 July 1965), provides for the optimum development of the Nation's natural resources through coordinated planning of water and related land resources. It provides authority for the establishment of a water resources council and river basin commission.
PL 89-298, Flood Control Act of 1965 (27 October 1965), authorizes the Secretary of the Army to design and construct navigation, flood risk management, and shore protection projects if the cost of any single project does not exceed $10 million.
PL 92-500, Federal Water Pollution Control Act (Clean Water Act) (October 18, 1972) Establishes a national goal of eliminating all discharges into U.S. waters by 1985 and an interim goal of making the waters safe for fish, shellfish, wildlife and people by July 1, 1983. Also provides that in the planning of any Corps reservoir consideration shall be given to inclusion of storage for regulation of streamflow. PL 95-217, Clean Water Act of 1977 (15 December 1977), amends PL 87-88 and requires the Environmental Protection Agency (EPA) to enter into written agreements with the Secretaries of Agriculture, the Army, and the Interior to provide maximum utilization of the laws and programs to maintain water quality.
PL 99-662, Water Resource Development Act of 1986 (17 November 1986), establishes cost sharing formulas for the construction of harbors, inland waterway transportation, and flood risk management projects.

Fish and Wildlife Resources
A number of public laws address protection and maintenance of fish and wildlife resources. The following are pertinent to the Table Rock Lake project:

PL 79-732, Fish and Wildlife Coordination Act (10 March 1934), provides authority for making project lands available for management by interested State agencies for wildlife purposes.
Title 16 U.S. Code (U.S.C.) §§ 668-668a-d, Bald and Golden Eagle Protection Act of 1940 (8 June 1940) as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles (*Haliaeetus leucocephalus)*, including their nests or eggs.
PL 85-624, Fish and Wildlife Coordination Act (12 August 1958), states that fish and wildlife conservation will receive equal consideration with other project purposes and be coordinated with other features of water resources development programs.

The Federal Water Project Recreation Act of 1965 (PL 89-72) requires consideration of opportunities for fish and wildlife enhancement in planning water resources projects. Non-Federal bodies are encouraged to operate and maintain the project fish and wildlife enhancement facilities. If non-Federal bodies agree in writing to administer the facilities at their expense, the fish and wildlife benefits are included in the project benefits and project cost allocated to fish and wildlife. Fees may be charged by the non-Federal bodies to repay their costs. If non-Federal bodies do not so agree, no facilities for fish and wildlife may be provided.

PL 91-190, National Environmental Policy Act of 1969 (NEPA) (1 January 1970), establishes a broad Federal policy on environmental quality stating that the Federal government will assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings, and preserve important historic, cultural, and natural aspects of our national heritage.

PL 93-205, Conservation, Protection, and Propagation of Endangered Species (28 December 1973), requires that Federal agencies will, in consultation with the U.S. Fish and Wildlife Service (USFWS), further conservation of endangered and threatened species and ensure that their actions are not likely to jeopardize such species or destroy or modify their critical habitat.

PL 95-632, Endangered Species Act Amendments of 1978 (10 November 1978), specifies a consultation process between Federal agencies and the Secretaries of the Interior, Commerce, or Agriculture for carrying out programs for the conservation of endangered and threatened species.

PL 101-233, North American Wetland Conservation Act (13 December 1989), directs the conservation of North America wetland ecosystems and requires agencies to manage their lands for wetland/waterfowl purposes to the extent consistent with missions.

PL 104-303 (the Water Resources Development Act of 1996). Authorized recreation and fish and wildlife mitigation as purposes of the project, to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project.

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

Forest Resources

The following law pertains to management of forested lands and is pertinent to the Table Rock 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.

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 Table Rock Lake project:

PL 59-209, Antiquities Act of 1906 (8 June 1906), applies to the appropriation or destruction of antiquities on federally owned or controlled lands and has served as the precedent for subsequent legislation.
PL 74-292, Historic Sites Act of 1935 (21 August 1935), declares that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States.
PL 86-523, Reservoir Salvage Act of 1960 (27 June 1960), provides for the preservation of historical and archaeological data that might otherwise be lost as the result of the construction of a dam and attendant facilities and activities.
PL 89-665, National Historic Preservation Act of 1966 (NHPA) (15 October 1966), establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
PL 93-291, Archaeological and Historic Preservation Act of 1974 (24 May 1974), amends PL 86-523 and provides for the Secretary of Interior to coordinate all Federal survey and recovery activities authorized under this expansion of the Reservoir Salvage Act of 1960. The Federal construction agency may expend up to 1 percent of project funds on cultural resource surveys.
PL 96-95, Archaeological Resources Protection Act of 1979 (31 October 1979), updates PL 59-209 and protects archaeological resources and sites on public lands and fosters increased cooperation and exchange of information among governmental authorities, the professional archaeological community, and private individuals.
PL 101-601, Native American Graves Protection and Repatriation Act (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

Leases, Easements, and Rights-of-Way
A number of laws and regulations govern the granting of leases, easements, and rights-of-way on Federal lands. The following are pertinent to USACE project lands at the Table Rock 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 receives 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 Table Rock Lake Master Plan Revision Vision Statement

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

"Balanced public use of the lake while sustaining the natural, cultural, and socio-economic resources of the area."

b. Policy and Master Plan Revision Schedule

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

The Table Rock Master Plan Revision began in June 2012 and the process was divided by the Project Delivery Team (PDT) into five phases:

Phase 1 – Initiate Master Plan Revision Process. (June – December 2012)

1. Internal PDT coordination.
    a. Educate PDT/District Leadership/Vertical Team on Master Plans and proposed process
    b. Develop Project Management Plan (PMP) (update as needed)
    c. Assign PDT Roles/Responsibilities and begin developing MP background information, MP outline/format and GIS database and Mapping needs.
    d. Id and engage Vertical Team. Develop appropriate In Progress Review (IPR) schedule.

2. Scope and evaluate NEPA requirements (EA/EIS/Cat Excl.) and develop/approve sequence and timing of implementation. Incorporate decisions into PMP.

3. Develop Communication Plan. Incorporate into PMP.

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

4. Data Inventory.
   a. ID data needed or required

5. Scoping Workshops
   a. Educate public on what a master plan is (it is not a SMP or OMP)—30,000 ft view. Include this information in public notices about scoping workshops, on website page, on any social media
   b. Agency, Partner, Stakeholder scoping workshops.
   c. Conduct public orientation/input/scoping workshops.

6. Public Comment period. Collect comments. Comment analysis—develop scoping report.

Phase 2 – Develop Draft Master Plan. (January-July 2013)

1. Initiate Chapter Development (Chapters 1 and 2)
2. Scoping Report—take information from this and 'digest'—what is the public telling us?
3. Formulate Chapter 3, 4, 5, 6, 7, 8, and 9.
4. Meet with Focus Groups (fix numbering)
4. DQC draft document
5. Conduct In Progress Reviews with Vertical Team.
6. News release and newsletter about draft Master Plan public review and input.
7. Correspondence to key partners and political interests explaining draft MP with their comments from scoping.
8. Conduct agency workshop(s) explaining draft MP with their comments from scoping.
9. Conduct Partners and stakeholders workshop(s) explaining draft MP with their comments from scoping.
10. Conduct public workshop(s) explaining draft MP with their comments from scoping.

Phase 3 – Develop Final Master Plan. (August-September 2013)

1. Address Vertical Team, DQC, and ATR, comments.
2. Address agency, partner, stakeholder and public comments.
3. Conduct agency/partner/stakeholder workshops explaining final MP and what happens next.

4. Conduct public workshops explaining final MP and what happens next.

Phase 4 – Receive approval of Final Master Plan.(October-November 2013)

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

Phase 5—Implement Final Master Plan (December 2013)

1. Supplements as necessary.
2. Plan for next revision in 2018.

c. Goals and Objectives

(1) Goals

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

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

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

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

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

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

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

(2) Resource 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, Table Rock Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, Environmental Operating Principles (EOPs), and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and take public input into consideration. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found in this Master Plan. Both the Missouri and Arkansas State Comprehensive Outdoor Recreation Plans (SCORP) were considered as well. The objectives in this Master Plan to the best extent possible aim to maximize project benefits, meet public needs, and foster environmental sustainability for Table Rock Lake.

Recreational Objectives

- Evaluate the demand for improved recreation facilities and increased public access on Corps-managed public lands and water for recreational activities (i.e. camping, walking, hiking, biking, boating, hunting, fishing, wildlife viewing, etc.) and facilities (i.e. campsites, picnic facilities, overlooks, all types of trails, boat ramps, courtesy docks, interpretive signs/exhibits, and parking lots). Goal A, C
- Monitor current public use levels (i.e. with a special focus on boating congestion) and evaluate impacts from overuse and crowding. Take action to prevent overuse, conflict, and public safety concerns. Goal A, C
- Evaluate recreational use zoning and regulations for designated quiet water or no-wake areas with emphasis on natural resource protection, quality recreational opportunities, and public safety concerns. Goal A
- Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans. Goal B, C, E
- Increase universally accessible facilities on Table Rock Lake. Goal A, C, E
- Evaluate demand for commercial facilities on public lands and waters. Goal A, C
- Consider flood/conservation pool to address potential impact to recreational facilities (i.e. campsites, docks, etc.); Note that water level management is not within the scope of the Master Plan. Goal A, B, C, D
- Ensure consistency with USACE Recreation Strategic Plan. Goal E
- Reference the Missouri Statewide Comprehensive Outdoor Recreation Plan (SCORP) and the Arkansas Statewide Comprehensive Outdoor Recreation Plan to ensure consistency in achieving recreation goals. Goal E

Natural Resource Management Objectives

- Consider flood/conservation pool levels to optimize habitat conditions, as long as there is no interference with the Project's other authorized purposes, i.e. flood risk management and hydroelectric power generation. Note that water level management is not within the scope of the Master Plan. Goal A, B, D
- Actively manage and conserve fish and wildlife resources, especially special status species, by implementing ecosystem management principles. Goal A, B, D, E

- Consider watershed approach during decision-making process. Goal E
- Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats. Goal B, E
- Optimize resources, labor, funds, and partnerships for the prevention of invasive species in Table Rock Lake. Goal B.
- Minimize activities which disturb the scenic beauty and aesthetics of the lake. Goal A, B, C, D
- Continually evaluate erosion control and sedimentation issues at Table Rock Lake. Goal A, B, E
- Identify and protect unique or sensitive habitat areas. Goal A, B, D, E
  Stop unauthorized uses of public lands such as agricultural trespass, timber theft, unpermitted docks and other structures, clearing of vegetation, unauthorized roadways, off-road vehicle (ORV) use, trash dumping, poaching, and placement of advertising signs that create negative environmental impacts. Goal A, B, C, D, E

Environmental Compliance Objectives

- Improve the lake's water quality to sustain healthy fish and wildlife populations, habitat conditions, recreation opportunities, and avoid negative effects to public water supply, ensuring public health and safety. Goal A, B, C, D, E
- Consider both point and non-point sources of water quality problems during decision making. Goal A, B, D, E
- Improve coordination, communication, and cooperation between regulating agencies and non-governmental organizations to resolve and/or mitigate environmental problems. Goal A, B, D, E
- Ensure compliance with Environmental Review Guide for Operations (ERGO) at all Table Rock Lake recreational facilities. Goal A, B, E

Visitor Information, Education, and Outreach Objectives

- Provide more opportunities (i.e. town hall meetings) for communication between agencies, special interest groups, and the general public. Goal A, D, E
- Implement more educational and outreach programs on the lake. Topics to include water quality, history, cultural resources, water safety, recreation, nature, and ecology. Goal A, B, C, D, E
- Establish a network among local, state, and federal agencies concerning the exchange of lake-related information for public education and management purposes. Goal A, D, E
- Increase public awareness of special use permits or other authorizations required for special activities, organized special events, and commercial activities on public lands and waters of the lake. Goal A, B, C
- Capture trends concerning boating accidents and other incidents on public lands and waters and coordinate data collection with other public safety officials. Goal A, C, D, E
- Promote Corps Water Safety message. Goal A, C, D, E
- Educate adjacent landowners on difference between shoreline cleanup policies and vegetation modification. Goal A, B, C, D, E

Economic Impacts Objectives

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

General Management Objectives

- Resurvey and maintain the public lands boundary lines to ensure it is clearly marked and recognized in all areas. Goal A, B, D
- Secure sustainable funding for the shoreline management program. Goal A, B, C, D, E
- Ensure consistency with USACE Campaign Plan (national level), IPlan (regional level), OPlan (District level). Goal E
- Reference Recreation Adjustment Plan if funding levels change in future years. Goal E
- Ensure consistency with Executive Order 13148, 'Greening the Government Through Leadership in Environmental Management' (21 April 2000). Goal E
- Ensure consistency with Executive Orders 13423 and 13514, 'Strengthening Federal Environmental, Energy, and Transportation Management (24 January 2007) and 'Federal Leadership in Environmental, Energy, and Economic Performance (5 October 2009), respectively, to guarantee compliance with Leadership in Energy and Environmental Design (LEED) criteria for government facilities. Goal E
- Carefully manage non-recreation outgrants, such as utility easements, in accordance with national guidance set forth in ER 1130-2-550.

Cultural Resources Management Objectives

- Monitor and better coordinate lake development and the protection of cultural resources with State Historic Preservation Offices and federally recognized Tribes. Goal A, B, D, E
- Complete an inventory of cultural resources. Goal A, B, D, E
- Increase public awareness and education of regional history. Goal B, D, E
- Maintain full compliance with Section 106 and 110 of the National Historic Preservation Act; the Archeological Resources Protection Act; and the Native American Graves Protection and Repatriation Act on public lands surrounding the lake. Goal B, D, E
- Stop unauthorized use of public lands as it pertains to the illegal excavation and removal of cultural resources. Goal B, D, E

Chapter 4 Land Allocation, Land Classification, Water Surface, and Project Easement Lands

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

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

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

The existing lands required for project operation purposes and recreation have been indicated on land classification Plates (LC-1 through LC-25) The lands described in the various designations throughout the lake are very similar in general characteristics of soil, topography, and vegetative cover typical of the foothills of the Ozark Mountains.

Project lands total 62,208 acres which include 2,576 acres of easement lands. The easement lands lie above or landward of the fee acquisition line but below the 936 elevation and are indicated by the purple color on the land classification maps.

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

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

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

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

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

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

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

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

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

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

(4) Environmentally Sensitive Areas. Areas where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statues. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area.

(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.)

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

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

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

(6) Water Surface. 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.

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

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

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

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

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

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

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

Chapter 5 Resource Plan

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

Classification and Justification

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 Table Rock the lands classified as Project Operations have been classified by definition. Areas adjacent to the dam, auxiliary spillway, maintenance compound, Lake Taneycomo below the dam, and storage areas have remained project operations. Some lands that were previously classified for appurtenant works were reclassified to other classifications as they are no longer used for project operations purposes.

Resource Objectives: General Management
(Acreage = 232; 1% of Corps land)

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

Justification: On Table Rock the lands classified as high density recreation in this Revised Master Plan are primarily lands that were similarly classified in the previous Master Plan as supplemented. A portion of the lands added to this classification, totaling 21 acres, are for lands adjacent to Big Cedar Lodge and Still Waters Resort, which are considered as 'destination' resorts. The Chateau on the Lake also falls in this category of resorts; however, the land covered by their lease was classified high density in the previous Master Plan. Additionally, a portion of the lands added to this classification are for areas that are adjacent to private lands that will be developed to the extent that quasi-public facilities will be needed on Federal land, thus requiring a High Density land classification. These lands were identified during the Master Plan revision process and includes Federal lands near the future site of The Outdoor Academy; Paradise Point Resort; Stonecroft Property; and Dogwood Canyon (requested by Big Cedar Lodge, LLC) and the Fisher Creek Area of Kimberling City (requested by the City of Kimberling City), for a total of 74 acres. A total of 69 acres has been added to this classification by converting the area around the Dewey Short Visitor Center and Project Office from Project Operations classification to High Density Recreation.

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. Currently there is LDA zoning in the area classified as High Density for The Outdoor Academy and Dogwood Canyon, this LDA should not be considered for the placement of private/community docks.

Destination Resorts are pre-existing resorts that have grown to the point that they now appear to be operating in a commercial nature, although they are currently under a limited motel resort lease. They are defined in this Master Plan as those resorts that are primarily located on private property, but authorized to provide limited commercial services on government property in support of water based recreation to include: the selling of gas, food, beverage, and sundry items; boat rentals; and boat cruises. A real estate instrument will be developed by Corps personnel to facilitate these activities at Destination Resorts, once the conversion to a high density is implemented and if a waiver of competition is granted by Headquarters, USACE. Long-term boat slip rentals will not be authorized at Destination Resorts. The real estate instrument will further detail and specify the terms of the agreement and will be issued in accordance with all applicable laws and regulations.

Resource Objectives: Recreation, Economic Impacts, General Management
(Acreage = 1,986; 10% of Corps land)

Mitigation land classification allows for lands with an allocation of Mitigation and that were acquired specifically for the purposes of offsetting losses associated with development of the project. There are currently no lands classified as mitigation land at the Table Rock project.

Environmentally Sensitive Area (ESA) land classification is for those land areas where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statutes. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands currently; examples of permits that could be issued are unimproved walking paths, specific erosion control measures, and removal of invasive species. At Table Rock Lake, approximately 0.2% of ESA lands have permitted uses that will be grandfathered. 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. Lands classified as ESA include some parcels that were a part of the land exchange that took place in 1999 between the US Forest Service and the Corps and areas adjacent to US Forest Service land. Classification of lands as ESAs is responsive to public comment seeking to keep the lake natural, scenic and to ensure that water quality is maintained for future generations. In making ESA classification decisions areas that were previously classified as Natural Area and currently have no active shoreline use permits were retained as ESA. Areas that were previously classified as Natural Area and currently have active shoreline use permits and/or with LDA zoning have been classified as Low Density Recreation. This process resulted in a net loss of acreage that was previously classified as Natural Area. To balance this loss, some lands that were classified as

Low Density Recreation in the previous Master Plan have been classified as ESA if those lands had no active permits and no adjacent residences.
Past classification lines, edges of zoning, property boundary line monuments, and terrain such as ditch lines were used as boundaries for this classification..

Resource Objectives: Environmental Compliance, Cultural Resource Management, Natural Resource Management
(Acreage = 6,876; equals 35% of Corps land)

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

- 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 be contain Limited Development Area within the context of the Shoreline Management Plan (SMP) (Note: Distribution of shoreline areas to Limited Development status requires revision of the SMP to include an intense public involvement process and possible additional documentation pursuant to NEPA).

Justification: With the advancement of technology available, the low density recreation land has been adjusted accordingly to accommodate existing recreational development. This accommodation allowed for modifying low density areas to capture developed areas and met the opportunity of adjacent land development. In areas which were previously low density recreation land with no active permits, no limited development area, no houses, and undeveloped lots, these areas where changed to environmentally sensitive in an effort to preserve the scenic, historical, archaeological, scientific, water quality, or ecological value of the overall project. In areas which were previously low density, with adjacent development such as housing, these areas remained low density unless existing land was not suitable for this classification. (e.g. ecological, aesthetic, environmental, or cultural resources present). Past classification lines, edges of zoning, monuments, and terrain such as ditch lines were used as boundaries for this classification. The Low Density classification includes a 50ft vegetative management area which adds 2,004 acres or 10%, which totals 37% of Corps lands.

Resource Objectives: Recreation, Economic Impact, Natural Resource Management, Environmental Compliance, Cultural Resource Management, Visitor Information and Education
(Acreage = 5,186; 3,182 acres of Low Density Recreation and 2,004 acres of Vegetative Management, which combined equals 37% of Corps lands above conservation pool).

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

Justification: On Table Rock Lake, areas which have been classified as wildlife management lands consist of large tracts of land and shoreline areas where food plots can be

established to supplement and enhance the existing wildlife forage. The areas classified have been determined to contain suitable habitat for native wildlife and will be protected for this purpose. The majority of these areas have been established in locations that are accessible by road or by water for the public. If these areas are developed as wildlife management in the future, hunting will be allowed, unless otherwise posted. The majority of the lands classified as wildlife management in the current Master Plan were acquired by the Corps of Engineers thru the 1999 U.S. Forest Service Land Exchange.

Resource Objectives: Natural Resource Management, Recreation, Environmental Compliance
Acreage = 3,252 (17% of Corps lands)

- Vegetative Management land is designated for stewardship of forest, prairie, and other native vegetative cover.

Justification: On Table Rock Lake, vegetative management land is classified along the entire shoreline of the lake adjacent to Low Density (with the exception of existing resort lease areas), ESA, and Wildlife Management lands. It is a 50 linear foot vegetative management area measured as slope distance from 915 msl. The Vegetative Management Land classification as allows for an opportunity to respond to the public's demand for ensuring water quality conservation. The Vegetative Management Land classification on Table Rock has been established as a platform to the Shore Line Management Plan, thus, allowing flexibility of the management of various vegetative species to ensure a healthy riparian vegetation buffer. Riparian vegetation plays an important role in water quality. Specifically, a riparian buffer provides bank stabilization, acts as a natural filter, captures sediment and pollutants from runoff, and provides habitat protection.

Resource Objectives: Natural Resource Management, Recreation, Environmental Compliance, Economic Impact
(Acreage = 4,081 21% of Corps land).

-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. Table Rock project has no land areas in this classification category. The project has no developed recreation areas that have been completely closed. The area previously listed as the "Future James River Recreation Area" has been classified as a Wildlife Management Area by 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 is for those waters classified for particular purposes when the project administers a surface water zoning program. Table Rock Lake did not have water surface classifications in prior master plans.

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

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

Resource Objectives: General Management
(Acreage = 29; less than 1% of surface water)

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

-**Designated No Wake** surface waters are established protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety. Table Rock project has no water surface area in this classification category; however, it is generally understood that areas near USACE boat ramps are considered 'no wake' for boater safety.

There are "no wake/no ski" buoys located on the lake; this is determined by the Missouri State Highway Patrol upon request and consideration with the Corps of Engineers Table Rock Project Office. New requests for buoys will only be considered at commercial concessions or upon request by the Missouri State Highway Patrol.

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

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

Justification: On Table Rock Lake all water surface acres are classified as open recreation, with the exception of restricted areas immediately above and below the dam and immediately above the auxiliary spillway. This classification is not meant to usurp the authority of the Missouri State Water Patrol to actively manage activities on the lake.

Resource Objectives: Recreation, Natural Resources Management, Economic Impact, General Management
(Acreage = 42,643; more than 99% of the surface water)

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

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

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

Resource Objectives: General Management, Recreation, Economic Impact, Natural Resource Management
Acreage: 58 Acres

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

Justification: The easements acquired for the operation of the Table Rock Project are typically applicable to that portion of the described property lying between elevation 936 feet, National Geodetic Vertical Datum, and the Government Fee Take Line. The typical flowage easement estate grants the Government the perpetual right to occasionally overflow the easement area, if necessary, for the operation of the reservoir; and specifically provides that, "No structures for human habitation shall be constructed or maintained on the land […]; and provided further that, "No other structures of any other type shall be constructed or maintained on the land except as may be approved in writing by the representative of the United States in charge of the project." All flowage easement deeds should be checked for exact rights acquired prior to proceeding in any action on the easement.

Resource Objectives: General Management
Acreage: 2,576Acres

(3) **Conservation Easement**. The Corps retains the rights to lands for aesthetic, recreation, and environmental benefits. There are currently no lands classified as conservation easement lands on Table Rock 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 Table Rock 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, Table Rock Lake Project Office Area of Responsibility (AOR). For simplicity, the topics are discussed below under generalized headings.

a. Sedimentation

While Table Rock Lake is perceived as having exceptionally clear water some issues with sedimentation exist at points along the lake. During the scoping process, the area around the dam was noted to have an issue with sedimentation. This poses a problem for the water intake structure for the MDC's Shepherd of the Hills Fish Hatchery located just downstream of the Table Rock Lake Dam. It was also noted during scoping that increased sedimentation could be linked with adverse water quality issues. While drafting the Master Plan, the PDT discussed this issue and had the following recommendations for potential resolution:

- Determine rate of sedimentation (i.e. how much sediment is already there; what is the rate of sedimentation).
    - Every year during the budget cycle, a request is made for sedimentation surveys to be completed at Corps lakes. The information from these surveys would help in determining both the amount of sedimentation present and the rate of sedimentation.
- Monitor sediment deposits.
- Consider implementing policies for boat dock owners to improve the existing roadways to their docks and launch ramps to allow the capture of gravels and sediments.
- Consider a cost-sharing partnership with other agencies to find resolutions to sedimentation issues.

Water Supply

Table Rock Lake has no municipal/ industrial users or contracts for water supply at this time. However, during the master plan revision process, the PDT noted another ongoing study, the Southwest Missouri Water Demand Planning Assistance to States (PAS) study, within the Little Rock District. This study will investigate potential water supply sources for areas located in Missouri, Kansas, and Oklahoma. This PAS is being done in partnership with the Tri-State Water Resource Coalition and the Missouri Department of Natural Resources.
The PDT took the ongoing PAS study into consideration and an indication there would be a future water reallocation request with the intention of completing a water supply contract and construction of a water supply intake structure on Table Rock Lake. Coordination and communication took place between the two teams as to potential locations for an intake structure

around the lake. This information helped the Master Plan PDT in determining the proposed land classification uses mentioned in Chapter 5.

Public Safety

One of the top three concerns identified through the scoping process was the safety of the public, including the size and speed of boats on the lake. The PDT discussed how to resolve the public's concern with perceived safety issues on Table Rock Lake and have following recommendations for potential resolution:

- Pro-active communication with the Missouri State Highway Patrol.
    - Buoy placement
    - Incident response
- Recommend limiting boat dock slip size on community, marina, and resort docks.
- Recommend increasing officer presence on the lake (i.e. leverage partnership opportunities).
- Consider Water Safety Partnership/Coalition with other agencies/groups/communities to promote Corps Water Safety message.

Public Outreach

The Table Rock Lake area encompasses a substantial amount of land and water in southwest Missouri and parts of northern Arkansas. Within this area comes numerous resources and responsibility for those resources often intertwine and overlap among various agencies (federal, state, and local) and interest groups. The PDT recognized this issue from the beginning of this master plan revision process and after consideration, have the following recommendation for potential resolution:

- Organize a 'steering committee' made up of the key resource agencies and interests groups.
- Educate the general public about the resources of the lake and what agency responsibilities are at the lake (i.e. specifically, what are Corps responsibilities for Table Rock Lake).

Some of the topics identified for further discussion amongst the steering committee include the following:

- Clean Marina Initiative
- Creating a strategic vision among agencies, partners, and stakeholders
- Table Rock National Fish Habitat Initiative (NFHI)
- Future development adjacent to Table Rock Lake
- Table Rock Lake and surrounding area as a high tourist destination—how to maximize capture of economic benefits
- Continue to promote Corps Water Safety message.
- Invasive Species Prevention

Boat Dock Building

Boat dock building is a million dollar industry at Table Rock Lake. The Corps recognizes dock building and repair businesses are necessary on Table Rock Lake, as the SMP allows for issuing of boat dock permits. However, dock builders have historically operated, and continue to operate, without a lease or license. Boat dock builders on Table Rock Lake have traditionally constructed docks wherever they could find a suitable location; at the end of a county road, nearby their business or home on the lake, or at a public launching facility. The Corps has had numerous complaints throughout the years of boat dock builders crowding and blocking launching ramps, leaving construction debris behind including metal and nails, creating noise disturbances, etc. The Corps has had a difficult time finding lands for this industry to operate. There is not enough land within commercial marinas lease areas or within developed recreation areas to allow for their operation. Community residents in areas where public launching facilities are located have expressed their concerns with allowing dock builders to "take over" these areas. In an effort to somewhat alleviate this problem, in 2007 Table Rock implemented a requirement that boat dock builders build docks only at "shared" designated locations around the lake or on-site. There were 4 designated areas identified, all of which were within partially closed parks (Coombs Ferry, Joe Bald, Big Indian, and Kings River). Prior to constructing, all builders were required to sign an Agreement with the Corps establishing terms and conditions of using the shared sites. This requirement has been beneficial in regard to lessening the number of complaints. However, these dock companies are still operating on Government property without an official lease or license.

Corps Partnership with Ozark Rivers Heritage Foundation (ORHF)

The Ozarks Rivers Heritage Foundation (ORHF), a non-profit 501(c)(3) corporation registered with the Missouri Secretary of State's office, was developed in early 2010 for the purpose of providing support for recreational facilities and projects involving the general public. In 2011, the Little Rock District entered into a Cooperative Agreement and Cooperative Lease with ORHF through which ORHF provides special events, educational programs, volunteer opportunities, advocacy, technical assistance, stewardship, land/lake access improvements and research in support of the Corps mission at the Table Rock Project. The foundation currently operates eight recreation areas, the Dewey Short Visitor Center, and provides tours of the Table Rock Dam. ORHF provides financial and other support for the Table Rock's recreational facilities and projects involving the general public. Funding for ORHF is provided through product sales, fees, and donations. Revenue collected by the foundation remains at Table Rock to enhance facilities owned by the Corps. The Cooperative Agreement and Lease between ORHF and the Little Rock District has been very successful in reducing the Project's operation costs, while providing first class recreation opportunities for the visiting public.

Dry Storage Operations

As the popularity of boat storage on Table Rock Lake increased, the need to minimize the impact to the environmental and aesthetic integrity of Table Rock's shoreline became apparent. One apparent solution came in the form of dry storage operations at commercial marinas: a large storage building is constructed on land near the water with boat ramp and courtesy dock nearby to support the use of the boats kept in the dry storage. It was determined that a building storing 120 boats only needed a 12-slip courtesy dock and launching ramp, whereas wet slips for the same number of boats would disturb a substantially larger area of shoreline. In 1999 the Corps

developed a policy for dry storage operations on Table Rock that allows dry storage operation lease consideration for residential developments on lands contiguous to projects lands zoned as Limited Development. The PDT recognizes the continuing need to minimize the impact to environmental and aesthetic integrity of the lake's shoreline and regulations and policies should be developed to encourage and promote dry storage over wet storage, unless the physical and/or socio-economic attributes of the location are prohibitive to the feasibility of a dry storage operation.

Water Management and Flood Risk Management

Six White River Basin lakes are operated together as a system to reduce the frequency and severity of floods. These lakes are Beaver, Table Rock, Bull Shoals, Norfork, Greers Ferry and Clearwater. Beaver, Table Rock and Bull Shoals lakes are in a row along the main stem of the White River in Arkansas and Missouri. Norfork Lake is on the North Fork River, which empties into the White River near the town of Norfork in north central Arkansas. Clearwater Lake is on the Black River near Piedmont, Missouri. The Black River's confluence with the White River is near Jacksonport, Arkansas. Greers Ferry Lake is on the Little Red River near Heber Springs, Arkansas. The Little Red's confluence with the White River is near Georgetown, Arkansas.

Flood Risk Management is a primary purpose of the White River Basin lakes. These lakes were among dozens Congress ordered the Corps of Engineers to build in the Mississippi River Valley to reduce flood damage and loss of life. This was primarily in response to the great flood of 1927, which swelled rivers across the entire Mississippi River Valley. That year incessant rainfall soaked 31 states and two Canadian provinces. This and subsequent floods in the 1930s and 1940s prompted legislation that led to construction of the Corps dams in the White River Basin. These lakes also work in conjunction with a system of levees, which provide additional reduction in flood damages. Since they were constructed, the White River Basin lakes and levees have prevented an estimated $1 billion in flood losses.

Flood risk management lakes work by capturing runoff in their 'flood pools' during heavy rain. After rivers downstream begin receding, water is released in a controlled fashion following pre-determined 'operating plans'. Without the lakes, all that water would roll downriver at one time. Flood crests would rise higher and spread over more land, thus causing more damage and possibly loss of life. The water stored in the flood pool must be evacuated in preparation for the next storm as quickly as downstream conditions permit without creating additional flooding. The difficulty with repeated rain is engineers are not always able to release all the water captured in the flood pool between rains. This can cause lake levels to rise with each new rainfall. When that occurs, it can sometimes take many months to empty the huge volumes of water from the flood pools and return all the lakes to their 'conservation pools'.

It is worth noting the lakes are not intended to prevent all flooding. The lakes have limitations that Mother Nature can exceed, and from time to time does. Therefore, downstream property owners should be judicious in how they develop land within the flood plains. Floods are not as frequent because of the dams, and when they do occur, they are typically not as severe as they were before the dams were built. But there will still be occasions when significant floods occur downstream of these dams. Planting crops on land that floods on occasion might be profitable in

the long run. Building a home or business on that same land might not be. Farming, running a business, or having a home in the flood plain of a river is a risk that each landowner accepts. When Congress instructed the Corps to build the White River Basin lakes, they also told the Corps to include storage for hydroelectric power generation at five of them; Clearwater Lake does not have hydropower. Water supply storage was also included at Beaver Lake, and Congress gave the Corps authority to reallocate limited amounts of storage in each lake for additional water supply. The storage space that holds water for hydropower generation and water supply primarily comprises what is referred to as the 'conservation pool'. Basically, the conservation pool creates the lakes and provides the ancillary recreational opportunities. In recognition of these opportunities, Congress also instructed the Corps to provide public access at each lake, which led to the construction of Corps parks.

While Congress and the Corps recognize the value in recreation, the White River Basin lakes were built to store water for hydropower and water supply during average weather and to store floodwater during wet weather. Therefore, the lake levels are weather dependent. Levels can range from very high during abnormally wet weather to very low during drought. This is how the lakes were designed, and it is how they provide benefits to repay the taxpayer investment in them. Just this decade, weather patterns have created both drought (2005-2007) and flood conditions (2008, 2009, and 2011).

The Corps has had many requests to keep the lake levels more steady during the recreation season, but the Corps does not have the legal authority to manage lake levels for recreation. The Corps is bound under the law to follow the White River Water Control Plan, which dictates how the system is operated.

The White River Water Control Plan has a lengthy history. In 1942, the Basis of Design for Definite Project Report was developed, which included the original studies for the method of operation for Bull Shoals and Norfork. This report helped establish the size of the flood and conservation pools in each lake. In 1952, the Plan of Flood Regulation for Bull Shoals and Norfork Reservoirs was developed. This reports described the proposed plan of regulation for Bull Shoals and Norfork. In 1954, the Master Manual for Reservoir Regulation of the White River Basin was first developed. This described the operating criteria for Bull Shoals, Norfork, and Greers Ferry. In 1963, the Reservoir Regulation Manual for Beaver, Table Rock, Bull Shoals, and Norfork Reservoirs was developed. This was revised in 1966. In 1993, the Master Manual for Reservoir Regulation for White River Basin was developed. No changes to the Water Control Plan were made, only basin conditions were updated. The economic analysis showed that changing the allocation of storage for purposes other than flood control, hydropower, or water supply was not economically justified. After years of additional study, a revision was made in 1998 to the water control plan that lowered the regulating stages on the White River during the growing season.

The keys that dictate the releases from a White River dam are rainfall amounts and consumer demand for electricity, either through power generation, spillway gates, or conduits. At times, water may be released through all three. In 2005, 2006, 2007, and again in 2012, the basin had below normal rainfall resulting in significant drought. Because there was less water coming into the lakes, there was less water released from the dams, but some power generation was still

necessary to meet consumer demands for electricity. Therefore, most lakes experienced lower lake levels. By comparison, 2008, 2009, and 2011 were wet, flood-producing years, and with so much water coming into the lakes, lake levels remained high much of the time until all the stored floodwater could be released in a controlled fashion according to the Water Control Plan. Conditions in the lake and conditions downstream of the dam also help dictate releases. When a lake is in its conservation pool, Southwestern Power Administration (SWPA) determines the releases within certain limits. They are subjected to 7-day and 28-day drawdown limits, along with having a minimum release requirement to ensure trout survival during the warm months. SWPA is also subject to maximum release limits based on downstream conditions during high water. The maximum release is determined by the Corps' Water Control Plan. Since the lakes are operated as a system, it gets still more complex. For instance, Beaver Lake releases are determined by conditions in Table Rock and Bull Shoals lakes downstream. Below Bull Shoals, Norfork and Greers Ferry lakes, releases are determined based on river levels miles downstream of the dams. The Corps will release water stored in the flood pools of Bull Shoals and Norfork based on the White River stage at Newport to empty the lakes as quickly as possible. Both the Corps and SWPA are following the missions entrusted to them under the law.

The water control plan, simply stated, says releases from Beaver are dependent upon the elevation in Table Rock and Bull Shoals Lakes; releases from Table Rock are dependent upon the elevation in Bull Shoals Lake; and releases from Bull Shoals and Norfork are dependent upon the seasonal regulating stage at Newport, Arkansas. Release criteria for the lakes were developed more specifically based upon the pool elevation, pool elevation of downstream lakes, the time of year, and downstream river conditions. Bull Shoals and Norfork releases are sized based on the following criteria:

- From 1 December through 14 April - Regulate to 21 feet except, if a natural rise exceeding 21 feet occurs, regulate to the lesser of the observed crest or 24 feet.
- From 15 April through 7 May - Regulate to 14 feet except, regulate to 21 feet, from 15 April through 30 April, and 18 feet, from 1 May through 14 May, if the four-lake system storage exceeds 50% full.
- From 8 May through 30 November - Regulate to 12 feet except, regulate to 14 feet from 15 May through 30 November, if the 4-lake system storage exceeds 70% full.
- Release a minimum of firm power and in extreme cases zero if a significant reduction in critical immediate downstream flood conditions is possible.
- Prorate the flood control releases between Bull Shoals and Norfork to maintain equal percentages of available flood control storage in NF and the BV-TR-BS.
- Release a maximum of 32,500 cfs from BS and 10,500 cfs from NF subject to a 50,000 cfs flow limit at Batesville.
- Curtail secondary power generation 'releases exceeding firm power' until six days after the crest at Newport. Secondary power releases should provide that stages above the regulating stage continue to recede until the regulating stage is reached.

While lowering lake levels in the winter to prepare for spring rains does in effect increase the size of the flood pool, at the same time it takes away from hydropower and water supply storage. The Corps does not have legal authority to do this. The current allocation of storage for flood

risk management was approved by Congress. Changing that allocation would require Congressional action.

Also, that is a very risky action because there is no way to forecast long-range how much or how little rain will fall. If the Corps artificially lowered lake levels in the winter and spring rains did not come, a shortage of water to generate electricity, meet the needs of water utilities or provide viable recreation opportunities could ensue. The water supply and power users pay for that storage. If the drought progressed, instead of recovering, lake levels could continue to drop and cause an extreme water shortage.

Regulation during storm periods is based on runoff predicted from the rain that has occurred and can be measured. Rainfall forecasts are not sufficiently accurate to base operational decisions on them. Because rainfall forecasts are inaccurate, pre-releasing would put downstream users at risk if rain developed in the uncontrolled areas instead of upstream of the dam. Conversely, we are also asked by some users to stop releases from the dams before a rainfall begins. This can also cause issues since we would be holding water in the flood pool, which lessens our ability to reduce peak downstream flows from large rainfall events.
Analysis of over 60 years of hydrologic data has proven that major floods develop from the accumulation of storage in the lakes from persistent, repeated rain storms that do not allow enough time in between to evacuate flood storage. In other words, flood storage is most always filled at the lakes by several smaller storms rather than by one large storm. So using that long-term perspective, the Corps prepares for the future by making releases whenever possible any time flood storage is in use.

As the White River basin has developed, the request for operations keyed to specific interests has intensified, and at times these requests are for conflicting operations. Farmers request lower river stages; navigation interests request sustained rivers stages; downstream fisheries want sustained cold water releases; hydropower interests would like sustained high pool levels; those concerned with downstream flood control would like low pool levels; still others would like constant pool levels. The water control plan managed by the Corps is a compromise to distribute the benefits fairly among all stakeholders.

It is a matter of balancing flood storage among the lakes in this interconnected system to best prepare for a variety of scenarios if more rain falls. This is a key part of the water control plan. It helps to understand that Bull Shoals Lake has more than twice the flood storage capacity of Beaver and Table Rock combined. The flood pool at Bull Shoals is 41 feet deep. By comparison, the flood pool at Table Rock is only 16 feet deep, and Table Rock Lake is much smaller than Bull Shoals. Let's say we've had heavy rain and Bull Shoals is 15 ft high. It still has more than two-thirds of its flood storage capacity available to capture more rain runoff. When Table Rock Lake is 15 feet high, it is 99 percent full and a fairly small rain event could cause it to spill and flood homes and businesses downstream. So we would allow Table Rock Lake to release some of its flood pool first.

The Corps attempts to balance the percentage of flood storage available in the three lakes on the main stem of the White River (Beaver, Table Rock, and Bull Shoals) with the percentage of flood storage available in Norfork. This better ensures the full use of available flood storage

when needed. Computer simulations of 60 years of river data show that maintaining equal percentages of available flood storage between the 3-lake sub-system and Norfork Lake best provides flood risk management to the lower White River valley.

What do we mean by balance? If Norfork is using 85 percent of its flood storage capacity, we make releases trying to balance the average flood storage capacity in use at 85 percent across Beaver, Table Rock and Bull Shoals. This does not mean we try to hold each of these three lakes at 85 percent full, it is the average among these three lakes. Keep in mind, Beaver provides supplemental storage for Table Rock and is much smaller. Table Rock protects homes and businesses immediately downstream of the dam. Bull Shoals Lake is larger than Beaver and Table Rock combined and has more than double the flood storage capacity. Bull Shoals works with Norfork Lake to reduce flood peaks in the lower White River Valley. For example, holding flood water in Beaver's flood pool when there is flood control storage in use at Table Rock and/or Bull Shoals provides the additional flood storage for Table Rock. The result is generally that Beaver Lake fills first and empties last. The releases from Beaver Lake are limited to 1,000 cubic feet per second daily average release when either Table Rock or Bull Shoals is more than 2 feet into the flood pool. Once the current pool elevations for both Table Rock and Bull Shoals are within 2 feet of their conservation pool elevation, releases can be increased from Beaver Lake. Evacuating storage from Table Rock provides the maximum downstream protection and ensures that if rain continues, Table Rock and Bull Shoals will be in balance as both begin reaching their maximum capacities.

The Corps has a water management Website at www.swl-wc.usace.army.mil. Real-time data, project operating data, and daily reports are a few of the items available. Also, the White River Water Control Plan is available on this site. In addition, our personnel make annual presentations to local elected officials and emergency managers from jurisdictions along the rivers. At other times, presentations are made to various stakeholder groups at their request. The Reservoir Control staff also fields numerous phone calls from the general public, media, and congressional staffs throughout the year.

During the large floods in 2008 and 2011, the six lakes working in conjunction with levees downstream in the river basins prevented an estimated $230 million in flood damage, working exactly as they were designed. Even though some of the lakes filled to record levels during either of both events, peak discharges downstream were actually tempered by operating the spillway gates. When the spillway gates were opened, they temporarily created or induced additional flood storage because water could be stored to a higher level. Since the flow coming into the lake was greater than the amount released, the lake rose while the downstream flood peak was reduced.

For instance at Beaver Lake in 2008, the peak flow coming into the lake was 110,000 cubic feet per second, but the peak flow released at the dam was only 92,400 c.f.s. During the flooding in 2011 at Table Rock, the flow coming into the lake was over 200,000 cubic feet per second for 36 consecutive hours. The peak flow released from Table Rock was 69,000 c.f.s. The 2011 event set a couple of records at Bull Shoals Lake with record pool of 696.5' and a record release rate of 53,000 c.f.s. Maximum inflow into Bull Shoals for 6 hours was over 340,000 c.f.s and maximum 1 hour inflow was over 436,000 c.f.s. Norfork Lake made a large spillway release in

2008. Peak inflow to Norfork was about 115,000 cubic feet per second and the peak flow released was 81,700 c.f.s.

Although the releases from each dam were many more times larger than the 'typical' hydropower release, the dams performed exactly as designed by reducing the peak flow released into the White River basin, which lessened the extent of downstream flooding and undoubtedly contributed to saving lives.

Vegetative Management Area

A riparian vegetative management area along the water's edge has long been a goal for Project Operations at Table Rock Lake. The Vegetative Management Land Classification is established as an opportunity to respond to the public's demand of ensuring good water quality for the lake in the future. Water quality was the number one issue for lake users by an overwhelming majority as discovered during the public scoping meetings. This land classification will establish a platform for the Shoreline Management Plan update, allowing flexibility to establish a buffer strip of land which will protect and improve water quality in the lake.
Vegetative management areas have many benefits which include….

. Infiltrating runoff water that contains potential pollutants;
. Removing sediment from runoff and wastewater;
. Transforming entrapped pollutants into nontoxic compounds;
. Providing food and habitat for fish and wildlife;
. Increasing biodiversity;
. Assisting with wind and water erosion control from runoff and wave action;

On slopes of 10 percent it is recommended that a vegetative management area be 45 feet in width ("Missouri Water Shed Protection Practice" Missouri Department of Conservation 1997). As the slope increases a corresponding distance in width of the vegetative management area should also increase. Project Operations is proposing a 50 linear foot vegetative management area measured from the water's edge (915 msl) measured by slope. This distance will encompass most of the slopes around the lake and will provide sufficient buffering to protect and improve water quality.

Population Increase/Generational Analysis

Several generations have passed since the last Master Plan revision was completed in 1976 and the general population of the area surrounding the lake has increased over time. The PDT discussed these two inter-related points and the impacts they would have on the resources around lake.

With generational analysis, the PDT discussed how the older generations (i.e. Traditionalists and Baby Boomers) viewed and 'used' the lake versus how the younger generations (i.e. Gen X, Gen Y, and Millenials) viewed and used the lake. While the PDT could not complete a full analysis on this topic due to time and funding constraints, the perception is that the older generations typically are more conservative and traditional in their uses of the resources around the lake (i.e. they stick to traditional camping, swimming, hiking, wildlife viewing etc. and have a need/desire to 'unplug' from technology like cell phones, WiFi, etc.); the younger generations can also be

conservative in the uses of the resources around the lake, but are also interested in more innovative and improved technology when it comes to resource use (i.e. looking for new recreational activities like kayak trails, paddleboards, etc. and have a need/desire to stay 'connected' to the world through cell phones, the internet, etc.).

Generational analysis shall be included when considering future development proposals around the lake.

Symbiotic relationship between Table Rock Lake and Branson

Near the eastern end of Table Rock Lake lies Branson, Missouri. Branson is a popular tourist destination in the region that attracts millions of guests every year with its numerous theaters along Highway 76 and their line-up of major recording artists, as well as other family oriented entertainment offerings. Being so close to Table Rock Lake, it is clear that visitors to both the lake and Branson enjoy the benefits of having the other nearby. In November 2010, the US Army Corps of Engineers Engineering Research and Development Center (USACE ERDC) released a study characterizing the visitors of not only Table Rock Lake but also two other nearby Corps lakes, Norfork Lake and Bull Shoals Lake. The ERDC report sheds some light on the mutually beneficial relationship between Table Rock Lake and Branson, Missouri.

The ERDC report identified a few different characteristics of visitors to Table Rock Lake that illustrates the symbiotic relationship between Table Rock Lake and Branson, Missouri. The three most telling characteristics are average spending per visitor, the percent of non-local visitors, and visitor frequency.

Average spending and spending categories are useful in telling which activities guests might have participated in while visiting Table Rock Lake. The most consistent difference between visitors to Table Rock Lake and the other lakes in the report was spending on attractions by non-local visitors. At Table Rock, the average spending on attractions by motel users was $108, $53 for those who camped, and $92 for other overnight visitors. These amounts are 3-10 times higher than the same visitor segments at Norfork Lake and 10-50 times greater than those at Bull Shoals Lake. The report attributes this large difference to the proximity of Table Rock Lake to Branson. The percent of non-local visitors also helps illustrate the Table Rock-Branson relationship. Table Rock Lake experienced 38% of recreation trips made by local visitors (within 30 miles) and 62% made by non-local visitors (more than 30 miles). The other two lakes in the study experienced rates for local and non-local visitors opposite that of Table Rock Lake -- which indicates that something else in the Table Rock Lake area is helping pull in visitors from farther away. The ERDC report attributes this difference to the proximity of the lake to Branson and a multi-lane US Highway running near the lake.

Table Rock Lake experienced a rate of 20% first trip visitors while Norfork and Bull Shoals received 6% and 10% respectively. This also helps indicate that there is something else helping bring visitors from farther away to Table Rock Lake. This is most likely due to the attractions provided in Branson. The most obvious indication that some visitors to Table Rock Lake are there for another reason are the approximately 13% of visitors that stated their visit was associated with travel to Branson. All of this evidence shows that Table Rock Lake and

Branson, Missouri, both benefit from the recreational opportunities the other provides. While it is clear that without Branson Table Rock Lake would receive fewer visits, it is unclear how many fewer visits would occur.

The PDT recommends consideration of this relationship between the City of Branson and Table Rock Lake when reviewing future development around the lake.

Table Rock Lake Shoreline Management Plan (SMP)

During the initial public involvement phase of the Master Plan revision, high public interest in the status of the Shoreline Management Plan was frequently encountered, especially regarding any planned revisions of the SMP.

Every effort was made to explain that the revision of the SMP will not take place concurrently with the Master Plan revision due to (1) increased cost; (2) increased timing; (3) the consideration that the Master Plan is the 'overarching' document and should be updated first, with the other management documents to follow suit (and to be brought into compliance with the Master Plan).

In cases where the MP conflicts with the current SMP, the MP is the overriding document until such time the SMP is updated.

It is the Corps intention to update the SMP when appropriate funding and timing are available.

Encroachments

Encroachments, including trespasses, are a long-standing issue in the management of Table Rock Lake. The relatively small land base acquired for project construction (note: the land base is small when compared to other comparably sized lakes) allows for home construction near the water. This proximity of development to the water's edge has resulted in buildings frequently being constructed on Federal lands and easements as well as frequent acts of trespass involving unauthorized removal of trees, mowing, trail constructions, and placement of personal property on public land. The Corps will continue to pursue removal of all encroachments and to prosecute those engaged in acts of trespass.

Chapter 7 Agency and Public Coordination

a. Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Table Rock 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 water 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 Table Rock 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 Table Rock Lake to aggressively leverage project financial capability and human resources in order to identify and satisfy customer expectations, project and sustain natural and cultural resources and recreational infrastructure, and programmatically bring Corps management efforts and outputs up to a justified level of service.
Public involvement and extensive coordination within the Corps of Engineers and with other affected agencies and organizations is a critical feature required in developing or revising a Project Master Plan.

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

b. Scoping.

One agency and three public scoping workshops were held in late November and early December 2012 with over 2,000 people in attendance. To prepare for the scoping workshops, the Corps contracted with CDM-Smith. An after action Memorandum for Record (MFR) is included in Appendix B, Summary of Public Comments that details the preparation and work prior to, during, and after the public scoping workshops held in the fall of 2012. From the scoping process, a Scoping Report was finalized on 4 February 2013. The report summarizes the public participation process for, and the public comments resulting from, the Table Rock Lake

MP Revision public scoping workshops and comment period. “Scoping” is the process of determining the scope, focus, and content of a NEPA document. Scoping workshops are a useful tool to obtain information from the public and governmental agencies. For a planning process such as the MP revision, the scoping process was also used as an opportunity to get input from the public and agencies about the vision for the MP update and the issues that the MP should address where possible. The Scoping Report is located on the Table Rock Lake Master Plan website, http://www.swl.usace.army.mil/Missions/Planning/TableRockMasterPlanUpdate.aspx

c. Focus Groups.

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

The initial focus group meetings were held on the 8th and 9th of May 2013 at the Dewey Short Visitors Center Theater. An informal icebreaker session was held the evening of Tuesday, May 7th, 2013 from 4:00PM to 6:00PM also at the Dewey Short Visitors Center. The icebreaker session provided the opportunity for all three focus groups to meet together, share ideas, and talk with the Corps Master Plan PDT on an informal basis. Ground rules and expectations for the focus group meetings were set during this time.

A second recreation focus group meeting was held on the 29th of May 2013 because of the three focus groups, this was the largest group member-wise and they requested more time to talk about issues related to recreation for consideration in the MP.

A ‘cross talk’ focus group meeting, which included team leaders chosen from each of the three focus groups, was held on the 5th of June 2013. The idea behind this meeting was to allow all three focus groups to hear from each other on feedback and comments given to that point on the preliminary draft master plan.

A final focus group meeting is scheduled for the 26th of June 2013 to allow the PDT to discuss with the focus groups on how their feedback and comments were included into the draft MP.

d. Draft Master Plan/Draft Environmental Assessment.

Currently scheduled for release at end of July 2013 with public workshops scheduled for mid-August 2013.

e. Final Master Plan/Final EA.

Currently scheduled for early December 2013 with public workshops in mid-December 2013.

Chapter 8 Summary of Recommendations

a. Summary Overview

The proposals made in previous chapters of this MP are for the courses of action necessary to manage Table Rock Lake's current and future challenges. Actions set forth in this plan can ensure the future health and sustainability of Table Rock 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 Table Rock project consonant with the capabilities of the resource and public needs. The plan is also flexible in that supplementation can be achieved through a formal process to address unforeseen needs. The master plan will be periodically reviewed to facilitate the evaluation and utilization of new information as it becomes available.

This MP for Table Rock 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 Table Rock Project.

b. Land Classifications

As described in detail in Chapter 5, the PDT strived to achieve a 'balanced' approach in making the land classification decisions. The team took numerous factors and expressed public concerns into consideration when determining land classification for the 2013 Table Rock Lake Master Plan revision, which included but are not limited to: how lands were previously classified in 1976; what kind of development or non-development was taking place adjacent to Corps property; if there are existing shoreline use permits and what SMP zoning existed in the prior land classification; and what kinds of activities are currently taking place in those areas.

c. Recommendation

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

Chapter 9 Bibliography

Arkansas Department of Parks and Tourism. 2009. Statewide Comprehensive Outdoor Recreation Plan. January 2009 through December 2013.

Bush, Shane. Telephone Interview. 2012.

Casaletto, David. Ozarks Water Watch. 2012.

Chapman, Carl. 1986. Archeological Assessments Report No. 49, Cultural Resources Survey at Selected Locations, Table Rock Lake, Missouri and Arkansas.

Chapman, Carl. 1993. Archeological Assessments Report No. 167, Archeological Investigations at 3CR238.

Cherokee CRC, LLC. Recreational Boating Use Study, Table Rock Lake, Missouri. April 2010.

Executive Order No. 13112. Invasive Species. 3 February 1999.

Executive Order No. 11987. Exotic Organisms. 24 May 1977.

Executive Order No. 13148. Greening the Government Through Leadership in Environmental Management. 21 April 200.

Executive Order No. 13423. Strengthening Federal Environmental, Energy, and Transportation Management. 24 January 2007.

Executive Order No. 13514. Federal Leadership in Environmental, Energy, and Economic Performance. 5 October 2009.

Kasul, Richard, Daniel Stynes, Lichu Lee, Wen-Huei Chang, R. Scott Jackson, Christine Wibowo, Sam Franco, and Kathleen Perales. Characterization of Park Visitors, Visitation Levels, and Associated Economic Impacts of Recreation at Bull Shoals, Norfork, and Table Rock Lakes. November 2010.

Missouri Department of Conservation. 1997. “Missouri Water Shed Protection Practice”

Table Rock Lake Water Quality Incorporated. 2012. Table Rock Lake Watershed Management Plan. Accessed at: http://trlwq.org/whats-happening/table-rock-lake-watershed-management-plans/table-rock-lake-water-quality-conditions

Tennessee Valley Authority (TVA). 2010. Table Rock Project Forebay Oxygen Diffuser System Report Update.

U.S. Army Corps of Engineers (USACE). 1976. Table Rock Dam and Reservoir, White River, Missouri and Arkansas, Updated Master Plan for Reservoir Development and Management, Design Memorandum 17-E.

USACE. 2013. Engineer Regulation 1130-2-550, Project Operations, Recreation Operations and Maintenance, Guidance and Procedures. HQUSACE.

USACE. 2013. Engineer Pamphlet 1130-2-550, Project Operations, Recreation Operations and Maintenance, Guidance and Procedures. HQUSACE.

USACE. 2008. ER 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance and Procedures. HQUSACE.

USACE. 2008. EP 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance and Procedures. HQUSACE.

USACE. 2013. USACE Dam Safety Program. Accessed at: www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx

USACE. 1993. White River Basin, Arkansas and Missouri, Water Control Master Manual.

USACE. 2007. Table Rock Operational Action Plan for 2007 Low Dissolved Oxygen Season.

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

Appendix A
NEPA Documents

Appendix-A

Appendix B
Summary of Public Comments

Appendix-B

Appendix C
Design Memorandums and Previous Supplements

Memo No.	Subject	Date Submitted	Date Approved
1	Access Facilities	1 Jul 52	5 Aug 52
2	Office, Service Buildings, and Utilities	3 Jul 52	9 Sep 52
3	Power Features	9 Jul 52	2 Oct 52
4	Spillway, Conduits, and Stilling Basin	24 Jul 52	13 Oct 52
5	Source of Aggregate for Concrete Works	12 Aug 52	16 Sep 52
6	Foundations – Preparation and Treatment	22 Aug 52	17 Oct 52
7	Embankment Design (Supplement)	23 Dec 54	9 Feb 55
8	Hydrology	6 Aug 52	9 Dec 52
9	Temperature and Stress Control for Concrete	11 May 53	15 Jun 53
10	Concrete Properties for Dam	23 Feb 54	5 May 54
11-1	Relocations – Cemeteries	10 Sep 54	19 Oct 54
11-2A	Relocations – State Highways	23 Nov 54	4 Mar 55
11-2B	Relocations – Local Roads	30 Dec 54	8 Jun 55
11-3A	Relocations – Utilities	6 Apr 55	10 Jun 55
11-3B	Relocations – Railroad (Revised)	7 Jan 58	10 Apr 58
12	Reservoir Clearing (Supplement)	6 Mar 57	1 Apr 57
13-1		26 Feb 53	18 Mar 53
Thru		Thru	Thru
13-15	Power Plant Design	2 Mar 56	22 Oct 56
14	Sediment Ranges	26 Jan 53	24 Nov 53
15	Instrumentation Program	8 Jun 53	22 Jul 53

Memo No.	Subject	Date Submitted	Date Approved
16-1	Real Estate – Dam Site, Work Area, and Access Road	25 Jul 52	20 Aug 52
16-2	Real Estate – Quarry Area	9 Apr 54	27 May 54
16-3	Real Estate – Reservoir Area	8 Nov 54	18 Feb 55
16-4	Real Estate – Access Roads to Public-Use Areas	6 Nov 58	24 Nov 58
17	Table Rock Dam and Reservoir, White River, Missouri and Arkansas, Design Memorandum No. 17, Reservoir Management	26 Sep 55	19 Jan 56
-	Table Rock Dam and Reservoir, White River, Missouri and Arkansas, Master Plan for Reservoir Development and Management	24 Dec 57	29 Jun 59
-	Supplement No. 1, Table Rock Dam and Reservoir, White River, Missouri and Arkansas, Master Plan for Reservoir Development and Management	3 Aug 62	6 Sep 62
17-C	Table Rock Dam and Reservoir, Updated Master Plan for Reservoir Development and Management	8 Oct 65	19 Aug 66
17-D	Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	16 Mar 70	30 Sep 70

Memo No.	Subject	Date Submitted	Date Approved
-	Supplement No. 1, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	14 Apr 71	Not approved
-	Supplement No. 2, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	2 Mar 73	23 Apr 73
-	Supplement No. 3, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	28 Aug 73	2 Oct 73
-	Supplement No. 4, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	5 Jul 74	31 Oct 74
-	Supplement No. 5, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	28 Feb 75	21 Mar 75
-	Supplement No. 6, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	2 Feb76	8 Mar 76
-	Supplement No. 7, Table Rock Dam and	15 Jul 76	19 Aug 76

Memo No.	Subject	Date Submitted	Date Approved
	Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir		
-	Supplement No. 8, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	30 Jul 76	26 Nov 76
18	Dam and Appurtenant Works	26 Jan 56	* Summarizes previous submissions and approvals
19	Operational Facilities	29 Oct 59	6 Jun 60
19	Enhancement of Public Areas of the Powerhouse	6 Sep 72	15 Feb 73
20	Resident Office and Visitor Center	31 Aug 72	16 Nov 73
17-E	Table Rock Lake, Updated Master Plan for Development and Management of Table Rock Lake	13 Oct 76	23 Dec 76
-	Supplement No. 1, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	3 Feb 77	15 Mar 77
-	Supplement No. 2, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	26 Apr 77	16 May 77
-	Supplement No. 3, Table Rock Dam and Reservoir, Updated Master Plan for	13 Feb 79	13 Mar 79

Memo No.	Subject	Date Submitted	Date Approved
	Development and Management of Table Rock Reservoir		
-	Supplement No. 4, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	8 Jul 81	23 Jul 81
-	Supplement No. 5, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	10 Sep 81	15 Oct 81
-	Supplement No. 6, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	26 Oct 81	3 Nov 81
-	Supplement No. 7, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	27 Jun 84	6 Nov 84
-	Supplement No. 8, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	21 Nov 84	24 Dec 84
-	Supplement No. 9, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table	20 Dec 84	18 Apr 85

Memo No.	Subject	Date Submitted	Date Approved
	Rock Reservoir		
-	Supplement No. 10, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	31 Jan 85	22 Mar 85*Disapproved
-	Supplement No. 11, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	28 Mar 85	16 Apr 85
-	Supplement No. 12, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	19 Nov 85	4 Dec 85
-	Supplement No. 13, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	5 Mar 86	2 Apr 86
-	Supplement No. 14, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	23 May 86	12 Jun 86
-	Supplement No. 15, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	30 Jun 86	18 Jul 86
-	Supplement No. 16,	4 Apr 88	19 Apr 88

Memo No.	Subject	Date Submitted	Date Approved
	Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir		
-	Supplement No. 17, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	11 May 88	7 Jun 88
-	Supplement No. 18, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	10 Apr 89	24 Apr 89
-	Supplement No. 19, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir		
-	Supplement No. 20, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	31 Jan 90	28 Feb 90
-	Supplement No. 21, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	16 Mar 90	5 Apr 90
-	Supplement No. 22, Table Rock Dam and Reservoir, Updated	13 Aug 90	30 Aug 90

Memo No.	Subject	Date Submitted	Date Approved
	Master Plan for Development and Management of Table Rock Reservoir		
-	Supplement No. 23, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	1 Nov 90	26 Nov 90*Action Suspended
-	Supplement No. 24, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	19 Mar 92	8 Apr 92
-	Supplement No. 25, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	9 Mar 93	31 Mar 93
-	Supplement No. 26, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	22 Feb 94	1 Mar 94
-	Supplement No. 27, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	7 Jul 94	21 Jul 94
-	Supplement No. 28, Table Rock Dam and Reservoir, Updated Master Plan for Development and	27 Mar 95	13 Apr 95

Memo No.	Subject	Date Submitted	Date Approved
	Management of Table Rock Reservoir		
-	Supplement No. 29, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	26 Apr 95	28 Jul 95
-	Supplement No. 30, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	20 Sep 95	16 Oct 95
-	Supplement No. 31, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir		
-	Supplement No. 32, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	8 Nov 99	18 Feb 00
-	Supplement No. 33, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	3 Aug 99	23 Mar 00
-	Supplement No. 34, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	28 Mar 00	10 May 00

Memo No.	Subject	Date Submitted	Date Approved
-	Supplement No. 35, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	25 Feb 00	4 May 00
-	Supplement No. 36, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	27 Aug 02	24 Sep 02
-	Supplement No. 37, Table Rock Dam and Reservoir, Updated Master Plan for Development and Management of Table Rock Reservoir	25 Jul 02	4 Sep 02

Appendix D
Park Map Plates

Appendix-D

Appendix E
Land Classification Plates
Alternative 2

Appendix-E

US Army Corps of Engineers
Little Rock District

DRAFT ENVIRONMENTAL ASSESSMENT

Draft Master Plan Revision
Table Rock Lake

July 2013

For Further Information, Contact:
Planning and Environmental Division,
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DRAFT MASTER PLAN REVISION
TABLE ROCK LAKE
ENVIRONMENTAL ASSESSMENT

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DRAFT MASTER PLAN REVISION
TABLE ROCK LAKE
DRAFT ENVIRONMENTAL
ASSESSMENT

LIST OF FIGURES AND TABLES

TITLE **PAGE**

1 INTRODUCTION

The revised Master Plan updates Design Memorandum No. 17-E, Updated Master Plan for Development and Management of Table Rock Reservoir (USACE 1976). 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.

With the proposed Master Plan update, an Environmental Assessment (EA) is being completed to evaluate existing conditions and potential impacts of proposed alternatives. The EA is prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR,1500–1517), and the Corps implementing regulation, Policy and Procedures for Implementing NEPA, Engineer Regulation (ER) 200-2-2 (1988).

2 PURPOSE AND NEED FOR ACTION

2.1 Purpose and Need

The current Table Rock Lake Master Plan is out dated and does not adequately address the needs of the lake or sets a vision for the lake for the next 10 to 20 years. The Master Plan was last approved in 1976; this was followed by multiple supplements over the last 37 years. During that time, public use patterns have changed significantly. Population growth in southeastern Missouri and northwestern Arkansas has increased by 14.4% from 2000 to 2012. Table Rock Lake receives constant pressure for both private shoreline and public recreation use. With public use at project facilities changing, reallocations of services at these facilities need to be addressed. Changes involving recreation area closures and improvements have occurred during the last four decades to meet the evolving demands of the public. In addition, cooperative agreements have occurred recently to operate and maintain facilities, lessening the financial burden on the tax payers.

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

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

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

2.2 Project History

Table Rock Lake is a multiple purpose water resource development project primarily for flood management and hydropower generation. Additional purposes include providing water storage to supply a fish hatchery (Public Law 86-93 of 1959); recreation and fish and wildlife mitigation, to the extent that those additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project (Flood Control Act of 1944 as amended in 1946, 1954, 1962, 1965 and 1968 and the Water Resources Act of 1996). Table Rock Lake is a major

component of a comprehensive plan for water resource development in the White River Basin of Missouri and Arkansas. Additional beneficial uses include increased power output of downstream power stations resulting from the regulated flow from the Table Rock Lake project.
The project is located in the scenic Ozark Mountain region of southwest Missouri and northwest Arkansas. The total area contained in the Table Rock project, including both land and water surface, consists of 62,208 acres. Of this total, 2,576 acres are in flowage easement (Note: a small difference in acreage figures exist throughout this document due to using GIS/survey plats data which is more accurate and based on new technology versus the deed language which were done many years ago without the aid of technology). The region is characterized by narrow ridges between deeply cut valleys that are well wooded with deciduous trees and scattered pine and cedar. When the lake is at the top of the conservation pool, the water area comprises 42,560 acres and 742 miles of shoreline within fee. The shoreline is irregular with topography ranging from steep bluffs to gentle slopes.

Construction of Table Rock Dam was initiated in November 1954. The dam was completed in August 1958, and the powerhouse and switchyard were completed in June 1959. The lake was declared operational for public use in March 1960. There are 26 public use areas around Table Rock Lake. There 14 parks on the lake presently managed by the Corps of Engineers, eight of which are operated by the Ozarks Rivers Heritage Foundation through a partnership agreement. The U.S. Forest Service has developed one park which they maintain and operate. One State Park is located on Table Rock Lake and it is operated by the Department of Natural Resources. One Park is operated by a commercial concessionaire. One Park is operated by the City of Beaver, Arkansas. There are eight other public use areas operated by the Corps around the lake. A more detailed description of these parks can be found in Chapter 2 of the updated Master Plan.

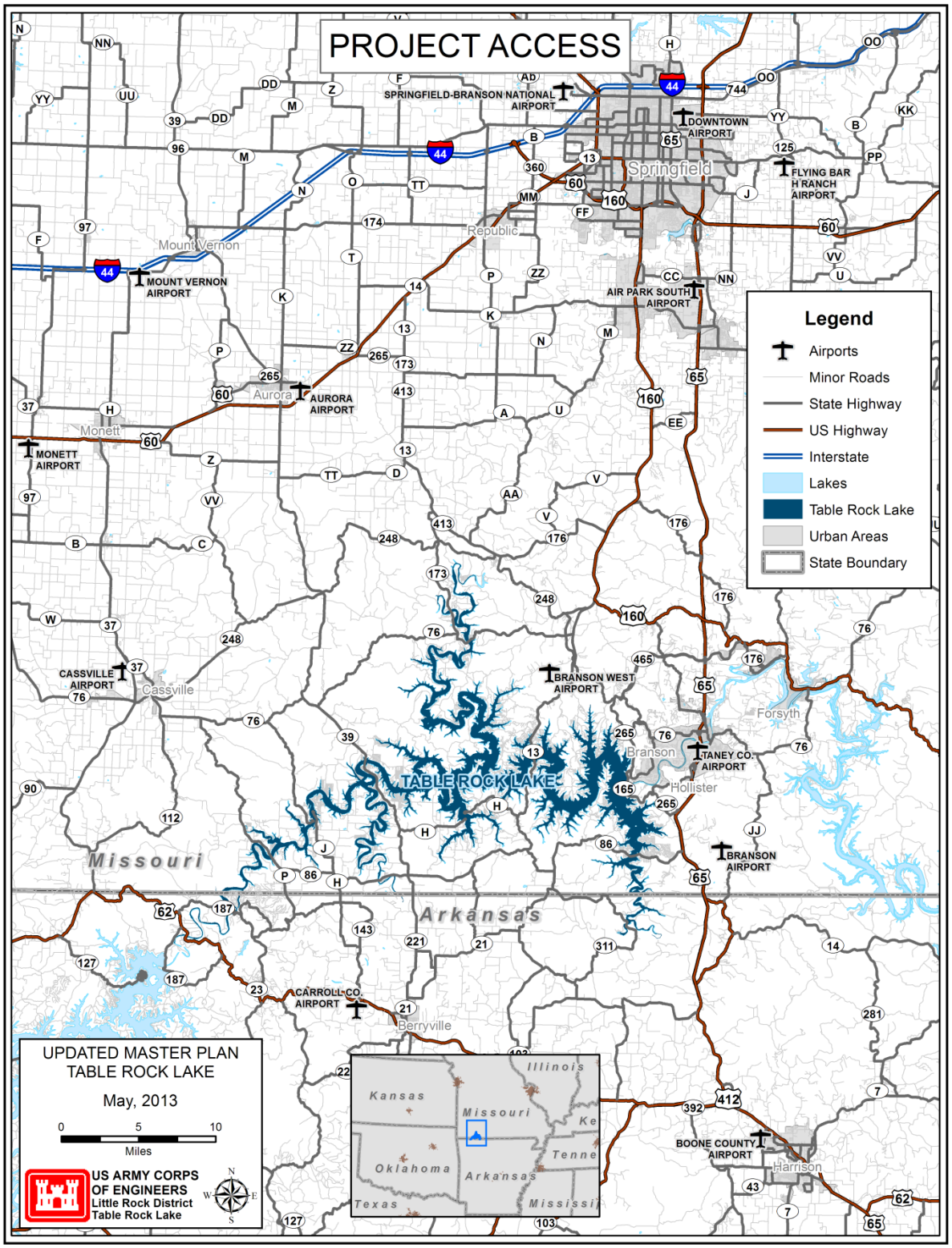


Figure 2.1. Table Rock Lake Map

Table 2.1. Pertinent Data of Table Rock Dam and Lake

PERTINENT DATA OF THE DAM AND LAKE	
General Information	
Purpose, Stream, States	FC, P (1) White River Missouri & Arkansas
Drainage area, square miles	4,020
Average annual rainfall over the drainage area, inches, approximately	45.4
Dam	
Length in feet	6,423
Height, feet above streambed	252
Top of dam elevation, feet above mean sea level	947
Generators	
Main units, number	4
Rated capacity each unit, kilowatts	50,000
Station service units, number	2
Rated capacity each unit, kilowatts	700
Lake	
Nominal bottom of power drawdown Elevation, feet above mean sea level	881
Area, acres	27,300
Nominal top of conservation pool Elevation, feet above mean sea level	915
Area, acres	42,644
Length of shoreline, miles	758
Nominal top of flood-control pool Elevation, feet above mean sea level	931
Area, acres	51,291
Length of shoreline, miles	927
Five-Year frequency pool	
Elevation, feet above mean sea level (flood pool)	921
Elevation, feet above mean sea level (drawdown)	902
(1) FC – flood control, P – power	

3 ALTERNATIVES

Through the course of revising the Master Plan, the PDT discussed and formulated the approach in shaping the alternatives found in this Environmental Assessment. From comments received during the Scoping phase, the team developed a spectrum of alternatives, with each extreme end (i.e. Conservative on one side and High Development on the other side) and with alternatives found in the 'middle'—the No Action alternative and the Balanced Use alternative. Following initial alternative development and drafting a preliminary draft Master Plan, the team met with the Focus Groups over the course of a couple months. It was determined that variations of the Balanced Use alternative were reasonable to include in the formulation of alternatives. Further discussion of public involvement during this revision process can be found in Chapter 7 of this EA.

Alternatives evaluated in the Environmental Assessment are depicted in Figure 3.1 and Figure 3.2, which include the following eight alternatives: Alternative 1, No Action; Alternative 2 (Balanced Use); Alternative 2a (Slow Growth); Alternative 2b (Maintain High Density); Alternative 2c (No New High Density); Alternative 2d (No Vegetative Management Area) ; Alternative 3, Conservative; and Alternative 4, Extreme Development. For a more detailed map analysis of these alternatives, refer to Appendix D of the Table Rock Master Plan, which contains topographic maps depicting land classification areas around the shoreline.

Table 3.1. Change in Land Classification per Alternatives

Alternative One (No Change)	Acres	% of Land		Alternative Two (Proposed)	Acres	%of Land		+/-Acres	% +/- Change		Alternative 2A: SLOW GROWTH	Acres	%of Land	+/-Acres From Alt2	% +/- Change From Alt 2
Total land and Water	62,208			Total Land and Water	62,208						Total Land and Water	62,208			
Total Water	42,669			Total Water	42,672						Total Water	42,672			
Restricted Water	29			Restricted Water	29						Restricted Water	29			
Open Recreation Water	42,640			Open Recreation Water	42,643						Open Recreation Water	42,643			
Land	19,539			Land	19,536						Land	19,536			
High Density Recreation	1,984	10%		High Density	1,986	10%		2	0%		High Density	1,986	10%	0	0%
Low Density Recreation	7,798	40%		Low Density	7,190	37%		-608	-3%		Low Density	7,422	38%	232	1%
Environmentally Sensitive	4,639	24%		Environmentally Sensitive	6,876	35%		2237	11%		Environmentally Sensitive	6,644	34%	-232	-1%
Project Operations	393	2%		Project Operations	232	1%		-161	-1%		Project Operations	232	1%	0	0%
Wildlife Management	232	1%		Wildlife Management	3,252	17%		3020	15%		Wildlife Management	3,252	17%	0	0%
No Allocation	4,492	23%		Low Density Alone (No Veg Buffer)	5,186	27%		-2612	-13%		REQUESTED LOW DENSITY	232			
Vegetative Management	0	0%		Low Density Vegetative Management Buffer	2,004	10%		2004	10%		Low Density Alone (No Veg Buffer)	5,341	27%	155	1%
				Env Sens Alone (No Veg Buffer)	4,964	25%					Vegetative Management Buffer	2,081	11%	77	0%
				Env Sens Vegetative Management Buffer	1,912	10%					Env Sens Alone (No Veg Buffer)	4,964	25%		
				Wildlife Management Alone (No Veg Buffer)	3,086	16%					Env Sens Vegetative Management Buffer	1,912	10%		
				Wildlife Vegetative Management Buffer	166	1%					Wildlife Management Alone (No Veg Buffer)	3,086	16%		
				Vegetative Management Buffer Total	4,081	21%					Wildlife Vegetative Management Buffer	166	1%		
											Vegetative Management Buffer Total	4,159	21%		
+/- Change is compared to above No Change				**Alternative Three (Conservative)**											
				Total Land and Water	62,208						**Alternative 2B: MAINTAIN HD**	**Acres**			
				Total Water	42,672						Total Land and Water	62,208			
				Restricted Water	29						Total Water	42,672			
				Open Recreation Water	42,643						Restricted Water	29			
				Land	19,536						Open Recreation Water	42,643			
				High Density	1,906	10%		-78	0%		Land	19,536			
				0 Low Density	0	0%		-7798	-40%						
				Environmentally Sensitive	14,146	72%		9507	49%						
				Project Operations	232	1%		-161	-1%		MAINTAIN HIGH DENSITY	2,000			
				Wildlife Management	3,252	17%		3020	15%						
											Alternative 2C: NO NEW HIGH DENSITY	**Acres**			
+/- Change is compared to above No Change				**Alternative Four (Extreme Development)**							Total Land and Water	62,208			
				Total Land and Water	62,208						Total Water	42,672			
				Total Water	42,672						Restricted Water	29			
				Restricted Water	29						Open Recreation Water	42,643			
				Open Recreation Water	42,643						Land	19,536			
				Land	19,536										
				High Density	1,986	10%		2	0%						
				Low Density	14,066	72%		6268	32%		NO NEW HIGH DENSITY				
				0 Environmentally Sensitive	0	0%		-4639	-24%		LOW DENSITY	7,516			
				Project Operations	232	1%		-161	-1%		ENVIRONMENTALLY SENSITIVE	6,645			
				Wildlife Management	3,252	17%		3020	15%						
				Low Density Alone (No Veg Buffer)	10,065	52%		2267	12%		**Alternative 2D: NO VEG MGT**	**Acres**			
				Vegetative Management Buffer	3,915	20%		3915	20%		Total Land and Water	62,208			
											Total Water	42,672			
											Restricted Water	29			
											Open Recreation Water	42,643			
											Land	19,536			
											NO VEG AREA	4,081			

3.1 No-Action (Alternative 1)

The No-Action alternative is defined as the Corps taking No Action and therefore not implementing an update to the Table Rock Master Plan. With this action, no new resource analysis and classification would occur, nor would a revision to project sites' inventory be completed. Operation and management of Table Rock would continue as outlined in the current Master Plan Update, which lists 1,984 acres as High Density recreation, 7,798 acres as recreation, 4,639 acres as Environmentally Sensitive areas, 393 acres as project operations, 232 acres as Wildlife Management, no acreage allotted for vegetative management, and 4,492 acres currently having no classification. High Density recreation refers to lands developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for concessions (marinas, commercial concessions, etc), and quasi-public development. Low Density recreation lands have minimal development or infrastructure that support a passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing, resorts, etc.). Environmentally Sensitive areas include those lands where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statues. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These areas are typically distinct parcels located within another, and perhaps larger, land classification area. The project operations 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. Wildlife Management lands are designated for stewardship of fish and wildlife resources. Vegetative management lands are designated for stewardship of forest, prairie, and other native vegetative cover.

3.2 Balanced-Use (Alternative 2)

Alternative 2, which is the preferred alternative, allows for a two acre increase in High Density recreation, totaling 1,986 acres. Low Density lands total 7,190 acres. A Vegetative Management Area which consists of 4,081 acres. Environmentally Sensitive lands are proposed to increase by 2,236 acres from the existing acreage of 4,639 acres, with the increase in acreage primarily due to reclassification of previously unclassified lands lying adjacent to US Forest Service lands. Some lands which were previously classified as Natural Area have been converted to Environmentally Sensitive Lands due to a terminology change in policy guidance. In response to the public's feedback to keep the lake natural and scenic, areas which fall within the definition above have been retained or converted to Environmentally Sensitive for preservation of the land and aesthetic purposes. Project Operations lands are proposed to decrease by 161 acres, representing land previously classified for appurtenant works. This acreage is no longer being used for project operations purposes, leaving a total of 232 acres for project operations. Wildlife Management acres are proposed to increase from 232 acres to 3,252 acres, due to a 1999 Forest Service land exchange wherein USACE obtained the Cow Creek area of the lake.

3.3 Slow Growth (Alternative 2a)

Alternative 2a, also considered the slow growth alternative, focuses on plated subdivisions with at least half of adjacent lots developed with homes. These area were originally considered Environmentally Sensitive because they lacked the proper vegetation modification permits that residents could obtain under Low Density Classifications. Residents in these areas have been mowing into Corps fee-land boundaries without permits, so this reclassification under Low Density is designed to keep the residents in compliance with the shoreline management plan permitting process. There are 22 areas around the lake that fall in this category, and Low Density acreage will increase from 7,190 to 7,422, while Environmentally Sensitive acreage will decrease from 6,876 to 6,644, which represents a 232 acre shift in these land classifications. Of the 7,422 acres of Low Density lands, 5,341 acres will be Low Density alone, and 2,081 will be Low Density with a Vegetative Management Area requirement.

3.4 Maintain High Density (Alternative 2b)

Alternative 2b includes areas that would remain as High Density. Under this alternative, 74 acres of High Density lands would maintain as High Density (under Alternative 2, these 74 acres are under consideration to convert 33 acres to Low Density lands and 41 acres to Wildlife Management lands). These areas are under consideration to remain as High Density because, similar to the situation with partially closed USACE parks, if an interested entity, such as another federal agency, state/local agency, or city/township could partner with USACE to take over management of these areas, then they could be retained as High Density for future development. These areas include the James River Park (undeveloped campground), Swiss Villa, Christ in Youth, Jellystone, Sunset Cove, and Kimberling Cove Resort.

3.5 No New High Density (Alternative 2c)

The No New High Density alternative would include areas that would not convert from Low Density and Environmentally Sensitive areas to High Density. In Alternative 2, these areas are under consideration for conversion from Low Density/Environmentally Sensitive to High Density. This alternative would keep these areas as Low Density (94 acres) and Environmentally Sensitive (1 acre). The areas include Dogwood Canyon, StoneCroft Property, Paradise Point, Outdoor Academy, Kimberling City, Still Waters, and Big Cedar Resort, for a total of 95 acres.

3.6 No Vegetative Management Area (Alternative 2d)

This alternative, while similar to Alternative 2, would remove the Vegetative Management Area requirement from all land classifications, rather than the proposed Vegetative Management Area in Alternative 2.

3.7 Conservative (Alternative 3)

This alternative is the most conservative of the evaluated alternatives. High Density lands are reduced by 78 acres from the current classification of 1,986 acres. All current Low Density lands are proposed to be reclassified to Environmentally Sensitive lands, which increases that acreage to 14,146, representing a 49% increase in this classification. Project operations lands and Wildlife Management lands remain the same acreages as noted in the proposed Alternative 2.

3.8 Extreme Development (Alternative 4)

This alternative would allow for much more development than all other evaluated alternatives, due to the 14,146 acres of Environmentally Sensitive lands of Alternative 3 being reclassified as Low Density lands. Of this total, 10,065 acres would have no vegetative management area requirement, while 4,001 acres would require a vegetative management area. Project operations lands and Wildlife Management lands would retain the same acreage as in the proposed Alternative 2 and Alternative 3.

4 AFFECTED ENVIRONMENT

4.1 Project Setting

The project area is located in the heart of the Ozark Mountain region. Most of Table Rock Lake lies in southwestern Missouri with a very small portion of the lake in northwestern Arkansas. The waters of Table Rock Lake have become a playground for visitors from all over the nation. Table Rock Lake's water recreation and activities are as varied as the Ozark Mountain terrain that surrounds the lake.

With nearly 800 miles of shoreline, Table Rock's many coves and lake arms make boating and water recreation such as skiing, fishing, diving, and swimming especially popular. Four major rivers, James River, White River, Kings River, and Long Creek, make up the lake's major tributaries. Commercial concessions like marinas and resorts are scattered throughout the lake and about 12 percent of the shoreline is made available for wet slip storage. Also scattered around the lake are public recreation areas that are known nationwide for camping.

Much of the shoreline has numerous subdivisions, as the Branson and Kimberling City areas of the lake are extremely developed. The predominant shoreline vegetation is an oak-hickory hard wood forest. Numerous limestone bluffs are found around the lake also, and red cedar is the principal evergreen and is dispersed throughout the region. The Cow Creek area, located on the south border and center of the lake, remains relatively undeveloped. The extent of Table Rock Lake and the structural features of the project also contribute to the tremendous attraction for a large amount of visitors to this area. The quality recreational and environmental resources of the project have greatly influenced the development of the entire region.

4.2 Climate, Physiography, Topography, Geology, and Soils

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

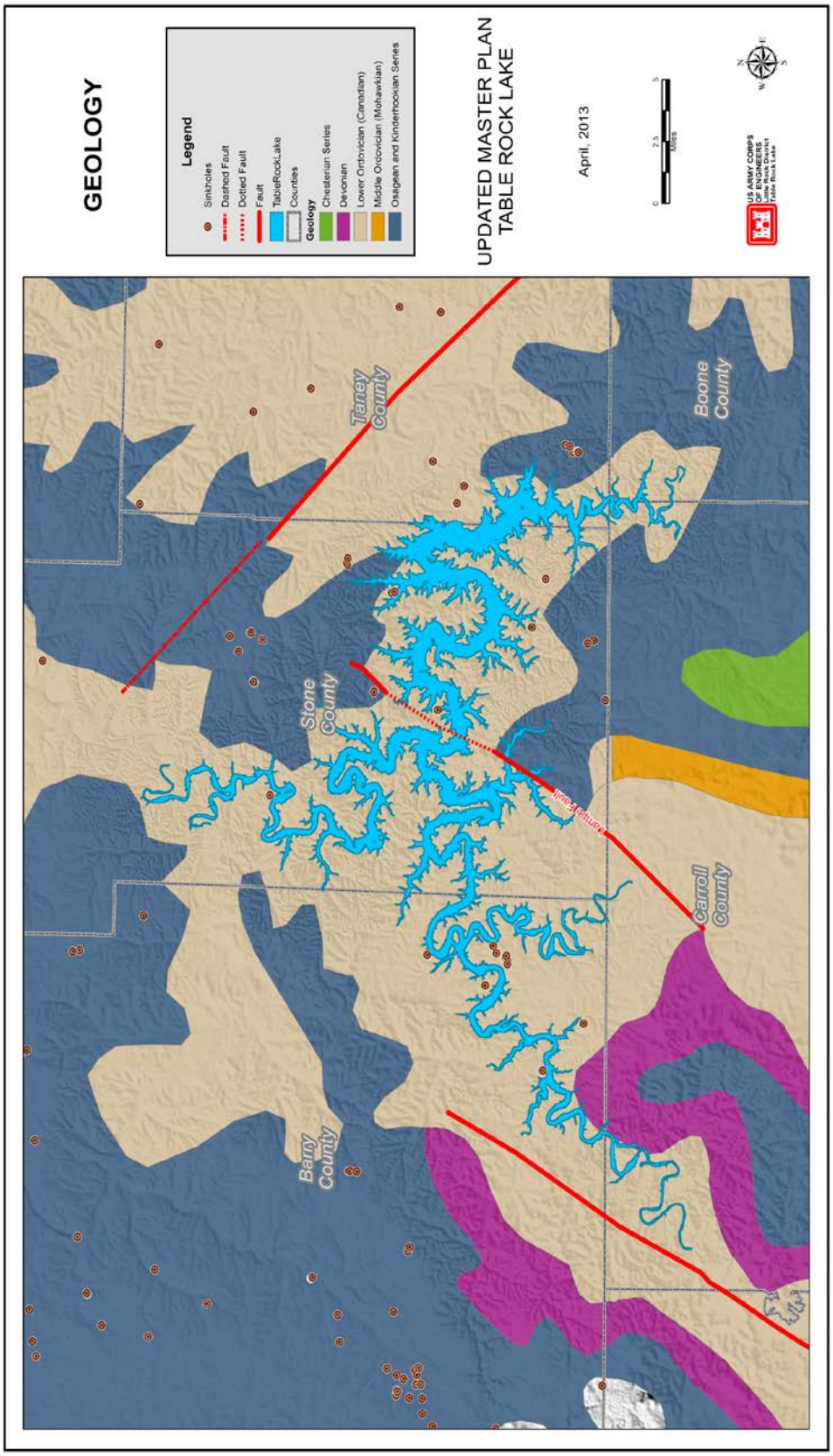
Table Rock Lake is on the southwest flank of the Ozark uplift, a structural and topographic high, which is often referred to as the Ozark Plateaus province. The plateau surfaces of this province are underlain by gently dipping, sedimentary bedrock. The highest ridges in the area surrounding the lake are a part of the Springfield Plateau, the middle level of the plateau province, which in this region rises to an elevation of about 1,400 feet. In this region the river and its tributaries have entrenched themselves about 700 feet below the plateau surface. As a result, the plateau has been

deeply dissected by erosion and the original surface is present only as the tops of narrow steep ridges.

Bedrock strata exposed in the uplands bordering the lake are of Mississippian and Ordovician age. The formations of Mississippian age underlie the plateau surface and most of the higher slopes of the basin and in most areas are well away from the lake and associated lake shore developments. Strata of the Jefferson City-Cotter Formation of Ordovician age underlie the lake and the adjoining slopes. This formation is predominantly dolomite but contains subordinate amounts of chert, quartzite, sandstone, and shale. Most of the strata are more or less argillaceous, and several have been silicified in various degrees. Chert occurs as nodules, and in thin beds along with sandstone or quartzite. Shale occurs as material along partings, and as thin seams along bedding planes.

The strata about the lake appear to be nearly horizontal, but are warped gently over a large area by the Osage-Verona anticline, the crest of which is aligned over the Kings River arm of the lake. Two major faults are in the lake area (figure 4-1). These are very old and there are no indications of recent movement along them. One, a part of the Shell Knob - Eagle Rock structure crosses Roaring River where it empties into the lake. It trends about N. 37 E., and is downthrown on the east. It has no effect on the strata beyond the immediate vicinity of the fault. The other, Lampe fault crosses under the Highway 13 White River Bridge. It trends N. 30 E., has a displacement of about 190 feet, and is downthrown on the east. Joints observed in rock along the lake are nearly vertical and do not carry through many beds. The strike of the most prominent set (primary) ranges from N. 5 E. to N. 10 W. A secondary, more poorly developed set intersects these at near right angles.

Figure 4.1 Geology and Fault Lines of Table Rock Lake



The region surrounding Table Rock Dam is subject to infrequent, mild, seismic shocks but not within recorded history are any shocks of sufficient intensity to damage structures or property. Although the bedrock of the region is soluble, most of the basin where it is underlain by the dolomites of the Jefferson City-Cotter Formation is characterized by surface drainage. This is indicated by the scarcity of important sinks, the absence of large areas without surface drainage, and a well developed stream system with normal well-branched tributaries. Two caves, Marvel Cave and Fairy Cave, are operated commercially in the region of the lake. Both caves are in the Boone Formation and extend into the Jefferson City-Cotter Formation. However, it should be noted that over most of the area in the Jefferson City-Cotter Formation is not favorable to the extensive development of caves, and those noted in the formation are small.

The most significant factor limiting the development of project land is topography. The typical ruggedness of this area hampers intensive development in many locations, and limits the number of sites containing appropriate slopes and adequately-sized areas of land desirable for the location of water access recreation facilities. Extensive alteration of landforms is not acceptable under Corps of Engineers guidelines.

The geology of the area imposes no unusual restraints on construction. However, ground water pollution is a potentially a problem because of the easy access of surface water into the water table and of the free interchange of water between rock formations. Soils around the lake, except in the flood plain, and terrace deposits along the streams, are principally residual material formed by decomposition of the dolomite beds. Generally, they are silty soil over clay subsoil, both containing chert fragments from sand size up to small boulders. The material is loose and friable near the surface but becomes harder and more compact with depth. Contacts of leached chert, disintegrated limestone, and plasticity also increase with depth. As much as 20 feet of residual soil has been encountered by borings, but at most places it is less than 8 feet thick and in some places it is entirely absent. Flood plain material consists of silt and sand over sandy, chert gravel at many places in stream channels. Most of the soils in the vicinity of the lake are low in fertility. Detailed soil survey information can be found through Natural Resources Conservation Service at: (http://SoilDataMart.nrcs.usda.gov).

The following four soils associations are found in and around the Table Rock Project area: Clarksville-Noark, Captina-Nixa, Caydon-Pembroke-Sogn, and the Caydon-Sogn. Most of the soils found in the Table Rock project do have characteristics which must be considered in development. The ability of soils to withstand intensive use should be investigated prior to initiation of construction. Trampling on these sites may cause soil compaction, resulting in increased surface runoff and accelerated erosion. Also, vegetative cover may be affected because of the reduction of air and water holding capacity of the soil. It should be noted, however, that soil compaction on use sites is not now a major problem because most of the soils are stony and resist compaction. Another factor in some areas is shoreline erosion resulting from wave action which may cause serious problems in maintenance and hamper development of water related facilities.

4.3 Aquatic Environment

Hydrology and Groundwater. Three of the large springs of Missouri feed into Table Rock Lake. Reeds Spring is at the town of the same name in Stone County; Crystal Spring is one-half mile north of Cassville in Barry County; and Roaring River Spring is in Roaring River State Park 7

Miles south of Cassville. A great many unnamed springs, both permanent and intermittent, are in the lake area, and all appear to derive their water from higher ground. Information from wells and small springs in the area indicates that the water table under the higher part of that portion of the lake rim is probably near elevation 900. Many impermeable zones exist which create perched water tables, and many of the shallow wells obtain their water from perched ground water pools. However, because of solution widened joints and structures in the rock, an interchange of water occurs between the formations that underlie the area and leaky aquifers are common. Additionally, because of exposed fractured, weathered, permeable rock, percolation of surface water into the water table is common place.

Major tributaries to Table Rock Lake are the Kings River and Long Creek from the south and the James River from the north. The drainage is typically steep in the headwaters of the smaller streams and transitions to lesser slopes as they reach the main stem of the White River. These streams can be flashy with intense rainfall. The area is primarily wooded and rural with the exception of the Highway 65 corridor from Branson to Springfield. The percent of the basin which is impervious has increased with the rapid development of the area, but remains a small percentage of the overall watershed.

Water Quality. Table Rock Lake has been listed by the Missouri Department of Natural Resources (MDNR) as an impaired waterbody on the Environmental Protection Agency (the 303(d) List). The initial listing was due to excessive nutrient concentrations, particularly nitrogen and phosphorus, in 2002. The listing has continued in each of MDNR's biennial Integrated Surface Water Quality Reports, with the most recent listing in 2010. According to the Integrated Report, these excessive nutrient concentrations occur most frequently in the James River, Kings River and Long Creek arms of the lake. The upper portion of the White River is also listed as impaired for excessive chlorophyll and nitrogen. In the study by Jones, et. al. (2008), it was shown that Table Rock Lake was an oligotrophic lake based on the samples taken near Table Rock Dam, while various arms or branches of the lake such as the James River mouth or Long Creek area, where it receives water from these tributaries, shows tendencies toward being more eutrophic *(Information provided by Table Rock Lake Water Quality, Inc., citing the Jones et. al. 2008 report). A* Total Maximum Daily Load (TMDL) evaluation is scheduled for completion in 2016 by MDNR.

Lake fluctuations, associated with power production and flood control procedures, produce changes in the environment along the shoreline of the lake. Turbidity adversely affects Table Rock Lake short periods of time after heavy rains. During these periods of heavy runoff, urban areas and other parts of the terrain especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. Table Rock, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. This naturally occurring phenomenon causes portions of the lake below the thermocline to be unfit for fish habitat because of low concentrations of dissolved oxygen. This undesirable water, when discharged downstream may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and liquid oxygen is added to the discharge waters as necessary. A highly productive trout fishery has been established in Lake Taneycomo by the Missouri Department of Conservation because of the available discharge of cold water from the dam.

Historically, Table Rock Lake experiences periods of up to five months (July-November) duration

when dissolved oxygen (DO) concentrations are less than 4 mg/L near the turbine intakes. Accordingly, turbine release DO levels have been low enough to cause concern for downstream aquatic life. During these low DO periods, the turbines at Table Rock have been operated at reduced capacity to aspirate air through the vacuum breaker system (i.e. 'venting operation').

Water releases are generally made for power generation except in the case of flood control operation. The Southwestern Power Administration (SWPA) markets power generated at this dam and other projects in the region. Four 50-mega-watt (MW) generating units provide approximately 640,000 mega-watt hours (MWh) annually. The typical peak flow for the hydro facility is 13,000 cubic feet per second (cfs). The maximum turbine discharge is 15,100 cfs.

During these low DO periods, there are various management measures that are implemented to improve the DO concentration in the hydropower releases that have been agreed-upon amongst the member agencies of the White River DO Committee and are described in the Table Rock Operational Action Plan developed and approved by the White River DO Committee prior to each low DO season. Turbine aeration modifications (vacuum breaker bypass, ring deflectors, hub holes, and booster baffles) were funded by Southwestern Power Administration (SWPA) and implemented at Table Rock in 1998, which provide for increase aeration of the hydropower releases when the turbine vents and bypass are blocked open (i.e. 'venting operation'), improving the DO concentration by as much as 3 mg/L. The turbine venting operation is the first management measure applied. Further DO concentration improvements can be achieved by SWPA voluntarily reducing the electrical output capacity of the generating unit, which allows for even greater entrainment of air in the hydropower releases. While the venting operation can improve release DO concentrations significantly, both of these measures can be costly due to efficiency losses. Additionally, reducing capacity hinders the plant's electrical peaking capability.

The venting operation can improve release DO concentrations significantly, but the plant derating is costly due to efficiency losses and loss of peaking capacity. In addition to using turbine venting and capacity reduction to increase DO, Table Rock is utilizing an existing oxygen system where oxygen is injected into the penstocks. The oxygen storage and injection system at Table Rock was installed in 1973 and has since been modernized for safety and increased liquid oxygen capacity. Currently, oxygen is injected into the penstock through two, ¾-inch piezometer taps around the lower perimeter of the penstock. The oxygen for this system is supplied from a liquid oxygen storage and supply facility consisting of two 52-ton (11,000-gallons each) liquid oxygen storage tanks and a set of water-cooled evaporators capable of producing at least 4,430 scfm of gaseous oxygen..

During the low DO season, maximum generation is limited based on the Table Rock Operational Action Plan. The following is a quote out of the Table Rock Operational Action Plan for 2013 Low Dissolved Oxygen Season:

"Plan of Action: The operational objective is to sustain DO concentrations in the release at or above 6 mg/L as long as possible through use of the turbine venting systems improvements and to prevent DO concentrations from receding below 4 mg/L, if possible, through actions as outlined below. The plan to accomplish this consists of an oxygen monitoring program, improvements to the turbine venting systems, use of the oxygen injection system, and operational response actions scaled to the severity of DO depletions. Throughout the low DO season, all unit loadings by the

powerhouse operator will take into consideration the turbine venting systems improvements to insure the release DO is as high as possible while meeting current electrical output requirements. When required generation combined with the use of the turbine venting systems improvements is insufficient to maintain DO concentrations at the first downstream monitor at or above 4 mg/L, then the use of the oxygen injection system and/or spillway releases will be used to maintain 4.0 mg/L in the downstream releases to the extent possible."

It should be noted that the inflow from Table Rock Lake watershed brings in nutrients, pollutants, and organic compounds that increase the oxygen demand within the lake and act to deplete the DO concentration. Therefore, future improvements to water quality in Table Rock Lake, through efforts addressing point and non-point sources of pollutants and nutrients in the watershed, will have a positive effect on the DO concentration in Table Rock Lake and subsequently on the hydropower releases.

In September 2010, the Tennessee Valley Authority (TVA) released a report ("Table Rock Project Forebay Oxygen Diffuser System Report Update, September 29, 2010") that presented an analysis of a 'Forebay Oxygen Diffuser System' at Table Rock Lake; this forebay oxygen diffuser system would work in conjunction with the existing venting operation and oxygen injection system to help alleviate the low DO concentrations Table Rock Lake experiences. It was decided at the time the new system was too costly to install, with operation and maintenance costs also very high; the existing plan of action (use of the venting operation plus the existing oxygen injection system) would attain the desired results needed during events of low DO concentrations.

Aquatic Resources. The impoundment of the White River and other tributary streams and rivers which form Table Rock Lake resulted in changes in the composition of the fish populations. Smallmouth bass was the principal game fish found in the White River prior to impoundment. The Missouri Department of Conservation (MDC) is the agency responsible for managing the fishery. Sport fish species currently found in Table Rock Lake include: largemouth bass, spotted bass, smallmouth bass, white bass, walleye, flathead catfish, channel catfish, white crappie, black crappie and paddlefish. Due to the quality and diversity of the fishery, Table Rock Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

Table Rock Lake was first impounded in 1959. Since its impoundment, the native forests that were flooded in abundance have begun to degrade, thus reducing existing fish and forage habitat. In 2007, the Table Rock Lake National Fish Habitat Initiative (NFHI) began with the primary objective to improve fish habitat within Table Rock Lake. Water quality, along with monitoring the effectiveness and longevity of the structures are additional goals of this project. This project has developed a framework for a broader national habitat program (Casaletto-Water Watch 2012). Since 2007, 2,096 fish habitat structures have been placed in Table Rock Lake. Structures include piles of hardwood and evergreen trees, stumps, and rocks.

The impoundment of Table Rock Lake caused environmental changes in the tailwater portion of the White River downstream from the dam. MDC realized that the cold water discharges from Table Rock Lake would necessitate a change in their fisheries management program for Lake Taneycomo, a 2,080 acre lake formed by the construction of Powersite Dam on the White River in Taney County, Missouri. Rainbow trout and brown trout were stocked in Lake Taneycomo to replace the warm-water fishery. This cold-water fishery is a success. However, because of various

unfavorable environmental factors such as lack of suitable substrate, fluctuation of water temperatures and dissolved oxygen levels, and pulsation of current and water level, trout reproduction is very limited. Shepherd of the Hills trout hatchery has been established downstream from Table Rock Dam by the MDC. Public Law 86-93 provides that 27,000 acre-feet in the power drawdown storage, not to exceed 22 cubic feet per second, would be for the use of this hatchery. 700,000 rainbow and 10,000 brown trout from Shepherd of the Hills Hatchery and from hatcheries of the U.S. Fish and Wildlife Service are stocked in Taneycomo annually. The trout fishery has flourished and is now Missouri's largest and most popular trout fishing destination. Fishing effort has increased from approximately 25,000 fishing trips in 1959 to 140,000 fishing trips in 2009.

Paddlefish and walleye have been introduced into Table Rock Lake to add diversity to the fishery. Natural reproduction of paddlefish in Table Rock Lake is considered minimal. MDC stocks approximately 7,500 paddlefish in the James River Arm each year. Walleye have been stocked by both Arkansas Game and Fish Commission (AGFC) and MDC. MDC has stocked over 350,000 walleye in the James River Arm and these fish are now reproducing on their own (Bush 2012).

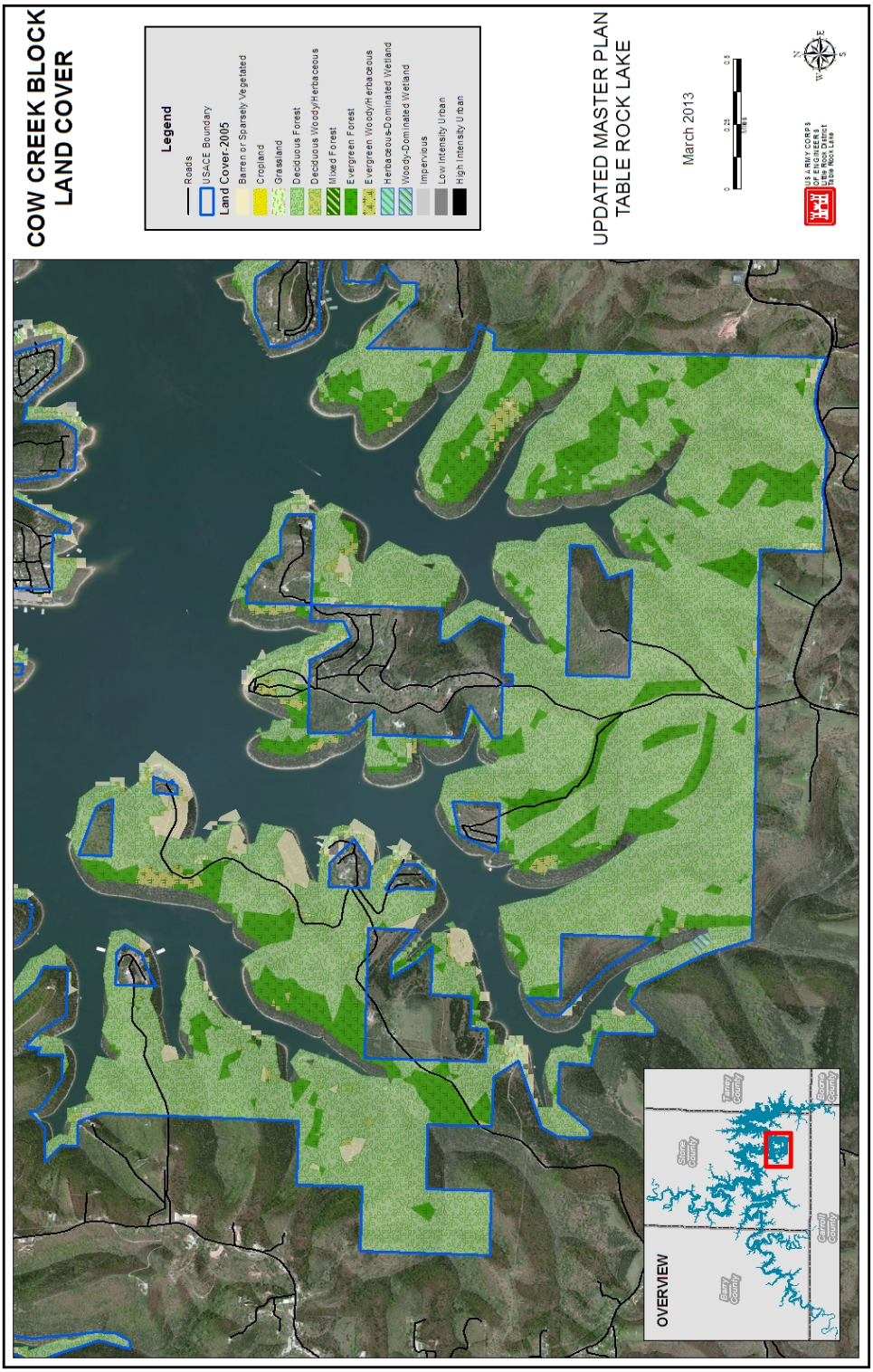
Wetland areas are relatively limited within Table Rock Lake and throughout the adjacent government property surrounding the lake. This is due to the steeply sloped terrain and thin, rocky soil layers overlying bedrock along the shoreline, which do not typically support wetland vegetation. The sparse wetland areas that occur within the lake surface area have mostly formed as mud flats within the upper reaches of the major tributaries to the lake. Additionally, a few coves on the lake have also established small wetland areas. This is due to sediment washing from streams and accumulating at the point where the stream bed enters the normal lake surface at the upper end of the cove. These areas can support emergent wetland vegetation at times depending on seasonal flooding and the controlled lake elevation. Within the State of Missouri, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) indicates approximately 12 acres of wetlands occurring within the lake surface area and in adjacent floodplains. The NWI maps also indicate wetlands in the Arkansas portion of the lake, but approximate acreages are not included. The majority of this wetland acreage is classified as palustrine scrub/shrub, either seasonally or temporarily flooded. Further, there are some areas mapped as palustrine forested occurring within wooded floodplain areas along the upper reaches of the James River, Kings River, and Long Creek.

4.4 Terrestrial Resources and Land Use

Vegetation. The area surrounding the lake is mostly forested. Trees and shrubs around the lakeshore include persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, snowberry, sumac, and buttonbush. Frequent periods of inundation keep the thin strip of government owned lands around the lake in early stages of succession. Red cedar, the principal evergreen, is dispersed throughout the region and is found in many large, scattered groups. Ground covers consist of green briar, sedge, and native grasses.

In 1999 a large tract of land was exchanged between the Corps of Engineers and the U.S. Forest Service in the Cow Creek area. The Corps gained a block of land that is approximately 3,300 acres. Land cover types in this area consist mainly of a deciduous forest. Evergreens consist of shortleaf pine that was planted by the U.S. Forest Service along the ridge tops and red cedar in the side slope glades (See figure 4.2 Cow Creek Block Land Cover).

Figure 4.2 Cow Creek Block Land Cover



Wildlife. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Table Rock Lake area. Black bear have become more common in the area over the past few years though Missouri has yet to demonstrate that the black bear population is large enough to sustain hunting.

The principal small game species found in the Table Rock Lake area in open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas and are also popular for sportsmen. Habitat management that includes removal of exotic species and application of prescribed fire do much to benefit these populations.

The ringed-neck duck and lesser scaup are the predominant migratory waterfowl species visiting the Table Rock Lake area. Mallard ducks are also present; however, they are only transient visitors, as their characteristic feeding habits of obtaining food from shallow waters discourage them from obtaining food from the deep, clear waters of Table Rock Lake. Migratory geese common to the area are lesser snow geese and Canada geese of the Eastern Prairie Population. Giant Canada geese were introduced to the area by the MDC in 1971 and 1972 and have become established as a resident population. Resident giant Canada geese are in fact so numerous in several coves that their presence has become a nuisance. Several egg and nest destruction permits are issued every year to limit local reproduction. Ring-billed gulls are seen frequently around the Table Rock Lake area. Greater and lesser yellow legs are also seen during their peak migration in the spring and fall. Table Rock is also one of the few places in Missouri where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Principal furbearing animals found in the Table Rock Lake area are mink, muskrat, beaver, and raccoon. In recent years, otters have become more prevalent around the lake.

Invasive Species. In accordance with Executive Order (EO) 13112, an invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem. In contrast, exotic species, as defined by EO 11987, include all plants and animals not naturally occurring, either presently or historically, in any ecosystem of the United States. Invasive species can take over and out compete native species by consuming their food, taking over their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars every year. Table Rock Project is not protected from the spread of invasive species. Locally the project office works with its partners, MDC and United States Department of Agriculture, to help stop the spread of some of the Ozarks most unwanted species. These would include feral hogs (*Sus scrofa)*, zebra mussels (*Dreissena polymorpha)*, and the emerald ash borer (*Agrilus planipennis*). Project rangers post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Rangers also place emerald ash borer traps on project lands to monitor any infestations of this species.

4.5 Threatened and Endangered Species

There are many species in the Ozarks that are considered either threatened or endangered. Species become imperiled for a variety of reasons including over-hunting, over fishing, and habitat loss as a result of human development and pollution; of these, habitat loss is the main contributor that imperils most species. A threatened species is one that is likely to become endangered within the

foreseeable future. An endangered species is one in danger of extinction throughout all or a significant portion of its range. The bald eagle, Halieetus leucocephalus, is common during the winter months around Table Rock Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the Bald and Golden Eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. Black vultures, a species of conservation concern, also nest in the Table Rock area. Transient populations of gray bats, a federally listed as endangered species, are documented near the Table Rock dam area. The following species listed in Figure 4.3 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Missouri Natural Heritage data set which have been reported on project lands. There are other threatened and endangered species that are known to be in the area.

Table 4.1 Threatened, Endangered, Protected and Species of Concern

Common Name	Scientific Name	Federal/State Status	State/Global Rank
Bald Eagle	*Haliaeetus leucocephalus*	P/unknown	
Gray Bat	*Myotis grisescens*	E/E	S3/G3
Black Vulture	*Coragyps atratus*	-	S3/G5
Bush's Poppy Mallow	*Callirhoe bushii*	-	S2/G3

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

4.6 Archaeological and Historic Resources

Prehistoric. Evidence of human settlement in the Ozark region can be traced back about 14,000 years, coinciding with the end of the last ice age. Early Native Americans in the region were likely a mixture of hunter-gatherers, utilizing caves and bluffs seasonally for shelter near waterways. These nomadic tribes claimed territories, which they would use seasonally for hunting, fishing, and gathering. While the archeological record shows evidence of human settlement in the Ozarks, it is difficult to identify all tribes that made this region their home.

Prehistory is primarily divided into four periods: PaleoIndian (10,000-7,800 BC), Archaic (7,800-800 BC), Woodland (800-950 AD), and Mississippian (950-1600 AD). The PaleoIndian period marks the earliest evidence of habitations in the Ozark region. The emergence of the Archaic period witnesses an increase in populations and larger seasonal encampments on the bluffs along the White River, and its tributaries. The introduction of earthen pottery and the bow and arrow is generally recognized as the Woodland Period in the Ozarks. The Mississippian Culture emerges, flourishes, then declines in present-day. Mississippi River Valley and southeastern U.S. Burial mounds, domestic structures, agriculture, and more permanent settlements characterize this era. The Jenkins Cave, located near the head of Bull Creek, and Slow Drip Rockshelter in southern

Stone County, contained evidence of a Mississippian component due to the presence of shell-tempered pottery and triangular arrow point. Oral and early written history and archeological evidence suggest some tribes known to have lived or hunted in the Ozarks include the Osage, Caddo, and Quapaw.

Historic. Historically, Ozark country of southwestern Missouri and northwestern Arkansas had few, if any, white settlers before the Nineteenth Century. Henry Schoolcraft, the first traveler to document his excursions to the region, traveled this portion of the White and James Rivers in 1818 and 1819 while making a survey of lead mines in southwestern Missouri. The turbulent period of the Civil War was keenly felt in southwestern Missouri and northwestern Arkansas. Two of the major battles west of the Mississippi were fought in this part of the country; one in southwestern Missouri at Wilson's Creek and one in the northwestern corner of Arkansas, the Battle of Pea Ridge. The areas surrounding Table Rock have several historical sites that are significant on the local and regional level. None of these sites have National significance. However, when combined with others like them across the country they record the theme of the American way of life. Marvel Cave, which is located at Silver Dollar City, Missouri, the largest privately owned commercial tourist attraction in the Table Rock Lake area, is listed on the National Registry of natural landmarks.

In the southern portion of the Ozarks in Eureka Springs, AR, much of the rich cultural heritage lies along an area that was once traversed by Native American people during the Trail of Tears. The Bluff Shelter at Blue Springs, which is listed on the National Register of Historic Places, is a small shelter that has evidence of prehistoric occupation that dates as far back as 8,000 BC. The small town of Beaver, Arkansas has a rich historic significance. Beaver Park, which borders the little community of Beaver, was the home place of Squire Beaver, a legendary resident of the portion of the White River which is now the upper end of Table Rock Lake. Beaver Park is the only project property with any specific historical significance. The Beaver Bridge, which is listed on the National Register of Historic Places and on Table Rock Lake property, survives as one of three wire cable suspension bridges left in Arkansas and as an outstanding example of Early Transportation Era (1903-1922) engineering. This entire portion of the Ozarks, however, represents a heritage of determined mountain dwellers who adapted to a rough way of life in order to survive. Examples of how dwellers of the Ozarks lived historically can be seen in some of the private tourist attractions within the Table Rock Lake region.

Previous Archaeological Investigations at Table Rock. The waterways are so important archeologically that the major physiographic regions of the state were subdivided by stream drainages to facilitate the survey and excavation of the archeological resources. A survey of the Table Rock Lake area was conducted under the supervision of Carl Chapman, University of Missouri, in 1951, with additional excavations and testing being conducted by Chapman from 1955 through 1959 during the construction phase of Table Rock Dam. At the conclusion of the work in 1959, 872 sites had been identified in and around Table Rock Lake. Subsequent studies include “Archaeological Assessments Report No. 49, Cultural Resources Survey at Selected Locations, Table Rock Lake, Missouri and Arkansas, 1986”; “Archaeological Assessments Report No. 167, Archeological Investigations at 3CR238, 1993”.

Recorded Cultural Resources at Table Rock. Today, Table Rock fee land is home to 1,076 archeological sites made up of open camp sites, shelter and cave sites, rock cairns, and earthen

mound sites. Less than one percent of the known sites within the lake area were investigated any further than documentation. However, Chapman concluded that a reasonable picture was obtained of the archaeological potential in the lake area.

4.7 Air Quality

Air quality in the Branson/Table Rock Lake area is generally good. There have been no violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA. Air monitoring requirements are established by EPA and are dictated under their guidance and monitoring objectives. Monitoring sites are placed in areas believed to have higher concentration of pollutants, which generally consist of the state's larger metropolitan areas. These areas, called Metropolitan Statistical Areas (MSA's) are defined by the larger population centers and surrounding counties. Based on these guidelines, the Branson MSA has one air quality monitoring site, with ozone the only constituent being monitored. The ozone concentration is consistently below the 75 parts per billion (ppb) established by EPA for this pollutant.

4.8 Socio-Economic Resources

There are five counties that surround Table Rock Lake, three in Missouri and two in Arkansas. Table 4.2 provides a comparative summary of population trends within those five counties that are adjacent to the project area. The total population of those counties in 2000 was 161,676, with the current (2012) population estimated at 185,007. The 2012 population represents a 14% increase since 2000. During the same time period the United States of America had population increase of 11.5%.

Table 4.2: Population Trends

	Population 2012	Population 2000	Percent Change (2000-2012)
Boone County, AR	37,327	33,948	10.0%
Carroll County, AR	27,610	25,357	8.9%
Barry County, MO	35,546	34,010	4.5%
Stone County, MO	31,568	28,658	10.2%
Taney County, MO	52,956	39,703	33.4%
Total	185,007	161,676	14.4%
Data from www.census.gov			

Table 4.3 portrays selected housing characteristics related to number of units, median value, vacancy rate and size of household. In 2010 there were a total of 99,524 housing units within the surrounding counties according to the 2010 U.S. Census. Approximately 73% of the housing units are owner occupied, with the average household size being approximately 2.4 people per unit.

As indicated in Table 4.3 the median value of owner-occupied housing in 2010 was $121,340.

Table 4.3: Housing Characteristics, 2010

	Total Housing Units	Percent Owner Occupied	Median Value (owner occupied)	Average Household Size (owner occupied)
Boone County, AR	16,902	72.8	108,400	2.49
Carroll County, AR	13,691	71.8	118,200	2.35
Barry County, MO	17,591	75.6	102,700	2.54
Stone County, MO	20,735	78.1	141,300	2.40
Taney County, MO	30,605	67.3	136,100	2.39
Total	99,524	73.1	121,340	2.43
Data from www.census.gov				

Median household incomes from 2007-2011 were $37,001 in the five counties surrounding Table Rock Lake according to the U.S. Census American Community Survey. Almost 17% of the population within those counties was considered to be below the poverty level in 2010 according to the 2010 U.S. Census (Table 4.4). The relative share of the population below the poverty level for the project area is lower than for the State of Arkansas (18.4%), but is higher than for the State of Missouri (14.3%). Around 83% of the population from the counties surrounding the lake have at least a high school diploma, and 16.1% have a bachelors degree or higher.

Table 4.4: Income and Education, 2007-2011

	Median Income	Persons Below Poverty Level (percent)	High School Graduates (percent)	Bachelors or Higher (percent)
Boone County, AR	37,327	15.8	84.7	14.2
Carroll County, AR	27,610	17.0	80.4	17.1
Barry County, MO	35,546	16.4	80.8	13.2
Stone County, MO	31,568	19.1	83.8	16.2
Taney County, MO	52,956	16.3	85.7	19.8
Total	37,001	16.9	83.1	16.1
Data from www.census.gov				

According to the 2010 U.S. Census, 4% of the population within the project area consisted of racial minority populations in 2010 as compared to 20% for the State of Arkansas and 16% for the State of Missouri (Table 4.5).

Table 4.5 Population by Race and Origin, 2010

	White	Black	Other	Hispanic or Latino Origin
Boone County, AR	96.4	0.6	3.0	2.0
Carroll County, AR	95.4	0.7	3.9	13.3
Barry County, MO	95.4	0.5	4.1	8.1
Stone County, MO	97.3	0.4	2.3	1.8
Taney County, MO	94.8	1.3	3.9	5.1
Total	95.9	0.7	3.4	6.1
Data from www.census.gov				

4.9 Recreation Resources

The recreational resource of the Table Rock Lake is considered to be of great importance to this Ozark Mountain region. The project offers many recreational activities such as swimming, SCUBA diving, boating, water skiing, fishing, picnicking, camping, as well as hiking and biking trails. There are 25 public use areas around Table Rock Lake. There are 26 public use areas around Table Rock Lake. There 14 parks on the lake presently managed by the Corps of Engineers, eight of which are operated by the Ozarks Rivers Heritage Foundation through a partnership agreement. The U.S. Forest Service has developed one park which they maintain and operate. One State Park is located on Table Rock Lake and it is operated by the Department of Natural Resources. One Park is operated by a commercial concessionaire. One Park is operated by the City of Beaver, Arkansas. There are eight other public use areas operated by the Corps around the lake. For a detailed description of the recreational resources of Table Rock Lake see Chapter 2 of the Table Rock Revised Master Plan.

4.10 Health and Safety

Safety of project visitors and project staff are highest priority in daily project operations. Facilities and recreational areas are routinely evaluated to ensure sites are safe for visitor use. Project staff conducts numerous water safety programs and public announcements to educate children and project visitors about ways to be safe on the lake.

In coordination with the Missouri State Highway Patrol (MSHP), water safety hazards and no wake zones are marked with buoys. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. MSHP provides water safety patrols on the lake as their budgets allow.

4.11 Aesthetics

Management objectives include maintaining scenic vistas while limiting impacts that would negatively affect aesthetics. Aesthetics is an important feature that enhances the recreational experience. The perimeter lands around Table Rock Lake provide a natural setting that is aesthetically pleasing as well as buffering the lake from development and negative impacts such as erosion and stormwater runoff. However, there are problems in maintaining these aesthetic qualities. Project resource staff is continually investigating trespasses that include activities such as timber cutting and land destruction by unauthorized off road vehicles. In addition, litter and illegal trash dumping both on project lands and project waters are continual problems. Vandalism within recreation areas also occurs frequently.

Other concerns that impact aesthetics are demands put upon project resources for uses such as road and utility line corridors. As Table Rock Lake continues to be surrounded by residential and commercial development, these demands are continually increasing. In many instances, these requests are in areas where the natural vegetation and landscape would be disturbed.

5 ENVIRONMENTAL CONSEQUENCES

The following table summarizes which resources are likely to be affected by implementation of a Master Plan Update or a No Action alternative. Discussion of potential impacts will follow the table.

Table 5-1. Resources Likely Affected with Implementation of Alternatives

Resource Category	Alternative 1 (No Action)	Alternative 2 (Preferred) Balanced-Use	Alternative 2a, Slow Growth	Alternative 2b, Maintain High Density	Alternative 2c, No New High Density	Alternative 2d, No Vegetative Management Area	Alternative 3 (Conservative)	Alternative 4 (Extreme Development)
Climate, Physiography, Topography, Geology and Soils	There will be impact, although not significant, to climate, physiography, topography and geology as a result of implementation of the no action alternative.	The balanced use (preferred) alternative is similar to the no action alternative in terms of potential impacts to climate, physiography, topography and geology.	There will be impact, although not significant, to climate, physiography, topography and geology as a result of implementation of the slow growth alternative. Minor seasonal temperature variations may occur due to vegetation removal.	There will be some impact, althought not significnat, to climate, physiography, topography and geology as a result of implementation of the maintain High Density alternative.	There will be little to no impact to climate, physiography, topography and geology as a result of implementation of the No New High Density alternative.	There will be impact, althought not significant, to climate, physiography, topography and geology as a result of implementation of the no vegetative management area alternative. Minor seasonal temperature variations may occur due to potential vegetation removal due to private development.	Alternative 3 is the most conservative alternative and should have little to no impacts to climate, physiography, topography and geology.	Alternative 4 is similar to the no action alternative in terms of potential impacts to climate, physiography, topography and geology.
Aquatic Environment	The hydrology and groundwater components of Table Rock Lake will not change from the existing condition due to the implementation of a no action alternative.	The balanced use (preferred) alternative is similar to the no action alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment.	The slow growth alternative is similar to the balanced use alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. Minor negative impacts to water quality may occur due to soil disturbance and increased pesticide or herbicide use at private residence developments.	The hydrology and groundwater components of Table Rock Lake will not change significantly from the existing condition due to any potential impacts from the implementation of the Maintain High Density alternative.	The No New High Density alternative is similar to the slow growth alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. Minor negative impacts to water quality may occur due to soil disturbance and increased pesticide or herbicide use at private residence developments.	The hydrology and groundwater components of Table Rock Lake may potentially undergo minor negative impacts to water quality by implementing the no vegetative management area alternative do to potential increased private development and associated soil disturbance and possible pesticide or herbicide usage.	The conservative alternative little to no impacts to the hydrology and groundwater components of the aquatic environment	The extreme development alternative is similar to the no action alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment.
Terrestrial Resources/Land Use	Under the no action alternative there is no vegetative management area. Based on this, the potential exists for continual degradation of shoreline vegetation due to increased development and subsequent vegetation removal and mowing activities.	Implementation of the balanced use alternative will have a positive impact on terrestrial resources as compared to the no action alternative. Due to an increase in environmentally sensitive, and wildlife management lands and addition of 4,081 acres in vegetative management area, this will have a positive benefit to the area.	Implementation of the slow growth alternative will have a similar impact on terrestrial resources as the balanced use alternative.	Implementation of the Maintain High Density alternative will have a similar impact on terrestrial resources as the slow growth alternative. Addition of 74 acres High Density will have little impact on terrestrial resources and land use.	Implementation of the No New High Density alternative will have a similar impact on terrestrial resources as the Maintain High Density alternative. Addition of 95 acres Low Density will have minimal impact on terrestrial resources and land use.	Implementation of the no vegetative management area alternative could have a negative impact on terrestrial resources and land use from not including 4,081 acres. This would potentially result in woody vegetation removal, which may alter wildlife habitat and movement patterns along the shoreline.	Alternative 3, the conservative alternative, will provide the greatest benefits to terrestrial resources of all the alternatives evaluated	Alternative 4, the extreme development alternative, will have the greatest negative impact on the lakeside terrestrial resources of all the alternatives evaluated.

Resource Category	Alternative 1 (No Action)	Alternative 2 (Preferred) Balanced-Use	Alternative 2a, Slow Growth	Alternative 2b, Maintain High Density	Alternative 2c, No New High Density	Alternative 2d, No Vegetative Management Area	Alternative 3 (Conservative)	Alternative 4 (Extreme Development)
Threatened & Endangered Species	The no action alternative will have no significant imnpant on the Gray Bat or the protected Bald Eagle. Bush's Poppy Mallow is also unlikely to be negatively impacted by the no action alternative.	The balanced use (preferred) alternative will likely have little to no impacts on any listed Threatened, Endangered, Protected, or Species of State Concern. Due to the increase in Environmentally Sensitive and Wildlife Management lands and Vegetative Management Area, there may be some positive benefits to any or all the listed species.	The slow growth alternative may have some impacts, although not siginificant due the minor acreage increase of Low Density lands, on any listed Threatened, Endangered, Protected, or Species of State Concern.	The Maintain High Density alternative will likely have some impact, although not significant due to the low acreage amount, on any listed Threatened, Endangered, Protected, or Species of State Concern.	The No New High Density alternative will likely have little to no impacts on any listed Threatened, Endangered, Protected, or Species of State Concern.	Implementation of the no vegetative management Area alternative could have potential minor negative impact on Threatened, Endangered, Protected, or Species of State Concern (Bush's Poppy Mallow) from not including 4,081 acres of Vegetative Management Area. This would potentially result in less woody vegetation and/or vegetation along the shoreline, which may alter potential habitat of these species.	The conservative (Alternative 3) alternative will likely have little to no impacts on any species listed Threatened, Endangered, Protected, or Species of State Concern	The extreme development alternative could have a significant impact on any species listed Threatened, Endangered, Protected, or Species of State Concern, due to the fact that this alternative will allow development on 82% of available shoreline; there will be lakeside flora and fauna impacts due to vegetation removal and modification, which will impact game and non-game wildlife foraging and movement patterns.
Archaeological & Historic Resources	Under the no action alternative, the greatest potential for effects to cultural resources and historic properties would occur in the areas located as Low and High Density Recreation and the No Allocation classification.	Under the balanced use alternative, the land classification would be very similar to the No Action Alternative, except for the stark increase in Environmentally Sensitive and Wildlife Management acreage, which would avoid impact to sites.	Under the slow growth alternative, the land classification would be similar to the balanced use alternative, with no direct impacts to cultural resources expected.	The Maintain High Density alternative may have some potential to impact cultural resource sites due to the maintenance of 74 acres of High Density land classification.	The No New High Density alternative may have some an indirect positive impact on cultural resources due to keeping 95 acres in the Low Density and Environmentally Sensitive classifications.	The No Vegetative Management Area alternative is likely to have some impact, although not significant, on cultural resources or historic sites. By not including the 50ft. Vegetative Mgt Area, there is a possibility for increased erosion along the shoreline, specifically where minimal or no development has taken place.	Under Alternative 3, the amount of Environmentally Sensitive and Wildlife Management would increase by 9,449 and 3,020 acres, respectively. This alternative is very preservation oriented and would constitute the best opportunity to minimize any potential impacts to cultural resource sites or historic properties.	This Alternative would have the greatest increase in potential impacts on cultural resource sites and historic properties compared to all the alternatives due to the potential for development around the shoreline of the lake.
Air Quality	Under the no action alternative, the air quality around the lake will remain the same as currently exists. There could be an increase in vehicular exhaust emissions due to localized development, and associated construction equipment. No violations of the current National Ambient Air Quality Standards (NAAQS) established by the EPA are expected with this alternative.	Implementation of the balanced use alternative would result in similar air quality impacts as noted in the no action alternative.	Implementation of the slow growth alternative would result in insignificant air quality impacts due to conversion of an additional 232 acres to Low Density lands.	Implementation of the Maintain High Density alternative would result in insignificant negative air quality impacts due to keeping 74 acres of High Density lands.	Implementation of the No New High Density alternative would result in insignificant positive air quality impacts due to conversion of 95 acres from High Density lands to Low Density lands.	There will be little to no impact to air quality due to the implementation of the no vegetative management area alternative. No violations of the current National Ambient Air Qulaity Standards are expected.	Implementation of the conservative alternative would result in less of an impact to existing air quality due to the reduction in lands classified for development around the lake shoreline.	Implementation of the extreme development alternative would have the greatest impact to air quality of all the evaluated alternatives, due to the acreage reclassified as Low Density recreation.

Resource Category	Alternative 1 (No Action)	Alternative 2 (Preferred) Balanced-Use	Alternative 2a, Slow Growth	Alternative 2b, Maintain High Density	Alternative 2c, No New High Density	Alternative 2d, No Vegetative Management Area	Alternative 3 (Conservative)	Alternative 4 (Extreme Development)
Socio-economics	The No Action Alternative will likely have very little impact on the socio-economic situation in the counties surrounding Table Rock Lake, and even less impact on the counties within the lake's Zone of Influence. Any changes in the socio-economic conditions of the Table Rock area would likely be the result of outside influences, and not those created by the No Action alternative.	The Balanced Use Alternative will likely have an impact on the socio-economic situation in the counties surrounding Table Rock Lake, but much less of an impact on the counties within the lake's Zone of Influence. Population would likely grow due to the increased High Density acreage and the adjusment to the Low Density acreage to the developed areas of the lake.	Implementation of the slow growth alternative would result in similar socioeconomic impacts as Alternative 2. A conversion of an additional 232 acres to Low Density lands will increase opportunity for development and recreation.	Implementation of the Maintain High Density alternative would result in similar socioeconomic impacts as Alternative 2. Maintaining 74 acres of High Density lands will increase opportunity for recreation.	Implementation of the No New High Density alternative would result in similar socioeconomic impacts as Alternative 2. Keeping 95 of Low Density and Environmentally Sensitive lands may decrease opportunity for public recreation.	There will be little to no impact to the socioeconomics of the area due to the implementation of the no vegetative management area alternative.	Alternative 3 will likely have an impact on the socio-economic situation in the counties surrounding Table Rock Lake, but much less of an impact on the counties within the lake's Zone of Influence. Population may stay the same or decrease due to the decrease in High Density and reclassification of Low Density lands.	Alternative 4 will likely have similar impacts on the socio-economic situation in the counties surrounding Table Rock Lake to that of Alternative 2 although at much greater rate. The economy of the area would most likely grow due to the increased recreational and developed areas around the lake.
Recreation Resources	Provision of recreational facilities and services would continue at Table Rock Lake without an update to the Table Rock Lake Master Plan. However, the plan by which the Resource Manager and staff operate would not accurately reflect the current status of project facilities. Lands with no classification would remain as unclassified lands.	These update in classification will help achieve a balanced public use of the lake while sustaining the natural, cultural, and socio-economic resources of the area. All lands would have a land classifications.	Implementation of the slow growth alternative would result in similar recreational impacts as Alternative 2. A conversion of an additional 232 acres to Low Density lands will increase opportunity for shoreline development and recreation.	Implementation of the Maintain High Density alternative would result in potentially more commercial development within these areas. In keeping these areas classified as High Density, the Corps could partner with others for future development.	The No New High Density alternative would result in potential negative impacts on recreation resources because it restricts the visiting publics' area on which to recreate on a large scale.	This alternative should not impact recreational opportunities on the lake. The could be potential benefit to homeowners adjacent to the lake by allowing an increase in shoreline use.	The Conservative alternative will have some recreation impact as opportunities will be reduced such as private boat docks and vegetative modification permits due to an increase in environmentally sensitive classifications that does not allow most types of development.	Under alternative 4, areas around Table Rock will experience and increase in opportunities for commercial growth, but because of water quality degradation, this growth may decrease the quality of the recreating experience. The potential for overdevelopment poses a possbility for an increase in boating-realated incidents, fatalities, and an increase in boat traffic.
Health & Safety	The no action alternative would have no vegetative management area which could potentially impact water quality. Continued development may lead to increased water traffic and primary body contact, with the potential for increased accidents and water quality degradation.	The increased recreational opportunities, balanced with conservation of natural environment could lead to better health, both mental and physical, of visiting populations. The preferred alternative would continue to see some degree of boat congestion, especially in high use areas; water related incidents would continue to be an issue under this alternative. The increase in Environmentally Sensitive and Wildlife	Implementation of the slow growth alternative would create a potential for additional boat docks due to conversion of an additional 232 acres to Low Density lands. This could potentially result in increased boat congestion and water related incidents.	Implementation of the Maintain High Density alternative would result in similar impacts as Alternative 2A, due to keeping 74 acres as High Density lands, with associated development, increased water traffic and primary contact recreation.	Implementation of the No New High Density alternative would have potential positive impacts to health and safety issues due to keeping 95 acres Low Density and Environmentally Sensitive lands, which may result in a reduction in water traffic and primary contact recreation.	There will be little to no impact to health and safety issues of the area due to the implementation of the no vegetative management area alternative, with the possible exception of minor water quality impacts from potential increased herbicide and pesticide use.	Under this alternative, access to Table Rock Lake would be limited and there lies the potential for a significant decrease in water-based recreational opportunities. However, land-based recreational opportunities, such as hiking, hunting, and wildlife obsevation could be seen.	The Extreme Development Alternative would most likely require the implementation of a range of mitigation measures to ensure a safe environment, such as slow zones, creation of boating activity use zones, or one-way directional travel restrictions. Recreational boating experiences and boater satisfaction may be negatively impacted.

Resource Category	Alternative 1 (No Action)	Alternative 2 (Preferred) Balanced-Use	Alternative 2a, Slow Growth	Alternative 2b, Maintain High Density	Alternative 2c, No New High Density	Alternative 2d, No Vegetative Management Area	Alternative 3 (Conservative)	Alternative 4 (Extreme Development)
		Management areas could result in an increase in human exposure to insects and wildlife.						Other similar impacts from the No Action alternative could also be observed with this alternative.
Aesthetics	Under the no-action alternative the visual character of the landscape would slowly suffer due to continued development.	The wide panorama of Table Rock Lake and the nearby shore would continue to convey a sense of enormity to the lake, but the high dock density would eliminate the sense of relatively pristine shoreline. The 50ft. Vegetative Management Area requirement would provide for some development screening and could enhance the viewscapes of those recreating on the lake.	Implementation of the slow growth alternative would result in similar aesthetic impacts as Alternative 2. A 232 acre increase in Low Density lands may have a potential boat dock increase, but an increase in the Vegetative management area lands of Alternative 2 would help screen new private development from a lake view.	Implementation of the Maintain High Density alternative would result in similar impacts as Alternative 2a. Though keeping 74 acres as High Density lands, with associated development, is proposed, this development is confined to specific areas with previously established viewscapes.	Implementation of the No New High Density alternative would mirror the aesthetic impacts of the slow growth alternative, but to a lesser degree because of keeping 95 acres in Low Density and Environmentally Sensitive lands is proposed.	Implementation of the no vegetative management Area alternative would potentially have the greatest aesthetic impact of the Alternative 2 variations due to not having any Vegetative Management Area lands. This could result in increased private developments, including access roads, utility corridors, increased vegetation removal permits, boat docks and fragmentation of previously natural wooded shoreline segments.	Alternative 3 wouldis minimize all activities which disturb the scenic beauty and or aesthetics of the lake.	The development of additional homes and docks in this viewshed would eliminate the unspoiled and untamed aesthetic of this landscape. The extreme development alternative would visually compete with and detract from the boulders, bluffs, and mature forestflora that currently dominate the view.

5.1 Climate, Physiography, Topography, Geology, and Soils

5.1.1 No-Action (Alternative 1)

There will be impact, although not significant, to climate, physiography, topography and geology as a result of implementation of the No Action alternative. Soil erosion would persist due to development being allowed under this alternative. Approximately 50% of available acreage (19,539 acres) around the lake is currently classified as high and Low Density recreation (10% and 40%, respectively). High Density acreage would allow development of intense recreational activities including campgrounds, parks, marinas, resorts and other public development infrastructure. This development requires soil disturbance, vegetation removal and transforming pervious surfaces to impervious areas. This promotes erosion during construction activities and increased runoff velocity after development is completed. The remaining pervious surfaces around these developed areas will become more impervious due to increased foot traffic from recreational activity. Of the activities associated with Low Density land classification—primitive camping, fishing, hunting, trails, wildlife viewing and shoreline use permits—the use permits will typically have the greatest impacts on soil disturbance due to potential vegetation removal and transforming pervious surfaces to impervious. Under the No Action alternative there is no land classification for vegetative management, which potentially could result in vegetative removal and mowing down to the water's edge, further enhancing the potential for soil erosion.

5.1.2 Balanced Use (Alternative 2)

The Balanced Use (preferred) alternative is similar to the No Action alternative in terms of potential impacts to climate, physiography, topography and geology. There will be little to no impact to the existing conditions regarding these features. High Density Recreation acreage will be similar to the No Action alternative (1,986 acres), the Low Density recreation acreage has been reduced by 608 acres to 7,190 acres. Of this total, 4,081 acres will be required to have a Vegetative Management Area, which will provide storm water velocity reduction and act as a filtering mechanism. This will reduce erosion and sediment deposition in the lake in the classification of Low Density.

5.1.3 Slow growth (Alternative 2a)

Impacts from Alternative 2a will be similar as the No Action Alternative for climate, physiography, topography, geology and soils from implementation of this alternative. There are 22 platted areas around the lake that have at least half of the plots previously developed. This alternative would allow the development of the remaining plots in these areas. Similar to Alternative 1, this development requires soil disturbance, vegetation removal and transforming pervious surfaces to impervious areas. This promotes erosion during construction activities and increased runoff velocity after development is completed. The remaining pervious surfaces around these developed areas will become more impervious due to increased foot traffic from recreational activity. Of the activities associated with Low Density land classification—primitive camping, fishing, hunting, trails, wildlife viewing and shoreline use permits—the use permits will typically have the greatest impacts on soil disturbance due to potential vegetation removal and transforming pervious surfaces to impervious. The total acreage increase in Low Density development classification is 232 acres, which represents about 1% of total lands available.

5.1.4 Maintain High Density (Alternative 2b)

Impacts from Alternative 2b will be similar as the No Action Alternative for climate, physiography, topography, geology and soils from implementation of this alternative. This alternative would maintain a total of 74 acres in the High Density classification instead of conversion in the preferred Alternative 2 to Low Density (33 acres) and Wildlife Management (41 acres). These areas include James River Park (an undeveloped campground), Swiss Villa, Christ in Youth, JellyStone, Sunset Cove, and Kimberling Cove Resort.

5.1.5 No New High Density (Alternative 2c)

This alternative takes a total of 95 acres, classified in Alternative 2 as High Density Recreation, and keeps it classified as either Low Density (94 acres) or Environmentally Sensitive (1 acre). The areas include Dogwood Canyon, StoneCroft Property, Paradise Point, The Outdoor academy, Kimberling City, Still Waters, and Big Cedar Resort. The potential limits to increased development in these areas still classified as Low Density would result in some impact, although not significant, to climate, physiography, topography, geology and soils from implementation of this alternative.

5.1.6 No Vegetative Management Area (Alternative 2d)

Alternative 2d is similar to Alternative 2, but would remove the requirement of a Vegetative Management Area from the remainder of the shoreline acreage of the lake. In Alternative 2, there are 4,159 acres of available acreage with a vegetative Management Area requirement. The potential increased number of shoreline use permits issued as a result of implementation of this alternative would result in impact, although not significant, to climate, physiography, topography, geology and soils.

5.1.7 Conservative (Alternative 3)

Alternative 3 is the most conservative alternative and should have little to no impact to climate, physiography, topography and geology. High Density recreation acreage decreases to 1,906 acres, the Low Density recreation acreage has been reclassified to an Environmentally Sensitive classification for a total of 14,146 acres, representing 72% of available acreage around the lake. Typically, limited or no development for public use is allowed on Environmentally Sensitive classified lands. This classification is for those land areas where scientific, ecological, cultural or aesthetic features have been identified. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. With these restrictions on a majority of the shoreline acreage, obvious benefits to reduced erosion and sedimentation would result from the implementation of this alternative.

5.1.8 Extreme Development (Alternative 4)

Alternative 4 is similar to the No Action alternative in terms of potential impacts to climate, physiography, topography and geology. There will be impact to the existing conditions regarding these features. High Density recreation acreage goes to 1,986 acres, representing 10% of the lake shore acreage, the Low Density recreation classification has been increased to a total of 14,066 acres, representing 72% of available acreage around the lake. While 4,001 acres of the Low Density recreation lands will require a vegetative management area, the potential development of

82% of the shoreline in this alternative could have significant detrimental effects due to increased erosion and lake sedimentation due to vegetation removal and conversion of land from a previous condition to an impervious condition due to development. Increased storm water velocity and surface scour is an additional by-product of development.

5.2 Aquatic Environment

5.2.1 No-Action (Alternative 1)

The hydrology and groundwater components of Table Rock Lake will not change from the existing condition due to the implementation of a No Action alternative. The lake has a drainage area of 4,020 square miles, with the near-lake portion containing many springs, both perennial and intermittent, which derive their water from higher elevations. Information from wells and small springs in the area indicates that the water table under the higher part of that portion of the lake rim is probably near elevation 900. Many impermeable zones exist which create perched water tables, and many of the shallow wells obtain their water from perched ground water pools. However, because of solution widened joints and structures in the rock, an interchange of water occurs between the formations that underlie the area and leaky aquifers are common. Additionally, because of exposed fractured, weathered, permeable rock, percolation of surface water into the water table is common place.

Major tributaries to Table Rock Lake are the Kings River and Long Creek from the south and the James River from the north. The drainage is typically steep in the headwaters of the smaller streams and transitions to lesser slopes as they reach the main stem of the White River. These streams can be flashy with intense rainfall. The area is primarily wooded and rural with the exception of the Highway 65 corridor from Branson to Springfield. The percent of the basin which is impervious has increased with the rapid development of the area, but remains a small percentage of the overall watershed.

Water quality issues arise after periods of heavy rainfall in the watershed, primarily due to nutrient influx, with associated sedimentation and algal blooms. Table Rock Lake has been listed on the 303(d) List by MDNR in their biennial Integrated Surface Water Quality Report (Integrated Report) to the Environmental Protection Agency as impaired due to excessive nutrient concentrations, particularly nitrogen and phosphorus. The initial impairment listing was in 2002, with the most recent listing in 2010. According to the Integrated Report, these excessive nutrient concentrations occur most frequently in the James River, Kings River and Long Creek arms of the lake. The upper portion of the White River is also listed as impaired for excessive chlorophyll and nitrogen. In the report by Jones, et.al. (2008), it was shown that Table Rock Lake was an oligotrophic lake based on the samples taken near Table Rock Dam, while various arms or branches of the lake such as the James River mouth or Long Creek area, where it receives water from these tributaries, shows tendencies toward being more eutrophic. A TMDL, designed to reduce nutrient contribution to the lake, is scheduled by MDNR to initiate in 2016. A previous 2001 TMDL, conducted on the James River, focused on nutrient reduction by placing nitrogen and phosphorus limits on point source dischargers in the basin.

Lake fluctuations, associated with power production and flood control procedures, produce changes in the environment along the shoreline of the lake. Turbidity adversely affects Table Rock Lake short periods of time after heavy rains. During these periods of heavy runoff, urban areas and

other parts of the terrain especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. While implementation of the No Action alternative is relatively independent of the existing watershed drainage on the lake water quality, continued development around the lake shoreline will exacerbate water quality issues due to potential increased erosion, localized increases in turbidity and increased sedimentation in the lake following storm events.

Wetland areas are relatively limited within Table Rock Lake and throughout the adjacent government property surrounding the lake and will not undergo any significant change from existing conditions due to implementation of the No Action alternative. This is due to the steeply sloped terrain and thin, rocky soil layers overlying bedrock along the shoreline, which do not typically support wetland vegetation. The sparse wetland areas that occur within the lake surface area have mostly formed as mud flats within the upper reaches of the major tributaries to the lake. Additionally, a few coves on the lake have also established small wetland areas. This is due to sediment washing from streams and accumulating at the point where the stream bed enters the normal lake surface at the upper end of the cove. These areas can support emergent wetland vegetation at times depending on seasonal flooding and the controlled lake elevation.

Within the State of Missouri, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) indicates approximately 12 acres of wetlands occurring within the lake surface area and in adjacent floodplains. The NWI maps also indicate wetlands in the Arkansas portion of the lake, but approximate acreages are not included. The majority of this wetland acreage is classified as palustrine scrub/shrub, either seasonally or temporarily flooded. Further, there are some areas mapped as palustrine forested occurring within wooded floodplain areas along the upper reaches of the James River, Kings River, and Long Creek.

The aquatic resources will not undergo a significant change from the existing condition due to implementation of the No Action alternative. Fishing is a major recreation component of Table Rock Lake, having regional and nation-wide popularity. Sport fish species currently found in the lake include largemouth bass, spotted bass, smallmouth bass, white bass, walleye, flathead catfish, channel catfish, white crappie, black crappie and paddlefish. Due to the quality and diversity of the fishery, Table Rock Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually. Implementation of the No Action alternative, however, will allow continued development around the shoreline, and with no vegetative management area requirement, vegetation removal down to water's edge from development will impact shoreline stability, remove fish habitat provided by overhanging vegetation, tree trunks and roots at water's edge, and exacerbate storm water erosion and sedimentation. During the spring spawning season this sedimentation has the potential to disrupt spawning activity and productivity in the coves and lake arms where spawning commonly occurs.

5.2.2 Balanced Use (Alternative 2)

The Balanced Use (preferred) alternative is similar to the No Action alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive positive benefits due to implementation of this alternative. While the High Density recreation acres are similar to the No Action Alternative, there

is a reduction of 608 acres from the Low Density recreation classification, and a significant increase in Environmentally Sensitive acreage, from 4,639 acres to 6,876 acres—a gain of 2,236 acres representing an 11% increase. These land reclassifications will serve to limit development on these lands, thereby reducing impacts to ground disturbance and subsequent increased erosion. In addition, positive impacts will be achieved by having a required Vegetative Management Area on 4,081 acres of the projects' lands (Low Density, Environmentally Sensitive, and Wildlife Management). These factors will reduce erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional benefits of retention of more shoreline vegetation, better fishery habitat, and improved spawning conditions due to the decrease of turbidity and sediment deposition. There will be little to no change in the wetland status from the existing condition due to implementation of the preferred alternative.

5.2.3 Slow Growth (Alternative 2a)

The slow growth alternative is similar to the Balanced Use alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive similar positive benefits due to implementation of this alternative, with only 1% of Environmentally Sensitive lands being reclassified as Low Density recreation. Positive impacts could be achieved by having a required vegetative management area on 2,081 acres of the Low Density recreation lands, which is a 78 acre increase over the Balanced Use alternative. These factors will reduce erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional benefits of retention of more shoreline vegetation, better fishery habitat, and improved spawning conditions due to the decrease of turbidity and sediment deposition. There will be little to no change in the wetland status from the existing condition due to implementation of the slow growth alternative.

5.2.4 Maintain High Density (Alternative 2b)

The Maintain High Density alternative includes the areas noted below that would remain as High Density lands, however, due to the minor acreage involved, would result in insignificant impacts to the hydrology and groundwater components of the aquatic environment. The areas of James River Park (an undeveloped campground), Swiss Villa, Christ in Youth, JellyStone, Sunset Cove and Kimberling Cove Resort, cumulatively total 74 acres. In Alternative 2 these areas are under consideration for conversion from High Density to Low Density because they currently do not support the definition of High Density recreation. However, similar to partially closed Corps parks, if an interested entity, such as another federal agency, state/local agency, or city/township, could partner with the Corps to take over management of these areas, the Corps could keep them classified as High Density for future development.

5.2.5 No New High Density (Alternative 2c)

The No New High Density alternative includes areas that would not convert from Low Density/Environmentally Sensitive to High Density. In Alternative 2, these areas are under consideration for conversion from Low Density to High Density because they support the definition of High Density recreation. It is expected that development will take place adjacent to Corps property that will support recreation facilities for public use. These areas include Dogwood

Canyon, StoneCroft Property, Paradise Point, Outdoor Academy, Kimberling City, Still Waters and Big Cedar Resort. Due to the limited acreage involved (95 acres), potential impacts to the hydrology and groundwater components of the aquatic environment, as well as water quality, should be minimal due to this proposed change.

5.2.6 No Vegetative Management Area (Alternative 2d)

The No Vegetative Management Area alternative is similar to the No Action Alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive some negative benefits due to implementation of this alternative, with the proposed removal of 4,081 acres of designated Vegetative Management Area lands, which enhances the potential for issuance of shoreline mowing permits. While grass cover does effectively improve water infiltration and removes sediments from storm water runoff, there is increased potential for water quality impacts due to increased herbicide/pesticide usage in these mowed lands.

5.2.7 Conservative (Alternative 3)

The Conservative (Alternative 3) alternative is will have little to no impacts in terms of the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive positive benefits due to implementation of this alternative. While the High Density recreation acres are similar to the No Action alternative, the 7,798 acres of Low Density recreation lands have been reclassified as Environmentally Sensitive lands, representing 72% of available lakeshore area (14,146 acres of Environmentally Sensitive). Typically, limited or no development for public use is allowed on Environmentally Sensitive classified lands. This classification is for those land areas where scientific, ecological, cultural or aesthetic features have been identified. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. With these restrictions on a majority of the shoreline acreage, obvious benefits to reduced erosion and sedimentation would result from the implementation of this alternative, which will benefit water quality, as well as fishery habitat and productivity. There will be little to no change in the wetland status from the existing condition due to implementation of the conservative alternative.

5.2.8 Extreme Development (Alternative 4)

The Extreme Development (Alternative 4) alternative is similar to the No Action alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, will likely be negatively impacted from implementation of this alternative. While the High Density recreation acreage is similar to the No Action alternative (1,986 acres), representing 10% of the lake shore acreage, the Low Density recreation classification has been increased to a total of 14,066 acres, representing 72% of available acreage around the lake. While 4,001 acres of the Low Density recreation lands will

require a vegetative management area, the potential development of 82% of the shoreline in this alternative could have significant detrimental effects due to increased erosion and lake sedimentation due to vegetation removal and conversion of land from a previous condition to an impervious condition due to development. Increased storm water velocity and surface scour is an additional by-product of development.

This will degrade water quality due to flushing of pollutants from developed areas, and the increase in sedimentation and turbidity will have a negative effect on fishery habitat and productivity. There will be little to no change in the wetland status from the existing condition due to implementation of the extreme development alternative. Most of the wetlands have been identified in the upper reaches of the major tributary streams, therefore shoreline development will have little impact to this resource.

5.3 Terrestrial Resources and Land Use

5.3.1 No Action (Alternative 1)

Under the No Action alternative, High Density recreation land classification will be at 1,986 acres (10% of total available area), Low Density recreation lands will be 7,798 acres (40%), Environmentally Sensitive lands include 4,639 acres (24%), classified Wildlife Management lands total 232 acres (1%), while 4,492 acres have no current classification, representing 23% of the available shoreline acreage. There is no vegetative management area under the No Action alternative. Based on this, the potential exists for continual degradation of shoreline vegetation due to increased development and subsequent vegetation removal and mowing activities. Unclassified lands are potentially developable, resulting in 74% of the shoreline acreage subject to increased or new development. This will result in negative impacts to wildlife due to potential removal of trees and understory vegetation, thereby altering food sources and migratory patterns of both birds and mammal species.

5.3.2 Balanced Use (Alternative 2)

Implementation of the Balanced Use alternative will have a positive impact on terrestrial resources as compared to the No Action alternative. There is a 608 acre reduction in Low Density recreation land classification (7,190 acres), an 11% increase in Environmentally Sensitive lands classification (6,876 total acres) and an increase in Wildlife Management lands from 232 acres to 3,252 acres, which results in 17% of available acreage classified as Wildlife Management lands. This increase in this area is largely the result of a land swap with the US Forest Service wherein the Cow Creek area lands were obtained. The increases in lands classified in these three areas will serve as additional protection for lakeside vegetation and preservation of habitat for wildlife and migratory bird species. An additional benefit to terrestrial resources is due to the 4,081 acres of Low Density, Environmentally Sensitive, and Wildlife Management lands requiring a Vegetative Management Area, which provides a buffer of natural vegetation to remain along the shoreline for this designated acreage.

5.3.3 Slow Growth (Alternative 2a)

The Slow Growth alternative is similar to the Balanced Use alternative in terms of potential impacts to the terrestrial resources and land use patterns. A proposed increase in Low Density

lands of 232 acres, representing 1% of available acreage, will likely have an insignificant impact. In spite of this increase in Low Density lands, there is a small increase of 78 acres in Vegetative Management Area lands, which will provide limited benefits to wildlife habitat and movement patterns.

5.3.4 Maintain High Density (Alternative 2b)

The Maintain High Density alternative includes the areas noted below that would remain as High Density lands. However, due to the small acreage involved as these lands have already been 'disturbed' in the past, would result in insignificant impacts to terrestrial resources and land use patterns. Low Density lands would not gain 33 acres and nor would there be a 41 acre increase Wildlife Management (74 acre total). The areas involved include James River Park (an undeveloped campground), Swiss Villa, Christ in Youth, JellyStone, Sunset Cove and Kimberling Cove Resort.

5.3.5 No New High Density (Alternative 2c)

The No New High Density alternative includes areas that would not convert from Low Density/Environmentally Sensitive to High Density. In Alternative 2, these areas are under consideration for conversion from Low Density to High Density because they support the definition of High Density recreation. It is expected that development will take place adjacent to Corps property that will support recreation facilities for public use. These areas include Dogwood Canyon, StoneCroft, Paradise Point, Outdoor Academy, Kimberling City, Still Waters and Big Cedar Resort. Due to the limited acreage involved (95 acres), potential impacts to the terrestrial resources and land use should be minimal due to this proposed change. There will be some minor benefits incurred regarding wildlife habit and movement corridors by keeping this acreage as Low Density (94 acres) and Environmentally Sensitive (1 acre) lands.

5.3.6 No Vegetative Management Area (Alternative 2d)

The No Vegetative Management Area alternative is similar to the Balanced Use alternative in terms of retaining the High and Low Density land acreages, but the elimination of the Vegetative Management Area on 4,081 acres will have some negative impacts to terrestrial resources (both plant and animal), as well as potential land uses. This action would potentially result in woody vegetation removal, with grass replacement, which would alter wildlife habitat, movement patterns, and feeding activity along the shoreline environment.

5.3.7 Conservative (Alternative 3)

Alternative 3, the Conservative alternative, will provide the greatest benefits to terrestrial resources of all the alternatives evaluated. The reclassification of all Low Density recreation lands to Environmentally Sensitive lands, totaling 14,146 acres (72% of total available acreage), will offer more protection to lakeshore vegetation and habitat protection for the lakeside terrestrial game and non-game fauna. An additional 3,252 acres are classified as Wildlife Management, and this 17% results in 87% of total available acreage around the shoreline being classified in categories that are beneficial to the preservation of shoreline terrestrial resources. Under this alternative, 10% of available acreage remains classified as High Density recreation.

5.3.8 Extreme Development (Alternative 4)

Alternative 4, the Extreme Development alternative, will have the greatest negative impact on the lakeside terrestrial resources of all the alternatives evaluated. While the High Density recreation acreage is similar to the No Action alternative (1,986 acres), representing 10% of the lake shore acreage, the Low Density recreation classification has been increased to a total of 14,066 acres, representing 72% of available acreage around the lake. While 4,001 acres of the Low Density recreation lands will require a vegetative management area, the potential development of 82% of the shoreline in this alternative could have significant detrimental effects due to vegetation removal during development and through issuance of shoreline use permits. Wildlife habitat and behavior will be impacted due to the removal of movement and shelter corridors and destruction of nesting, perching and food sources.

5.4 Threatened and Endangered Species

5.4.1 No Action (Alternative 1)

Of the species listed in Table 4.5 of Section 4.0 AFFECTED ENVIRONMENT, only the Gray Bat, *Myotis grisescens,* is listed as Threatened or Endangered. This species has been observed at times around the dam area of Table Rock Lake. Since this bat roosts in nearby caves during the summer and hibernates in caves during the winter, the No Action alternative will have no significant impact on this species. The Bald Eagle, *Haliaeetus leucocephalus,* was removed from the Threatened listing in 2007 by the USFWS, but it still remains a protected species. While there have been reports of nesting in some locations around the lake perimeter, there is only one recorded nesting site by the Missouri Department of Conservation (MDC), located just above the Arkansas border in the Kings River arm of the lake. This location is in a rural area with no road access, and is highly unlikely to be impacted by any evaluated alternative. The state species of concern, the Black Vulture, *Coragyps atratus,* is a year-round resident species, but nests in old buildings or on the ground away from human activity, and will be likely not be significantly impacted by any alternative evaluated. The other species of state concern, Bush's Poppy Mallow, *Callirhoe bushii,* has also been documented at one location by MDC, in the vicinity of the Bald Eagle documentation in the upper Kings River lake arm in a remote, relatively inaccessible area. This plant is unlikely to be negatively impacted by any evaluated alternative.

5.4.2 Balanced Use (Alternative 2)

The Balanced Use (preferred) alternative will likely have little to no impacts on any listed Threatened, Endangered, Protected, or Species of State Concern based on the documentation and justification noted in the No Action alternative. Due to the increase of Environmentally Sensitive and Wildlife Management acreage from the No Action lands classifications, there may be potential positive benefits to any or all the listed species, and possibly other yet undiscovered species that may exist in the area.

5.4.3 Slow Growth (Alternative 2a)

Similar to Alternative 2, the Slow Growth alternative will likely have little to no impacts on any listed Threatened, Endangered, Protected, or Species of State Concern based on the documentation and justification noted in the No Action alternative. Due to the conversion of 232 acres of Environmentally Sensitive acreage to Low Density acreage classification, there may

be potential minor negative impacts to any or all the listed species, and possibly other yet undiscovered species that may exist in the area.

5.4.4 Maintain High Density (Alternative 2b)

The Maintain High Density alternative will likely have some impacts, although not significant due to the low acreage amount, on any listed Threatened, Endangered, Protected, or State Species of Concern based on the documentation and justification noted in the No Action alternative. Due to the maintenance of 74 acres (33 acres from Low Density, 41 acres from Wildlife Management) to High Density recreation lands classification, there may be potential minor negative impacts to any or all the listed species, and possibly other yet undiscovered species that may exist in the area.

5.4.5 No New High Density (Alternative 2c)

The No New High Density alternative will likely have little to no impacts on any listed Threatened, Endangered, Protected, or Species of State Concern based on the documentation and justification noted in the No Action alternative. Due to keeping 95 acres in Low Density (94 acres) and Environmentally Sensitive (1 acre) land classification, there may be potential minor positive benefits to any or all the listed species, and possibly other yet undiscovered species that may exist in the area.

5.4.6 No Vegetative Management Area (Alternative 2d)

The No Vegetative Management Area alternative may have some potential minor impacts on listed Threatened, Endangered, Protected, or Species of State Concern, such as the Bush's Poppy Mallow (*Callirhoe bushii)*, and possibly other yet undiscovered species that may exist in the area due to the removal of 4,081 acres of Vegetative Management Area. Possible future nesting sites of the federally protected Bald Eagle (*Haliaeetus leucocephalus)* and the Black vulture, may also be impacted by this action.

5.4.7 Conservative (Alternative 3)

The Conservative (Alternative 3) alternative will likely have little to no impacts on any species listed as Threatened, Endangered, Protected, or Species of State Concern based on the documentation and justification noted in the No Action alternative. Due to the significant increase of Environmentally Sensitive and Wildlife Management acreage from the No Action land classifications, there may be potential positive benefits to any or all the listed species, and possibly other yet undiscovered species that may exist in the area.

5.4.8 Extreme Development (Alternative 4)

The Extreme Development alternative could have a significant impact on any species listed Threatened, Endangered, Protected, or Species of State Concern based on the documentation and justification noted in the No Action alternative. Due to the fact that this alternative will allow development on 82% of available shoreline, there will be lakeside flora and fauna impacts due to vegetation removal and modification, which will impact game and non-game wildlife foraging and movement patterns. This alternative may have negative impact on species like the Black Vulture,

which depends primarily on wildlife for its food source.

5.5 Archaeological and Historic Resources

5.5.1 No-Action (Alternative 1)

Under the No-Action Alternative there would be no change in the current Master Plan land classifications as designated under the 1976 MP. Under this alternative, the greatest potential for effects to cultural resources and historic properties would occur in the areas located as Low and High Density Recreation and those lands with no classification. Due to land acquisitions by the Corps, subsequent to the updating of the 1976 Master Plan, approximately 23% of Corps managed property has no land classification. Cultural Resources under the No Action Alternative would be at risk of disturbance in areas that would allow for intensive development. Any new ground disturbing activities on USACE lands would require a permit to be issued prior to commencement of the activity. Cultural Resource sites within Low Density classification areas could potentially undergo the most severe impact due to the fact that activities such as boat dock construction and shoreline use permits require a degree of ground disturbance which pose a threat to intact cultural deposits. Through the site review process prior to issuance of a permit, unknown sites would be identified, and known sites would be evaluated for their significance and eligibility for the National Register, pursuant to 36 CFR Part 800 of the National Historic Preservation Act. Cultural Resource sites within Low Density classification areas could potentially undergo the most serve impact due to the fact that activities such as boat dock constructions and shoreline use permits require a degree of ground disturbance which pose a threat to intact cultural deposits.

5.5.2 Balanced Use (Alternative 2)

Under the Balanced Use alternative, the land classification would be very similar to the No Action Alternative, except for the increase in Environmentally Sensitive and Wildlife Management acreage. With the implementation of a Vegetative Management Area, there would essentially be less potential for ground disturbing activities along the shoreline to impact cultural resources. In areas which were previously Low Density recreation land with no permits, no houses, and undeveloped lots, these areas were changed to Environmentally Sensitive in effort to preserve the scenic, historical, archaeological, scientific, water quality, or ecological value of the overall project.

Wildlife Management areas, which consists of lands acquired by the Corps through the 1999 U.S. Forest Service Exchange, poses a great benefit for the stewardship of cultural resources. Environmentally Sensitive areas will increase by approximately 2,200 acres and occur in areas where significant natural or cultural resources have been identified. These Environmentally Sensitive areas will allow for limited or no development of public use. This designation informs the Corps that within this designation lie natural or cultural resources that are deemed significant and therefore must be considered by management to ensure they are not adversely impacted.

5.5.3 Slow Growth (Alternative 2-A)

Under the Slow Growth alternative, 22 areas around the lake would be reclassified from Environmentally Sensitive to Low Density, except in areas which contain cultural resource sites.

This means that no cultural resource sites will be impacted directly due to the reclassification. Since these areas are located in platted subdivisions, it is assumed no cultural or historical resource sites will be impacted. Alternative 2a will mirror the Balanced-Use Alternative.

5.5.4 Maintain High Density (Alternative 2b)

Under the Maintain High Density alternative there is some potential to impact cultural resource sites because maintenance of High Density lands allows for potentially more development. There is approximately 74 acres which will be affected. Since these areas were already classified as High Density, this alternative should have low impact cultural sites, but it cannot be ruled out. In addition, this alternative would hinder preservation by keeping these areas High Density.

5.5.5 No New High Density (Alternative 2c)

The No New High Density Alternative has the potential cause an indirect positive impact to cultural resources. The lands total 95 acres that would remain as Low Density or Environmentally Sensitive lands. Although this alternative may not have impacts to cultural resources on USACE property, it has the potential to positively impact cultural resources on adjacent lands, due to the fact that potentially less intensive development would occur on these lands.

5.5.6 No Vegetative Management Area (Alternative 2d)

Alternative 2d is likely to have some impact, although not significant, on cultural resource sites. By removing this 50 ft Vegetative Management Area in all areas, there lies the possibility for increased erosion along the shoreline, specifically where minimal development has taken place. These areas usually have the potential for intact cultural resources because they have not suffered the disturbance of developed areas.

5.5.7 Conservation (Alternative 3)

Under Alternative 3, the amount of Environmentally Sensitive and Wildlife Management would increase by 9,507 and 3,020 acres, respectively. This alternative is very preservation-oriented and would constitute the best opportunity to minimize any potential impacts to cultural resource sites and historic properties. High Density recreation would be similar as the No-Action Alternative, and the Low Density recreation classification would juristically decrease in acreage by 40% and that area would be reclassified as Environmentally Sensitive. This would minimize the amount of development, and subsequently minimize adverse effects to cultural resources, that could be performed on lands adjacent to Table Rock Lake.

5.5.8 Extreme Development (Alternative 4)

Under Alternative 4, Environmentally Sensitive classifications are decreased by 24% to approximately 0 acres. This Alternative, though very development and construction oriented, would have the greatest increase in potential impacts on cultural resource sites and historic properties compared to all the alternatives. Under Alternative 4 the Environmentally Sensitive classifications lands would become Low Density recreation and could promote the development of lands adjacent to the lake. The Wildlife Management classification areas, which are designated for stewardship of wildlife resources, remain the same as the Preferred Alternative and will constitute minimal effects to cultural resources.

5.6 Socio-Economic Resources

5.6.1 No Action (Alternative 1)

The No Action Alternative will likely have very little impact on the socio-economic situation in the counties surrounding Table Rock Lake, and even less impact on the counties within the lake's Zone of Influence. Population growth and the racial makeup of the population would most likely remain similar to the current rates and percentages the area experiences now. Housing units and their values would not be affected if the No Action alternative was implemented. Any changes in the socio-economic conditions of the Table Rock area would likely be the result of outside influences, and not those created by the No Action alternative.

5.6.2 Balanced Use (Alternative 2)

The Balanced Use Alternative will likely have an impact on the socio-economic situation in the counties surrounding Table Rock Lake, but much less of an impact on the counties within the lake's Zone of Influence. Population would likely grow in the adjacent counties due to the increased High Density acreage and adjustment to the Low Density acreage to developed areas of the lake, although the racial makeup of the population would likely be unaffected. Total housing units would likely increase due to the increased availability of recreation at the lake, but it is unclear how housing values would change, if at all. The economy of the area would most likely grow due to the increased recreational areas which would increase the availability of jobs in the surrounding counties.

5.6.3 Slow Growth (Alternative 2a)

Alternative 2a, also considered the Slow Growth alternative, would likely result in a similar socio-economic situation as Alternative 2. Due to the increase in Low Density acreage the economy in the area would grow due to the increased opportunity for recreation.

5.6.4 Maintain High Density (Alternative 2b)

Alternative 2b would likely result in a similar socio-economic situation as Alternative 2. Due to maintaining the High Density acreage the economy in the area would grow due to the increased opportunity for recreation the acreage provides.

5.6.5 No New High Density (Alternative 2c)

Alternative 2c would likely result in a similar socio-economic situation as Alternative 2. Due to the no new High Density acreage, but keeping Low Density and Environmentally Sensitive areas, the economy in the area may shrink due to the decreased opportunity for public recreation the acreage provides.

5.6.6 No Vegetative Management Area (Alternative 2d)

It is most likely that with an absence of a Vegetative Management Area, the socio-economic situation of Table Rock Lake would be unchanged, similar to the No Action alternative.

5.6.7 Conservative (Alternative 3)

Alternative 3 will likely have an impact on the socio-economic situation in the counties surrounding Table Rock Lake, but much less of an impact on the counties within the lake's Zone of Influence. Population would likely stay the same or decrease in the adjacent counties due to the decreased High Density acreage and the reclassification of Low Density although the racial makeup of the population would likely be unaffected. Total housing units would likely stay the same due to the decreased availability of recreation at the lake resulting in little new development, but it is unclear how housing values would change, if at all. It is unclear how the other facets of socio-economics would change.

5.6.8 Extreme Development (Alternative 4)

Alternative 4 will likely have similar impacts on the socio-economic situation in the counties surrounding Table Rock Lake to that of Alternative 2 although much greater. Population would likely grow in the adjacent counties due to the increased high and Low Density acreage although the racial makeup of the population would likely be unaffected. Total housing units would likely increase due to the increased availability of recreation at the lake, but it is unclear how housing values would change, if at all. The economy of the area would most likely grow due to the increased recreational areas which would increase the availability of jobs in the surrounding counties.

5.7 Recreation Resources

5.7.1 No-Action (Alternative 1)

Provision of recreational facilities and services would continue at Table Rock Lake without an update to the Table Rock Lake Master Plan. However, the plan by which the Resource Manager and staff operate would not accurately reflect the current status of project facilities. Nor would there be additional measures in place, such as trail corridors and additional land use designations, to better accommodate recreational needs while protecting the natural resources. There are currently many boat docks outside of the zoning area and the implementation of the Master Plan would reclassify many of those locations and would allow for future re-zoning during the update to the shoreline management plan. Currently, all Corps managed land along Table Rock Lake does not have land classifications. For example, lands with flowage easements were not classified when the Master Plan was updated in 1976.

5.7.2 Balanced Use (Alternative 2)

Under the Balanced Use alternative, all lands will now have land classifications. This update in classification will help achieve a balanced public use of the lake while sustaining the natural, cultural, and socio-economic resources of the area. Under Alternative 2, Corps parks will be allowed to 'modernize' and update facilities which will enhance opportunities on the lake. This proposed action will also improve recreation in Wildlife Management classification lands and will allow for more commercial and private recreational opportunities. This increase in Wildlife Management and Environmentally Sensitive classified lands action will also assist in forging partnerships between public and private entities for recreational and wildlife conservation opportunities. The Vegetative Management Area classification could lead to improved water quality by use of a 50ft. riparian buffer area where native grasses and shrubs re-grow, and allow

for other potential beneficial vegetative management initiatives.

5.7.3 Slow Growth (Alternative 2a)

Alternative 2a will not deviate significantly from the Balanced Use Alternative. The 22 areas which have been reclassified to Low Density recreation from Environmentally Sensitive lands will allow for the potential to have private boat docks for fishing and lake access, as well as the potential to develop nature trails and wildlife viewing areas, thus increasing recreational traffic along Table Rock and its adjacent lands.

5.7.4 Maintain High Density (Alternative 2b)

The Maintain High Density Classification will maintain areas in High Density. This maintenance action has the potential to positively impact recreation resources because the new land classification will allow more commercial development within these areas. In keeping these areas classified as High Density, the Corps could partner with others for future development.

5.7.5 New High Density (Alternative 2c)

This alternative has the potential to have a negative impact on recreation resources because it is restricting the visiting publics' areas on which to recreate on a large scale, such as destination resorts, marinas, and large scale commercial operations. This alternative would keep 95 acres classified as Low Density or Environmentally Sensitive instead of conversion to High Density.

5.7.6 No Vegetative Management Area (Alternative 2d)

Alternative 2d should not impact recreational opportunities on the lake. Not having the Vegetative Management Areas along the lake has the potential to be beneficial to those homeowners adjacent to Corps land by potentially allowing an increase in shoreline use.

5.7.7 Conservative (Alternative 3)

Under the alternative 3, which is considered the Conservative alternative, some recreation opportunities will be reduced such as private boat docks and vegetative modification permits due to an increase in Environmentally Sensitive classifications that does not allow most types of development. This alternative will also limit commercial opportunities, for example no further growth at marinas because no expansion outside of the existing High Density classification. Although it minimizes potential for development, it will improve land-based recreational opportunities such as hunting, hiking, bird watching. This alternative also has the ability to improve viewscapes along the lake since it will allow for native flora and fauna to thrive. Some of the indirect impacts from this alternative will be a reduction in tax revenue to local counties, essentially reducing their economic development, due to the fact that the Corps will be granting no more permits which allow expansion or new development.

5.7.8 Extreme Development (Alternative 4)

Under alternative 4, areas around Table Rock will experience and increase in opportunities for commercial growth, but because of water quality degradation, this growth may decrease the quality of the recreating experience. Lake management feels that an increase in traffic due to growth in

development would be a disadvantage for people that hope to embrace the aesthetic value of the lake. This increase in traffic along the water could also pose a recreational threat Although this alternative is considered extreme development, there will be a substantially larger vegetative management area consisting of approximately 50 ft around the lake. The overdevelopment posed in Alternative 4 has the potential to mirror Lake of the Ozarks in regards to the high number of boating-related accidents, fatalities and boating traffic.

5.8 Air Quality

5.8.1 No Action (Alternative 1)

Under the No Action alternative, the air quality around the lake will remain the same as currently exists. There will likely be increases in vehicular exhaust emissions due to localized development, and the associated construction equipment and traffic in the area. No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.2 Balanced Use (Alternative 2)

Implementation of the Balanced Use alternative would result in similar air quality impacts as noted in the No Action alternative. Since this alternative provides lands that allow continued shore line development, local vehicular exhaust emissions would increase based on development and increased lake usage activities. No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.3 Slow Growth (Alternative 2a)

Similar to the Balanced Use, the Slow Growth alternative would result in similar air quality impacts as noted in the No Action alternative. This alternative would reclassify lands to Low Density, from Environmentally Sensitive, due to the creation of subdivision development, thus local vehicular exhaust emissions would increase based on development and increased lake usage activities. No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.4 Maintain High Density (Alternative 2b)

Under the Maintain High Density alternative, the air quality around the lake will remain the same as currently exists. There will likely be slight increase in vehicular exhaust emissions due to the 74 acre maintenance in High Density classification, possibly resulting in some increase in recreation-related traffic within these areas. No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.5 No New High Density (Alternative 2c)

Under the No New High Density alternative, the air quality around the lake will remain basically the same as currently exists. There will likely be a slight decrease in vehicular exhaust emissions due to keeping 95 acres in Low Density and Environmentally classifications. This alternative limits commercial development (i.e. no new High Density lands) and could have a positive impact

on air quality due to the potential for less public use areas (i.e. less vehicular traffic). No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.6 No Vegetative Management Area (Alternative 2d)

Under the No Vegetative Management Area alternative, the air quality around the lake will not be significantly impacted and will likely remain similar to the current air quality. There will likely be increases in mower exhaust emissions due to lack of a Vegetative Management Area. No violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative.

5.8.7 Conservative (Alternative 3)

Implementation of the Conservative alternative would result in less of an impact to existing air quality due to the reduction in lands classified for development around the Table Rock Lake shore line. A majority of the available acreage is classified as Environmentally Sensitive and Wildlife Management lands (87% of total available acreage), which would result in much less vehicular traffic, less construction equipment usage, and less mower exhaust emissions on these lands.

5.8.8 Extreme Development (Alternative 4)

Implementation of the Extreme Development alternative would have the greatest impact to air quality of all the evaluated alternatives, due to the acreage reclassified as Low Density recreation. When combined with the classified High Density recreation lands, a total of 82% of all available shoreline acreage is classified for development. Exhaust emissions will increase under this alternative due to land development and lake use activities. However, no violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA are expected as a result of the implementation of this alternative

5.9 Health & Safety

5.9.1 No-Action (Alternative 1)

Safety of project visitors and project staff are highest priority in daily project operations. Facilities and recreational areas are routinely evaluated to ensure sites are safe for visitor use. Project staff conducts numerous water safety programs and public announcements to educate children and project visitors about ways to be safe on the lake. In coordination with the Missouri State Highway Patrol (MSHP), water safety hazards and no wake zones are marked with buoys. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. MSHP provides water safety patrols on the lake as their budgets allow. Water quality on Table Rock is tested for pH and dissolved oxygen levels, nutrients, turbidity, and presence of fecal coliform bacteria is tested by the Arkansas Department of Environmental Quality (ADEQ) and the Missouri Department of Natural Resources (MDNR).

The No Action alternative does not have the Vegetation Management Area; this action could potentially decrease the water quality. There would be continued heavy traffic of watercraft along the water, which leads to an increase in congestion. The lake could experience increased user

conflict, for example, boats vs. personal watercrafts. Under the No Action alternative, populations who recreate at the lake could be exposed to health risks associated with water quality, such as E. coli and potential hazardous run off.

5.9.2 Balanced Use (Alternative 2)

The increased recreational opportunities, balanced with conservation of natural environment could lead to better health, both mental and physical, of the visiting population. The proposed alternative would continue to see some degree of traffic congestion on the water, especially in high use areas; thus water related incidents would be an issue under this alternative. The increase in Environmentally Sensitive and Wildlife Management areas could increase exposure to insect and animals, which might pose a threat to the human population if encountered.

5.9.3 Slow Growth (Alternative 2a)

Similar to Alternative 2 impacts, the Slow Growth alternative could also create a potential for additional boat docks being built due to the reclassification of 232 acres of Environmentally Sensitive lands to Low Density recreation lands. This alternative would potentially result in a small increase of traffic congestion on the water, thus water related incidents would remain an issue under this alternative.

5.9.4 Maintain High Density (Alternative 2b)

The implementation of the Maintain High Density alternative would have the potential to create similar health and safety concerns as noted in the Slow Growth alternative, due to the potential creation of more water based recreation facilities from the 74 acre maintenance in High Density recreation lands. This could also potentially have water quality impacts due to increased petroleum contaminants entering the water, as well as an increase in primary body contact activities on the lake.

5.9.5 No New High Density (Alternative 2c)

Implementation of the No New High Density alternative could potentially reduce health and safety concerns due to keeping 95 acres of to a Low Density recreation or Environmentally Sensitive classification. This action may result in a slight decrease of crowding associated with commercial concession areas, and a small reduction of vehicular congestion in these areas. A reduction in development of public facilities and private resorts would likely reduce the number of watercraft and people on the lake, thereby lessening accident possibilities and water quality degradation.

5.9.6 No Vegetative Management Area (Alternative 2d)

The implementation of a No Vegetative Management Area alternative will not generally have an impact on health and safety issues on the lake, with the possible exception of minor water quality impacts from increased usage of herbicides and pesticides around housing developments along the lake shoreline. Potential additional mowing and vegetation removal permits could be issued if this alternative is implemented.

5.9.7 Conservative (Alternative 3)

Under this alternative, access to Table Rock Lake would be limited and there lies the potential for a significant decrease in water-based recreational opportunities. Although water-based activities may be impacted, an increase in land-based recreation opportunities such as hiking, hunting and wild-life observation could be observed. There could also be some partnership opportunities with conservation-based organizations within the region. The decrease in rate of development could also have positive impacts on water quality by reduced run off from the shoreline.

5.9.8 Extreme Development (Alternative 4)

The Extreme Development Alternative would most likely require the implementation of a range of mitigation measures to ensure a safe environment, such as slow zones, creation of boating activity use zones, or one-way directional travel restrictions. Restricting the use of certain types of watercraft, such as personal watercraft might also be considered in some locations. Increased boating law enforcement resources may also be required. Recreational boating experiences and boater satisfaction would most likely be negatively impacted. The implementation of mitigation measures intended to promote boating safety such as slow zones may degrade the boating experience. Increased recreational opportunities that are posed through the extreme development alternative could lead to better health of general population or could expose general population to health risks associated with water quality, for example E. coli and potential hazardous run-off.

5.10 Aesthetics

5.10.1 No-Action (Alternative 1)

Aesthetics is an important feature that enhances the recreational experience. Lands around Table Rock Lake provide a natural setting that is aesthetically pleasing as well as buffering the lake from development and negative impacts such as erosion and storm water runoff. However, there are problems in maintaining these aesthetic qualities. The regional viewshed landscape will be impacted by implementing the Master Plan and the Corps goal is to ensure that the lake retains its beautiful viewscapes, while evaluating the need for recreational development around Table Rock.

Project resource staff is continually investigating issues such as vandalism and trespassing. These include activities such as unpermitted timber cutting and land destruction by unauthorized off road vehicles. In addition, litter and illegal trash dumping both on project lands and project waters are continual problems, which will need to be considered in assessing aesthetics along the lake.

Under the no-action alternative the visual character of the landscape would slowly suffer due to continued development. Dock development would eliminate the unspoiled and untamed aesthetic of this landscape. Road and Utility line corridors also impact aesthetics and visual resources at Table Rock. Since the lake is surrounded by residential and commercial development, these demands are continually increasing. In many instances, these requests are in areas where the natural vegetation and landscape would be disturbed.

5.10.2 Balanced Use (Alternative 2)

The wide panorama of Table Rock Lake and the nearby shore would continue to convey a sense of enormity to the lake, but the high dock density would eliminate the sense of relatively pristine shoreline. The 50 foot vegetative management area required would somewhat screen the houses, but the docks would still be very visible. The vegetative management areas along the shoreline would enhance the viewscapes of the people recreating on the lake, while potentially impeding the view of the lake from the shore. Under this action, homeowners could work with Corps staff to determine the appropriate vegetation management measures for their specific site within the vegetation management area.

5.10.3 Slow Growth (Alternative 2a)

Implementation of this alternative would be similar in regards to aesthetics as the Balanced Use alternative. A 232 acre increase in Low Density lands would have the potential for additional boat dock construction, but this alternative increases the total acreage of Vegetative Management Area of the Balanced Use alternative (Alternative 2) by 78 acres (now 4,159 acres), which would help to screen any new private housing development from people recreating on the lake.

5.10.4 Maintain High Density (Alternative 2b)

While the Maintain High Density alternative proposes a 74 acre maintenance in High Density lands, the aesthetic impacts will likely be similar to those noted in the slow growth alternative. High Density recreation lands development is typically more confined to specific areas, as opposed to Low Density developments, and most High Density areas have already established a viewscape visable to people recreating on the lake. The Alternative 2 Vegetative Management Area lands are retained in this alternative, which enhances the view of an aesthetically pleasing natural, wooded shoreline.

5.10.5 No New High Density (Alternative 2c)

The implementation of this alternative would also mirror the impacts on aesthetics as discussed in the slow growth alternative, but to a lesser degree of impact due to the fact that only 95 acres are proposed to be kept Low Density recreation and Environmentally Sensitive lands. There would be some potential for additional private residence and boat dock construction, but the Vegetative Management Area lands of Alternative 2 would remain in this alternative. The reduced acreage available for High Density recreation development may result in a small reduction in the number of watercraft on the lake at any given time, thereby enhancing the ‘on the water’ aesthetics.

5.10.6 No Vegetative Management Area (Alternative 2d)

Implementation of this alternative could potentially have the greatest negative aesthetic impacts of all the Alternative 2 variations by removing 4,081 acres of lands from the Vegetative Management Area classification. This action could result in an increasing number of private developments, including access roads and utility corridors, within the reclassified lands. Additional vegetation removal and mowing permits, as well as boat docks, would likely result. Fragmentation of areas of previously uninterrupted natural, wooded shoreline would impact the viewscape of lake users.

5.10.7 Conservative (Alternative 3)

Alternative 3 would minimize all activities which disturb the scenic beauty and aesthetics of the lake. This alternative and the implementation of the Environmentally Sensitive and Wildlife Management would be the most aesthetically pleasing for those recreating along the lake, but could potentially be n hindrance to homeowners and their viewshed of the lake. The user experience in areas such as the park would still be relatively peaceful at most times, with the aesthetic of domesticated nature. Some of the more heavily used areas could experience annual wear and deterioration of acreage and existing facilities.

5.10.8 Extreme Development (Alternative 4)

The development of additional homes and docks in this viewshed would eliminate the unspoiled and untamed aesthetic of this landscape. The extreme development alternative would visually compete with and detract from the boulders, bluffs, and flora that currently dominate the view. The visual character of the viewscape would be more developed than it would be. Some of the coves would be slightly more active, becoming areas where people congregate to stay out of the higher trafficked areas. The 50 foot vegetative management area required would somewhat screen the houses, but the docks would still be very visible. The vegetative management areas along the shoreline would enhance the viewscapes of the people recreating on the lake, while potentially impeding the view of the lake from the shore. Under this action, homeowners could work with Corps staff to determine the appropriate vegetation management measures for their specific site within the vegetation management area.

5.11 Cumulative Impacts

Cumulative impacts would result from the incremental impact of the proposed action added to those of other past, present, or reasonably foreseeable future actions in the local area. The Master Plan for Table Rock Lake was last approved in 1976; this was followed by multiple supplements over the last 37 years. Since the conception of the 1976 Master Plan, development and public use patterns have changed significantly, due in part to the population explosions experienced in southeastern Missouri and northwestern Arkansas. Table Rock Lake receives constant pressure for both private shoreline and public recreation use. With public use at project facilities changing, reallocations of services at these facilities need to be addressed to meet the evolving demands of the public. A transformation at Table Rock has occurred since the updated implementation of the Master Plan, from cooperative agreements to park closures.

Two main themes came out of the scoping process, which was a cumulative exercise involving private and public entities, and local, state and federal agencies—improved water quality and responsible development (i.e. smart development). Past watershed and development activities have resulted in Table Rock Lake being listed in 2002 on MDNR's impaired waterbody list (303d) for excessive nutrients. While it is noted that the majority of the source of this impairment is due to activities within a 4,020 square mile watershed, unregulated or poorly regulated shoreline development exacerbates water quality degradation. Existing conditions at the lake allow for some degree of development on 50% of available shoreline acreage, with an additional 23% of shoreline acreage having no specific land classification. Currently there is no land classified for vegetative management, i.e, no vegetative management area requirements.

Implementation of the preferred Balanced Use alternative will address these near-shore activities and enhance water quality by restricting Low Density recreation development, increasing the amount of Environmentally Sensitive and Wildlife Management acreage, thereby retaining more of the natural shoreline vegetation, and requiring a vegetative management area on 10% of the shoreline acreage. Collaboration and coordination with state and federal resource agencies, as well as local agencies and watershed groups, is necessary to monitor, evaluate and remediate aging infrastructure, failing septic systems around the shoreline, and potential water quality impacts. Coordination with these entities could also evaluate and promote watershed enhancement programs that would serve to institute stream bank stabilization, land improvement and conservation programs, and implementation of best management practices to reduce watershed runoff and erosion during storm events.

Responsible development will enhance the maintenance and/or improvement in water quality through use of best management practices during construction such as silt barriers, selective vegetation removal, use of detention basins, using pervious surface parking areas, implementation of rain gardens where practicable, and other water retention and conservation measures. Implementation of the Balanced Use alternative will promote a more responsible development process by delineating areas where and what type of development is allowed. The classification of additional lands as Environmentally Sensitive and Wildlife Management areas, as well as designation of vegetative management areas will all serve to enhance the water quality of the lake. Improvements in water quality will result in a corresponding improvement in aquatic life habitat and productivity, and will, in conjunction with other control mechanisms, results in a better recreational experience for lake visitors. As management of Table Rock Lake ensues, the Corps will continue to coordinate with Federal, State, and local agencies to avoid, minimize or mitigate potential impacts.

6 ENVIRONMENTAL COMPLIANCE

Compliance with Federal Acts and Executive Orders are summarized in the following table.

Act/Executive Order	Status	Compliance
Wetlands (EO 11990)	No effect	C
Prime/Unique Farmlands	N/A	N/A
Floodplain Management (EO 11988)	N/A	N/A
Clean Water Act		
Section 404	No effect	N/A
Section 401	No effect	N/A
NPDES	No effect	N/A
Fish and Wildlife Coordination Act	No effect	C
Endangered Species Act	No effect	C
National Historic Preservation Act	No effect	C
Environmental Justice (EO 12898)	No effect	C
Clean Air Act	No effect	C
Comprehensive Environmental Response Compensation and Liability Act (CERCLA)	N/A	N/A
Resource Conservation and Recovery Act (RCRA)	N/A	N/A
Wild and Scenic Rivers Act	N/A	N/A
Rivers and Harbors Act	N/A	N/A
N/A—not applicable C--Compliant		

Table 6: Federal Act/Executive Order Compliance

6.1 Fish and Wildlife Coordination Act

The Corps is required to coordinate with the USFWS and MDNR under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 USC 661 et. seq.). Coordination was initiated with a scoping notice; no concerns were raised. Review of the Environmental Assessment is pending; no concerns are anticipated.

6.2 Endangered Species Act

The Endangered Species Act (ESA) requires the determination of possible effects on or degradation of habitat critical to Federally-listed endangered or threatened species. Implementation of an updated Master Plan would not affect threatened or endangered species. Individual requests for use of project lands would be evaluated to ensure compliance with this Act.

6.3 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, requires Federal agencies to promote "nondiscrimination in Federal programs substantially affecting human health and environment". In response to this directive, Federal Agencies must identify and address

disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. The final step in the environmental justice evaluation process is to evaluate the impact of the project on the population and to ascertain whether target populations are affected more adversely than other residents.

Implementing the proposed Master Plan Update would not disproportionately affect minority or low-income populations.

6.4 Cultural Resource Requirement

Section 106 of the National Historic Preservation Act of 1966 requires the Corps to identify historic properties affected by the proposed action and to evaluate the eligibility of those properties for the National Register of Historic Places. Section 110 of the Act requires the Corps to assume responsibility for the preservation of historic properties in its ownership. The Act also requires Federal agencies to provide the Advisory Council on Historic Preservation an opportunity to comment on undertakings through the process outlined in the Council's regulations (36 CFR 800).

There would be no affect to cultural resources with implementation of an updated Master Plan. Individual requests for use of project lands would be evaluated on a case-by-case basis to ensure compliance with this act.

7 Scoping and Public Concern

7.1 Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Table Rock 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 water 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 Table Rock 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 Table Rock Lake to aggressively leverage project financial capability and human resources in order to identify and satisfy customer expectations, project and sustain natural and cultural resources and recreational infrastructure, and programmatically bring Corps management efforts and outputs up to a justified level of service.
Public involvement and extensive coordination within the Corps of Engineers and with other affected agencies and organizations is a critical feature required in developing or revising a Project Master Plan.

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

7.2 Scoping

One agency and three public scoping workshops were held in late November and early December 2012 with over 2,000 people in attendance. To prepare for the scoping workshops, the Corps contracted with CDM-Smith. From the scoping process, a Scoping Report was finalized on 4 February 2013. The report summarizes the public participation process for, and the public comments resulting from, the Table Rock Lake MP Revision public scoping workshops and comment period. “Scoping” is the process of determining the scope, focus, and content of a NEPA document. Scoping workshops are a useful tool to obtain information from the public and governmental agencies. For a planning process such as the MP revision, the scoping process was also used as an opportunity to get input from the public and agencies about

the vision for the MP update and the issues that the MP should address where possible. The Scoping Report is located on the Table Rock Lake Master Plan website, http://www.swl.usace.army.mil/Missions/Planning/TableRockMasterPlanUpdate.aspx

7.3 Focus Groups

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

The initial focus group meetings were held on the 8th and 9th of May 2013 at the Dewey Short Visitors Center Theater. An informal icebreaker session was held the evening of Tuesday, May 7th, 2013 from 4:00PM to 6:00PM also at the Dewey Short Visitors Center. The icebreaker session provided the opportunity for all three focus groups to meet together, share ideas, and talk with the Corps Master Plan PDT on an informal basis. Ground rules and expectations for the focus group meetings were set during this time.

A second recreation focus group meeting was held on the 29th of May 2013 because of the three focus groups, this was the largest group member-wise and they requested more time to talk about issues related to recreation for consideration in the MP.

A 'cross talk' focus group meeting, which included team leaders chosen from each of the three focus groups, was held on the 5th of June 2013. The idea behind this meeting was to allow all three focus groups to hear from each other on feedback and comments given to that point on the preliminary draft master plan.

A final focus group meeting was held the 26th of June 2013 to allow the PDT to discuss with the focus groups on how their feedback and comments were included into the draft MP.

7.4 Draft Master Plan/Draft Environmental Assessment.

Currently scheduled for release at end of July 2013 with public workshops scheduled for mid-August 2013.

7.5 Final Master Plan/Final EA.

Currently scheduled for early December 2013 with public workshops in mid-December 2013.

8 Conclusions

The Master Plan for Table Rock Lake was last approved in 1976; this was followed by multiple supplements over the last 37 years. During this time, public use patterns have changed significantly, and with population growth in southeastern Missouri and northwestern Arkansas increasing tremendously, Table Rock Lake receives constant pressure for both private shoreline use and public recreation use. With public use at project facilities changing, reallocations of services at these facilities need to be addressed. Changes involving recreation area closures and improvements have occurred during the last four decades to meet the evolving demands of the public. In addition, cooperative agreements have occurred recently to operate and maintain facilities, lessening the financial burden on the tax payers.

The Master Plan is not intended to address the specifics of regional water quality, shoreline management, or water level management; these areas are covered in a project's shoreline management plan or water management plan. However, specific issues identified through the Master Plan revision process can still be communicated and coordinated with the appropriate internal Corps resource (i.e. Operations for shoreline management) or external resource agency (i.e. Missouri Department of Natural Resources for water quality) responsible for that specific area. To facilitate this action, the current Master Plan development evaluated four alternatives relative to their potential impacts on the land and water resources of Table Rock Lake.

These alternatives spanned the gamut of increased shoreline protection to increased shoreline development and the potential effects on the human, terrestrial, and aquatic environment from their implementation. A no action alternative looked at leaving the lake as it currently exists in terms of developable areas and protected areas. Of the 19,539 acres of available land around the lake, 50% of this is classified as high and low density recreation (10% high), with potential future development occurring. While 24% of available acreage is classified as environmentally sensitive lands, 23% of land currently has no classification. This discrepancy is addressed in the action alternatives' evaluations.

The action alternatives included an extreme development alternative, a conservative alternative, and a balanced use alternative. The extreme development alternative (Alternative 4) shifted the majority of the available shoreline acreage toward future development, with 10% classified as high density recreation and 72% classified as low density recreation. Potential effects from this will be increased vegetation removal and increased soil erosion due to construction and conversion of pervious surfaces to impervious—this being detrimental to water quality and terrestrial and aquatic wildlife species. Extreme development will also result in more boats on the lake, increased health and safety issues, aesthetic impacts, and impaired recreational experiences for many visitors. The conservative alternative (Alternative 3) reduces the developable lands to the 10% high density recreation, while converting the low density lands to an environmentally sensitive classification. This action would preserve shoreline vegetation, reduce stormwater runoff quantity and velocity, resulting in less in-lake sedimentation and turbidity, and improve water quality. This action, while improving health and safety issues, aesthetics, terrestrial and aquatic wildlife habitat, may have potential

economic impacts due to the restrictions on shoreline development. Variations of Alternative 2 were developed and examined in response to comments received during meetings with Focus Groups. The variations of the Balanced Use alternative also provided a range of options that the team felt could be areas of concern with the public.

The Preferred action alternative is a balanced use scenario (Alternative 2), which provides for limited future development by keeping the 10% high density recreation land classification, but reclassifying 37% of available acreage for low density recreation. Environmentally sensitive lands will comprise 35% of available acreage, with an additional 17% classified as wildlife management acreage. The balance seeks to address all components of lake usage, including enhancing the growth and recreation potential, protecting and preserving terrestrial and aquatic resources, having no significant impacts, and setting the vision for the lake for the next 10 to 20 years.

9 Bibliography

Arkansas Department of Parks and Tourism. 2009. Statewide Comprehensive Outdoor Recreation Plan. January 2009 through December 2013.

Bush, Shane. Telephone Interview. 2012.

Casaletto, David. Ozarks Water Watch. 2012.

Chapman, Carl. 1986. Archeological Assessments Report No. 49, Cultural Resources Survey at Selected Locations, Table Rock Lake, Missouri and Arkansas.

Chapman, Carl. 1993. Archeological Assessments Report No. 167, Archeological Investigations at 3CR238.

Cherokee CRC, LLC. Recreational Boating Use Study, Table Rock Lake, Missouri. April 2010.

Executive Order No. 13112. Invasive Species. 3 February 1999.

Executive Order No. 11987. Exotic Organisms. 24 May 1977.

Executive Order No. 13148. Greening the Government Through Leadership in Environmental Management. 21 April 200.

Executive Order No. 13423. Strengthening Federal Environmental, Energy, and Transportation Management. 24 January 2007.

Executive Order No. 13514. Federal Leadership in Environmental, Energy, and Economic Performance. 5 October 2009.

Kasul, Richard, Daniel Stynes, Lichu Lee, Wen-Huei Chang, R. Scott Jackson, Christine Wibowo, Sam Franco, and Kathleen Perales. Characterization of Park Visitors, Visitation Levels, and Associated Economic Impacts of Recreation at Bull Shoals, Norfork, and Table Rock Lakes. November 2010.

Missouri Department of Conservation. 1997. “Missouri Water Shed Protection Practice”

Table Rock Lake Water Quality Incorporated. 2012. Table Rock Lake Watershed Management Plan. Accessed at: http://trlwq.org/whats-happening/table-rock-lake-watershed-management-plans/table-rock-lake-water-quality-conditions

Tennessee Valley Authority (TVA). 2010. Table Rock Project Forebay Oxygen Diffuser System Report Update.

U.S. Army Corps of Engineers (USACE). 1976. Table Rock Dam and Reservoir, White River,

Missouri and Arkansas, Updated Master Plan for Reservoir Development and Management, Design Memorandum 17-E.

USACE. 2013. Engineer Regulation 1130-2-550, Project Operations, Recreation Operations and Maintenance, Guidance and Procedures. HQUSACE.

USACE. 2013. Engineer Pamphlet 1130-2-550, Project Operations, Recreation Operations and Maintenance, Guidance and Procedures. HQUSACE.

USACE. 2008. ER 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance and Procedures. HQUSACE.

USACE. 2008. EP 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance and Procedures. HQUSACE.

USACE. 2013. USACE Dam Safety Program. Accessed at: www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx

USACE. 1993. White River Basin, Arkansas and Missouri, Water Control Master Manual.

USACE. 2007. Table Rock Operational Action Plan for 2007 Low Dissolved Oxygen Season.

USACE. 2013. Little Rock District Water Management website. Accessed at: www.swl-wc.usace.army.mil

United States Census Bureau. 2013. Easy Facts Website. Accessed at: http://www.census.gov/easystats/

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Appendix A
Draft Finding of No Significant Impact (FONSI)

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

NAME OF PROPOSED ACTION: Table Rock Lake Master Plan Revision

PURPOSE AND NEED FOR THE PROPOSED ACTION

The revised Master Plan updates Design Memorandum No. 17-E, Updated Master Plan for Development and Management of Table Rock Reservoir approved December 1976. 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.

With the proposed Master Plan revision, an Environmental Assessment (EA) is being completed to evaluate existing conditions and potential impacts of proposed alternatives. The EA is prepared pursuant to the National Environmental Policy Act (NEPA), CEQ regulations (40 CFR, 1500–1517), and the Corps implementing regulation, Policy and Procedures for Implementing NEPA, ER 200-2-2, 1988.

ALTERNATIVES: In addition to the preferred alternative (Alternative 2, "Balanced Use"), a No Action alternative, a Slow Growth alternative, a Maintain High Density alternative, a No New High Density alternative, a No Vegetative Management Area alternative, a Conservative alternative and an Extreme Development alternative (Alternatives 1, 2a, 2b, 2c, 2d, 3,and 4, respectively) were evaluated in the Environmental Assessment.

No Action Alternative - The "No Action" alternative will not reclassify any of the 19,539 available lands for uses that differ from the current land classifications. High Density lands would total 1,984 acres; Low Density lands would total 7,798 acres; Environmentally Sensitive lands would total 4,639 acres; Project Operations would total 393 acres; Wildlife Management would total 232 acres. Lands that are currently not classified (i.e. lands from the US Forest Service land exchange) would remain unclassified and would total 4,492 acres. In addition, there would not be a Vegetative Management classification. Under this scenario, land and water resources could potentially continue to be impacted by increasing shoreline development.

Slow Growth Alternative –The Slow Growth alternative focuses on platted subdivisions with at least half of adjacent lots developed with homes. These areas were originally considered Environmentally Sensitive because they lacked the proper vegetation modification permits that residents could obtain under Low Density Classifications. Residents in these areas have been mowing into Corps fee-land boundaries without permits, so this reclassification under Low Density is designed to keep the residents in compliance with the shoreline management plan permitting process. There are 22 areas around the lake that fall in this category, and Low Density acreage will increase from 7,190 to 7,422, while Environmentally Sensitive acreage will decrease from 6,876 to 6,644, which represents a 232 acre shift in these land classifications.

Maintain High Density Alternative – The Maintain High Density alternative includes areas that would remain as High Density. Under this alternative, 74 acres of High Density lands would maintain as High Density (under Alternative 2, these 74 acres are under consideration to convert 33 acres to Low Density lands and 41 acres to Wildlife Management lands). These areas are under consideration to remain as High Density because, similar to the situation with partially closed USACE parks, if an interested entity, such as another federal agency, state/local agency, or city/township could partner with USACE to take over management of these areas, then they could be retained as High Density for future development. These areas include the James River Park (undeveloped campground), Swiss Villa, Christ in Youth, Jellystone, Sunset Cove, and Kimberling Cove Resort.

No New High Density Alternative –The No New High Density alternative would include areas that would not convert from Low Density and Environmentally Sensitive areas to High Density. In Alternative 2, these areas are under consideration for conversion from Low Density/Environmentally Sensitive to High Density. This alternative would keep these areas as Low Density (94 acres) and Environmentally Sensitive (1 acre). The areas include Dogwood Canyon, StoneCroft Property, Paradise Point, Outdoor Academy, Kimberling City, Still Waters, and Big Cedar Resort, for a total of 95 acres.

No Vegetative Management Area Alternative –This alternative, while similar to Alternative 2, would remove the Vegetative Management Area requirement from all land classifications, rather than the proposed Vegetative Management Area in Alternative 2.

Conservative Alternative – This alternative provides for approximately 10% of available acreage to remain as high density lands (1,914 acres), but reclassifies all low density lands to environmentally sensitive lands, totaling 14,138 acres representing 72% of available acreage.

Extreme Development Alternative – This alternative designates 1,997 acres to high density recreation, and reclassifies all environmentally sensitive lands to low density recreation lands (14,055 acres), resulting in 82% of available shoreline acreage classified for potential development.

Preferred Alternative, Balanced Use Alternative – The preferred alternative includes a 608 acre reduction (-3% change) in low density recreation acreage (now totaling 7,190 acres from 7,798 acres), a 3,020 acre increase (15%) in wildlife management lands, a 2,236 acre increase in environmentally sensitive lands (11%), while 47% of available acreage remains as high and low density lands (1,986 and 7,179 acres, respectively). There would be a 4,081 acre Vegetative Management Area along the shoreline, except in High Density areas and at resorts located in Low Density areas.

ANTICIPATED ENVIRONMENTAL IMPACTS: Consideration of the effects disclosed in the EA, and a finding that they are not significant, is necessary to prepare a FONSI. This determination of significance is required by 40 CFR 1508.13. Additionally, 40 CFR 1508.27 defines significance at it relates to consideration of environmental effects of a direct, indirect or cumulative nature.

Criteria that must be considered in making this finding are addressed below, in terms of both context and intensity. The significance of both short and long term effects must be viewed in several contexts: society as a whole (human, national); the affected region; the affected interests; and the locality. The context for this determination is primarily local. The context for this action is not highly significant geographically, nor is it controversial in any significant way. Consideration of intensity refers to the magnitude and intensity of impact, where impacts may be both beneficial and adverse. Within this context, the magnitude and intensity of impacts resulting from this decision are not significant. The determination for each impact topic is listed below.

1. The degree to which the action results in both beneficial and adverse effects. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. The EA indicates that there will be beneficial effects from implementation of Alternative 2 (balanced use) to water quality, terrestrial and aquatic resources. Alternative 2 would also allow for the continued potential development in low density and high density land classifications, yielding a balanced approach.

2. The degree to which the action affects public health or safety. No adverse effects to public health or safety will result from the balanced use (preferred) alternative. Possible adverse environmental effects may occur from implementation of the No Action Alternative and High Development alternative due to potential increased development resulting in more people and watercraft on the lake. Possible adverse economic and socioeconomic effects may occur from implementation of Alternative 3, the Conservative alternative.

3. The degree to which the action affects unique characteristics of the potentially affected area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. The preferred alternative does not directly threaten impact to any historic properties. Coordination with Federal, State, and local agencies and Federally Recognized Tribes will be required to avoid, minimize or mitigate potential unforeseen impacts. Park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas will not be impacted by implementation of the preferred alternative.

4. The degree to which effects on the quality of the human environment are likely to be highly controversial. The project will benefit the public through a balance of terrestrial and aquatic resource preservation with recreation provision. Therefore the Little Rock District; Corps of Engineers does not regard this activity as controversial.

5. The degree to which the possible effects on the human environment is highly uncertain or involves unique or unknown risks. The uncertainty of the impacts of this action is low since land reclassification around the lake shoreline results in a projection of known and regulated activities as a result of the implementation of the preferred alternative.

6. The degree to which the action may establish a precedent for future actions with significant impacts. Because the proposed action involves updating the existing Table Rock Lake Master Plan, which provides checks and balances on future lakeshore activities, the action should not establish a precedent for significant future impacts.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. There are no other known individual actions associated with this project, therefore there are no cumulatively significant impacts identified with this action.

8. The degree to which the action may adversely affect items listed or eligible for listing in the National Register of Historic Places, or other significant scientific, cultural or historic resources. The preferred alternative does not directly threaten impact to any historic properties or other significant scientific, cultural, or historical resources. Coordination with Federal, State, and local agencies and Federally Recognized Tribes will be required to avoid, minimize or mitigate potential unforeseen impacts.

9. The degree to which the action may adversely affect an endangered or threatened species or its critical habitat. The proposed action will not adversely affect any Threatened & Endangered species as areas with known T&E species and species habitat was classified as Environmentally Sensitive lands. The only listed T & E species in the area is the Gray Bat which is a cave- hibernating and roosting species. Land classifications to Environmentally Sensitive land should not impact the Gray Bat due to no development on this land classification type.

10. Whether the action threatens a violation of Federal, state or local law or requirements imposed for the protection of the environment. No such violations will occur. All applicable Federal, state or local laws and regulations will be complied with during the implementation of the action.

CONCLUSIONS: The impacts identified in the prepared EA have been thoroughly discussed and assessed. No impacts identified in the EA would cause any significant adverse effects to the human environment. Therefore, due to the analysis presented in the EA and comments received from a 30-day public review period that began on July 31st, 2013 and ended on August 30th, 2013, it is my decision that the preparation of an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) is unwarranted and a "Finding of No Significant Impact" (FONSI) is appropriate. The signing of this document indicates the Corps final decision of the proposed action as it relates to NEPA. The EA and FONSI will be held on file in the Environmental Branch, Planning and Environmental Division of the Little Rock District, Corps of Engineers for future reference. Consultation with regulatory agencies will be ongoing to ensure compliance with all federal, state, regional, and local regulations and guidelines.

_____ _____

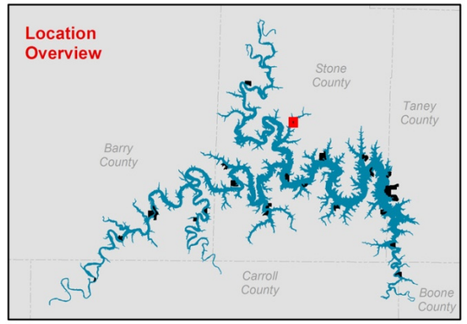
Date

COURTNEY W. PAUL
Colonel, US Army

AUNTS CREEK

Legend

- Picnic Site
- Dump Station
- Courtesy Dock
- Monuments
- USACE Boundary Line
- 10ft Contours
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

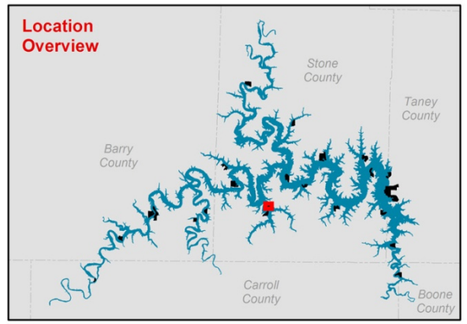
Feet
0 200 400

US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

BAXTER

Legend

- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Gate
- Swim Beach
- Playground
- Mini Shelter
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Campsite
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 200 400

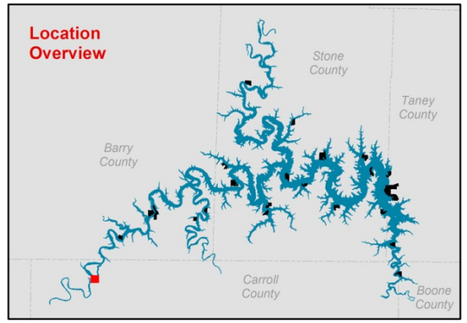
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

BEAVER TOWN

Legend

- Picnic Site
- Campsite
- Dump Station
- Monuments
- USACE Boundary Line
- Hiking Trail
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 100 200

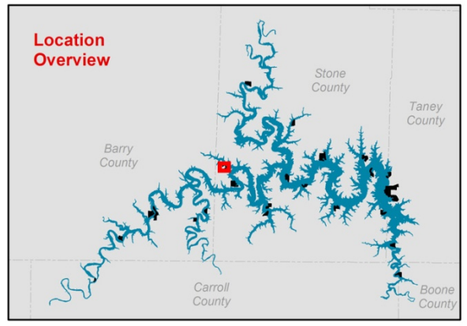
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

BIG BAY

Legend

- Monuments
- USACE Boundary Line
- 20ft Contours
- Roads
- Boat Ramp
- Parking
- USDA Forest Service Land
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

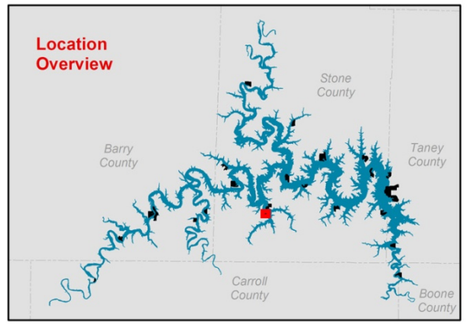
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

BIG INDIAN

Legend

- Courtesy Dock
- Monuments
- USACE Boundary Line
- 10ft Contours
- Boat Ramp
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

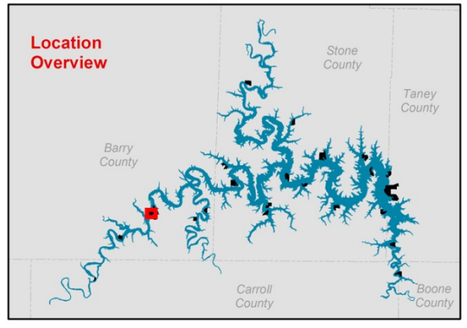
Feet
0 200 400

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

BIG M

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- VolleyBall Court
- Swim Beach
- Playground
- Mini Shelter
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

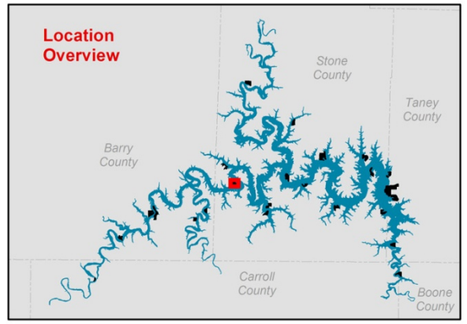
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

CAMPBELL POINT

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- VolleyBall Court
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Road
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

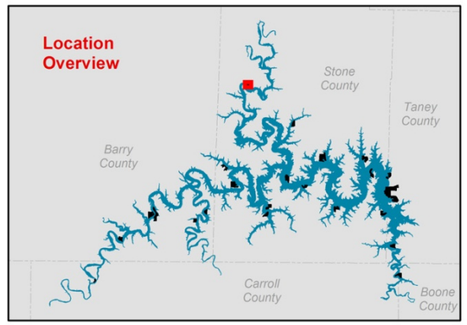
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

CAPE FAIR

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

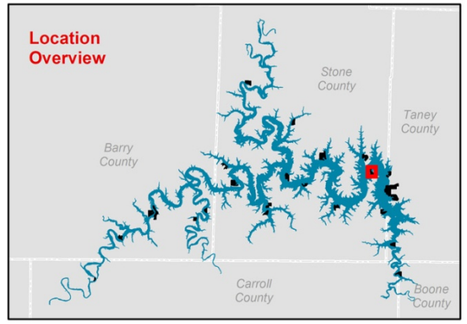
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

COOMBS FERRY

Legend

- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Boat Ramp
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

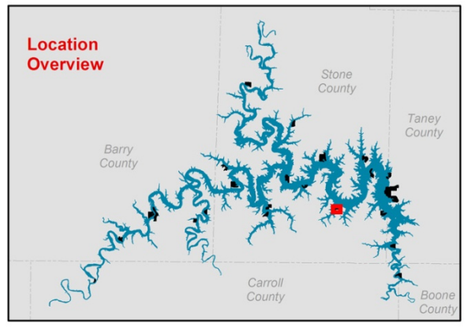
Feet
0 400 800

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

COW CREEK

Legend

- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Pavilion
- Building
- Boat Ramp
- Driveway
- Road
- Parking
- Proposed Cub Scout Fire Ring
- Proposed Amphitheater
- Proposed Trail
- Proposed Fishing Dock
- Proposed Storage
- Proposed Restroom
- Proposed Cabin
- Proposed Campsite
- Proposed Road
- Proposed Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

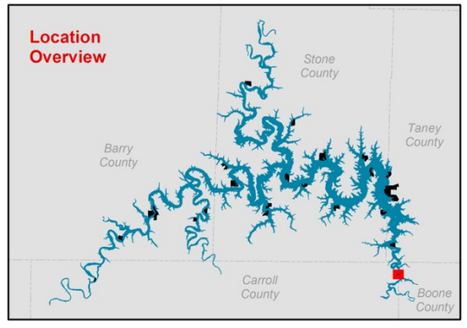
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

CRICKET CREEK

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Swim Beach
- Playground
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Campsite
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

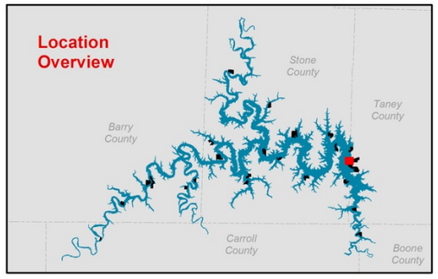
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

DEWEY SHORT VISITOR CENTER AND PROJECT OFFICE

Legend

- Courtesy Dock
- Bench
- Bike Rack
- Trail Head
- Lakeshore Trail
- 10ft Contours
- Gate
- Mini Shelter
- Bridge
- Building
- Stairs
- Pedestrian Pathway
- Driveway
- Road
- Parking
- Volunteer Campsite
- Proposed Wildlife Observation
- Proposed Outdoor Classroom
- Proposed Pedestrian Crossway
- Proposed Pedestrian Pathway
- Proposed Fishing Dock
- Proposed Observation Platform
- Proposed Eco Playground
- Proposed Pavilion
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet

0 200 400

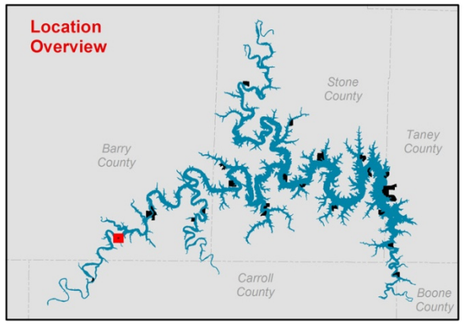
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

EAGLE ROCK

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Cemetery
- VolleyBall Court
- Swim Beach
- Playground
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Pavilion
- Proposed Site Relocation
- Proposed Road
- Proposed Campsite
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 200 400

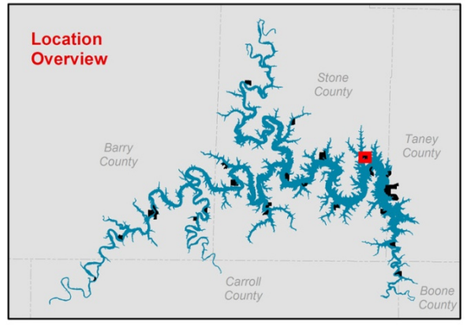
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

INDIAN POINT

Legend

- Courtesy Dock
- Picnic Site
- Dump Station
- Group Camp Area
- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Road
- Proposed Campsite
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

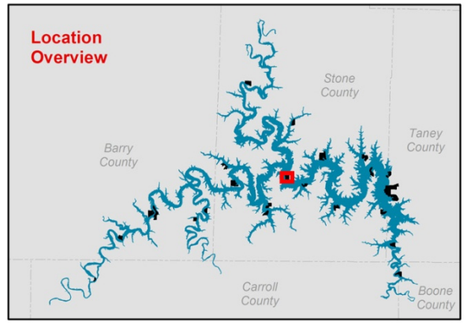
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

JOE BALD

Legend

- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

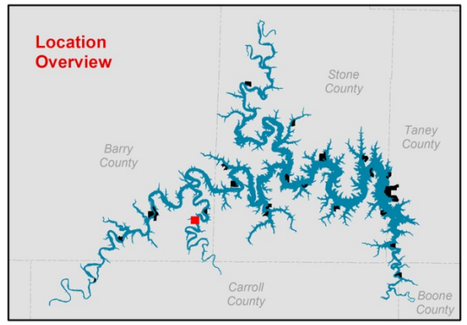
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

KINGS RIVER

Legend

- Monuments
- USACE Boundary Line
- 10ft Contours
- Building
- Boat Ramp
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 200 400

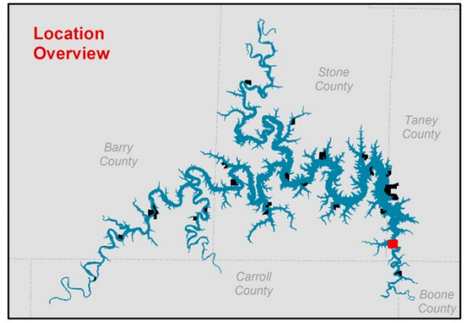
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

LONG CREEK

Legend

- Courtesy Dock
- Picnic Site
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Swim Beach
- Playground
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 200 400

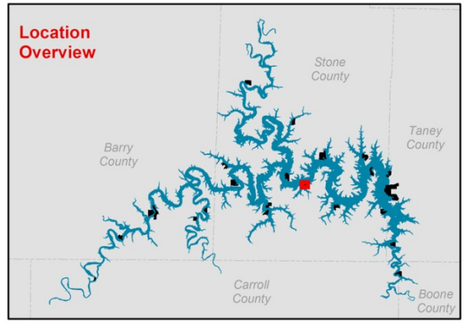
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

MILL CREEK

Legend

- Courtesy Dock
- Basketball Goal
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- VolleyBall Court
- Swim Beach
- Playground
- Mini Shelter
- Pavilion
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Fish Weigh In Station
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 200 400

US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

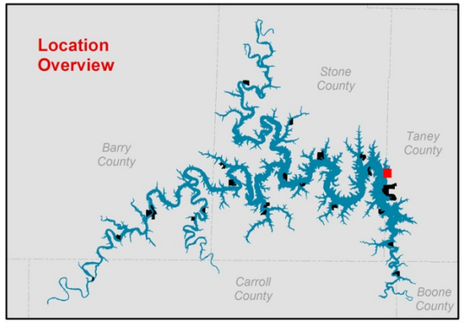
N
W E
S

MOONSHINE BEACH

Legend

- Courtesy Dock
- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Swim Beach
- Playground
- Mini Shelter
- Pavilion
- Building
- Boat Ramp
- Road
- Parking
- Attendant Campsite
- Proposed Pavilion
- Proposed Road
- Proposed Parking
- Park Boundary

Location Overview



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

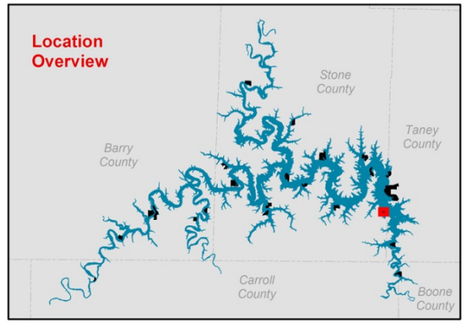
Feet
0 200 400

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

OLD HIGHWAY 86

Legend

- Picnic Site
- Basketball Goal
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- VolleyBall Court
- Swim Beach
- Playground
- Building
- Mini Shelter
- Pavilion
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Campsite
- Proposed Road
- Proposed Parking
- Proposed Restroom-Showerhouse
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

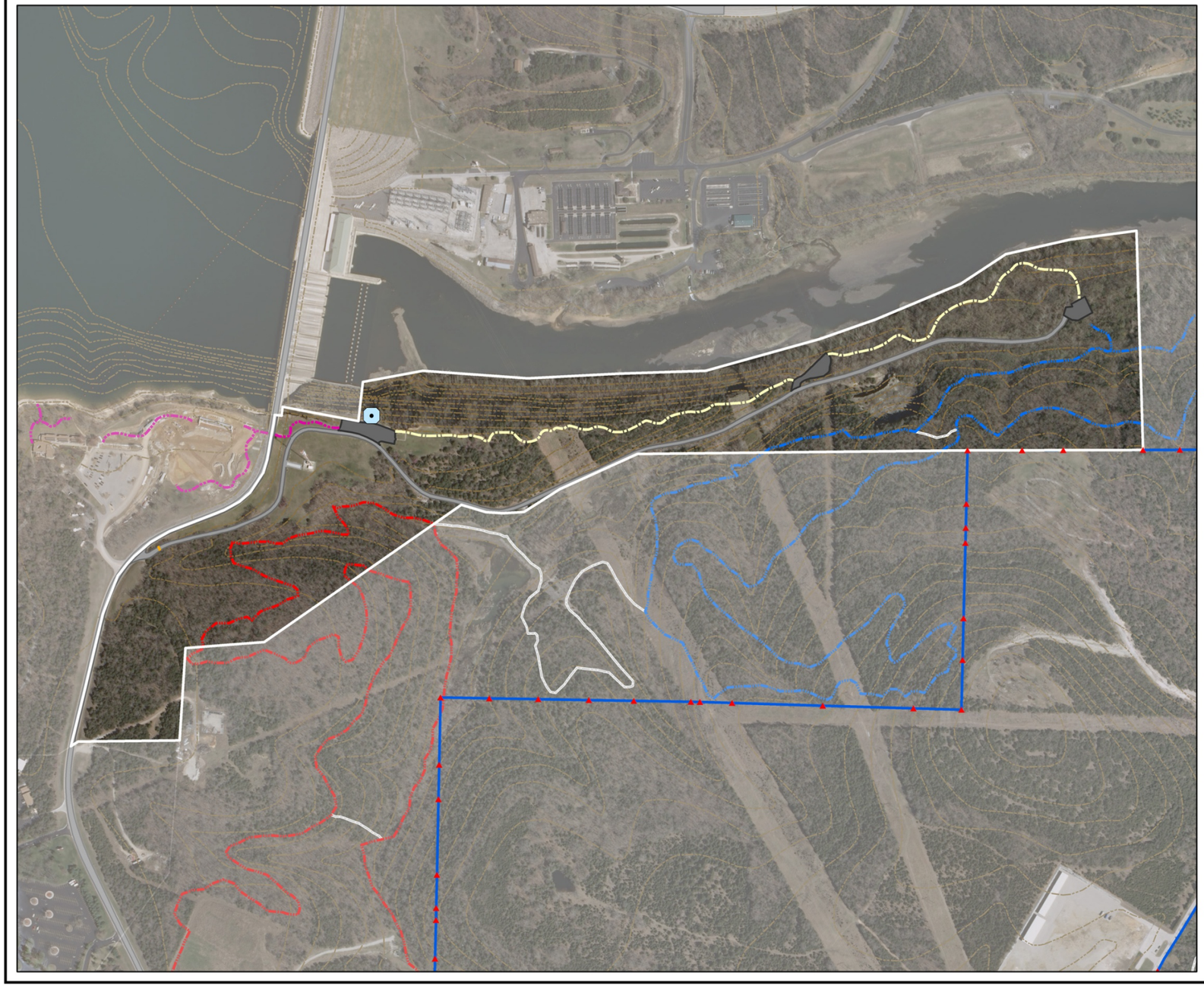
Feet

0 300 600

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

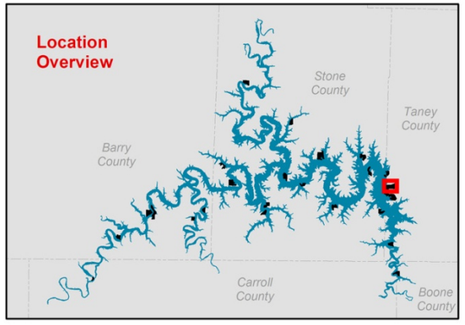
OVERLOOK



Legend

- Monuments
- USACE Boundary Line
- Gate
- 20ft Contours
- State Park Trail Red Loop
- State Park Trail Blue Loop
- State Park Trail Connectors
- Driveway
- Road
- Parking
- Proposed Observation Platform
- Proposed Trail
- Proposed Pedestrian Pathway
- Park Boundary

Location Overview



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 500 1,000

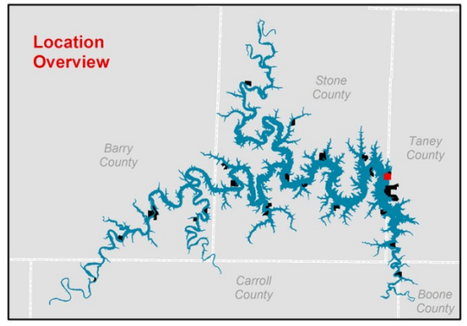
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

PENINSULA OBSERVATION LOOP

Legend

- Gate
- 10ft Contours
- Road
- Parking
- Proposed Restroom
- Proposed Fishing Dock
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 100 200

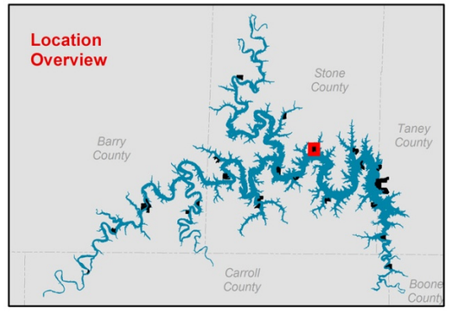
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

N W E S

PORT OF KIMBERLING

Legend

- Courtesy Dock
- Dump Station
- Group Camp Area
- Monuments
- USACE Boundary Line
- Gate
- 10ft Contours
- Pavilion
- Dog Walk Area
- Tennis Court
- Baseball Field
- Basketball Court
- VolleyBall Court
- Swim Beach
- Playground
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Camp/Cabin Areas
- Proposed Entrance Gate
- Proposed Showerhouse Expansion
- Proposed Dry Storage Expansion
- Proposed Game Room
- Proposed Playground
- Proposed Campsite
- Proposed Employee Campsite
- Proposed Parking
- Proposed Road
- Proposed Entrance Road
- Proposed Store/Check-In Building
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

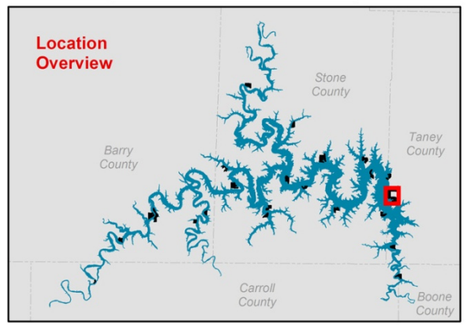
Feet
0 300 600

US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

TABLE ROCK STATE PARK

Legend

- Courtesy Dock
- Monuments
- USACE Boundary Line
- Gate
- 20ft Contours
- Trail Bridge
- Trail Head
- Lakeshore Trail
- State Park Trail
- VolleyBall Court
- Playground
- Pavilion
- Building
- Campsite
- Driveway
- Road
- Parking
- Boat Ramp
- Existing Entrance
- Proposed Entrance
- Proposed Road
- Proposed Lodging
- Proposed Service Area
- Proposed Administrative Office
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet

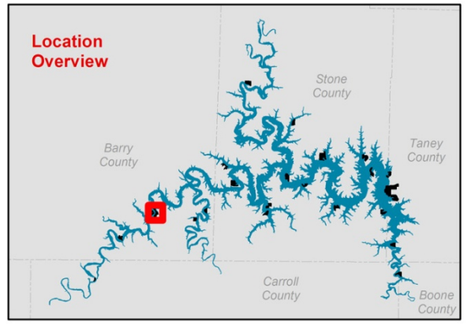
0 500 1,000

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake

VINEY CREEK

Legend

- Picnic Site
- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- VolleyBall Court
- Swim Beach
- Playground
- Mini Shelter
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Pavilion
- Proposed Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet
0 300 600

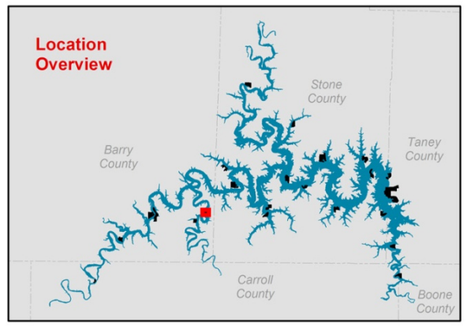
US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

VIOLA

Legend

- Courtesy Dock
- Dump Station
- Monuments
- USACE Boundary Line
- 10ft Contours
- Swim Beach
- Playground
- Building
- Boat Ramp
- Campsite
- Driveway
- Road
- Parking
- Proposed Path
- Proposed Beach Relocation
- Proposed Parking
- Park Boundary



UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Feet

0 300 600

US ARMY CORPS
OF ENGINEERS
Little Rock District
Table Rock Lake

N
W E
S

RECREATION AREAS OVERVIEW

PUBLIC USE AREA	ACRES
AUNTS CREEK	59
BAXTER	60
BEAVER TOWN	11
BIG BAY	21
BIG INDIAN	52
BIG M	97
CAMPBELL POINT	110
CAPE FAIR	77
COOMBS FERRY	64
COW CREEK	63
CRICKET CREEK	57
DEWEY SHORT VISITOR CENTER	34
EAGLE ROCK	45
INDIAN POINT	89
JOE BALD	85
KINGS RIVER	38
LONG CREEK	57
MILL CREEK	33
MOONSHINE	38
OLD HWY 86	57
OVERLOOK	91
PENINSULA OBSERVATION LOOP	12
PORT OF KIMBERLING	153
TABLE ROCK STATE PARK	325
VINEY CREEK	98
VIOLA	34

PUBLIC USE AREAS

- Corps Operated
- ORHF Operated
- State Operated
- City Operated
- Privately Operated
- Lake Access Only

Legend

- Point Markers
- State Highway
- US Highway
- Counties
- USDA Forest Service

UPDATED MASTER PLAN
TABLE ROCK LAKE

Date: July, 2013

Imagery Date: 2011

Miles
0 2.5 5

US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake