

CESWT-OD-NR

09 November 2023

MEMORANDUM FOR Commander, Tulsa District

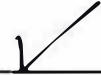
SUBJECT: Broken Bow Lake Revised Master Plan (December 2023)

1. Enclosed subject Master Plan is submitted for review and approval in accordance with ER 1130-2-550, Change 7 and EP 1130-2-550, Change 5.
2. Point-of-contact in Operations Division is Mrs. Amanda Palmer, 918-669-4903



Allen G. Ryan
Chief, Operations Division

Encl

Approved: 

Disapproved: _____



Timothy P. Hudson
Colonel, U.S. Army
District Commander

STAFF COORDINATION AND ROUTER

TO: CESWT-PE, CESWT-OC, CESWT-RE,
CESWT-OD, CESWF-PEM, CESWF-PEE

SUBJECT:DOC Review Final Broken Bow Lake Master Plan and EA

FROM: CESWF-PEM-E

DATE: 03 OCT 2023

SUMMARY OF ACTION REQUIRED, NOTES, REMARKS, ETC:

ACTION POINT OF CONTACT: Tennille Hammonds/ Eric Irwin
TELEPHONE NO: 254-978-1210 / 817-886-1870

This router is for the 2023 Final Broken Bow Lake Master Plan and EA revision. The draft document received no public or agency comments.


Tennille Hammonds
Courtney.T.Hammonds@usace.army.mil

Eric Irwin
Eric.J.Irwin@usace.army.mil

**Thank you,
Tennille Hammonds**

OFFICE /STAFF COORDINATION[illegible]

EXECUTIVE COORDINATION

	APPROVE	DISAPPROVE	SEE ME
COMMANDER			
DEPUTY COMMANDER			
DEPUTY DISTRICT ENGINEER			
CHIEF OF STAFF			

EXECUTIVE REMARKS:

**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT FOR THE
BROKEN BOW LAKE MASTER PLAN 2023
MOUNTAIN FORK RIVER BASIN
MCCURTAIN COUNTY, OKLAHOMA**

The U.S. Army Corps of Engineers (USACE) Engineering Regulation (ER) 1130-2-550 Change 07, dated 30 January 2013 and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 January 2013, require Master Plans for the USACE water resources development projects having a federally owned land base. The proposed revision of the 1979 Broken Bow Lake Master Plan is being conducted pursuant to this ER and EP, and is necessary to bring it up to date to reflect current ecological, socio-demographic, and outdoor recreation trends that are affecting the lake, as well as those anticipated to occur within the planning period of 2023 to 2048.

In accordance with the National Environmental Policy Act of 1969, as amended, including guidelines in 33 Code of Federal Regulations (CFR), Part 230 and 40 CFR Parts 1500-1508, the U.S. Army Corps of Engineers, Tulsa District has conducted an environmental analysis on the Broken Bow Lake Master Plan 2023. The Broken Bow Lake Master Plan 2023 addresses the need for an updated comprehensive land management document for Broken Bow Lake in McCurtain County, Oklahoma. The final recommendation will be contained in the Broken Bow Lake Master Plan 2023.

The revision of the 1979 Broken Bow Lake Master Plan (hereafter Plan or Master Plan) is a framework built collaboratively to serve as a guide toward appropriate stewardship of USACE administered resources at Broken Bow Lake over the next 25 years.

The Environmental Assessment (EA) for the Broken Bow Lake Master Plan 2023 evaluated an alternative that would revise the 1979 Broken Bow Lake Master Plan to meet current policy, and its assessment of impacts are summarized in Table 1. The EA is incorporated by reference.

In addition to a "no action" plan, one alternative that fully meets the project purpose was evaluated (proposed action/plan). Section 2.0 of the Broken Bow Lake Master Plan EA discusses the alternative formulation and selection as well as the summary of the new goals and objectives. Section 8, Tables 8-1, and 8-2 of the Master Plan summarizes the changes to the land classifications. The proposed plan includes coordination with the public, updates to comply with the USACE regulations and guidance, and reflects changes in land management and land uses that have occurred since 1979. Land classifications were refined to meet authorized project purposes and current resource objectives that address a mix of natural resources and recreation management objectives that are compatible with regional goals, recognize outdoor recreation trends, and are responsive to public comments.

Table 1: Summary of Potential Effects of the Proposed Plan

Resource	Insignificant Effects	Insignificant Effects as a Result of Mitigation	Resource Unaffected by Action
Aesthetics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aquatic resources/wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Invasive species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish and wildlife habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Threatened/Endangered species/critical habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic properties	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other cultural resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydrology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Socioeconomics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental justice	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate change	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

All practicable and appropriate means to avoid or minimize adverse environmental effects have been analyzed and incorporated into the proposed plan. The proposed plan will not entail any ground-disturbing activities. Future ground-disturbing activities on USACE property will be subject to all necessary environmental evaluations and compliance regulations.

No compensatory mitigation is required as part of the proposed plan.

Public review of the Master Plan, Environmental Assessment, and Finding of No Significant Impact (FONSI) was completed on June 29, 2023. All comments submitted during the public review period will be responded to in the final Master Plan.


Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers has determined that the proposed plan will have no effect on federally listed species or their designated critical habitat.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers has determined that the proposed plan has no potential to cause effects on historic properties.

All applicable environmental laws were considered and coordination with appropriate agencies and officials has been completed.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the report, the reviews by other Federal, State, and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the proposed plan would not cause significant adverse impacts on the quality of the human environment, therefore, preparation of an Environmental Impact Statement is not required.

16 Nov 2023
Date



Timothy P. Hudson
Colonel, EN
Commanding

Broken Bow Lake Master Plan

FINAL REPORT

Mountain Fork River Basin

McCurtain County, Oklahoma

December 2023



**US Army Corps
of Engineers**

Tulsa District

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EXECUTIVE SUMMARY

Broken Bow Lake Master Plan
U.S. Army Corps of Engineers
Prepared by the Southwestern Division
Regional Planning and Environmental Center (RPEC)
December 2023

ES.1 PURPOSE

The Broken Bow Lake Master Plan (hereafter Plan or Master Plan) is a complete revision of the 1979 *Broken Bow Lake Master Plan* and its supplements. The revision is a framework built collaboratively to guide appropriate stewardship of U.S. Army Corps of Engineers (USACE) administered resources at Broken Bow Lake over the next 25 years. The 1979 Master Plan has served well past its intended 25-year planning horizon and does not reflect the growing population around the lake and regional recreation needs.

Broken Bow Dam and Lake (Broken Bow Lake hereafter) was authorized in 1958 as a multipurpose project for flood control, hydroelectric power, water supply, recreation, and fish and wildlife. In addition to these primary missions, the USACE has an inherent mission for environmental stewardship of project lands while working closely with stakeholders and partners to provide regionally important outdoor recreation opportunities.

The Master Plan and supporting documentation provide an inventory and analysis, goals, objectives, and recommendations for USACE lands and waters at Broken Bow Lake, Oklahoma, with input from the public, stakeholders, and subject matter experts. The Master Plan is primarily a land use and outdoor recreation strategic plan that does not address the specific authorized purposes of flood risk management or water supply. Although water management is addressed in the 1999 USACE Water Control Manual for Broken Bow Lake, the Master Plan acknowledges that fluctuating water level for flood risk management and water supply can have a dramatic effect on outdoor recreation, especially at boat ramps, swim beaches, and the marina.

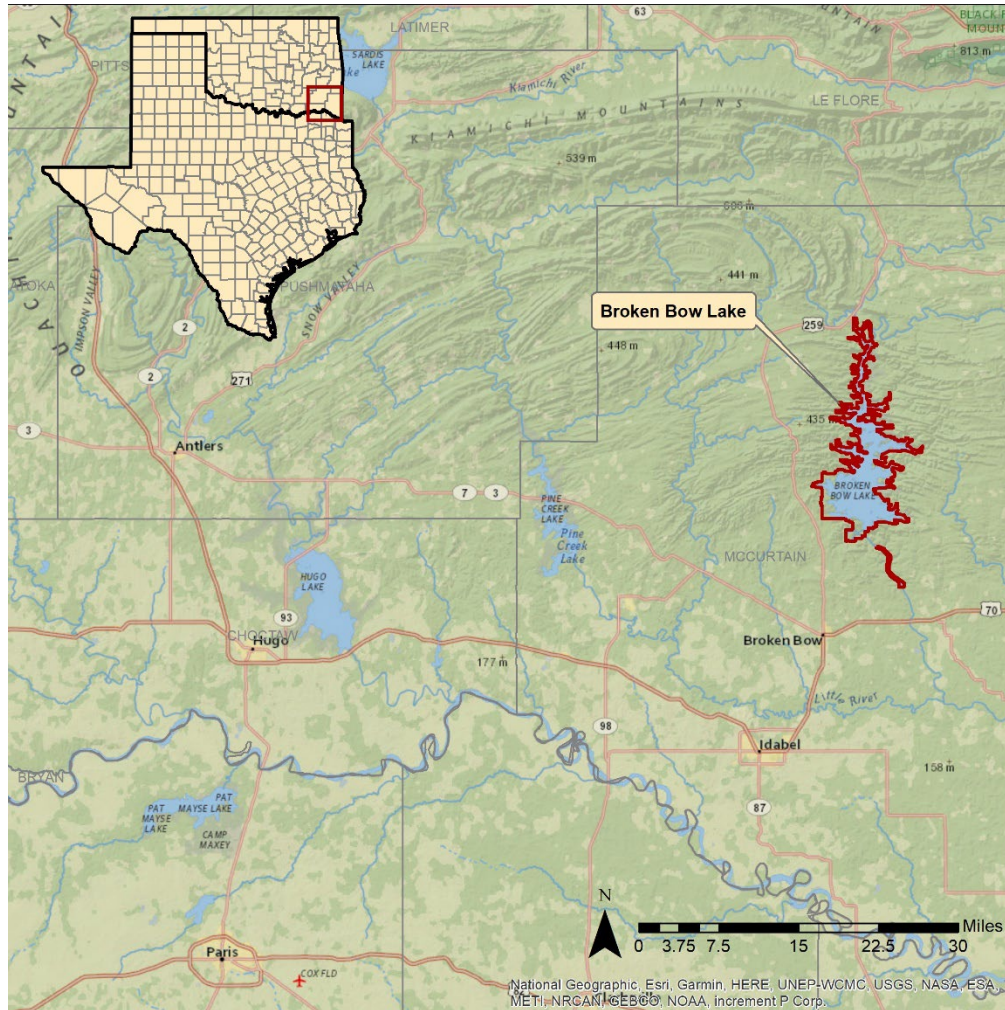


Figure ES. 1 Vicinity Map of Broken Bow Lake and Dam

The mapping used for this Master Plan revision uses modern satellite imagery and Geographic Information System (GIS) mapping, resulting in different acreage calculations than that of the 1979 Master Plan. Using GIS measurements, Broken Bow Lake has a water surface of 14,151 acres at conservation pool of 599.5 feet NGVD29 and approximately 13,956 acres of federal land lie above the conservation pool with a shoreline of approximately 204 miles at the top of the conservation pool.

ES.2 PUBLIC INPUT

To ensure a balance between operational, environmental, and recreational outcomes, USACE obtained both public and agency input toward the Master Plan. An Environmental Assessment (EA) was completed in conjunction with the Master Plan to evaluate the impacts of alternatives and can be found in Appendix B.

On May 23, 2022, a public information workshop was held at the Kiamichi Technology Center to inform the public of the intent to revise the master plan. The public input period remained open for 30 days from May 23, 2022, to June 23, 2022.

At the public information workshop, a presentation was given that included the following topics:

- What is a Master Plan
- What a Master Plan is Not
- Why Revise a Master Plan
- Overview of the National Environmental Policy Act (NEPA) process
- Master Planning Process
- Instructions for submitting comments

For Broken Bow Lake, USACE received 73 comments.

For the release of the Draft Broken Bow Lake Master Plan, a public information open house was held for the Broken Bow Lake Master Plan revision at the Southeastern Oklahoma State University, ET Dunlap Center, McCurtain County Campus in Idabel, Oklahoma, 74745 on May 30, 2023. The meeting was attended by 11 individuals. The purpose of this meeting was to provide attendees with information regarding the proposed Master Plan revision as well as to provide them the opportunity to provide comments on the proposed Draft Master Plan. The open house included the following topics:

- What is a Master Plan?
- What a Master Plan is Not;
- Why Revise a Master Plan?
- Overview of the National Environmental Policy Act (NEPA) process;
- Master Planning Process;
- Proposed Changes to the Master Plan; and
- Instructions for submitting comments.

The public input period remained open for 30 days from May 30, 2023, to June 29, 2023. During the 30-day comment period, the USACE received 8 comments. These comments and the USACE response can be found in Appendix E.

ES.3 RECOMMENDATIONS

The following land and water classification changes (detailed in Chapter 8) were a result of the inventory, analysis, synthesis of data, documents, and public and agency input. In general, all USACE land at Broken Bow Lake was reclassified either by a change in nomenclature required by regulation or changes needed to identify actual and projected use. Table ES. 1 illustrates the prior and revised land and water classifications, which includes small reductions in Project Operations, High Density Recreation, and Low Density Recreation and an increase Wildlife Management. Additionally, the update sets aside land under the Environmentally Sensitive Area classification for environmental, cultural, and/or aesthetic preservation.

**Table ES.0.1 Change from 1979 Land and Water Surface Classifications to 2023
Land and Water Surface Classification**

Prior Land Classifications (1979)	Acres	Land Classifications (2023)	Acres	Net Difference
Project Operations	427	Project Operations (PO)	322	(105)
Operations: Recreation – Intensive Use	3,468	High Density Recreation (HDR)	3,431	(37)
		Environmentally Sensitive Areas (ESA)	890	890
Operations: Recreation – Low Density	5,913	Multiple Resource Management – Low Density Recreation (LDR)	2,492	(3,421)
Operations: Wildlife Management	3,222	Multiple Resource Management – Wildlife Management (WMA)	6,821	3,599
Recreation Lands	896			(896)
Not Classified	58			(58)
TOTAL	13,984		13,956	(28)
Prior Water Surface Classifications (1979)	Acres	Water Surface Classifications (2023)	Acres	Net Difference
Permanent Pool	14,151	Open Recreation	14,007	
		Designated No-Wake	123	123
		Restricted	21	21
TOTAL	14,151		14,151	0
TOTAL FEE	28,135		28,107	(28)

* Total Acreage differences from the 1979 total to the 2023 totals are due to improvements in measurement technology, deposition/siltation, and erosion. Totals also differ due to rounding while adding parcels.

The acreages of the conservation pool and USACE land lying above the conservation pool were measured using satellite imagery and Geographical Information System (GIS) technology. The GIS software allows for more finely tuned measurements and, thus, stated acres may vary from official land acquisition records and acreage figures published in the 1979 Public Use Plan. Some changes may also be due to

erosion and siltation. A more detailed summary of changes and rationale can be found in Chapter 8.

ES.4 PLAN ORGANIZATION

Chapter 1 of the Master Plan presents an overall introduction to Broken Bow Lake. Chapter 2 consists of an inventory and analysis of Broken Bow Lake and associated land resources. Chapters 3 and 4 lay out management goals, resource objectives, and land classifications. Chapter 5 is the resource management plan that identifies how project lands will be managed for each land use classification. This includes current and projected overall park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. Chapter 6 details special topics that are unique to Broken Bow Lake. Chapter 7 identifies the public involvement efforts and stakeholder input gathered for the development of the Master Plan, and Chapter 8 gives a summary of the changes in land classification from the previous master plan to the present one. Finally, the appendices include information and supporting documents for this Master Plan revision, including Land Classification and Park Plate Maps (Appendix A).

An Environmental Assessment was developed with the Master Plan, which analyzed alternative management scenarios for Broken Bow Lake, in accordance federal regulations including the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality; and USACE regulations, including Engineer Regulation 200-2-2: Procedures for Implementing NEPA. The EA is a separate document that informs this Master Plan and can be found in its entirety in Appendix B.

The EA evaluated two alternatives as follows: 1) No Action Alternative, which would continue the use of the 1979 Public Use Plan, and 2) Proposed Action. The EA analyzed the potential impact these alternatives would have on the natural, cultural, and human environments. The Master Plan is conceptual and broad in nature, and any action proposed in the Plan that would result in significant disturbance to natural resources or result in significant public interest would require additional NEPA documentation at the time the action takes place.

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CHAPTER 1 – INTRODUCTION

1.1 GENERAL OVERVIEW

Broken Bow Lake is located at river mile (RM) 20.3 on the Mountain Fork River, within the Mountain Fork Basin (Figure 1.1). The damsite is in McCurtain County, about 9 miles north-northeast of Broken Bow, Oklahoma (Figure 1.10). Approximately 28,113 acres of fee simple land were purchased for the project in addition to 707 acres of easement lands to include flowage. The construction of Broken Bow Lake and Dam began in October 1961; the final storage began October 1968; and the conservation pool was filled for the first time in June 1970. The first power unit was put online January 1970, and the second unit in June 1970.

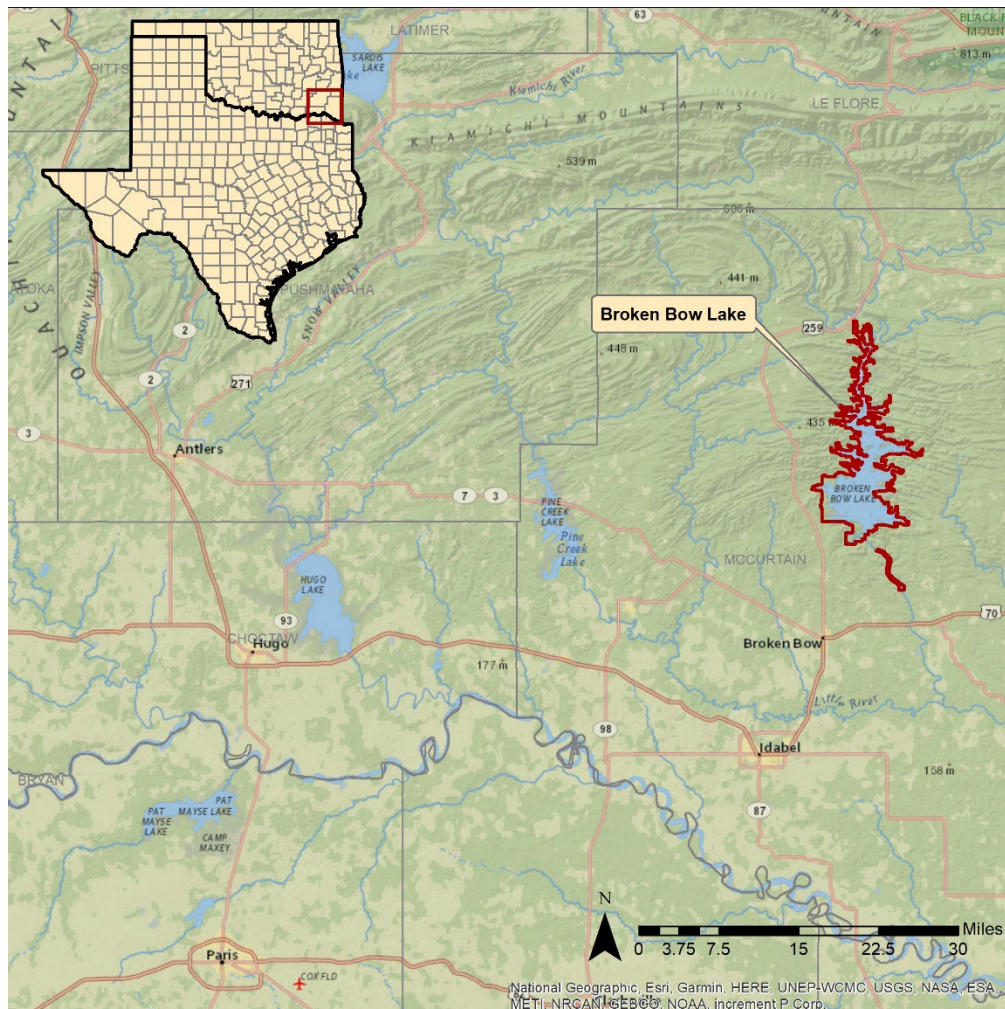


Figure 1.1 Vicinity Map of Broken Bow Lake and Dam

Broken Bow Lake is an integral part of the USACE plan for flood control and water conservation in the Mountain Fork Basin. The drainage area upstream of Broken Bow Dam is 754 square miles. The USACE operates and maintains the dam and

associated facilities and administers the Federal lands and flowage easements comprising the project through a combination of direct management and leases for park and recreation purposes and through consultation with local Tribal Nations.

The Master Plan is intended to serve as a comprehensive land and recreation management guide with an effective life of approximately 25 years. The focus of the plan is to guide the stewardship of natural and cultural resources and make provision for outdoor recreation facilities and opportunities on federal land associated with Broken Bow Lake. The Master Plan identifies conceptual types and levels of activities, but does not include designs, project sites, or estimated costs. All actions carried out by the USACE, other agencies, and individuals granted leases to USACE lands must be consistent with the Master Plan. The Plan does not address the flood risk management or water supply purposes of Broken Bow Lake. The Broken Bow Lake Master Plan was written as Design Memorandum No. 4B in 1979 and has served well past the intended planning horizon of 25 years. In 1999, USACE discontinued use of the Design Memorandum system as a means of organizing the many phases of civil works projects, therefore, the term “Design Memorandum” is not used in the title of this Master Plan revision.

National USACE missions associated with water resource development projects may include flood risk management, water supply, water quality, navigation, recreation, environmental stewardship, and hydroelectric power generation. Most of these missions serve to protect the built environment and natural resources of a region from the climate extremes of drought and floods. This helps to create a more resilient and sustainable region for the health, welfare, and energy security of its citizens. Mitigation, while not a formal mission at USACE lakes, may be implemented to achieve the stewardship and recreation missions. Maintaining a healthy vegetative cover and including a native prairie or tree cover where ecologically appropriate on Federal lands within the constraints imposed by primary project purposes helps reduce stormwater runoff and soil erosion, mitigates air pollution, and moderate temperatures. To this end, the USACE has developed the following statements.

The USACE Sustainability Policy and Strategic Plan states:

The U.S. Army Corps of Engineers strives to protect, sustain, and improve the natural and man-made environment of our Nation, and is committed to compliance with applicable environmental and energy statutes, regulations, and Executive Orders. Sustainability is not only a natural part of the Corps' decision processes; it is part of the culture.

Sustainability is an umbrella concept that encompasses energy, climate change and the environment to ensure today's actions do not negatively impact tomorrow. The Corps of Engineers is a steward for some of the Nation's most valuable natural resources and must ensure customers receive products and services that

provide sustainable solutions that address short and long-term environmental, social, and economic considerations.

The USACE mission for the Responses to Climate Change Program is:

To develop, implement, and assess adjustments or changes in operations and decision environments to enhance resilience or reduce vulnerability of USACE projects, systems, and programs to observed or expected changes in climate.

1.2 PROJECT AUTHORIZATION

Broken Bow Lake was authorized for construction by the Flood Control Act of 1958 (Public Law [PL] 85-500, HD 170, 85th Congress, 1st Session) and modified by the Flood Control Act of 1962 (SD 137, 87th Congress, 2nd Session. Modified in Section 102(v) of Water Resource Development Act (WRD) 1992 (106 Stat. 1187), Section 338 of WRDA 1996 (110 Stat. 1808). And further modified to require seasonal adjustments to the top of conservation pool in WRDA 1999.

1.3 PROJECT PURPOSE

Broken Bow Lake is a multipurpose water resource project constructed and operated by the USACE. The project was designed to provide maximum flood protection on the Mountain Fork River and Little River. Broken Bow Lake has the following primary purposes authorized by the laws listed above:

- Flood Control
- Hydroelectric Power
- Water Supply
- Recreation
- Fish and Wildlife

In addition to these primary missions, the USACE has an inherent mission for environmental stewardship of project lands while working closely with stakeholders and partners to provide regionally important outdoor recreation opportunities. Other laws, including but not limited to Public Law 91-190, National Environmental Policy Act of 1969 (NEPA) and Public Law 86-717, Forest Cover Act, place emphasis on the environmental stewardship of Federal lands and USACE-administered Federal lands, respectively.

1.4 MASTER PLAN PURPOSE AND SCOPE

In accordance with Engineering Regulation (ER) 1130-2-550 Change 07, dated 30 January 2013 and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 January 2013, master plans are required for most USACE water resources development projects having a federally owned land base. The master plan works in tandem with the Operational Management Plan (OMP), which is the task-oriented implementation tool for the resource objectives and development needs identified in the

master plan. This revision of the Master Plan is intended to bring the master plan up to date to reflect current ecological, socio-demographic, and outdoor recreation trends that are impacting the lake, as well as those anticipated to occur within the next 25 years.

The *Broken Bow Lake Master Plan* (hereafter Plan or Master Plan) is the strategic land use management document that guides the efficient, cost-effective, comprehensive management, development, and use of recreation, natural resources, and cultural resources throughout the life of the Broken Bow Lake project. It is a vital tool for responsible stewardship and sustainability of the project's natural and cultural resources for the benefit of present and future generations. The Plan guides and articulates USACE responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop the land, water, and associated resources. It is a dynamic and flexible tool designed to address changing conditions. The Plan focuses on carefully crafted resource-specific goals and objectives. It ensures that equal attention is given to the economy, quality, and needs in the management of Broken Bow Lake resources and facilities, and that goals and objectives are accomplished at an appropriate scale.

The master planning process encompasses a series of interrelated and overlapping tasks involving the examination and analysis of past, present, and future environmental, recreational, and socioeconomic conditions and trends. With a generalized conceptual framework, the process focuses on the following four primary components:

- Regional and ecosystem needs
- Project resource capabilities and suitability
- Expressed public interests that are compatible with Broken Bow Lake's authorized purposes
- Environmental sustainability elements

It is important to note what the Master Plan does not address. Details of design, management and administration, and implementation are not addressed here but are covered in the Broken Bow Lake OMP. In addition, the Master Plan does not address the specifics of regional water quality, shoreline management (a term used to describe primarily vegetation modification or permits by neighboring landowners), or water level management, nor does it address the operation and maintenance of prime project operations facilities such as the dam embankment, gate control outlet, and spillway. Additionally, the Plan does not address the flood control, hydroelectric power, water supply, or fish and wildlife purposes of Broken Bow Lake with respect to management of the water level in the lake.

The previous Plan was sufficient for prior land use planning and management, but changes in outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy have occurred over the past decades. Additionally, increased urbanization, increasing fragmentation of wildlife habitat, national policies related to land management, climate change, and growing demand for recreational access and protection of natural and cultural resources are all

factors affecting Broken Bow Lake and the region in general. In response to these escalating pressures and trends, a full revision of the 1979 Public Use Plan is required as set forth in this Master Plan. The Master Plan revision will update land classifications and include new resource management goals and objectives.

1.5 BRIEF WATERSHED AND PROJECT DESCRIPTION

Broken Bow Lake is located in the Mountain Fork River watershed in the Mountain Fork Basin. The Mountain Fork River rises near the Oklahoma/Arkansas border in the Ouachita Mountains, the river flows generally southeast across Arkansas into Polk County before turning southwest and crossing into Oklahoma. It continues southeast until McCurtain County, Oklahoma where it then curves southward for the remainder of its course before reaching the Little River. The total drainage area in the basin is 541,594 acres, with 754 square miles above Broken Bow Lake. There are no significant structures upstream or downstream of Broken Bow Dam on the Mountain Fork River.

Broken Bow Dam consists of a rolled earth-filled structure, a controlled spillway, eight tainter gates, and supporting facilities. The dam is a rolled earth-filled structure about 2,750 feet long, rising 225 feet above the streambed. The dike has a maximum height of 55', a design crest elevation of 645.09, and a length of 897' (STA. 10+00 to 18+97). The total length of the dam, dike, and spillway is 4,026 feet.

The controlled spillway is a concrete ogee weir located in a saddle about 1.25 miles northwest of the right abutment of the dam. Total length of the structure is 376 feet, with a clear opening of 320 feet controlled by eight 40- by 40-foot tainter gates. Design capacity of the spillway is 443,000 cfs at full pool. Seven 8-foot-wide piers support a roadway bridge across the spillway. Operating channel capacity below the dam is 8,000 cfs. A 17-foot-diameter diversion tunnel and a 24-inch corrugated metal pipe through the left abutment act as a low-level outlet facility to discharge water below elevation 599.0. This low-level outlet is operated by four 5- by 7-foot hydraulic slide gates placed two in tandem in each of two openings. The two upstream gates will normally be reserved for emergency use. The 24-inch pipe is adjacent to the 17-foot tunnel and both discharge into the old river channel. A 4- by 4-foot low flow sluice extends through the spillway weir. A 24-inch water supply pressure conduit is located parallel to the sluice.

A concrete gravity ogee weir, known as the Reregulation Dam, designed to spill water over its entire length is located on Mountain Fork Road at river mile 11.6, approximately 9 miles below Broken Bow Lake. Its purpose is to satisfy low flow requirements of the U.S. Fish and Wildlife Service and to smooth fluctuations caused by variable power releases. The top of the dam and spillway crest is at elevation 398.5 feet. A concrete flip bucket with a 20-foot radius is provided downstream of the dam to direct flows away from the structure. The flip bucket ends in an end sill that is 3.5 feet above the bucket invert. Five 8.5-foot-wide by 5.0-foot-high uncontrolled sluices are at elevation 387.5 feet. Four 24-inch uncontrolled low flow pipes pass through the weir near the center of the streambed. These pipes have an invert elevation of 363.0 feet.

1.6 DESCRIPTION OF RESERVOIR

Based on the Pertinent Data table maintained by the Tulsa District (see Section 1.10), Broken Bow Lake covers approximately 14,163 surface acres of water when at the top of conservation pool (599.5 NGVD29). The deepest part of the lake is located directly upstream of the dam and is approximately 185 feet deep, while depths gradually decrease further north of the dam. The top of the flood control pool is elevation 627.5 feet NGVD29. At the conservation pool, the lake was designed to accommodate 451,630 acre-feet for water supply, hydropower, fish, and wildlife.

1.7 PROJECT ACCESS

Broken Bow Lake has limited access on mainly tertiary roads. U.S. Highway (US)-259 runs north to south along the western edge of the lake. Oklahoma (OK) 259A makes a loop off US-259 on the south end of the lake crossing the dam.

1.8 PRIOR DESIGN MEMORANDA AND PLANNING REPORTS

Design Memoranda (DM) and planning reports approve and set forth design and development plans for all aspects of the project including the prime flood risk management facilities, real estate acquisition, road and utility relocations, reservoir clearing, and the master plan for recreation development and land management. The *Master Plan, Broken Bow Lake, Mountain Fork River, Oklahoma*, dated June 1979, presents a program for development and management of the Broken Bow Lake area for recreation and other land and water uses. The following are DMs for Broken Bow Lake:

- Design Memorandum No. 1, Hydrology, Little River Reservoir System, November 1959
- Design Memorandum No. 2, Hydrology, Broken Bow Dam and Reservoir, April 1960
- Design Memorandum No. 3, General Design, dated February 1960, revised August 1960 and March 1961
- Design Memorandum No. 4A, Preliminary Master Plan, March 1962
- Design Memorandum No. 4B, Master Plan for Broken Bow Reservoir, June 1964, updated June 1979
- Design Memorandum No. 5, Real Estate - Dam Site, June 1964
- Design Memorandum No. 6 Construction of Right Abutment Access Road, April 1961
- Design Memorandum No. 7, Construction of Embankment and Dike, October 1961
- Design Memorandum No. 8-1, Construction of Diversion Tunnel, October 1961
- Design Memorandum No. 8-2, Completion of Outlet Works, (No date of approval)
- Design Memorandum No. 9, Construction of Project Buildings, February 1962
- Design Memorandum No. 10, Construction of Spillway and Bridge, November 1962

- Design Memorandum No. 11, Relocation of Southwestern Electric Power Company Facilities, May 1963
- Design Memorandum No. 12, Abandonment and Removal of Choctaw Electric Coop. Inc., Facilities, June 1962
- Design Memorandum No. 13, Reservoir Clearing, October 1964
- Design Memorandum No. 15, Left Abutment Access and Service Road, April 1963
- Design Memorandum No. 16-1, Power Intake and Tunnel, October 1963
- Design Memorandum No. 16-2, Power Penstock, Surge Tank, and Wye Branch, March 1965
- Design Memorandum No. 17, Hydroelectric Power Capability, December 1962
- Design Memorandum No. 18, Relocation of U.S. Highway 259, September 1963
- Design Memorandum No. 19, McCurtain County Roads, Deleted.
- Design Memorandum No. 20-1, Powerplant and Appurtenant Structures, July 1963
- Design Memorandum No. 20-2, Powerhouse Discharge Channel, December 1964
- Design Memorandum No. 21, Construction Materials (Concrete Aggregate), February 1963
- Design memorandum No. 22, Reregulating Dam and Access Road, (No date of approval)
- Design Memorandum No. 24, Water Supply to Beavers Bend State Park, January 1969

1.9 PUBLIC LAWS

The following Public Laws (PL) are applicable to Broken Bow Lake. Additional information on Federal Statutes applicable to Broken Bow can be found in the Environmental Assessment for the Broken Bow Lake Master Plan revision in Appendix B of this Plan.

- Flood Control Act of 1944, Section 4 PL 78-534 of this act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes the USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to federal, state or local governmental agencies. This law also authorized the creation of the Southwestern Power Administration (SWPA), then within the Dept. of the Interior and now within the Dept. of Energy, as the agency responsible for marketing and delivering the power generated at federal reservoir projects.
- River and Harbor Act of 1946, PL 79-525. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Flood Control Act of 1946, PL 79-526. This act authorizes the construction, repair, and preservation of certain public works on rivers and

harbors for navigation, flood control, and for other purposes including construction of Broken Bow Lake. This law amends PL 78-534 to include authority to grant leases to non-profit organizations at recreational facilities in reservoir areas at reduced or nominal fees.

- Flood Control Act of 1954, PL 83-780. This act authorizes the construction, maintenance, and operation of public park and recreational facilities in reservoir areas under the control of the Department of the Army and authorizes the Secretary of the Army to grant leases of lands in reservoir areas deemed to be in the public interest.
- Fish and Wildlife Coordination Act 1958, PL 85-624. This act as amended in 1965 sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- Rivers and Harbors Act of 1962, PL 87-874. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Historic Preservation Act of 1966, PL 89-665. This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
- River and Harbor and Flood Control Act of 1968, PL 90-483. Mitigation of Shore Damages. Section 210 restricted collection of entrance fee at USACE lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.
- National Environmental Policy Act of 1969 (NEPA), PL 91-190. NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a "continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations, and public law of the United States shall be interpreted and administered in accordance with the policies of the Act.

- River and Harbor and Flood Control Act of 1970, PL 91-611. Section 234 provides that persons designated by the Chief of Engineers shall have authority to issue a citation for violations of regulations and rules of the Secretary of the Army, published in the Code of Federal Regulations.
- The Water Resources Development Act (WRDA) 1986, PL 99-662. This act provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure and establishes new requirements for cost sharing.
- WRDA 1996, PL 104-303. Authorizes recreation and fish and wildlife mitigation as purposes of a project, to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of a project.

1.10 PERTINENT PROJECT INFORMATION

Table 1.1 provides pertinent information regarding key reservoir elevations and storage capacity a Broken Bow Lake.

Table 1.1 Broken Bow Lake Pertinent Data

Feature	Elevation (feet)	Area (acres)	Capacity (acre-feet)	Equivalent Runoff ⁽¹⁾ (inches)
Top of Dam	645.0	20,664	1,677,786	41.71
Maximum Pool	639.7	19,785	1,570,64	39.05
Surcharge	632.5	18,750	1,430,900	35.58
Top of Flood Control Pool and Spillway Crest	627.5	17,930	1,350,350	33.57
Flood Control Storage	599.5-627.5	-	436,980	10.86
Top of Conservation/Power Pool	599.5	14,163 ⁽³⁾	913,370	22.71
Power & Water Supply Storage	559.0-599.5	-	451,630 ⁽²⁾	11.23
Spillway Crest	587.5	12,701	760,130	18.90
Top of Inactive Pool	559.0	9,470	461,740	11.48

(1) Drainage area is 754 square miles.

(2) Includes 107,000 acre-feet for trout. The rest of the water storage is for the following uses, based on the percentage of storage after the trout allotment is taken out: Water supply=1.30%, Uncontracted water supply=10.39%, and Hydropower=88.31%. Water supply yield is 175 mgd based on 152,000 acre-feet storage after sedimentation

(3) 14,163 acres of water surface differs from the revised water surface acres of 14,151 due to the use of GIS measurement technology used for the revision.

CHAPTER 2 – PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT PHYSIOGRAPHIC SETTING

2.1 ECOREGION OVERVIEW

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. The Environmental Protection Agency (EPA) has developed a series of maps that categorizes these regions across the United States. Levels I and II divide the North American continent into 15 and 52 regions, respectively, while Level III ecoregions represent a subdivision of those into 104 unique regions and Level IV a finer sub-classification of those. Broken Bow Lake and its watershed are located in the Level III Ouachita Mountains ecoregions as illustrated in Figure 2.1.

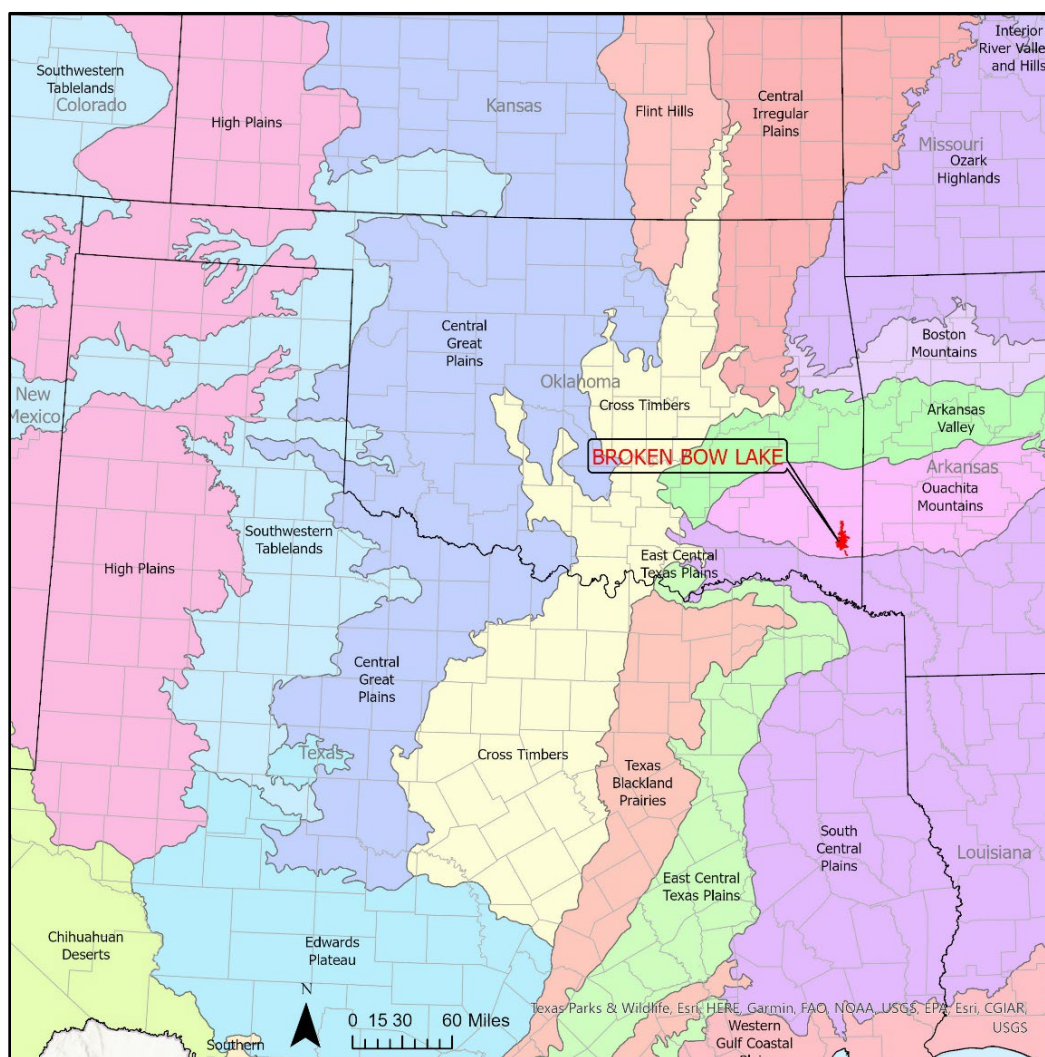


Figure 2.1 Broken Bow Lake within Oklahoma Ecoregions

Source: EPA (2021)

The Ouachita Mountains ecoregion vegetation is predominantly of an oak-hickory-pine forest. The common tree species are loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), southern red oak (*Quercus falcata*), scarlet oak (*Quercus coccinea*), black oak (*Quercus ellipsoidalis*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), white oak (*Quercus alba*), pignut hickory (*Carya glabra*), and mockernut hickory (*Carya tomentosa*). What prairies exist are typically confined to managed lands like parks and wildlife management areas, as areas outside of those units had typically evolved into pastures and forests. Bottomland forests and wetlands typically occur in poorly drained areas.

2.2 CLIMATE

Broken Bow Lake is located in the southeast part of the state of Oklahoma. The region is characterized by moderate winters and long, humid summers with high temperatures. Rainfall usually occurs as high intensity, local thunderstorms occurring primarily in the late spring and early fall months. These storms are frequently accompanied by high winds, hail, and occasional tornadoes. The mean annual temperature in nearby Bartlesville, Oklahoma (the nearest NOAA weather station) is about 59.5 degrees Fahrenheit (°F) (NOAA, 2021C). January, the coldest month, has an average temperature of 39.1°F and average minimum daily temperature of about 26.5°F. July has the highest average daily temperature of 79.2°F, and August has the highest average maximum daily temperature of 91.5°F. The average length of the growing season is 195 days (NOAA, 2021B). Broken Bow Lake is located within the USDA Plant Hardiness Zone 8A and 7B, which is determined by the winter extreme low temperatures, with 8A having normal winter lows between 10°F and 15°F and 7B having normal winter lows between 5° F and 10° F (USDA, 2021).

The normal annual precipitation is 57.6 inches with greater precipitation during spring and less precipitation during winter. The highest annual precipitation recorded since 2000 was in 2015 at 84.3 inches. The lowest annual precipitation recorded in the area since 2000 was in 2012, at 29.4 inches.

The average monthly climate data is presented in Figure 2.2 which includes the average precipitation each month and the average minimum, maximum, and daily average for each month.

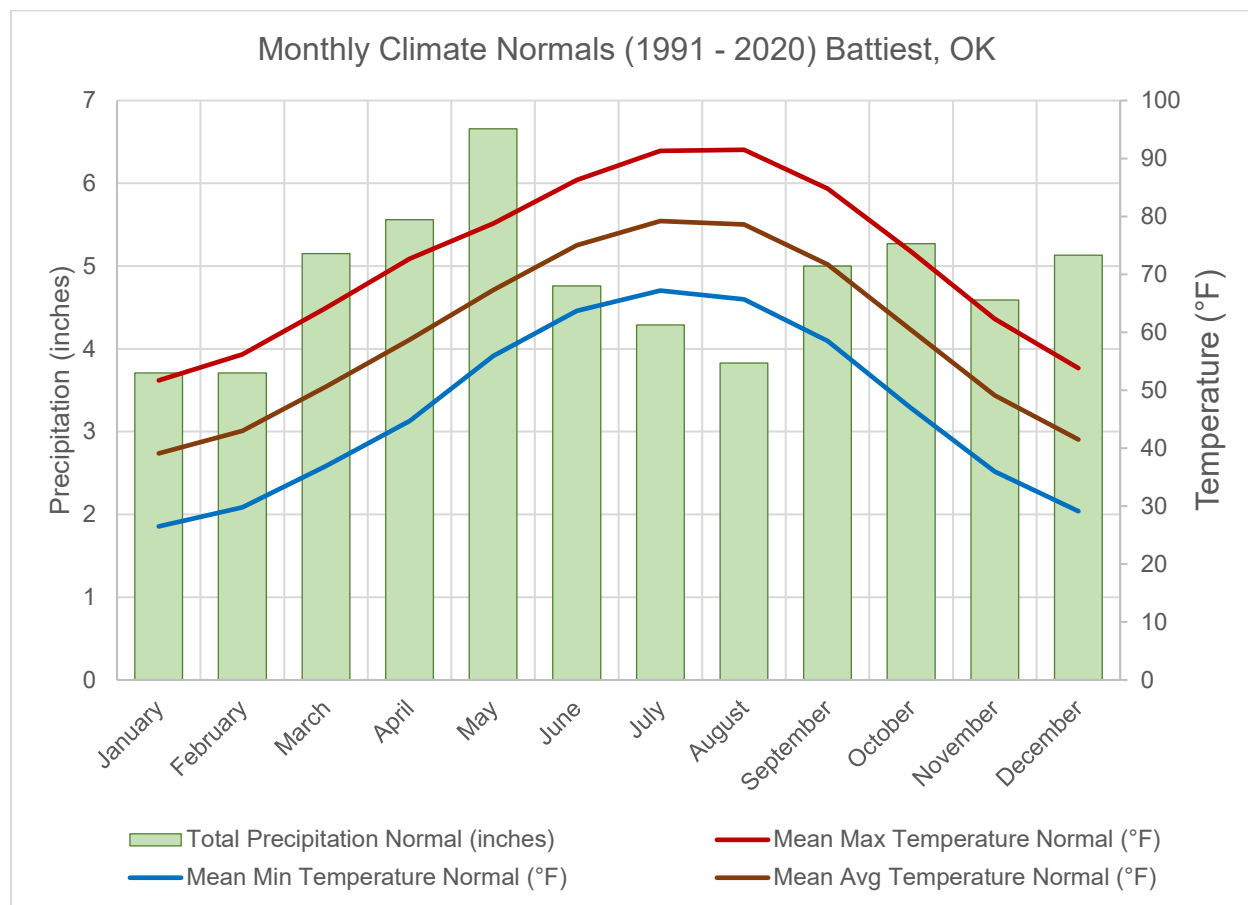


Figure 2.2 Average Monthly Climate Battiest, Oklahoma, 1991 – 2020

Source: NOAA, 2022.

2.3 CLIMATE CHANGE AND GREENHOUSE GASSES (GHG)

The U.S. Global Change Research Program (USGCRP) looks at potential impacts of climate change globally, nationally, regionally, and by resource (e.g., water resources, ecosystems, human health). Broken Bow Lake area is located within the Southern Great Plains region of analysis. The Southern Great Plains region has already seen evidence of climate change in the form of rising temperatures that are leading to increased demand for water and energy and impacts on agricultural practices. Over the last few decades, the Southern Great Plains has seen fewer cold days in winter and more hot days in summer, as well as changes to precipitation patterns. The decrease in the cold days has resulted in an overall increase of the frost-free season. Within this region, there has been an increase in average temperatures 1° – 2° Fahrenheit (F) since 1901 (Kloesel et al., 2018). The changing precipitation patterns in the region has led to more frequent extreme droughts, storms, and flood events. If the current rate of greenhouse gas (GHG) emissions continues, the potential increase will be much higher

by 2100. The USACE mission for the Responses to Climate Change Program is “to develop, implement, and assess adjustments or changes in operations and decision environments to enhance resilience or reduce vulnerability of USACE projects, systems, and programs to observed or expected changes in climate.” The effects of climate change and mitigation efforts are evolving, and Broken Bow Lake and all federally owned property will be managed to comply with laws and executive orders to respond to the growing threat of climate change.

2.4 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) established nationwide air quality standards to protect public health and welfare in 1971. The Air Quality Division of the Oklahoma Department of Environmental Quality has adopted the National Ambient Air Quality Standards (NAAQS) as the state’s air quality criteria. NAAQS standards specify maximum permissible short- and long-term concentrations of various air contaminants including primary and secondary standards for six criteria pollutants: Ozone (O₃), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Nitrogen Oxides (NO_x), particulate matter (PM₁₀ and PM_{2.5}), and Lead (Pb). If the concentrations of one or more criteria pollutants in a geographic area is found to exceed the regulated “threshold” level for one or more of the NAAQS, the area may be classified as a non-attainment area. Areas with concentrations that are below the established NAAQS levels are considered either attainment or unclassifiable area. There are currently no non-attainment areas for any monitored pollutants in the State of Oklahoma including the counties around Broken Bow Lake (Department of Environmental Quality, DEQ, 2021).

2.5 TOPOGRAPHY, GEOLOGY, AND SOILS

2.5.1 Geology

The Ouachita Mountains through which the Mountain Fork River flows are characterized by high, rugged mountains with very shallow soil cover. The rock is mostly shale and sandstone with some limestone. The soil is generally lean clay and clayey, silty sand and gravel. Overburden depth varies from practically none in the upper parts of the mountains to 60 feet in the lower part of the basin.

2.5.2 Topography

Most of the drainage area is located in the heavily timbered and mountainous hill country of the Ouachita Mountain Physiographic Province. The elevation of the headwaters of the Mountain Fork is in excess of 1,700 feet. From this point the land descends to about elevation 290 at the mouth of the Mountain Fork River on the Little River. There is a considerable overflow area near the mouth of the river. The channel slope varies from about 12 feet per mile in the upper reaches to 4 feet per mile in the lower reach.

2.5.3 Soils

The main soil series within Broken Bow Lake Project Lands is the Clebit-Carnasaw-Stapp association, 20 to 40 percent slopes. This soil makes up 69.43% of soils found within Broken Bow Lake project lands. The reason why it is considered an association rather than single soil is because of their close geographic close proximity and that their” anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately” (NRCS, 2022). The soils that comprise the association is Clebit, Carnasaw, Stapp and other minor components. The association is moderately well drained, and it is not a prime farmland soil.

The NRCS Web Soil Survey (2022) reports 10 soil types occurring within Broken Bow Lake project lands. Table 2.1 shows the acreage and farmland status associated with each soil & surface type in the detention area and Figure 2.3 shows where those soils can be found within the USACE Broken Bow fee boundary.

Table 2.1 Soil Types at Broken Bow Lake

Soil Type	Number of Acres	Percent Total	Farmland Status
Ceda gravelly fine sandy loam, 0 to 2 percent slopes, frequently flooded	200.0	1.47%	Not prime farmland
Ceda-Rubble land complex, 0 to 3 percent slopes, frequently flooded	441.2	3.23%	Not prime farmland
Carnasaw-Clebit association, 12 to 20 percent slopes	194.0	1.42%	Not prime farmland
Clebit-Carnasaw-Stapp association, 12 to 20 percent slopes	2,491.5	18.26%	Not prime farmland
Clebit-Carnasaw-Stapp association, 20 to 40 percent slopes	9,475.0	69.43%	Not prime farmland
Clebit-Rock outcrop complex, 35 to 60 percent slopes	702.0	5.14%	Not prime farmland
Pickens gravelly silt loam, 5 to 15 percent slopes	9.4	0.07%	Not prime farmland
Sallisaw loam, 0 to 1 percent slopes	47.6	0.35%	All areas are prime farmland
Sherwood-Zafra complex, 1 to 5 percent slopes	48.1	0.35%	All areas are prime farmland
Sherwood-Zafra complex, 5 to 12 percent slopes	38.1	0.28%	Not prime farmland
Total Acres	13,646.90		

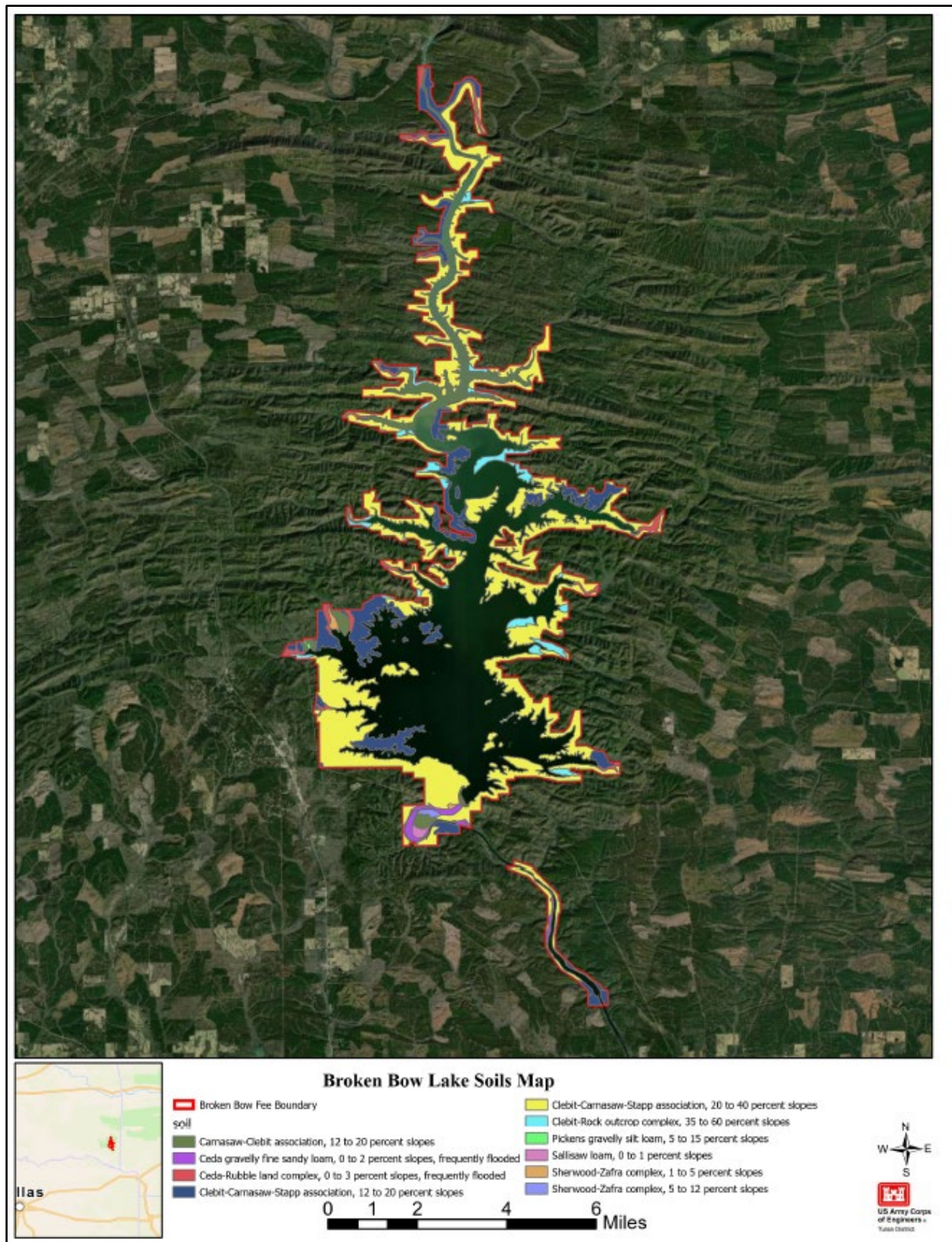


Figure 2.3 NRCS Soil Map of Broken Bow Lake

2.5.4 Prime Farmland

As required by Section 1541(b) of the Farmland Protection Policy Act (FPPA) of 1980 and 1995, 7 U.S.C. 4202(b), federal and state agencies, as well as projects funded with federal funds, are required to (a) use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) consider alternative actions, as appropriate, that could lessen adverse effects, and (c) ensure that their programs, to the extent practicable, are compatible with state and units of local government and private programs and policies to protect farmland.

There are several soil types in the study area that are considered prime farmland soils or soils associated with farmlands of state importance. However, the lands represented by these soil types have not been used for farming since the lands were acquired prior to the initiation of construction of Broken Bow Lake in October 1961.

2.6 WATER RESOURCES

2.6.1 Surface Water

Broken Bow Lake is located in the Mountain Fork River watershed in the Mountain Fork Sub Basin. The Mountain Fork River is 96.4 miles long and rises in the mountainous country of Le Flore County in southeast Oklahoma. From its headwaters in the Ouachita National Forest, it flows easterly from Le Flore County, into Polk County, Arkansas. At a point approximately 7 miles west of Mena, Arkansas, the Mountain Fork turns southwest to return to Oklahoma at the extreme northeast corner of McCurtain County. Near Smithville, Oklahoma, the river bends in a southerly direction for 35 miles, where it empties into the Little River at river mile 87.1. The total drainage area of the Mountain Fork River is 842 square miles. The Lower Mountain Fork River is a designated trout stream for 12 miles from the Broken Bow Reservoir Spillway downstream to the U.S. Highway 70 bridge. The upper Mountain Fork River also offers 32 miles of canoeing and kayaking providing both Class I and II whitewater rapids. The river flows down on a shallow gradient at approximately 9 to 10 feet per minute.

2.6.2 Wetlands

Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, and under normal circumstances these wetlands do support this vegetation type. Wetlands are a subset of the Waters of the United States that may be subject to regulation under Section 404 of the CWA (40 CFR 230.3), which are defined within the Clean Water Act (CWA). Jurisdiction for these waters is addressed with the USACE and EPA.

Wetland classifications presented are derived from the National Wetlands Inventory, which was established by USFWS to aid in conservation efforts by collecting

nationwide wetland distribution and type information (USFWS. 2023). The inventory is based on a single “snapshot” at the time of their survey and may not reflect conditions at conservation pool. Within the Broken Bow Lake project lands, wetlands generally occur near the rivers and flatter areas in various parts of the lake. Table 2.2 lists the acreages of various types of wetlands present at Broken Bow Lake and Figure 2.4 and Figure 2.5 displays the distribution of wetland habitat at Broken Bow Lake.

Table 2.2 Wetland Types at Broken Bow

Wetland Types	Acres
Freshwater Emergent Wetland	37.11
Freshwater Forested/Shrub Wetland	222.66
Freshwater Pond	2.16
Lake	14,561.12
Riverine	239.13
Total Acres of Wetlands	15,062.18

*These totals are based on EMS calculations and differ from the official or calculated acres reflected in other parts of this document.

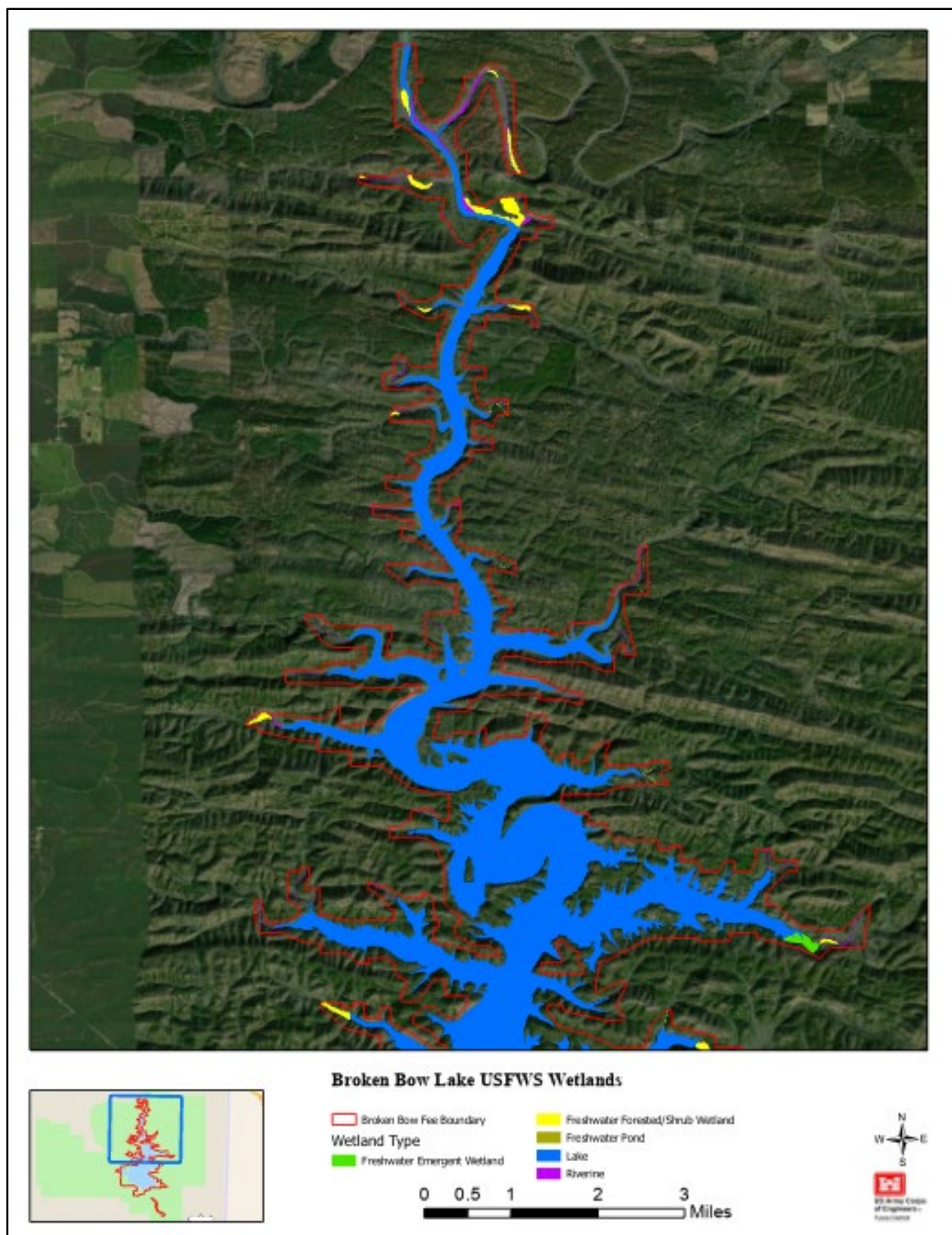


Figure 2.4 Map 1 of 2 for the Wetland Types Found at Broken Bow Lake

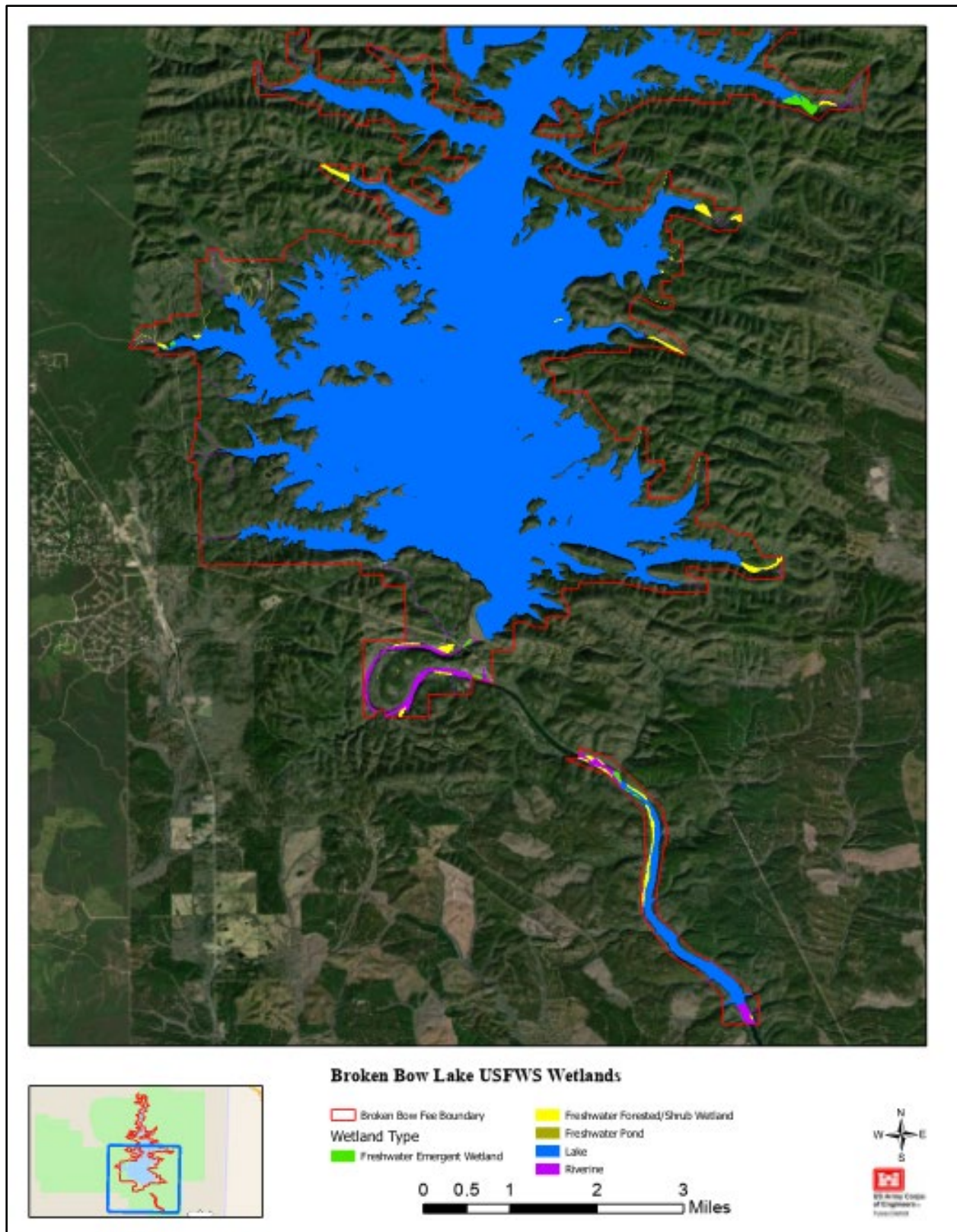


Figure 2.5 Map 2 of 2 for the Wetland Types Found at Broken Bow Lake

2.6.3 Groundwater

While no major aquifers are found within Broken Bow Lake federal fee boundary, the Broken Bow Minor Bedrock Aquifer is located deep below the lake. The Broken Bow Minor Bedrock Aquifer stores roughly 206,250 acre-feet of water (OWRB, 2001) and covers an area of 150,000 acres. The overall water quality is suitable for municipal use. Communities around the lake typically get their drinking water from Broken Bow Lake, instead of from the aquifers due to the stable supply of surface water throughout the region.

2.6.4 Hydrology

Surface waters are categorized by hydrologic units. Hydrologic units are classified by the United States Geologic Survey (USGS) using a Hydrologic Units Code (HUC) system. The units are classified from largest HUC with a two-digit region (i.e., the Arkansas-White-Red Region), encompassing the largest area, to a twelve-digit sub-watershed HUC. Broken Bow Lake is classified by sub-watersheds as follows:

- 11 (HUC 2: Region) – Arkansas-White-Red Region
- 1114 (HUC 4: Sub-region) – Red-Sulphur
- 111401 (HUC 6: Basin) – Red-Little
- 11140108 (HUC 8: Sub Basin) – Mountain Fork
- 1114010802 (HUC 10: Watershed) – Middle Mountain Fork
- 111401080209 (HUC 12: Sub-watershed) – Roosevelt Creek-Mountain Fork
- 1114010803 (HUC 10: Watershed) – Lower Mountain Fork
- 111401080303 (HUC 12: Sub-watershed) – Lower Buffalo Creek
- 111401080304 (HUC 12: Sub-watershed) – Hee Creek-Mountain Fork
- 111401080305 (HUC 12: Sub-watershed) – Holly Creek-Mountain Fork
- 111401080306 (HUC 12: Sub-watershed) – Broken Bow Dam-Mountain Fork
- 111401080307 (HUC 12: Sub-watershed) – Lick Creek-Mountain Fork

The hydrology within the basin is greatly affected by major storms. Most major storms in the Broken Bow Lake drainage basin have occurred in April through June and September through November. Thunderstorms and the remnants of hurricanes are the type of storms that produce most high runoff events in the basin. Major factors that determine the amount of runoff from a given storm include time of year and soil moisture conditions. Thus, some lesser storm events can result in runoff as great as or greater than storms of higher precipitation. Generally, the storms common to the drainage basin are not of uniform intensity.

Broken Bow Lake is an integral part of the USACE plan for flood control and water conservation in the Red River Basin and currently consists of the following major flood control projects, Texoma, Altus, Fort Cobb, Foss, De Queen, Pine Creek, Broken Bow, Millwood, Arbuckle, Pat Mayse, Hugo, Sardis, Lake Kemp, Mountain Park, Tom Steed, and Waurika. The total river basin is 92,600 square miles within the USACE Red River flood control and water conservation plan, while the drainage area upstream of

Broken Bow Lake is 754 square miles. USACE operates and maintains the dam and associated facilities and administers the Federal lands and flowage easements comprising the project through a combination of direct management and leases/licenses for park and recreation purposes.

2.6.5 Water Quality

Oklahoma Department of Environmental Quality (DEQ) sets and implements standards for surface water quality to improve and maintain the quality of water in the state, based on various beneficial use categories for the water body. The Water Quality in Oklahoma Draft 2022 Integrated Report, which is a requirement of the Federal Clean Water Act Sections 305(b) and 303(d), evaluates the quality of surface waters in Oklahoma and identifies those that do not meet uses and criteria defined in the Oklahoma Water Quality Standards (WQS). The Oklahoma Draft 2022 Integrated Report describes the status of Oklahoma natural waters based on historical data and assigns waterways to various categories depending on the extent to which they attain the WQS.

Existing water quality within Broken Bow Lake is affected by rainfall and associated stormwater flows originating from residential, commercial, and industrial point and nonpoint sources from properties upstream of the dam and reservoir. These stormwater flows have increased over time as a result of increased urbanization, development, and climate change.

The Oklahoma Draft 2022 Integrated Report-303(d) List (DEQ, 2022) lists the entire Broken Bow Lake as exceeding WQS for cadmium, dissolved oxygen, mercury and pH.

2.7 HAZARDOUS MATERIALS AND SOLID WASTE

There are no hazardous or solid waste advisories for Broken Bow Lake. However, DEQ has issued chemical contaminant advisories for Broken Bow Lake and recommends that persons should limit their consumption of certain species as explained in Section 2.6.5 of the Master Plan. The chemical contaminant of concern is mercury.

2.8 HEALTH AND SAFETY

Broken Bow Lake's authorized purposes include flood control, hydroelectric power, water supply, recreation, and fish and wildlife conservation. Compatible uses incorporated in project operation management plans include conservation and fish and wildlife habitat management components. The USACE, with some assistance from the Oklahoma Highway Patrol, Oklahoma Tourism and Recreational Department (OTRD), ODWC, and USFWS, has established public outreach programs to educate the public on water safety and conservation of natural resources. In addition to the water safety outreach programs, the project has established recreation management practices to protect the public. These include safe boating and swimming regulations, and speed limit and pedestrian signs for park roads. Broken Bow Lake also has solid waste

management plans in place for camping and day use areas that are maintained by the respective partners that hold the lease.

2.9 ECOREGION AND NATURAL RESOURCE ANALYSIS

2.9.1 Natural Resources

The Texas Parks and Wildlife Division (TPWD's WHAP was used to assist in the preparation of the Master Plan. The assessment was conducted May 23-27, 2022 at Broken Bow Lake by an interdisciplinary USACE team consisting of USACE biologists, and park rangers. A total of 103 data collection sites were surveyed. These WHAP survey point locations were selected and surveyed based on areas believed or known to have various habitat types and features based on aerial imagery from existing Geographical Information Systems (GIS) data as well as from local knowledge of the area. The purpose of the survey was to quickly assess wildlife habitat quality within the USACE Broken Bow Lake fee-owned property. The three major habitat types that were selected and assessed were swamp, riparian/bottomland hardwood forests (BHF), and upland forests. The highest score a site can receive is 1.00 while the lowest is 0.03, while a score of 0 represents a site skipped and not incorporated into the report calculations. The scores are not species dependent but rather diversity dependent. To evaluate all habitat types on an even scoring basis, upland forest and grassland scores were normalized by dividing their original scores by the maximum possible score for their respective habitat types. The data gathered from this survey helped to quantifiably describe the general habitat characteristics and identify unique/high quality areas found within USACE Broken Bow Fee Boundary. This data helped with revising the land classification based on what areas needed the most protection. The WHAP assessment report can be found in Appendix C of this Plan.

The WHAP assessment revealed that the two most abundant habitat types surveyed were upland forests and riparian/bottomland hardwood forest. However, the two habitat types that scored the highest on average were swamp and riparian/bottomland hardwood forest habitats. It was determined that the area just below the regulation dam has high quality habitat based on the scores calculated from the WHAP habitat assessment, with some of the highest scoring habitats.

2.9.2 Vegetation Resources

Broken Bow Lake is located within the Ouachita Mountains ecoregions (Level IV). The Ouachita Mountains ecoregion vegetation is predominantly of an oak-hickory-pine forest. This ecoregion is characterized by mountains being covered in oak-hickory-shortleaf pine forest, stream gradients being steep. The common tree species are loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinate*), southern red oak (*Quercus falcata*), scarlet oak (*Quercus coccinea*), black oak (*Quercus ellipsoidalis*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), white oak (*Quercus alba*), pignut hickory (*Carya glabra*), and mockernut hickory (*Carya tomentosa*). What prairies exist are typically confined to managed lands like parks and wildlife

management areas, as areas outside of those units had typically evolved into pastures and forests. Bottomland forests and wetlands typically occur in poorly drained areas.

This region like so many other ecological regions in Oklahoma has undergone significant changes in the past 150 years. Although habitat for wildlife is present throughout the ecological regions as a whole, populations vary considerably within sub-regions. The diversity and configuration of the plant communities on the landscape influence wildlife populations. Other factors include fragmentation of once continuous habitat into smaller land holdings; competition for food and cover with livestock; conversion of woodland habitat to improved pastures, or urban and rural developments; and lack of proper wildlife and habitat management.

2.10 FISHERIES AND WILDLIFE RESOURCES

Broken Bow Lake provides habitat for an abundance of fish and wildlife species. Predominant fish species in the lake are largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), white bass (*Morone chrysops*) and walleye (*Sander vitreus*). Just below the Broken Bow Dam there is a world class trout stream that is stocked on the biweekly basis by ODWC for rainbow (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*). This stocking effort brings in thousands of fishermen from all over the country to fish the area. Other less prominent species include carp, hybrid catfish, alligator gar, and sunfish. Although not sport fish, smaller fish are the most abundant fish in Broken Bow Lake.

Many of the undeveloped open spaces provide habitat for wildlife including white tail deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), eastern cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), grey squirrel (*Sciurus carolinensis*), possum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), striped skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), beavers (*Castor canadensis*) and wild boar (*Sus scrofa*). The area also provides habitat for a diverse range of birds including eastern wild turkey (*Meleagris gallopavo*), great blue herons (*Ardea herodias*), turkey vultures (*Cathartes aura*), American crows (*Corvus brachyrhynchos*), and bald eagles (*Haliaeetus leucocephalus*) and acts as a stopover for migratory birds.

2.11 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. USFWS is the primary agency responsible for implementing the Endangered Species Act and is responsible for birds and other terrestrial and freshwater species. USFWS responsibilities under the Endangered Species Act include (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research and recovery efforts for these species; and (4) consultation with other Federal agencies concerning measures to avoid harm to listed species.

An endangered species is a species officially recognized by USFWS as being in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Proposed species are those that have been formally submitted to Congress for official listing as threatened or endangered. Species may be considered eligible for listing as endangered or threatened when any of the five following criteria occur: (1) current/imminent destruction, modification, or curtailment of their habitat or range; (2) overuse of the species for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-induced factors affecting their continued existence.

In addition, USFWS has identified species that are candidates for listing because of identified threats to their continued existence. The candidate designation includes those species for which USFWS has sufficient information to support proposals to list as endangered or threatened under the Endangered Species Act; however, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Although not afforded protection by the Endangered Species Act, candidate species may be protected under other federal or state laws.

By protecting a specific species, the USFWS and National Marine Fisheries Service (NMFS) may list them as endangered, threatened, listed, migratory, and or protected. A species can have more than one protection measure with the exclusion of endangered, threatened, and listed. A species cannot be both endangered and threatened; however, a species can be endangered, migratory and protected.

- Endangered means that the USFWS and NMFS have determined that the species has a high chance of becoming extinct from the wild in the foreseeable future. Under this protection measure, a species cannot be taken, essential habitat altered and destroyed, nor transported without a permit. Take means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (USFWS, 2020B).
- Threatened means any species recognized by the USFWS as being likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Under this protection measure, a species cannot be taken, essential habitat altered and destroyed, nor transported without a permit.
- Candidate is a species for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions.
- Protected means that there are other Federal laws and regulations protecting the species than the Endangered Species Act and Migratory Bird Treaty Act. Examples include Bald and Golden Eagle Protection

Act, Lacey Act, and Migratory Bird Treaty Act. Just because a species is listed as migratory doesn't automatically qualify it as protected, it must be protected by more than one law.

- Migratory means it applies specifically to migratory birds. The law that governs these species is the Migratory Bird Treaty Act. Under this law "it is illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts*, nests, or eggs of such a bird except under the terms of a valid Federal permit" (USFWS, 2020A).

The USFWS may list a species under "Similarity of Appearance (Threatened)" because of the species similarity of appearance to another species that is currently listed as threatened. Under this classification these species will not have to go through Section 7 Consultation of the Endangered Species Act because they are not biologically endangered. However, under this listing category, the species may be protected by Section 9 of the Endangered Species Act, which primarily prohibits the "taking" of endangered species of fish and wildlife.

The USFWS's Information for Planning and Consultation (IPaC) database (2023) lists the threatened and endangered species, and trust resources that may occur within the Broken Bow Lake Federal Fee Boundary (see USFWS Species List and the IPaC Report in Appendix C). Based on the IPaC report, there are 15 federally listed species that could be found within Broken Bow Lake (USFWS, 2023). A list of these species is presented in Table 2.3. There is currently Critical Habitat for the Leopard Darter designated just to the northeast of Broken Bow Lake fee boundary within the Mountain Fork River. The species identified as Threatened, Endangered or Candidate Species by ODWC (2022C) that are not federally listed are included in Appendix C as well as a list of Species of Greatest Conservation Need (SGCN) for the Ouachita Mountains, Arkansas River Valley and West Gulf Coastal Plain Region (ODWC, 2016).

Table 2.3 Federally Listed Threatened & Endangered Species with Potential to Occur at Broken Bow Lake

Common Name	Scientific Name	Federal Status	State Status
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	Proposed Threatened	Not Listed
American Alligator	<i>Alligator mississippiensis</i>	Similarity of Appearance (Threatened)	Not Listed
American Burying Beetle	<i>Nicrophorus americanus</i>	Threatened	Not Listed
Harperella	<i>Ptilimnium nodosum</i>	Endangered	Not Listed
Leopard Darter	<i>Percina pantherine</i>	Threatened	Not Listed
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate	Not Listed
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Endangered	Not Listed
Ouachita Rock Pocketbook	<i>Arcidens wheeleri</i>	Endangered	Not Listed
Piping Plover	<i>Charadrius melodus</i>	Threatened	Not Listed
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	Threatened	Not Listed
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Endangered	Not Listed
Red Knot	<i>Calidris canutus rufa</i>	Threatened	Not Listed
Scaleshell Mussel	<i>Leptodea leptodon</i>	Endangered	Not Listed
Tricolored bat	<i>Perimyotis subflavus</i>	Proposed Endangered	Not Listed
Winged Mapleleaf	<i>Quadrula fragosa</i>	Endangered	Not Listed

The alligator snapping turtle (*Macrochelys temminckii*) is a reptile that is currently being considered by the USFWS as a proposed threatened species wherever it may be found (USFWS, 2022B). The turtle is a carnivorous species that primarily inhabits freshwater bodies of water like marshes, swamps, creeks, rivers, ponds, and lakes. It is characterized by the three rows of points that run along the topside of its shell, as well as the jagged edges of its shell. The turtle can grow up to 250 lbs, and be over 2ft in length (USFWS, 2022B). It is primarily an ambush predator that attracts its prey while submerged by waving its tongue and waiting until something comes close enough for it to attack. It can also be an opportunistic scavenger that will feed on carrion that it comes across. There is an abundance of food and habitat within the fee boundary at Broken Bow Lake, and there are recent official and informal sightings of the species; which makes for the species presence common within the Broken Bow Lake Fee Boundary.

The American Alligator (*Alligator mississippiensis*) is a reptile listed by USFWS as Similarity of Appearance (Threatened) within McCurtain County Oklahoma, and various parts of Florida and North Carolina (USFWS, 2022A). It is a carnivorous reptile that can range 10 to 15ft in length (ODWC, 2022). It is characterized by having a dark green scale like back side, with a white to yellow underside. It has a rounded snout, and sharp pointed teeth all along its elongated mouth. It can be found in and along freshwater rivers, creeks, lakes, ponds, marshes, and swamps. The species can tolerate saltwater bodies of water but prefers freshwater. Diet consists of various animals and fish that may be found in along its habitat. While there is plenty of habitat and food for the species within the fee boundary of Broken Bow Lake, the occurrence is expected to be rare. And that is because of the lack of recent informal and formal sightings of the species, as well as the fact the lake is far upstream of known areas (Little River, over 15 miles away) that the species is known to occur in.

The American burying beetle (*Alligator mississippiensis*) is a member of the family *Silphidae* (carrion or burying beetles) that is listed threatened (USFWS, 2022C). It is the largest species of Nicrophorus in North America. Existing populations of this species includes eastern Oklahoma. The American burying beetle is known to inhabit level areas in grasslands, grazed pastures, bottomland forest, open woodlands, and riparian areas. Wetlands with standing water or saturated soils and vegetation typical of hydric soils and wetland hydrology are listed as unfavorable habitats. American burying beetles are habitat generalists; however, it is thought that undisturbed habitat and the availability of carrion is the most likely influence on species distribution. Because of the availability of habitat and the project area being within its known range and the lack of recent sightings, the occurrence of this species is considered rare.

Harperella (*Ptilimnium nodosum*) is a white flowering annual herb that is listed by USFWS (2022C) as endangered wherever found. It can grow to a height of 6-36 inches. It spreads by both vegetative, and seed means. The species can be found in shallow waters of ponds, swift moving streams, and savannah meadows. Particularly within rocky areas that are subjected to fluctuating levels of water. The species is capable of handling being flooded but intolerant of dry conditions (NatureServe, 2022I). The species is known to occur in the Ouachita National Forest (USFWS, 2022D) and within the Mountain Fork River. The occurrence of the species within Broken Bow Lake is expected to be rare because of the lack of recent formal and informal sightings and of because of the overall rarity. However, below Broken Bow Dam within the Mountain Fork River within USACE fee owned property the species is expected to be uncommon because of the documented occurrence of the species within the river.

Leopard Darter (*Percina pantherine*) is a freshwater minnow that is listed as threatened wherever it is found by the USFWS (2022E). It is an invertivore that can grow up 8 cm in length (NatureServe, 2022G). It is further characterized by the green dots on a yellow background on its back and sides and a white belly. Habitat consists of pools, riffles, and runs with clear running water with depths ranging 20-80cm. Habitat substrate can consist of gravel, rubble or boulders. There is currently Critical Habitat listed for the Leopard Darter designated just to the northeast of Broken Bow Lake fee boundary within the Mountain Fork River. Because of the known habitat for the species

immediately on the outskirts of the lake, the species occurrence is expected to be considered common within the northern most portion of the lake.

The Monarch butterfly (*Danaus plexippus*) is listed as a candidate species wherever it is found (USFWS, 2022F). It is an orange butterfly with black stripes and white dots on its wings, whose span can be up to 10 cm (NatureServe, 2022D). Its breeding habitat consists primarily of milkweed species (*Asclepias* spp.), which its larvae feed exclusively on. When it is in North America and is migrating, the species can be found pretty much wherever blooming flowers are. Broken Bow Lake and its federal fee boundary does contain an abundance of blooming flowers and milkweed; this along with numerous recent sightings confirms that this species is common within the area when the species is migrating and during breeding season.

The USFWS lists the northern long-eared bat (*Myotis septentrionalis*) as endangered wherever it is found (USFWS, 2022G). The USFWS service lists project area as a location where northern long-eared bats may occur. Northern long-eared bats seasonally migrate between winter hibernacula and summer maternity or bachelor colonies. Roosting may take place in tree bark, tree cavities, caves, mines, and barns. Northern long-eared bats forage along forested hillsides and ridges near roosting and hibernating caves. They emerge at dusk and feed on various insect species such as moths, flies, leafhoppers, caddisflies, and beetles from vegetation and water surfaces (NatureServe, 2022F). The species occurrence is expected to be common within the project area because due to recent sightings and the availability of habitat.

The Ouachita rock pocketbook (*Arcidens wheeleri*) is a freshwater mussel listed by USFWS (2022H) as endangered wherever it is found. Preferred habitat consists of rivers and large creeks, substrate that is stable, large, diversified mussel beds, and areas that are next to sand/gravel/cobble bars, but these must be scoured clean or support emergent aquatic vegetation (NatureServe, 2022A). It is documented to occur within the federal fee boundary of Broken Bow Lake. Due to the documented but limited occurrence of the species within the project area and that the area still supports the preferred habitat the occurrence of the species is considered to be uncommon within the Broken Bow Lake federal fee boundary.

The piping plover (*Charadrius melodus*) is a shorebird listed as endangered in the watershed of the Great Lakes of North America and threatened in the remainder of its range, which includes the Northern Great Plains, the Atlantic Coast, the Gulf Coast, the Bahama Islands, and the West Indies (USFWS, 1996). The USFWS (2022I) identifies Broken Bow Lake as “situated within the probable migratory pathway between breeding and winter habitats [of the Northern Great Plains population] and contain[ing] sites that could provide stopover habitat during migration.”

The Northern Great Plains population of piping plover spends up to 10 months a year on its wintering ground along the Gulf Coast and arrives on prairie breeding grounds in early May. During migration periods, they use large rivers, reservoir beaches, mudflats, and alkali flats (NatureServe 2022C). They feed on a variety of aquatic and terrestrial invertebrates. The sandbars and bare gravel islands along the

Arkansas River within the study area could provide suitable habitat during the plovers' spring and fall migrations. The occurrence of the species within the project area is considered to be rare due to the lack of recent sightings.

The rabbitsfoot (*Quadrula cylindrica cylindrica*) is a freshwater mussel listed as threatened wherever found by the USFWS (2022J). It can grow up 12 inches in length, the shell is rectangular in shape and brown in color. Habitat consists of areas with slow moving water in various river sizes, within these areas it can be found along banks, riffles, and runs. The species prefers shallow water, but it has been found waters of up to 12ft deep. There is critical habitat for the species listed about 13 miles below Broken Bow Lake in the Little River. The occurrence of the species within the project area is rare due to lack of recent sightings despite the fact that there is habitat for the species is present within Broken Bow Lake federal fee boundary, however the species has a possibility of being present because of the criticalcritical habitat being nearby in the river that the Mountain Fork River flows into.

The red cockaded woodpecker (*Calidris canutus rufa*) is a small black and white bird with black beak and legs that is listed by the USFWS (2022K) as endangered wherever it is found. The preferred habitat of the Red-cockaded Woodpecker is that of a broad savanna that consists of mature to old growth pines that are frequently burned (NatureServe 2022E). It is a non-migratory omnivore that primarily feeds on insects but will feed on wild berries and pine seeds. It feeds by sight instead of sound which is characteristic of other species of woodpeckers. The occurrence of the species within the project area is considered to be common due to recent sightings and known nests within the lake.

The red knot (*Calidris canutus rufa*) is a migratory shorebird listed as threatened wherever found (USFWS, 2022L). Although sightings are rare, the project area is listed as a location where the red knot is "known or believed to occur" and is located within the probable migratory path, between breeding in the Arctic tundra and winter habitats in the southern U.S. and Central and South America. Red knots forage along sandy beaches and mud flats, and this species may use the study area for temporary stopover and foraging (NatureServe, 2022B). The sandbars and bare gravel shoreline along Broken Bow Lake could provide suitable habitat during the red knot's spring and fall migrations. Although there is available habitat and the project area is within its known range, the species is considered rare at Broken Bow Lake due to lack of recent sightings.

Scaleshell Mussel (*Leptodea leptodon*) is freshwater mussel that can grow up to 11 centimeters in length and is listed by the USFWS (2022M) as Endangered wherever it found. It has a thin brown shell. The scaley like appearance which the species is known for is only found within females. Preferred habitat consists of rivers with good water quality with stable river channels (NatureServe 2022H). The occurrence of the species within the project area is rare due to lack of recent sightings as evidenced by the information provided by the Oklahoma Natural Heritage Inventory (ONHI, 2022) and by (ODWC, 2022C).

The USFWS lists the tricolored bat (*Perimyotis subflavus*) as proposed endangered (USFWS, 2022N), and the Broken Bow Lake fee boundary as a location where the species may occur. Tricolored bats seasonally migrate between winter hibernacula and summer nursery sites. Roosting may take place in tree cavities, caves, mines, rock crevices, piles of dead leaves, under dead & live leaves, and buildings. Tricolored bats forage along the edge of forests and across waterways near roosting and hibernating sites. They emerge at dusk and feed on various insect species from over water and tops of trees (NatureServe, 2022J). The species occurrence is expected to be rare within the project areas due to lack of recent sightings.

Winged Mapleleaf (*Quadrula fragosa*) is a freshwater mussel that can grow up to 4 inches long and is listed by the USFWS (2022O) as Endangered with non-essential experimental populations. It has a thick brown shell with rows of bumps, with smaller sizes being characterized by having rays in addition to the bumps. Preferred habitat consists of clear water with underlying substrate consisting of either rubble, sand, or clean gravel (NatureServe 2022K). These areas are in portions of small rivers and streams that are characterized by rough waters. The occurrence of the species within the project area is rare due to lack of recent formal and informal sightings as evidenced by the information provided by the ONHI (ONHI, 2022).

2.12 OKLAHOMA NATURAL HERITAGE INVENTORY

The Oklahoma Natural Heritage Inventory (ONHI), administered by the University of Oklahoma (OU) (2022), manages and disseminates occurrence of information on rare species, native plant communities, and animal aggregations in Oklahoma to help guide project planning efforts. An official request via email was made requesting this information for the Broken Bow project area. In the inventory given to USACE, ONHI indicates that there are six Federally endangered, threatened, and protected species that are known to occur within the vicinity Broken Bow Lake Federal Fee Boundary: bald eagle (*Haliaeetus leucocephalus*), alligator snapping turtle (*Macrchelys temminckii*), northern long-eared bat (*Myotis septentrionalis*), leopard darter (*Percina pantherina*), red-cockaded woodpecker (*Picoides borealis*), and harperella (*Ptilimnium nodosum*).

2.13 INVASIVE SPECIES

An invasive species is defined as a plant or animal that is non-native (or native nuisance) to an ecosystem and whose introduction causes, or is likely to cause, economic and/or environmental harm, or harm to human health. Invasive species can thrive in areas beyond their normal range of dispersal. These species are characteristically adaptable, aggressive, and have high reproductive capacity. Their vigor, along with a lack of natural enemies or controls, often leads to outbreak populations with some level of negative effects on native plants, animals, and ecosystem functions and are often associated with disturbed ecosystems and human activities.

Table 2.4 lists many of the invasive and noxious native species found at Broken Bow Lake. Other species are currently being researched for their invasive characteristics.

Table 2.4 Invasive and Noxious Native Species Found at Broken Bow Lake

Common Name	Scientific Name	Native/Non-native
Birds		
Black Vulture	<i>Coragyps atratus</i>	Native
Cowbirds	<i>Molothrus ater</i>	Native
Mammals		
Wild Boar	<i>Sus scrofa</i>	Non-native
Insects		
Red Imported Fire Ant	<i>Solenopsis invicta</i>	Non-native
Plants		
Honey Locust	<i>Gleditsia triacanthos</i>	Native
Johnson Grass	<i>Sorghum halepense</i>	Non-native
Multiflora Rose	<i>Rosa multiflora</i>	Non-native
Musk Thistle	<i>Carduus nutans</i>	Non-native
Sericea Lespedeza	<i>Lespedeza cuneata</i>	Non-native
Sweetgum	<i>Liquidambar styraciflua</i>	Native
Amphibians		
None	None	None
Mollusks		
None	None	None
Fish		
Common Carp	<i>Cyprinus carpio</i>	Non-native
Brown Trout	<i>Salmo trutta</i>	Non-native
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Non-native

Because of the lake's relative isolation from metropolitan areas, it does not have as many invasive species compared to those within or directly adjacent to major metropolitan areas. The remoteness protects the lake from the inadvertent release and spread of common landscape plants that could become aggressive colonizers from nearby residential developments.

While currently not present in Broken Bow Lake, invasive mollusks including zebra mussels (*Dreissena polymorpha*) are an ongoing threat to native aquatic species and infrastructure due to their ability to infest and expand rapidly, and the close proximity to other infested lakes increases the risk at Broken Bow Lake. Asian Carp are not present within Broken Bow Lake.

Emerald Ash Borers (*Agrilus planipennis*) are a growing threat across much of the United States. Emerald Ash Borers are not native to North America but to parts of eastern Asia. All native North American ash species are susceptible to Emerald Ash Borers, including Green Ash (*Fraxinus pennsylvanica*) which is fairly abundant around Broken Bow Lake. While there have not been any Emerald Ash Borers identified at Broken Bow Lake, they have been identified in northern Oklahoma as well as every neighboring state except New Mexico. The Oklahoma Department of Agriculture, Food, and Forestry stated that “[Emerald Ash Borers are] now considered the most destructive forest pest ever seen in North America.” (DOA 2015).

Brown and rainbow trout are not native to the area but have been primarily introduced by the ODWC. The introduction was intentional and to provide recreational fishing opportunities in the streams, rivers, and lakes. The high fishing pressure that these species experience has prevented the population from becoming a major nuisance even though they do compete for food, shelter, and space that other native species would otherwise utilize.

Although native, cowbirds (*Molothrus ater*) have become problematic due to their expanding range associated with agriculture and human development and are considered a nuisance. They often outcompete many other native species while also acting as a brood parasite, introducing their own eggs into the nests of other birds, to the detriment of the other birds’ offspring.

2.14 AESTHETIC RESOURCES

Broken Bow Lake includes many acres of scenic shorelines, lake views, and wildlife viewing areas providing high visual and scenic qualities. Some areas are admired for their scenic attractiveness (intrinsic scenic beauty that evokes a positive response), scenic integrity (wholeness of landscape character), and landscape visibility (how many people view the landscape and for what reasons and how long). Because Broken Bow Lake is located a short drive away from the Tulsa metropolitan area and the Dallas-Fort Worth metropolitan area, people come from those urban and suburban communities to enjoy the scenic and naturalistic views offered at the lake. Some areas have been designated as Wildlife and Vegetative Management or Environmentally Sensitive Areas to preserve specific animal, plant, or environmental features that also add to the scenic qualities at the lake. Nearby parks have been designed to access the lake, allow access to hiking trails, and take advantage of scenic qualities at the lake and surrounding areas.

Adjacent landowners are informed that removing trees from USACE property to obtain a view of the lake not only destroys wildlife habitat but also lowers the scenic

quality of the shoreline when viewed by the public from the water surface. Furthermore, unauthorized removal of trees and other vegetation from USACE property is a direct violation of Federal Code, Title 36 – Part 327. Additionally, reasonable measures must be taken to ensure that damage to the natural landscape from invasive species and catastrophic wildfire are minimized. Vegetative management, debris removal, and other shoreline issues are managed by the USACE Broken Bow Lake Office.

2.15 CULTURAL RESOURCES

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

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

2.15.1 Cultural History Sequence

Six broad cultural divisions are applicable to a discussion of the culture history of the Broken Bow Lake region: Paleoindian, Archaic, Woodland, Mississippian/Plains Village, Protohistoric, and Historic. These general adaptation types are adopted in this Master Plan to characterize prehistoric cultural traditions, within the following regional chronology.

Paleoindian: 30,000 to 7000 BC

Archaic: 7000 BC to 1 AD

Woodland: AD 1 to 1000

Mississippian/Plains Village: AD 1000 to 1500

Protohistoric (Contact Period): AD 1500 to 1830

Historic: AD 1830 to present

Paleoindian Period

While it is becoming increasingly evident that humans arrived in the Americas as early as 30,000 years ago, the Paleoindian Period is broadly accepted as spanning the end of the Pleistocene into the Early Holocene. The Clovis complex (9500-8900) is the earliest well substantiated archaeological period in the Central Plains. Paleoindian sites are usually identified by the presence of the remains of extinct Pleistocene megafauna and signature stone tools. The most visible tools are projectile points, and these are used to reference different archaeological complexes. Point types are unnotched lanceolate projectile points, fluted (Clovis and Folsom) and unfluted (Allen-Frederick, Agate Basin, Hell Gap, Meserve, Plainview, Cody, Dalton, Plano, and undesignated "Late Paleoindian"). Long characterized as specialized big game hunters, it has now been demonstrated that the archaeological complexes of the Paleoindian Period represent diversified economies of small bands of hunters and gatherers, some more reliant on megafauna than others, and some hunting megafauna during specific seasons. The Dalton Complex is well represented in Eastern Oklahoma and spans the period from the end of the Paleoindian Period and into the Early Archaic (Ballenger 2001 and Meltzer 2009).

In Oklahoma, the earliest proven evidence of human occupation occurs at sites such as the Domebo site, a Clovis era mammoth kill site in Caddo County, and Jakes Bluff, a bison kill site in Harper County (Gilbert, 2000). Typically, in Oklahoma, isolated Paleoindian points have been found on the surface. These points are most often collected, which results in loss of archaeological context. For these reasons, a very limited number of Paleoindian sites have been recorded in the project area, though sites with both Paleoindian and Archaic deposits are better represented. The small number of sites from this period is much more a product of archaeological visibility than an actual representation of prehistoric populations and patterns of land use. In eastern Oklahoma

sites such as the Packard site in Mayes County, the Quince Site in Atoka County, and the Billy Ross site in Haskell County include large quantities of local chert, which may indicate that later Paleoindian peoples were less nomadic than earlier Paleoindians (Brooks 2021).

Archaic Period

During the Archaic Period, an increase in seasonal variability of resources and increasing populations resulted in changing settlement and subsistence patterns (Gilbert 2000). Repeated occupation of sites, often on a seasonal basis, and features such as rock-lined hearths, roasting pits, and grinding tools reflect intensive plant processing and the cyclical exploitation of resources (Brogan 1981; Brooks 2021). Increasing diversity of stone tools through time reflects the increasing variability of faunal and floral resources and diversity of activities taking place at habitation sites (Thies and Witty 1992). Projectile points from the Middle and Late Archaic are stylistically quite different (typically notched and stemmed) from those of the Paleoindian Period. Archaic assemblages include a variety of large dart points, knives, drills, axes, gouges, scrapers, and grinding implements (such as manos and metates). The Archaic Period is traditionally divided into Early, Middle, and Late Periods, the overall extent of which was approximately 7000 BC to 1 AD.

The Calf Creek Culture was prominent in Oklahoma during the Archaic Period between 7,000 and 4,000 years ago. This group adapted to a long drought period by living in highly mobile bands, hunting bison, and supplementing their diet with edible starchy plant seeds that were more readily available in the dry climate. Calf Creek is distinguished by finely made large spear points with deep notches on the base. Archaeologists believe there were four groups located in the east central, north central, south central, and western areas of the state based on their reliance on local flint found in the four areas (Gilbert 2000).

Prominent Calf Creek sites in Oklahoma include Primrose and Stillman Pit sites in Murray County, the Kubik site in Kay County, the Arrowhead Ditch site in Muskogee County, and the Anthony site in Caddo County. The Anthony site is unique in that it exhibits artifacts from all four Calf Creek groups and was likely a gathering place for the people (Gilbert 2000). Archaic sites further north along the Kiamachi River than the project area indicate people depended heavily on riverine resources, though sites closer to the Red River demonstrate less cultural diversity (Brooks 2021).

Woodland

The Woodland Period (AD 1 to 1000) in Oklahoma can be defined as one of technological innovation, with ceramics, the bow and arrow, gradual intensification of horticulture, and concomitant social changes differentiating this time period from more residentially mobile hunting and gathering populations of earlier times. As people began domesticating plants during this period, populations became more sedentary in order to cultivate and harvest crops. In North America sunflower, native squash, may grass, marsh elder, goosefoot, and pigweed were first domesticated while South American

crops such as corn, beans, squash, and chiles were imported through trade later. Bone tools from bison were commonly used in agricultural practices. People lived in small, seasonal villages with houses made of pole frameworks with grass thatch or cane matting to form walls and circular hearths (Gilbert 2000).

The appearance in the archaeological record of small corner notched projectile points indicates that the bow and arrow was in use. The presence of ceramic sherds indicates that ceramic use in the form of pottery for storage and cooking had become widespread. Projectile points from this period include, in addition to the small corner notched points, large contracting stem points and corner-notched projectile points in a variety of styles, indicating continued use of the atlatl and darts, as well as spears likely employed for symbolic political or religious effect (Gilbert 2000 and Brooks 2021).

Woodland Period sites in Oklahoma continued to follow a north-south, east-west distinction. In eastern Oklahoma north of the Arkansas River the Cooper Culture has been defined in Delaware and Mayes counties. These archaeological assemblages are similar to groups living near Kansas City including spearpoints, ceramics, clay figurines, and the use of rock shelters as seasonal camps. South of the Arkansas River but north of the Ouachita Mountains, the Fourche Maline Culture is prominent and exhibited by the McCutchan-McLaughlin site in Latimer County. In western Oklahoma people continued a nomadic bison hunting communities and were slow to adopt the bow and arrow. The Certain Bison Kill site in Beckham County represents this, though sites such as the Swift Horse site in Roger Mills County demonstrate more adaptation of plant subsistence and bow and arrow use (Brooks 2021).

Mississippian/Plains Village

From 1000 to 1500 AD, two main cultures were present in Oklahoma. The Mississippian to the east, and the Plains Village to the north and west. Although in other regions either the Mississippian or the Plains Village are considered unique cultures and time periods in prehistoric chronology, Oklahoma presents a crossroads where the cultures coexisted in the state around the same time. Both cultures became more reliant upon cultivating crops, and large villages soon became common. Both cultures also began creating more pottery forms and styles including bowls, jars, plates, bottles, and effigies with a wide variety of surface treatments. Ornamentation made from copper and a variety of minerals and textiles were widely used as well (Brooks 2021).

The Mississippian culture in Oklahoma, also known as the Caddoan culture, is the western-most representation of a mound building culture that dominated the southeast during this timeframe. Early Mississippians constructed houses and temples that had square or rectangular floor plans with center posts supporting the roofs. Later structures had only two center posts and some were circular. Large burial mounds surrounded by smaller mounds are defining features of Mississippian culture. Burials included grave goods that became more elaborate over time. The Harlan site in Cherokee County is the earliest known center of Mississippian culture in Oklahoma. Spiro Mounds in Le Flore County is the most famous Mississippian site in Oklahoma. Consisting of at least 12 mounds covering an area of 80 acres, the site contained many

well preserved and elaborate objects that yielded a great deal of information about the Mississippian people (Gilbert 2000).

Plains Village people grew crops and hunted and gathered wild resources. Artifact assemblages contain gardening tools along with triangular arrow points for hunting. Sites from this time are often identified in lowland terraces of waterways where gardening with bone tools was viable. These villages have been found along major rivers and their tributaries including the Arkansas, Canadian, North Canadian, Washita, and Red Rivers (Gilbert 2000). Food was stored in underground cache pits that could be 3-5 feet deep and 3-5 feet wide. Ceramics were used for cooking directly over fire both inside and out and were usually smooth, though some were cord marked. Clay figurines have been found at Plains Village sites as well and may have been used in fertility ceremonies related to agriculture. Usually, Plains Village people still lived in villages of 75-150 people. Houses were square or rectangular and could be over 20 feet long. Rather than mounds, Plains Village people buried their dead in nearby cemeteries (Gilbert 2000). Examples of Plains Village sites in Oklahoma include the Roy Smith Site in Beaver County, the Heerwald site in Custer County, the Arthur site in Garvin County, and the McLemore site in Washita County.

The Protohistoric (Contact) Period

The period from A.D. 1500-1830 is referred to as the Protohistoric (or Contact) Period. During this time, non-native explorers, trappers, and traders visited the region, and land claims by first the Spanish, and then the French brought great changes (Everett 2021a). This was a time of reorganization and relocation by native peoples in response to rapid culture change as European contacts brought new technologies, goods traded throughout the continent, diseases which spread ahead of them, the fur trade, and the horse. The pressures of these rapid changes led to increased inter-group conflict, including conflicts over access to, and control of, resources. People aggregated into large villages situated along major rivers, and in the later part of the period many of these villages were fortified (Vehik 2006). The Tribes first encountered by Europeans in Oklahoma included the Caddo and Wichita in the southern and eastern part of the state, and the Plains Apache, Osage, Pawnee, and other more nomadic groups in the northern and western part of the state. The project area was primarily occupied by the Wichita and the Caddo though the Osage were known to hunt and raid in the area (Everett 2021a).

The first Europeans documented in Oklahoma were part of a Spanish expedition led by Francisco Vazquez de Coronado in 1541. In search of gold they erroneously believed to be in the province of Quivira, the expedition began in New Mexico and ended at a Wichita village in southern Kansas, passing through the panhandles of Texas and Oklahoma (Everett 2021a). Additional Spanish explorations in search of gold were conducted in the region through the early 1600s, though the most valuable finding of these expeditions were the descriptions of the land, animals, and peoples they encountered. Spain eventually lost interest in exploring the area northeast of New Mexico and viewed it as a buffer zone between its territory and the French.

In 1682, Robert Cavelier, Sieur de la Salle, claimed the territory drained by the Mississippi as part of the French Empire in North America. By 1700, French traders were established in the region and had developed trading relationships with Wichita groups in the Arkansas Valley of northern Oklahoma and with the Osage to the east. In 1718 Jean Baptiste Benard Sieur de La Harpe lead a trading expedition with the eventual goal of establishing a trading post along the Red River in present day Texas, This expedition was the nearest European expedition recorded in Oklahoma to the project area, though their route likely did not enter the project area. (Everett 2021a, Goins and Goble 2006).

The Caddoan language speaking Wichita and Affiliated Tribes were historically known as the Wichita Proper, Waco, Taovaya, Tawakoni, and Kichai. The Tribes can be traced back at least 800 years to the Washita River culture of central and western Oklahoma. The Washita River people resided in small villages of rectangular, mud-plastered houses with small gardens nearby. Between 1350 and 1450, some Washita River people began migrating north to the Great Bend of the Arkansas River in southern Kansas. Great Bend villagers lived in large, circular grass houses, grew crops, and hunted bison and small game. The archaeological record documents significant long-distance trade with the southwest. Items such as painted and glazed pottery, turquoise beads and pendants, and shell beads distinctive to the Southwest Pueblo cultures attest to the extent of the trade networks in place. The Wichita used horses from the Spanish colonies to hunt buffalo and used guns, metal hoes, and buckets from the French in their daily lives and to trade with the Comanche. In the late 1700s, due to increased pressure from the Osage, the Wichita abandoned their homes in northern Oklahoma and traveled south into southern Oklahoma and Texas along the Red River near the project area (Wichita and Affiliated Tribes 2021). The Wichita didn't remain in the area for long. Despite Wichita villages and claims in the area, the U.S. recognized Osage and Quapaw authority to cede land south of the Arkansas River in Indian Territory to resettle displaced Tribes from the southeast (Pool 2021). The Wichita gradually relocated south into what today is northern Texas until 1859, when their reservation was established in Indian Territory west of the project area (Wichita and Affiliated Tribes 2021).

In present-day southeastern Oklahoma, southwestern Arkansas, and northeastern Texas the Caddo developed as a regional variant of the Mississippian tradition between AD 800-1100 and were encountered and described by Europeans during the 1500s and 1600s. The Caddo subsided on agriculture supplemented with hunting and gathering wild plants. They used digging tools of bone, wood, or shell to cultivate crops such as corn, beans, squash, and other domestic plants including tobacco. The Caddo were also skilled potters and made salt. Agriculture coincided with a dispersal of people into residential, year-round settlements usually containing large circular dwellings with pitched roofs. Elaborate mound burials were common until later in the period (Early 2012). Each Caddo community had a principal leader called a caddi. Caddi was a hereditary position and required years of tutoring in order to keep order in the community and contribute to the peace of the Caddo Nation. Few spiritual leaders, called chenesi, held power superior of the caddi. The chenesi lived in houses built on top of the flat-topped mounds and acted as guardians of sacred fire and communed with

Ayo-Caddi-Amay or “Great Leader Above” in order to advise the Caddo people. By 1790, the Caddo had been weakened by European epidemics and raids by their northern enemies, the Osage (Carter 2018). The Caddo abandoned their homes in Arkansas and Oklahoma along the Red River and migrated farther south to the Sabine River into Texas, outside of the project area (Perttula 2020).

The Osage were one of five immigrant Tribes of Dhegiha Siouan speakers who originated in the Ohio River area. Over time the Dhegiha Sioux diffused into different Tribes as they migrated westward, and the Osage were one of the last to split and settle in the central and western portions of Missouri around 1300 (Hunter et al 2013). Osage villages were physically arranged to reflect the Osage cosmos with a central street running east-west representing the path of the sun. Dwellings were long rectangular houses with domed roofs constructed of poles and woven cattail mats, bark, hides, or some combination thereof. Osages planted crops near their permanent villages, though the entire village would move onto the plains during the summer and autumn buffalo hunts and return to the permanent village locations for the remainder of the year (Bailey and Swan 2004). As the French built trade alliances with the Osage in the late 1600s and early 1700s, the Osage benefited greatly from the influx of guns and other French trade goods, as well their villages’ proximity to accessible river trade routes. The Osage became the dominant Tribe in the region and began forcing the Wichita and Caddo further south into the project area. In the 1790s, French trader Rene Auguste Chouteau convinced roughly one third of the Tribe to relocate to the Three Forks region of northeastern Oklahoma where the Arkansas, Verdigris, and Grand Rivers converge near Chouteau’s new trading posts. Known as the Arkansas Osage, the group mainly settled at Claremore with other villages nearby. This allowed the Osage to more easily raid into the project area. As eastern Tribes such as the Cherokee were forced to move into Osage territory in Arkansas by the United States in the early 1800s, increased conflict between the Osage and eastern Tribes became more commonplace as the groups competed for natural resources. In an effort to stop the violence the United States signed treaties in 1818 and 1825 with the Osage establishing their reservation in southern Kansas and forcing Osage removal. However, the last Arkansas Osage did not leave the region until 1839, when they became too overwhelmed by eastern Tribes forced into the area by the Indian Removal Act of 1830 (Bailey and Swan 2004).

The first printing press in Oklahoma was established at the Union Mission in 1835, technically ending the Protohistoric era in the state (Everett 2021b).

2.15.2 Historical Resources

What is now the state of Oklahoma was included in the Louisiana Purchase in 1803, becoming part of what was known as the Louisiana Territory. When Louisiana joined the Union as a state in 1812, Louisiana Territory was renamed the Missouri Territory by the U.S. Congress to avoid confusion with the new state. In the 1820s, Oklahoma was designated Indian Territory and closed to white settlement. From that time until 1890 when the Organic Act created the Oklahoma territory and incorporated it into the United States, more than three dozen Tribes had been forced to reside there (Bolton 2021). A portion of present-day McCurtain County was included in Miller

County, Arkansas as part of disputed territory between Mexico (present day Texas) and the United States. The county was later abolished when Texas declared its independence from Mexico in 1836 (Rowe 2022).

The Choctaw have two creation myths that differ dramatically, but both are centered around Nanih Waiya mound located in modern-day Mississippi. When the Choctaw were first referenced in the written record in the late 1600s, the Choctaw were a matrilineal community that lived in three geographical districts, with two social divisions and multiple clans within each division that determined social roles and hierarchy (Mould 2018). During the 1700s, their government consisted of local headmen presiding over groups of villages. It was not until the early 1800s that the Choctaw began to coalesce into one nation as a gradual response to pressure from the U.S. Government (Krauthamer 2013). The Choctaw were the first major tribe in the southeast to be removed to modern day Oklahoma. Removal for the Choctaw lasted for over 70 years, with groups periodically being removed from Choctaw homeland until 1903. The biggest group, approximately 12,000 people, made the journey first between 1830-1834 after the Treaty of Dancing Rabbit Creek was signed in 1830.

The Chickasaw homeland was located in portions of modern-day southwestern Kentucky, western Tennessee, northern Mississippi, and northwestern Alabama. (Chickasaw Nation 2021). Descendants of mound building societies, the Chickasaw were a matrilineal society that generally lived in towns containing around 200 households. Towns could move but kept the same names, spreading apart during peacetime but clustering during war. A typical town contained a log-palisaded fort, religious and council buildings, and grounds for councils, festivals, and sports. Individual households usually included a winter house that was circular, approximately twenty-five feet in diameter, and framed with pine logs and poles, with mud-plaster walls and a sunken earthen floor; one or two summer houses, which were rectangular and had two rooms, walls of loosely woven mats, and roofs of grass thatch and bark; and a storage house for crops (Newhall 2018). The Chickasaw were considered great warriors and were instrumental in fighting the French during the French and Indian War (Chickasaw Nation 2021). The Chickasaw were the last major tribe in the southeast to be removed to modern day Oklahoma and were able to negotiate favorable sales of their land in Mississippi. This allowed the Chickasaw to pay for their own removal and select favorable seasons to travel, which saved hundreds of lives.

In 1837 the Chickasaw, who had been traditional enemies of the Choctaw, signed a treaty with the Choctaw to create a Chickasaw district within Choctaw Nation. The Chickasaw would become a part of Choctaw Nation, and the two groups would negotiate with the United States together (Choctaw Nation, February 2021). At this time, Choctaw Nation was divided into three Choctaw districts to the east Moshulatubbee, Apukshunnubbee (where the project is located), and Pushmataha and the Chickasaw District to the west. Chickasaw and Choctaw families were free to live in any of the four districts despite their tribal affiliation, though the bulk of Chickasaw families lived in the Chickasaw district. In 1855 the Choctaw, Chickasaw, and United States entered into a treaty that split the tribes into two nations once again; and sold Choctaw land holdings west of the Chickasaw district to the United States, reducing the reservation from over

23.7 million acres to 6.688 million acres. During this time the Choctaw prospered economically through small farms and large cotton plantations (Choctaw Nation March 2021 and April 2021).

Both the Chickasaw and Choctaw had participated in the southern market economy built around chattel slavery. By the time both tribes were removed to Indian Territory, their slave-owning population reflected that of the rest of the deep south; the upper middle class owned anywhere from 1-15 slaves, a handful of extremely wealthy individuals owned hundreds of slaves, and the majority of Chickasaw and Choctaw citizens owned no slaves or would rent out their labor (Krauthamer 2013). Their slaveholdings meant that the majority of Choctaws and Chickasaws sympathized with the south during the Civil War, and that the tribes would ally with the confederacy.

Oklahoma went through a period of instability during the Civil War. Its low population, proximity to Confederate (Texas and Arkansas) and Union (Kansas) neighbors, relatively minor tactical importance to the western campaign focused on the Mississippi River, and the Tribes' smaller militaries ensured the territory became used for troop movements to other locales and a hotspot for small raids and guerilla warfare for both sides. The Five Tribes (Cherokee, Choctaw, Chickasaw, Muskogee Creek, and Seminole) signed treaties with the Confederacy in 1861 as the Confederacy promised to respect Tribal lands and sovereignty, and to not abolish slavery. At this time, approximately 14 percent of Oklahoma's residents were slaves. The Tribes formed regiments that fought in engagements throughout the western theater, most notably at Pea Ridge, Arkansas and Honey Springs, Oklahoma (Huston, 2021). The culminative battle at Honey Springs in 1863 ensured the Union maintained control of the territory for the remainder of the war, though small confederate raids continued. Due to constant marauding, retaliation, and split loyalties, refugee camps became common. Union loyalists were moved to Ft. Riley in Kansas and Ft. Smith in Arkansas, and Ft. Gibson was surrounded by as many as 7,000 refugees. Confederate camps along the Red River (near the project area) held close to 15,000 refugees (Huston 2021). After the Confederacy surrendered, the Five Tribes signed a peace treaty with the United States in 1866. The treaty gave the western half of the territory to other Tribes in Kansas, slavery was abolished, freedmen obtained citizenship and property rights, and the territory was opened to railroads across Tribal lands (Huston 2021).

During Reconstruction, Oklahoma struggled with lawlessness as much as, if not more than during the Civil War. It was difficult to police the region given the turmoil of the Civil War, and Tribal police and courts had no jurisdiction over non-Tribal citizens (Huston 2021). In the 1890s, The Dawes Commission began the process of allotment that would transition communally held Tribal lands into individually owned private property. This led to a large loss of Tribal lands, Tribal citizens who accepted allotments now becoming United State Citizens and allowed the area that had formerly been Indian Territory to become the territory of Oklahoma, which could then apply for statehood. Oklahoma achieved statehood in 1906 (Kidwell 2021a). Although Tribal governments were generally dissolved when Oklahoma became a state, the Choctaw Nation government continued to exist in order to manage subsurface coal and asphalt deposits located elsewhere in the Choctaw reservation (Kidwell 2021b).

Broken Bow Lake occupies McCurtain County. McCurtain County was organized at statehood in 1907 with Idabel as its seat. The county was named after a prominent Choctaw family whose members included three principal chiefs (Coleman 2022). Broken Bow, the town Broken Bow Lake takes its name from, was named after Broken Bow Nebraska, hometown of the founders of the Choctaw Lumber Company. Established in 1911, Broken Bow was a company town formed at the terminus of the Texas, Oklahoma, and Eastern Railroad for the Choctaw Lumber Company workers. Land on the north side of the railroad tracks was designated for residences, churches, schools, and retail while the south side of the tracks was reserved for the lumber mill, employee housing, and other buildings related to the Choctaw Lumber Company (LaGasse 2022).

After the railroads bisecting the Choctaw reservation were complete, small towns began to be established across the county and the population increased. Agriculture, ranching, and the lumber industry primarily supported the area's economy. Prior to the Great Depression, cotton was the main crop produced in the area and tenant farmers worked the majority of the farms. By the 1940s the county diversified its agricultural activities by converting former cotton fields to cattle pastures and grain fields closer to the Red River, though the Great Depression had hit the area hard and caused the population to decline. Forests that had been depleted at the turn of the century were restored by natural reseeding and active planting of pine trees, and several thousand acres are now part of the Ouachita National Forest (Coleman 2022). After the impoundment of Broken Bow Lake, tourism became a large economic factor for the community, drawing over 1.3 million visitors a year (LaGasse 2022).

Broken Bow Lake dam was authorized by the 1958 and 1962 Flood Control Acts as a comprehensive plan for flood control, hydroelectric power, water supply, fish and wildlife management, and recreation. Construction began in October 1961 and was completed in October 1968. The dam consists of a rolled earth-filled embankment about 2,750 feet long and its maximum height is 225 feet above the streambed. The dike has a maximum height of 55 feet, a design crest elevation of 645 feet, and a length of 897 feet.

Historic site types and related resources expected in the project area include homesteads and ranches, farmsteads, plantations, trails, cemeteries, wells, cisterns, privies, rock walls, foundations or foundation piers, cellar depressions, chimneys (stone or brick), stairs, railroad lines, roads, schools, dumps, and water diversion features.

2.15.3 Cultural Resources at Broken Bow Lake

There are more than 104 known archaeological sites located wholly or in part on USACE fee lands associated with Broken Bow Lake. There are 93 precontact sites, 6 known historic sites, and 5 multicomponent sites with both historic and precontact components. Of these, 15 sites have been determined eligible for the NRHP, 20 are ineligible, and 69 sites have not been assessed for the NRHP. No archaeological sites are currently listed on the NRHP. Ten sites were discussed in earlier publications as being on USACE fee land but are not actually located on USACE fee land. Seven of

those sites are precontact, two are historic, and one is multicomponent. Four sites are eligible for the NRHP, four are not eligible for the NRHP, and two are unknown. Multiple NRHP properties are within 10 miles of USACE fee lands including Beavers Bend State Park, historic bridge NBI No. 09531, the Citizens State Bank Building and End of the Trail Motel in Broken Bow, the Tiner School, and the Jefferson Gardner House. Beavers Bend State Park lies partially on USACE fee land and was included in the State Historic Preservation Office (SHPO) survey for Civilian Conservation Corps (CCC) and Works Progress Administration (WPA) recreation architecture of Oklahoma state parks completed in 1993. Of all the structures evaluated, the survey found the park as a whole was not eligible for the NRHP, but certain elements were eligible for the NRHP under Criterion A and C as a historic district. Contributing elements include the Caretaker's Cabin, Officer's Residence/Clinic, a cluster of cabins and a bath house, and multiple infrastructure locales (including bridges). Only two contributing resources, bridges built by the CCC, are on USACE fee land (Weisiger 1993). The dam itself was completed in 1968 and has not been evaluated for the NRHP. Multiple significant sites at Broken Bow Lake have been protected through various land classifications.

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

Multiple formal archaeological surveys have been completed at Broken Bow Lake since the 1960s in response to ongoing activities such as lake construction, inadvertent discoveries, and NHPA Section 106 compliance. This section includes an overview of work conducted in the area. The first archaeological survey known to take place within USACE fee lands of Broken Bow Lake was conducted by Don G. Wyckoff in 1961 (Wyckoff 1961). Wyckoff led a 20-day survey of the lake area prior to its inundation in July and September 1961, during which time 57 sites were identified with seven being recommended for further study. Five of these sites were then subjected to further testing over a 10-day period as an aspect of the same survey (Wyckoff 1961). Wyckoff was funded by the National Park Service over the next seven years to conduct more intensive investigations and archaeological salvage of sites that would ultimately be inundated by Broken Bow Lake. Four of the sites recommended for further study in 1961, including two of the five sites intensively tested, were subjected to further investigations in 1964 through 1968 (Wyckoff 1966, 1967, 1968), a previously unrecorded site was discovered in the wake of land-clearing operations and investigated/salvaged in 1964 (Wyckoff 1965) and the same for a site identified before

the 1961 survey (Wyckoff 1966). Additionally, Wyckoff investigated a site consisting of a series of mounds that yielded little archaeological material in 1967 (Wyckoff 1967).

A shoreline survey of certain areas of Broken Bow Lake for evaluation and possible mitigation of cultural resources due to fluctuating water levels was conducted by Timothy Klinger and Robert Cande in 1985 that identified 27 new cultural resources and 11 isolated finds. Seventeen of the sites had been severely impacted or destroyed by erosion and/or development while 5 were recommended for further study (Klinger and Cande 1987). The Oklahoma State Historic Preservation Office performed a pedestrian architectural/historic resource survey focused on Civilian Conservation Corps and Works Progress Corps-related resources in 1993 “to assist the Oklahoma Tourism and Recreation Department in understanding which parks contained historically and architecturally significant resources” and determined that Beavers Bend State Park (on the western shore of Broken Bow Lake) was potentially eligible for the National Register of Historic Places (Oklahoma State Historic Preservation Office 1993). A pedestrian cultural resources survey was performed John Hartley in 1995 for a proposed electric transmission line during which two isolated finds and one new site were located (Hartley 1995). Also in 1995, a small phase 1 survey was performed by Frank Winchell with the USACE Tulsa District on a 15-acre parcel of land prior to the construction of lodge and retention ponds that yielded no cultural resources (Winchell 1995).

Archaeological and Environmental Consultants were contracted by the USACE in 1997 to perform a shoreline survey of approximately 620-acres of land between the elevations of 599.5 and 604 feet above sea level in order to inventory cultural resources that may be affected by a conservation pool rise that documented 26 new archaeological sites and portions of two previously recorded sites. Five of these sites were recommended for further testing in order to determine NRHP eligibility (Perttula 1998). These five sites were further investigated in 2001 and found to be eligible for the NRHP (Perttula 2004). One of these five was later the subject of a data recovery project in 2010 in order to mitigate the effects of shoreline erosion and looting (Crowl 2013). The USACE followed up on this by having a further 11 sites investigated through test excavations by LOPEZGARCIA GROUP between July and September of 2003 in order to determine their integrity and evaluation for inclusion in the NRHP. Ten of these tested sites were recommended as eligible for inclusion in the NRHP while one site was found to be ineligible (Sundermeyer 2004).

A pedestrian survey with a single shovel test for a small building and path was performed in 2000 by Francie Sisson that yielded no cultural material (Sisson 2000). In 2004, Class III cultural resources inventory of approximately 160-acres was performed by Heather Szarka and Doug Briscoe (Szarka and Briscoe 2004) and a small area for the relocation of a single utility pole was performed by Lawrence Moore (Moore 2004) with both surveys performed that year yielding no cultural material. A pedestrian survey was performed on portions of Broken Bow (exactly how much acreage on USACE lands is unspecified) in 2005 ahead of forestry service burn activities that identified no new cultural resources (Carlson 2006). Briscoe/Szarka Consulting Services surveyed 26.56 acres within Beaver’s Bend State Park over two days in March 2011 ahead of the

rehabilitation to two sewage lagoons that identified two isolated finds and one site that was recommended for further testing (Briscoe 2011). Cojeen Archaeological Services surveyed approximately 20 acres of land over two days in 2015 ahead of the construction of a recreational zipline facility that identified two isolated finds but no sites (Cojeen 2015). Small surveys were formed ahead of the construction of four yurts in 2018 and a fifth in 2019 that yielded no cultural material (USACE 2018, 2019). Small surveys have been, and continue to be, conducted in and near Broken Bow Lake for compliance with Section 106 of the NHPA. When funds are available, surveys and other preservation activities are also conducted in accordance with Section 110 of the NHPA.

2.15.4 Long-term Objectives for Cultural Resources

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

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

The Archaeological Resources Protection Act (ARPA) secures the protection of archaeological resources and sites on lands owned and administered by the United States for the benefit of the American people. According to ARPA, it is illegal to excavate, remove, damage, or deface archaeological resources on public lands without a permit issued by the federal agency managing the land. It is also illegal to sell or transport archaeological resources removed from public lands. Tulsa District requires permits for archaeological investigations at Broken Bow Lake in accordance with ARPA

and is increasing surveillance and coordination with law enforcement agencies in the state to enforce ARPA civil and criminal penalties.

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

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

2.16 CURRENT SOCIAL AND ECONOMIC CONDITIONS

2.16.1 Zone of Interest

Broken Bow Lake is located on the Mountain Fork River 9 miles north-northeast of Broken Bow, Oklahoma. It is a major recreation destination for trout fishing, camping and other outdoor recreation related activities. The zone of interest (ZOI) for the socio-economic analysis of Broken Bow Lake encompasses four states and 15 counties.

Arkansas Counties: Little River, Polk, and Sevier.

Louisiana County: Bossier

Oklahoma Counties: Choctaw, Latimer, Le Flore, McCurtain, and Pushmataha.

Texas Counties: Bowie, Dallas, Denton, Lamar, Red River, and Tarrant.

2.16.2 Population

The total population for the zone of interest in 2021 was 6,096,368, as shown in Table 2.5. Approximately 42% of the zone of interest's population resides in Dallas County, TX, 35% in Tarrant County, TX, 15% in Denton County, TX. The remaining counties in the zone of interest each account for less than 3% of the zone of interest's population.

Table 2.5 2020 and 2021 Population Estimates and 2050 Projections

Geographical Area	2000	2010	2020 Population Estimate	2021 Population Estimate	2050 Population Projection
Arkansas	2,673,400	2,915,918	3,011,524	3,025,891	3,527,849
Louisiana	4,468,976	4,533,372	4,657,757	4,624,047	4,813,420
Oklahoma	3,450,654	3,751,351	3,450,654	3,986,639	4,860,554
Texas	20,851,820	25,145,561	29,145,505	29,527,941	47,341,105
Bossier County, LA	98,310	116,979	128,746	129,144	141,350
Little River County, AR	13,613	13,171	12,026	11,944	11,418
Polk County, AR	20,229	20,662	19,221	19,353	18,638
Sevier County, AR	15,747	17,058	15,839	15,783	22,856
Choctaw County, OK	15,325	15,205	14,204	12,223	14,248
Latimer County, OK	10,692	11,154	9,461	9,427	13,469
LeFlore County, OK	48,109	50,384	48,131	48,476	68,174
McCurtain County, OK	34,402	33,151	30,786	30,884	38,151
Pushmataha County, OK	11,667	11,572	10,797	10,815	13,773
Bowie County, TX	89,296	92,565	92,893	92,581	84,633
Dallas County, TX	2,218,899	2,377,351	2,622,634	2,586,050	3,869,605
Denton County, TX	432,976	662,614	906,422	941,647	2,332,629
Lamar County, TX	48,596	49,793	50,088	50,009	44,203
Red River County, TX	14,297	12,860	11,587	11,555	10,484
Tarrant County, TX	1,446,219	1,809,034	2,110,640	2,126,477	3,196,603
Zone of Interest Total	4,518,377	5,293,553	6,083,475	6,096,368	9,880,234

Source: U.S. Census Bureau, Population Division (2000 Estimate); U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020) Oklahoma Department of Commerce, (Oklahoma 2050 Projections) Demographics and Geography - The official website of Louisiana (2030 estimates) TDC - Texas Population Projections Program Population Projections by County and by City for the US.

From 2020 to 2050, the population in the zone of interest is expected to increase from 5,293,553 to approximately 9,880,234, an average annual growth rate of 2.1%. By comparison, the population of Arkansas is expected to increase at an annual rate of

.53%, Louisiana .11%, Oklahoma 1.15%, and Texas 1.63%. During this timeframe, counties indicating a decline in population include the counties of Little River, County AR, Polk County, AR, Bowie County, TX, Lamar County, TX and Red River County, TX. Population for the years 2000 and 2010 are included for historical reference.

The distribution of the population among gender, as shown in Table 2.6 is approximately 50% male and 50% female in the zone of interest.

Table 2.6 2020 Percent of Population Estimate by Gender

Geographical Area	Male	Female
Arkansas	1,493,681	1,532,210
Louisiana	2,260,866	2,363,181
Oklahoma	1,984,707	2,001,932
Texas	14,739,011	14,788,930
Bossier County, LA	63,638	65,506
Little River County, AR	5,940	6,164
Polk County, AR	9,522	9,831
Sevier County, AR	8,056	8,018
Choctaw County, OK	6,894	7,413
Latimer County, OK	4,867	4,688
LeFlore County, OK	24,311	24,125
McCurtain County, OK	15,373	15,739
Pushmataha County, OK	5,302	5,589
Bowie County, TX	46,687	45,894
Dallas County, TX	1,282,212	1,303,838
Denton County, TX	465,135	476,512
Lamar County TX	24,300	25,632
Red River County TX	5,568	6,117
Tarrant County, TX	1,044,968	1,081,509
Zone of Interest Total	3,012,773	3,086,575

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

Figure 2.6 shows the population by age group for the four states and the zone of interest. The zone of interest is consistent with the four states as whole with no notable difference plus or minus in percent populations for the noted age groups.

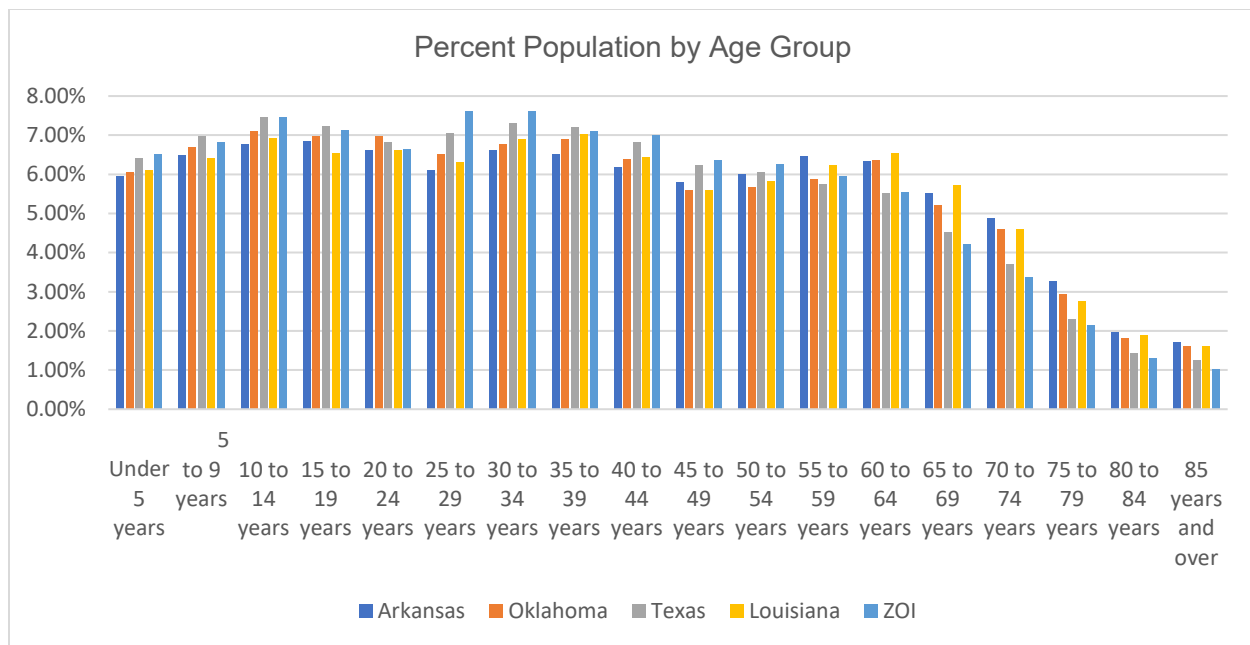


Figure 2.6 2020 Percent of Population by Age Group

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

Population by Race and Hispanic Origin is displayed in Table 2.7. The zone of interest is approximately 39% white, 32% Hispanic or Latino, 18% black, 0.45 % American Indian and Alaska native, 6.5% Asian, 0.08% native Hawaiian-Pacific Islander, 0.42% some other race and 3.4% two or more races. Notable differences include Arkansas 69% white, Louisiana 57% white, Oklahoma 61% white and Louisiana with a population of 31% black compared with the zone of interest population of 18% black.

Table 2.7 2020 Population Estimate by Race/Hispanic Origin

Area	White	Hispanic or Latino	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races
Arkansas	2,063,550	256,847	449,884	20,549	51,210	14,280	8,047	147,157
Louisiana	2,630,665	256,086	1,434,334	17,493	79,424	3,554	19,495	182,996
Oklahoma	2,407,188	471,931	283,242	311,890	89,653	8,168	13,602	373,679
Texas	11,584,597	11,441,717	3,444,712	85,425	1,561,518	27,857	113,584	886,095
Bossier Parish, LA	83,574	8,735	29,861	598	2,459	31	347	2,903
Little River County, AR	8,593	409	2,164	161	19	9	20	651
Polk County, AR	16,092	1,278	39	335	100	9	54	1,314
Sevier County, AR	8,400	5,508	550	305	60	241	21	754
Choctaw County, OK	8,114	595	1,371	2,502	29	4	57	1,532
Latimer County, OK	5,818	344	42	2,216	67	5	16	936
LeFlore County, OK	31,920	3,573	841	6,890	292	32	50	4,531
McCurtain County, OK	18,159	1,894	2,538	4,290	124	460	40	3,309
Pushmataha County, OK	7,382	376	66	1,830	52	0	23	1,083
Bowie County, TX	55,855	7,602	23,084	554	1,082	69	332	4,315

Area	White	Hispanic or Latino	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races
Dallas County, TX	691,940	1,070,078	564,766	3,890	172,276	696	9,031	73,373
Denton County, TX	511,111	188,139	96,545	674	93,347	260	6,493	45,078
Lamar County, TX	35,354	4,412	6,378	751	474	25	119	2,575
Red River County, TX	8,499	766	1,738	102	51	0	13	418
Tarrant County, TX	912,070	642,801	370,261	2,602	122,964	2,733	9,198	63,848
Zone of Interest	2,402,881	1,936,510	1,100,244	27,700	393,396	4,574	25,814	206,620

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

2.16.3 Education and Employment

Table 2.8 displays the highest level of education attained by the population ages 25 and over. In the zone of interest, 7.3% of the population has less than a 9th grade education, and another 7.3% has between a 9th and 12th grade education; 23% has a high school diploma or equivalent, and another 19.5% has some college and no degree; 7.2% has an Associate degree; 23% has a bachelor's degree, and 13% has a graduate or professional degree. The ZOI is similar in all other educational attainments except for the high school graduate group. The ZOI high school graduate group (23%) compared with Arkansas (34%), Louisiana (34%), Oklahoma (32%), and Texas (25%)

Table 2.8 2020 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older

Area	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate degree	Bachelor's degree	Graduate or professional degree
Arkansas	2,037,763	90,660	140,230	695,062	435,235	161,542	324,137	190,897
Louisiana	3,117,186	134,092	281,205	1,023,442	642,841	211,237	523,475	300,894
Oklahoma	2,639,889	102,238	195,776	811,661	578,915	214,116	483,168	254,015
Texas	19,224,688	1,459,699	1,349,205	4,723,476	3,876,378	1,449,493	4,077,821	2,288,616
Bossier County, LA	85,392	1,806	6,078	25,290	18,978	5,229	18,138	9,873
Little River County, AR	8,378	181	666	3,656	1,936	693	857	389
Polk County, AR	13,607	505	1,064	5,178	3,646	1,102	1,322	790
Sevier County, AR	10,057	1,328	1,334	3,474	1,917	835	775	394
Choctaw County, OK	9,736	485	1,106	3,780	2,351	629	903	482
Latimer County, OK	6,519	244	640	2,445	1,321	1,028	587	254
LeFlore County, OK	32,447	1,736	3,385	13,027	6,218	3,113	3,420	1,548
McCurtain County, OK	20,539	1,112	2,161	8,860	4,078	1,327	2,092	909

Area	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate degree	Bachelor's degree	Graduate or professional degree
Pushmataha County, OK	7,761	375	749	3,433	1,513	519	697	475
Bowie County, TX	62,113	1,230	5,288	24,165	12,530	4,272	8,722	5,906
Dallas County, TX	1,681,026	174,444	145,081	379,623	297,528	106,538	360,241	217,571
Denton County, TX	631,822	19,918	19,277	104,077	125,449	55,460	203,018	104,623
Lamar County, TX	34,196	1,449	2,843	11,724	8,100	3,414	4,441	2,225
Red River County, TX	8,599	369	683	3,552	2,067	661	864	403
Tarrant County, TX	1,379,726	89,486	94,249	328,467	292,773	102,843	309,528	162,380
Zone of Interest	3,991,918	294,668	284,604	920,751	780,405	287,663	915,605	508,222

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

Employment by sector is presented in Figure 2-7 and Table 2.9, showing that the largest percentage of the zone of interest is employed in the educational services, and health care and social assistance sector at 9.8%, followed by professional, scientific, and management 6.5 % and retail 5.6 % The remainder of the employment sectors each comprise 5% or less of the zone of interest's labor force.

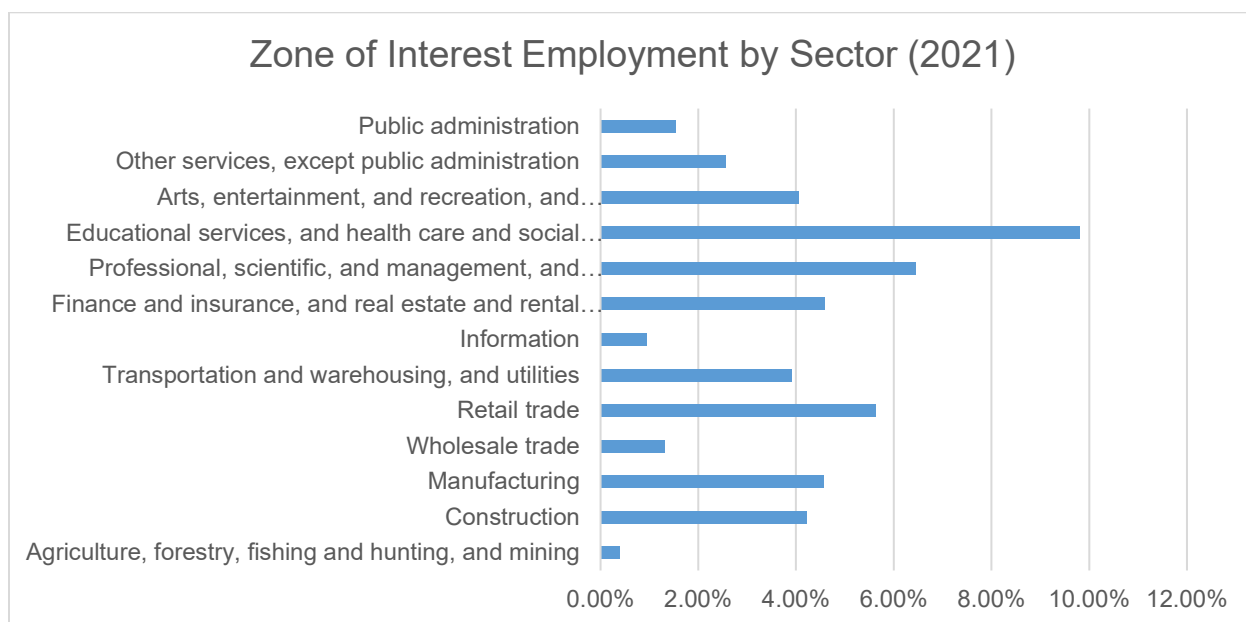


Figure 2.7 Zone of Interest Employment by Sector (2020)

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

Table 2.9 Annual Average Employment by Sector (2020)

Employment Sector	Arkansas	Oklahoma	Texas	Louisiana	Bossier, County, LA	Little River, AR	Sevier, AR	Polk, AR	Choctaw County, OK	Latimer, OK	LeFlore,OK	McCurtain County, OK	Pushmataha County, OK	Bowie, TX	Lamar, TX	Red River, TX	Dallas, County, TX	Denton, County, TX	Tarrant, County, TX	ZOI
Civilian employed population 16 years and over	1,323,511	1,780,086	13,796,229	1,957,790	50,117	4,992	6,657	7,466	5,495	3,533	18,436	12,125	3,756	38,641	22,828	4,557	1,286,699	509,534	1,061,812	3,036,648
Agriculture, forestry, fishing and hunting, and mining	31,949	63,140	304,046	60,246	1,846	145	463	505	282	305	1,346	617	279	572	1,107	200	6,178	3,917	5,793	23,555
Construction	96,829	124,087	1,175,579	154,956	3,524	417	632	554	418	240	1,392	998	393	1,650	1,719	465	126,859	28,731	87,716	255,708
Manufacturing	167,214	162,789	1,195,047	141,057	2,068	900	1,844	1,170	582	205	2,243	2,647	240	4,858	3,008	604	107,626	43,717	105,657	277,369
Wholesale trade	30,696	38,077	341,050	44,721	1,427	80	78	188	85	59	400	146	12	788	349	41	35,900	16,477	24,582	80,612
Retail trade	175,889	219,469	1,538,871	228,328	7,363	608	709	919	613	384	2,359	1,142	446	5,081	2,959	357	148,270	51,791	118,608	341,609
Transportation and warehousing, and utilities	83,383	104,874	904,310	113,952	3,349	248	354	442	451	277	1,406	687	292	854	1,624	179	92,788	31,466	103,408	237,825
Information	16,250	31,372	217,088	24,464	1,449	0	0	64	75	67	155	103	42	365	222	93	22,194	15,896	16,980	57,705
Finance and insurance, and real estate and rental and leasing	71,059	99,492	978,598	102,550	2,036	221	246	194	294	164	715	414	138	2,302	764	321	116,159	64,861	90,444	279,273
Professional, scientific, and management, and administrative and waste management services	104,934	161,172	1,730,616	190,771	3,940	205	350	354	267	257	926	519	246	1,910	1,592	280	189,210	71,961	119,786	391,803
Educational services, and health care and social assistance	325,570	417,859	3,001,036	503,607	11,879	1,438	1,255	1,837	1,172	890	4,399	2,514	991	9,254	5,718	1,191	236,039	103,202	214,262	596,041
Arts, entertainment, and recreation, and accommodation and food services	98,310	157,586	1,139,063	180,101	4,028	270	223	718	745	172	1,359	1,244	230	5,891	1,590	261	100,524	40,044	88,703	246,002
Other services, except public administration	61,312	87,398	680,249	100,293	2,665	218	286	299	233	191	809	533	156	1,472	1,255	262	70,952	23,068	52,991	155,390
Public administration	60,116	112,771	590,676	112,744	4,543	242	217	222	278	322	927	561	291	3,644	921	303	34,000	14,403	32,882	93,756

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates (2019 Estimate)

A summary of the civilian labor force in the zone of interest is displayed in Table 2.10. In 2020, the zone of interest had an unemployment rate of 4.27%, slightly higher than the 3.2% unemployment rate in Arkansas 3.2%, Oklahoma 3.6%, and Texas 4.0%. The states of Louisiana had the highest unemployment rate at 7.6%.

Table 2.10 Labor Force, Employment and Unemployment Rates, 2020 Annual Averages

Geographic Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate %
Arkansas	1,400,997	1,323,511	77,486	3.20
Louisiana	2,119,555	1,957,790	161,765	7.60
Oklahoma	1,892,357	1,780,086	112,271	3.60
Texas	14,707,042	13,796,229	910,813	4.00
Bossier County, LA	53,118	50,117	3,001	5.60
Little River County, AR	5,452	4,992	460	4.70
Polk County, AR	8328	7466	862	10.40
Sevier County, AR	6,995	6,657	338	2.80
Choctaw County, OK	5,939	5,495	444	4.00
Latimer County, OK	3,879	3,533	346	4.50
LeFlore County, OK	19,505	18,436	1,069	2.80
McCurtain County, OK	12,817	12,125	692	2.90
Pushmataha County, OK	4,102	3,756	346	4.00
Bowie County, TX	40,177	38,641	1,536	2.10
Dallas County, TX	1,362,947	1,286,699	76,248	5.60
Denton County, TX	538,804	509,534	29,270	5.40
Lamar County, TX	23,613	22,828	785	2.00
Red River County, TX	4,762	4,557	205	2.10
Tarrant County, TX	1,119,660	1,061,812	57,848	5.20
Zone of Interest	3,210,098	3,036,648	173,450	4.27 (avg)

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020) (2020 averages)

2.16.4 Households, Income and Poverty

Table 2.11 displays the number of households and average household sizes in the state and zone of interest. There were approximately 2,288,136 households in the zone of interest with an average household size of 2.6.

Table 2.11 2020 Households and Household Size

Geographic Area	Total Households	Average Household Size
Arkansas	1,380,768	2.55
Louisiana	1,783,924	2.52
Oklahoma	1,762,113	2.6
Texas	11,867,820	2.86
Bossier County, LA	49,418	2.57
Little River County, AR	6,089	2.46
Polk County, AR	7736	2.5
Sevier County, AR	6,771	2.91
Choctaw County, OK	7,128	2.47
Latimer County, OK	4,707	2.33
LeFlore County OK	21,123	2.67
McCurtain County, OK	14,083	2.67
Pushmataha County, OK	5,729	2.67
Bowie County, TX	39,691	2.68
Dallas County, TX	975,062	2.62
Denton County, TX	350,081	2.66
Lamar County, TX	22,641	2.55
Red River County, TX	6,220	2.48
Tarrant County, TX	771,657	2.72
Zone of Interest	2,288,136	2.60

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

The median household income in the zone of interest ranged from \$38,854 in Choctaw County, OK to \$97,671 in Denton County, TX in 2020, as displayed in Table 2.12. Per capita income in the zone of interest was \$26,686 in 2020, lower than the states of Arkansas, Louisiana, Oklahoma, and Texas which ranged from a low of \$29,252 in Arkansas and a high of \$34,717 in Texas.

Table 2.12 2020 Median and Per Capita Income

Geographic Area	Median Household Income (All)	Per Capita Income
Arkansas	52,528	29,252
Louisiana	52,087	30,117
Oklahoma	55,826	29,969
Texas	66,963	34,717

Geographic Area	Median Household Income (All)	Per Capita Income
Bossier, County, LA	49,418	29,600
Little River County, AR	57,614	27,738
Polk County, AR	43,444	26,879
Sevier County, AR	49,470	24,415
Choctaw County, OK	38,854	23,705
Latimer County, OK	39,939	26,072
LeFlore County, OK	43,049	22,167
McCurtain County, OK	43,435	21,908
Pushmataha County, OK	40,721	22,389
Bowie County, TX	54,154	27,121
Dallas County, TX	63,494	35,978
Denton County, TX	97,671	47,126
Lamar County, TX	51,561	26,686
Red River County, TX	40,674	22,998
Tarrant County, TX	71,346	36,978
Zone of Interest Median	49,418	26,686

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year (2009-2020)

Table 2.13 displays the percentage of persons and families whose incomes fell below the poverty level in the past twelve months as of 2020. Within the zone of interest, Choctaw County, OK had the greatest share of people with incomes below the poverty level at 23.1%, followed by McCurtain County, OK at 22.1%. In terms of families below the poverty level, McCurtain County, OK is reporting the highest percent with 17.4 % compared with Tarrant County, TX which is reporting the lowest rate at 5.1%. the ZOI median for both categories are shown in the table for reference.

Table 2.13 Percent of Families and People Whose Income in the Past 12 Months is Below the Poverty Level (2020)

Geographic Area	All Persons	All Families
Arkansas	16.30	6.10
Louisiana	19.60	6.70
Oklahoma	15.60	11.50
Texas	14.20	11.00
Bossier Parish, LA	16.90	16.90
Little River County, AR	12.40	8.10
Polk County, AR	20.90	16.60
Sevier County, AR	21.60	13.10
Choctaw County, OK	23.10	6.30
Latimer County, OK	17.20	15.60
LeFlore County, OK	21.20	17.00
McCurtain County, OK	22.10	17.40
Pushmataha County, OK	18.90	15.20
Bowie County, TX	17.30	13.80
Dallas County, TX	14.30	6.50
Denton County, TX	7.50	5.30
Lamar County, TX	16.90	12.40
Red River County, TX	21.40	17.30
Tarrant County, TX	11.60	5.10
Zone of Interest Median	17.30	13.80

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year Estimates

2.17 RECREATION FACILITIES, ACTIVITIES, NEEDS, AND TRENDS

Broken Bow Lake offers a variety of recreational opportunities. The lake stretches 22 miles into the Ouachita Mountains where its unusual beauty and scenic appeal is sought out by nature enthusiasts. The mountain terrain and dense forest provides a relaxing setting for camping, hunting, fishing, boating, birdwatching, hiking or horseback riding. Recreational boaters enjoy the open water on the lake with a beautifully forested shoreline. Ten public use areas offer an assortment of facilities making it easy to find something for everyone.

Table 2.14 provides a listing of areas as well as a general summary of the primary recreation facilities provided.

Table 2.14 Recreational Facilities and Operating Agencies

Holly Creek	O	N		*	*					A				
Carson Creek	O	E N		*	*			*		A G	*		H	*
Stevens Gap	O	E N	*	*	*	*	*	*		A G	*	BE	H	*
River Bend Area	O	E N G		*	*	*			P	A G	*	BE	H	*
East Ramp	U			*										
* Exists at lake Managing Entity O ORTD U USACE Camping E Electric Campsites N Non-electric Campsites G Group Camping Q Equestrian Campsites			Fishing C Fish Cleaning Stations D Fishing Docks P Fishing Piers Picnic A Picnic Area G Group Picnic Swimming BE Beach P Swimming Pool							Trails B Bike Trails Q Equestrian Trails H Hiking Trails I Interpretive Hiking Trails M Multipurpose Trails				

Source: USACE

2.17.1 Fishing and Hunting

Broken Bow Lake offers the public numerous hunting and fishing opportunities. Generally, all USACE lands are open to the public for hunting except developed recreation areas and lands around the dam and other structures. Licensed to the

Oklahoma Department of Wildlife Conservation (ODWC), the Broken Bow Wildlife Management Area (WMA) contains 5,420 acres managed for public hunting. Both hunting and fishing are described in more detail in Chapter 5 under Multiple Resource Management Lands Wildlife Management Areas.

2.17.2 Camping and Picnicking

Visitors to Broken Bow Lake are provided with numerous opportunities for camping and picnicking. Campsites range from primitive nonelectric sites to paved camping pads with water and electricity for fully equipped recreational vehicles. Camping is not the only way to visit Broken Bow as a modern hotel and cabin facilities are available for rent. There are eight managed parks at the lake, all of which are managed by the Oklahoma Tourism and Recreation Department (ORTD). Recreation areas include showers, overnight camping pads, electric hookups, playgrounds, fresh water, picnic tables, group shelters and grills.

2.17.3 Water Sports

The lake offers plenty of recreational opportunities for boaters and non-boater alike. Water lovers can enjoy skiing, tubing, kayaking, swimming, or simply relaxing on or around Broken Bow Lake. Eleven boat launching ramps are located at around the lake and two designated swim beaches have been developed in Stevens Gap and in River Bend Area.

Boating on the lake is in accordance with Oklahoma boating laws and Corps of Engineers' regulations.

2.17.4 Hiking Trails

Broken Bow Lake provides multiuse trails around the lake. Cedar Bluff Trail is a one mile loop with a scenic view of the Lower Mountain Fork River. The Friends of Beavers Bend Trail is a 1.5 mile loop that allows hikers to view a waterfall on the Lower Mountain Fork River. The Lakeview Trail, a multiuse trail for hiking and biking in the Stevens Gap area has a one, three, and a five mile option for visitors.

2.17.5 Commercial Concession Leases

Concessionaires provide valuable services to the public at USACE lakes across the United States. USACE makes efforts to attract concessionaires that can establish suitable, well-maintained businesses that will offer desirable water-related services to the general public. Presently, there are multiple sub-lease agreements under the primary lease to Oklahoma Tourism and Recreation Department on Broken Bow Lake.

2.17.6 Recreation Analysis – Trends and Needs

The 2017 Statewide Comprehensive Outdoor Recreation Plan (SCORP) was referred to in preparing the Plan. Preparation of the 2017 SCORP included numerous surveys including a statewide survey of cities and towns in Oklahoma, a survey of

recreation professionals as Members of the Oklahoma Municipal League, a survey of Oklahoma residents, a survey of trail users and advocates, and hosted two Recreation Rallies, one in Tulsa and one in Oklahoma City, that were open to members of the public and representatives of public and private recreation service providers. The 2017 SCORP also summarized the results of a survey conducted by the USACE in 2010 to garner public input on public preferences for lake usage and development in Oklahoma. The USACE survey was required by Section 3134 of the Water Resources Development Act of 2007 which established what is referred to as the Oklahoma Lakes Demonstration Program. In addition, the SCORP assessed public preferences through cited research pertinent to the recreation needs and issues of the people of Oklahoma and those who visit the state for recreational experiences.

The 2017 SCORP references data from a survey of statewide residents with questions pertaining to reasons and barriers to participation in outdoor recreation, funding priorities, use of technology while recreating, opinions about outdoor recreation issues, and demographics. The following are a list of findings from survey of statewide residents in the SCORP:

- 485 individuals completed the survey, with 95% of the respondents being Oklahoma residents.
- Nearly 70% of the respondents were female.
- 46% of the respondents indicated that they participate in outdoor recreation activities a few times per week.
- 51% of the respondents used one of the Oklahoma state parks for their most frequent outdoor recreation activity.
- The top 5 most important reasons for participation are outdoor recreation activities were: (1) for relaxation, (2) to enjoy the scenery, (3) for my mental well-being, (4) to be close to nature, and (5) to be with family and friends.
- The top 3 highest reasons identified as barriers to outdoor recreation participation were: (1) too busy with other activities, (2) lack of information, and (3) weather is not comfortable outside.
- The top 3 rated statements about issues and concerns for participation in outdoor recreation activities were: (1) recent budget cuts to parks and recreation providers have had a negative impact on outdoor recreation experiences in my area, (2) the parks and recreation in my community are generally well-maintained, and (3) access to the public outdoor recreation lands in my area is adequate.
- The top funding priorities for respondents were: (1) improve/enhance existing parks and recreation areas and facilities, (2) acquire more land for parks and open space, and (3) build bike and pedestrian paths between places of work, school, shopping areas, and neighborhoods.
- 86% of respondents stated that they used technology such as smartphone, maps, and social media websites while participating in outdoor recreation.

A summary of the USACE study includes:

- People have favorite lakes and favorite locations on those lakes. Knowledgeable lake visitors also avoid specific areas on their favorite lakes and have good, personal reasons for avoiding those locations.
- Personal preference for specific lakes and locations is motivated by aesthetic appearance of the property, quiet experience, safety and security of the property, friendly staff, special events, and tradition. Respondents rarely mentioned commercial development or private support services as motivators for preference of a recreation location.
- People desire public access locations, campgrounds, and public day use recreation sites at USACE lakes. They do not desire or support private development to the same extent as they do public development.
- Respondents want more development and more day use at some USACE managed lakes.
- One-half of the respondents believe present facilities at USACE lakes are inadequate. The structured survey responses revealed desires for changes related to physical aspects of USACE lakes, while the open-ended responses revealed desires for changes related to policies.
- The changes related to facilities desired by respondents were by level of importance from most important: (1) hiking trails, (2) swim beaches, (3) bike trails, (4) playgrounds, (5) campgrounds, (6) equestrian trails and canoe trails, (7) marinas.
- Crowding at these lakes is neither perceived nor an issue as related to number and location of docks, number of people, number of boats, or presence of structures.
- Respondents desire more parking, improved access roads, increased law enforcement, and retention of fee revenue at the lakes of origin.

The SCORP and related studies document national and regional trends showing the highest demand for unpaved trails for walking and hiking with demand expected to increase in the near future. Given the outdoor recreation trends, it is evident that future recreation development at Broken Bow Lake should focus less on campgrounds and more on providing increased trail opportunities (of all kinds), more facilities for family and group gatherings, and more wildlife and nature-related viewing opportunities. With the popularity of hunting in Wildlife Management Areas, trails can be developed for hiking and nature viewing during non-hunting seasons and provide parking and trailheads that can be used for both types of activities. The USACE should also place a high priority on the protection and retention of large, undeveloped parcels of public land. Doing so responds to outdoor recreation needs expressed in the SCORP and related studies. These large expanses of natural habitat on public land are held in high regard by the citizens throughout the zone of interest. This Plan responds to these needs through revised land classifications, new management objectives, and conceptual management plans for each land classification.

2.18 REAL ESTATE

A total of 28,113 acres of land were acquired in fee simple title for the Broken Bow Lake project. Originally, there were 707 easement acres, however, 74 acres were disposed leaving the current total of 633 easement acres. Easement acres reflect all easements on the project and not solely flowage easements. These are the official acres and may differ from those in other parts of this plan, which are for planning purposes only, due to improved measurement technology, erosion, and sedimentation.

2.18.1 Outgrants

The term “outgrant” is a broad term used by the USACE to describe a variety of real estate instruments wherein an interest in real property has been conveyed by the USACE to another party. Outgrants at Broken Bow Lake include leases, licenses, easements, consents, permits, and others which include the following:

- 14 Easements
- 2 Leases
- 1 License
- 5 Consents
- 2 Permits

The demand for real estate outgrants at Broken Bow Lake ranks fairly high among all USACE lake projects in terms of the total number and complexity of real estate outgrants. Management actions related to outgrants include routine inspections to ensure compliance with the terms of the outgrant, public safety requirements, and environmental compliance such as proper solid waste disposal and storage of pesticides. Additional actions include review of maintenance and construction proposals made by grantees. Leases are generally inspected annually for overall compliance, whereas minor outgrants are inspected approximately every five years or as needed. The management of outgrants is a major responsibility shared by the Operations and Real Estate Divisions of Tulsa District.

2.18.2 Guidelines for Property Adjacent to Public Land

It is the policy of the USACE to manage the natural, cultural, and developed resources of Broken Bow Lake to provide the public with safe and healthful recreational opportunities, while protecting and enhancing those resources. While private exclusive use of public land is not permitted, property owners adjacent to public lands do have all the same rights and privileges as any other citizen on their own property. Therefore, the information contained in these guidelines is designed to acquaint the adjoining landowner and other interested persons with the types of property involved in the management of government land at Broken Bow Lake.

2.18.3 Trespass and Encroachment

Government property is monitored by USACE personnel to identify and correct instances of unauthorized use, including trespasses and encroachments. The term “trespass” includes unauthorized transient use and occupancy, such as mowing, tree cutting and removal, livestock grazing, cultivation and harvesting crops, and any other alteration to Government property done without the USACE approval. Unauthorized trespasses may result in a Title 36 citation requiring violators to appear in Federal Magistrate Court, which could subject the violator to fines or imprisonment (See 36 C.F.R. Part 327 Rules and Regulations Governing Public Use of Water Resources Development Projects Administered by the Chief of Engineers). More serious trespasses will be referred to the USACE Office of Counsel for enforcement under state and federal law, which may require restoration of the premises and collection of monetary damages.

The term “encroachment” pertains to an unauthorized structure or improvement on Government property. When encroachments are discovered, lake personnel will attempt to resolve the issue at the project level. Where no resolution is reached, or where the encroachment is a permanent structure, the method of resolution will be determined by the USACE Real Estate Division, with recommendations from Operations Division and Office of Counsel. The USACE’s general policy is to require removal of encroachments, restoration of the premises, and collection of appropriate administrative costs and fair market value for the term of the unauthorized use. Incidents of unauthorized tree removal and mowing have occurred, as well as placement of the following; habitable dwelling, building, fence, deck, porch, barn, storage building, road, garden, gazebo, leach field, septic tank, propane tank, utility line, pool, deck, fill material (soil or another fill), retaining wall, etc.

The most common trespass are unauthorized mowing and paths, unauthorized structures such as fences and temporary structures, grazing, storage of personal property on USACE lands, and tree and vegetation removal. Trash dumping is an especially difficult and expensive problem at many USACE lakes. Efforts are continuously underway to resolve these unauthorized acts, but the sheer volume creates a workload that is difficult to accomplish. Encroachments can be prevented. Identifying the USACE fee boundary line and flowage easement designation are critical elements for the public who are planning for any type of activity near a USACE fee boundary.

CHAPTER 3 – RESOURCE GOALS AND OBJECTIVES

3.1 INTRODUCTION

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 specific task-oriented actions necessary to achieve the overall Master Plan goals.

3.2 RESOURCE GOALS

The following statements, paraphrased from EP 1130-2-550, Chapter 3, express the goals for the Broken Bow Lake Master Plan:

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

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

GOAL C. Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining the project’s natural resources.

GOAL D. Recognize the project’s unique qualities, characteristics, and potentials.

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

In addition to the above goals, USACE management activities are guided by USACE-wide Environmental Operating Principles as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.

- Seek ways and means to assess and mitigate cumulative impacts to the environment; bringing systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in USACE activities; listen to them actively and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

3.3 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 Tulsa District, Broken Bow Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, the USACE 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 they 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, as well as regional and state planning documents including:

- Oklahoma Comprehensive Wildlife Conservation Strategy – Ouachita Mountains, Arkansas River Valley, and Western Gulf Coastal Region
- Oklahoma Statewide Comprehensive Outdoor Recreation Plan

The objectives in this Master Plan are intended to provide project benefits, meet public needs, and foster environmental sustainability for Broken Bow Lake to the greatest extent possible. Tables 3.1 through 3.5 list the objectives for Broken Bow Lake.

Table 3.1 Recreational Objectives

Recreational Objectives	Goals				
	A	B	C	D	E
Support and provide technical guidance to lease partners for renovation of existing facilities to provide a quality recreation experience for visitors while protecting natural resources for use by others. Examples include development of high impact zones at campsites, provision of universally accessible facilities, separation of day use and camping facilities, improved electrical service at campsites.	*		*		
Consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety.	*		*	*	
Identify potential locations for future LDR or FOIR areas to accommodate visitation growth on USACE fee property. Provide opportunities for day use activities, especially picnicking. Provide enough campsites in popular areas.	*		*		
Monitor boating traffic and evaluate the need to conduct a comprehensive recreation boating use study to ensure visitor safety and enjoyment.	*		*		
Support and provide technical guidance to lease partners on the management of recreation facilities in accordance with public demand. Examples include universally accessible fishing docks, fish cleaning stations near boat ramps, playground equipment in day use and camping areas.	*		*		
Work with partners to expand existing trails and develop new ones.	*		*		*
Consider flood/conservation pool to address potential impact to recreational facilities (i.e., campsites, boat ramps, courtesy docks, etc.).	*	*	*	*	
Ensure consistency with USACE Natural Resource Management (NRM) Strategic Plan.					*
Monitor the Oklahoma SCORP to ensure that USACE is responsive to outdoor recreation trends, public needs and resource protection within a regional framework. All plans by others will be evaluated considering USACE policy and operational aspects of Broken Bow Lake.			*		*

*Denotes that the objective helps to meet the specified goal.

Table 3.2 Natural Resource Management Objectives

Natural Resource Management Objectives	Goals				
	A	B	C	D	E
Give priority to the preservation and improvement of wild land values in public use planning, design, development, and management activities. Give high priority to examining project lands for the presence of old growth forests characteristic of the Level III Ouachita Mountains and Level IV Central Mountain Ranges and Western Ouachitas.	*	*		*	*
Work with Tribal Nations to provide access to any culturally significant natural resources.		*		*	*
Consider flood/conservation pool levels to ensure that natural resources are managed in ways that are compatible with project purposes.	*	*		*	
Actively manage and conserve fish and wildlife resources, especially threatened and endangered species and Species of Greatest Conservation Need, by implementing ecosystem management principles. Key among these principles is the use of native species adapted to the Level IV Central Mountain Ranges and Western Ouachitas in restoration and mitigation plans.	*	*		*	*
Manage high density and low-density recreations lands in ways that enhance benefits to wildlife.					*
Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats.		*			*
Minimize activities which disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Work with USFS and Oklahoma State Parks on prescribed fire, timber harvests, and removal of targeted species as a management tool to promote the vigor and health of forests, woodlands, and prairies.	*	*			*
Stop unauthorized uses of public lands such as off-road vehicle (ORV) use, trash dumping, unauthorized fires, fireworks, poaching, clearing of vegetation, agricultural trespass, timber theft, unauthorized trails and paths, and placement of advertising signs that create negative environmental impacts.	*	*	*	*	*
Monitor lands and waters for invasive, non-native, and aggressively spreading native species and take action to prevent and/or reduce the spread of these species.	*	*		*	*
Protect and/or restore important native habitats such as prairies, bottomland hardwoods, riparian zones, and wetlands, where they occur, or historically occurred on project lands. Special emphasis should be taken to protect and/or restore special or rare plant species. Emphasize actions that promote butterfly and /or pollinator habitat, migratory bird habitat, habitat for birds listed by	*	*		*	*

Natural Resource Management Objectives	Goals				
USFWS as Birds of Conservation Concern, and potential habitat for American Burying Beetle.					
As funding permits, complete an inventory of timber resources and prepare a Forest Management Plan.	*	*		*	*

*Denotes that the objective helps to meet the specified goal.

Table 3.3 Visitor Information, Education, and Outreach Objectives

Visitor Information, Education, and Outreach Objectives	Goals				
	A	B	C	D	E
Provide opportunities (i.e., updates to local municipalities, web page) for communication with agencies, special interest groups, and the general public. Utilize social media to inform visitors.	*			*	*
Provide educational, interpretive, and outreach programs at the lake office and around the lake. Topics to include history, lake operations (flood risk management and water supply), water safety, recreation, cultural resources, ecology, and USACE missions.	*	*	*	*	*
Promote USACE Water Safety message.	*		*	*	*
Educate adjacent landowners on policies and permit processes in order to reduce encroachment actions.	*	*	*	*	*
Work with Tribal Nations to engage the public and provide educational and informational opportunities to the general public.	*	*	*	*	*

*Denotes that the objective helps to meet the specified goal.

Table 3.4 General Management Objectives

General Management Objectives	Goals				
	A	B	C	D	E
Resurvey and maintain the public lands boundary line to ensure it is clearly marked and recognizable in all areas to reduce habitat degradation and encroachment actions.	*	*		*	
Identify safety hazards or unsafe conditions; correct infractions and implement safety standards in accordance with EM 385-1-1.					*
Ensure green design, construction, and operation practices, such as the Leadership in Energy and Environmental Design (LEED) criteria for government facilities, are considered as well as applicable Executive Orders.					*
Manage non-recreation outgrants such as utility and road easements in accordance with national guidance set forth in ER and EP 1130-2-550 and applicable chapters in ER 405-1-12.	*				*
Manage project lands and recreational programs to advance broad national climate change mitigation goals, including but not limited to climate change resilience and carbon sequestration, as set forth in Executive Order 13990 and related USACE policy.					*
The USACE will continue to monitor both current and projected climate change impacts to operations and the authorized project purposes within USACE federal fee boundary and react through adaptation and resiliency projects, as funding becomes available.	*	*	*		*

*Denotes that the objective helps to meet the specified goal.

Table 3.5 Cultural Resources Management Objectives

Cultural Resources Management Objectives	Goals				
	A	B	C	D	E
As funding permits, complete an inventory in accordance with Section 110 NHPA and prepare a Cultural Resources Management Plan.	*	*		*	*
Increase public awareness and education of regional and local Tribal histories.		*		*	*
Monitor and enforce Title 36 and ARPA to prevent unauthorized excavation and removal of cultural resources.		*		*	*
Provide access by Tribal Nations to any cultural resources, sacred sites, or other Traditional Cultural Properties.	*	*			
Preserve and protect cultural resources sites in compliance with existing federal statutes and regulations.	*	*	*	*	*

*Denotes that the objective helps to meet the specified goal.

CHAPTER 4 – LAND ALLOCATION, LAND CLASSIFICATION, WATER SURFACE, AND PROJECT EASEMENT LANDS

4.1 LAND ALLOCATION

All lands at USACE water resource development projects are allocated by USACE into one of four categories in accordance with the congressionally authorized purpose for which the project lands were acquired: Operations, Recreation, Fish and Wildlife, and Mitigation. At Broken Bow Lake, the only land allocation category that applies is Operations, which is defined as those lands that are required to operate the project for the primary authorized purposes of flood risk management, water supply, recreation, water quality, and fish and wildlife. The remaining allocations of Recreation, Fish and Wildlife, and Mitigation would apply only if lands had been acquired specifically for these purposes.

4.2 LAND CLASSIFICATION

4.2.1 General

The objective of classifying project lands is to identify how a given parcel of land shall be used now and in the foreseeable future. Land classification is a central component of this plan, and once a particular classification is established any significant change to that classification would require a formal process including public review and comment.

4.2.2 Prior Land Classifications

The previous version of the Broken Bow Lake Master Plan included land classification criteria that were similar, but not identical to the current criteria. In the Plan, these prior land classifications were called Land-use allocations and zoning classifications. In the years since the previous Master Plan was published, wildlife habitat values, surrounding land use, and regional recreation trends have changed giving rise to the need for revised classifications. Table 4.1 identifies land and water surface classification changes from the 1979 Master Plan to the 2023 Master Plan Revision.

Table 4.1 Change from 1979 Land and Water Surface Classifications to 2023 Land and Water Surface Classifications

Prior Land Classifications (1979)	Acres	Land Classifications (2022)	Acres	Net Difference
Project Operations	427	Project Operations (PO)	322	(105)
Operations: Recreation – Intensive Use	3,468	High Density Recreation (HDR)	3,431	(37)
		Environmentally Sensitive Areas (ESA)	890	890
Operations: Recreation – Low Density	5,913	Multiple Resource Management – Low Density Recreation (LDR)	2,492	(3,421)
Operations: Wildlife Management	3,222	Multiple Resource Management – Wildlife Management (WMA)	6,821	3,599
Recreation Lands	896			(896)
Not Classified	58			(58)
TOTAL	13,984		13,956	(28)
Prior Water Surface Classifications (1979)	Acres	Water Surface Classifications (2022)	Acres	Net Difference
Permanent Pool	14,151	Open Recreation	14,007	
		Designated No-Wake	123	123
		Restricted	21	21
TOTAL	14,151		14,151	0
TOTAL FEE	28,135		28,107	(28)

* Total Acreage differences from the 1979 total to the 2023 totals are due to improvements in measurement technology, deposition/siltation, and erosion. Totals also differ due to rounding while adding parcels.

The previous land classifications were as follows:

- **Project Operations (PO):** Lands acquired for project operations and allocated for the safe and efficient operation of the project for those authorized purposes other than fish and wildlife. In all cases this included, but was not restricted to, land on which the operational structures are

located. Agricultural uses of this land are permitted on an interim basis only when it is not in conflict with use for an authorized purpose.

- **Operations: Recreation-Intensive Use (OPS: REC-IU):** Lands acquired for operations and allocated for use as developed public use areas for intensive recreational activities by the visiting public, including areas for concession and quasi-public developments. No agricultural uses are permitted on this land except on an interim basis.
- **Operations: Low-Density (OPS: REC-LDR):** Lands acquired for project operations and allocated for low density recreational activities by the visiting public as required as open space between intensive recreational developments or between an intensive recreational development and land which, by virtue of use, is incompatible with the recreational development and would detract from the quality of the public use. Such incompatible land may be located either on the project or adjacent to the project. Land required for ecological workshops and forums, hiking trails, primitive camping, or similar low density recreational use available for a significant role in shaping public understanding of the environment will be under this allocation. No agricultural uses are permitted on this land except on an interim basis.
- **Operations: Wildlife Management (OPS: WM):** Lands acquired for project operations and allocated as habitat for fish and wildlife or for propagation of such species. Such lands should be continuously available for low density recreation. When the Master Plan was written, the wildlife management lands at Broken Bow Lake along with 2,307 surface acres of water were licensed to the Oklahoma Department of Wildlife Conservation for management.

4.2.3 Land and Water Surface Classifications

USACE regulations require project lands and waters to be classified in accordance with the primary use for which project lands are managed. There are six primary and four subcategories of land classifications identified in USACE regulations, as well as four water classifications which are as follows:

- Project Operations
- High Density Recreation
- Mitigation
- Environmentally Sensitive Areas
- Multiple Resource Management Lands
 - Low Density Recreation
 - Wildlife Management
 - Vegetative Management
 - Future/Inactive Recreation

- Water Surface
 - Restricted Areas
 - Designated No Wake Areas
 - Fish and Wildlife Sanctuary
 - Open Recreation

The land and water surface classifications for Broken Bow Lake were established after considering public comments, input from key stakeholders and lessees operating on USACE land, as well as USACE expert assessment. Additionally, wildlife habitat values identified in the WHAP and the trends analysis provided in the SCORP was used in land and water classification decision making. Furthermore, the USACE consulted with Tribal Nations who have cultural and historical interests in the lands at Broken Bow Lake. Maps showing the various land classifications can be found in Appendix A. Each of the land classifications, including the acreage and description of allowable uses, is described in the following paragraphs.

4.2.4 Project Operations

This classification includes the lands managed for operation of the dam, stilling basin, project office, powerhouse, reregulation dam, and maintenance compound, all of which must be maintained to carry out the primary authorized purposes of flood control, hydroelectric power, water supply, recreation, and fish and wildlife. In addition to the operational activities taking place on these lands, limited recreational use may be allowed for activities. Regardless of any limited recreation use allowed on these lands, the primary classification of Project Operations will take precedent over other uses. There are 322 acres of Project Operations land specifically managed for this purpose.

4.2.5 High Density Recreation (HDR)

This classification includes lands developed, or available to be developed for intensive recreational activities including day use areas, campgrounds, marinas, and related concession areas. Recreation development by lessees operating on USACE lands must follow policy guidance contained in USACE regulations at ER 1130-2-550, Chapter 16. That policy includes the following statement:

“The primary rationale for any future recreation development must be dependent on the project’s natural or other resources. This dependency is typically reflected in facilities that accommodate or support water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps, and comprehensive resort facilities. Examples that do not rely on the project’s natural or other resources include theme parks or ride-type attractions, sports or concert stadiums, and standalone facilities such as restaurants, bars, motels, hotels, non-transient trailers, and golf courses. Normally, the recreation facilities that are dependent on the project’s natural or other resources, and accommodate or support water-based activities, overnight use, and day use, are approved first as primary facilities followed by those facilities that support them. Any support facilities (e.g., playgrounds, multipurpose sports fields, overnight facilities, restaurants, camp stores, bait shops, comfort

stations, and boat repair facilities) must also enhance the recreation experience, be dependent on the resource-based facilities, and be secondary to the original intent of the recreation development...

Lands classified for High Density Recreation are suitable for the development of comprehensive resorts. The regulation cited above defines Comprehensive Resort as follows:

“Typically, multi-faceted developments with facilities such as marinas, lodging, conference centers, golf courses, tennis courts, restaurants, and other similar facilities.”

At Broken Bow Lake, there are 3,431 acres classified as High Density Recreation land. Each of the High Density Recreation Public Use Areas is described briefly in Chapter 5 of this Plan.

4.2.6 Mitigation

This classification is used only for lands set aside for mitigation for the purpose of offsetting losses associated with the development of the project. This is not the same as allocated lands that are purchased for the purpose of mitigation. There are no lands at Broken Bow Lake with this classification.

4.2.7 Environmentally Sensitive Areas (ESA)

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. Several areas are designated as ESAs at Broken Bow Lake primarily for the protection of a combination of sensitive habitats, aesthetics, and legally protected cultural resources. Each of these areas is discussed in Chapter 5 of this Plan and illustrated on the maps in Appendix A. Within those areas, hunting and other wildlife management activities are still permitted, but protection of sensitive resources takes priority over any other activity. The process of correspondence with Tribal Nations to designate ESAs is briefly described as a special topic in Chapter 6 of this Plan. There are 890 acres classified as ESA at Broken Bow Lake.

4.2.8 Multiple Resource Management Lands (MRML)

This classification is divided into four sub-classifications identified as: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. A given tract of land may be classified using one or more of these sub-classifications, but the primary sub classification should reflect the dominant use of the land. Typically, Multiple Resource Management Lands support only passive, non-intrusive uses with very limited facilities or infrastructure. Where needed, some areas may require basic facilities that include, but are not limited to minimal parking space, a small boat ramp, and/or primitive sanitary facilities. There are 9,377 acres of land under this classification at Broken Bow Lake. The following paragraphs list each of the sub-classifications, and the number of acres and primary uses of each.

Low Density Recreation (LDR)

These are lands that may support passive public recreational use (e.g., fishing, hunting, wildlife viewing, natural surface trails, hiking, etc.). There are 2,492 acres under this classification at Broken Bow Lake

Wildlife Management (WM)

This land classification applies to lands managed primarily for the conservation of fish and wildlife habitat. These lands generally include comparatively large contiguous parcels, most of which are located within the flood pool of the lake. Passive recreation uses such as natural surface trails, fishing, hunting, and wildlife observation are compatible with this classification unless restrictions are necessary to protect sensitive species or to promote public safety. There are 6,821 acres of land included in this classification at Broken Bow Lake.

Vegetative Management (VM)

These are lands designated for stewardship of forest, prairie, and other native vegetative cover. Passive recreation activities previously described may be allowed in these areas. There are no acres under this classification at Broken Bow Lake.

Future or Inactive Recreation (FOIR)

These are lands with site characteristics compatible with High Density Recreation development but have been undeveloped or planned for very long-range recreation needs. These areas are typically closed to vehicular traffic and will be managed as multiple resource management lands until development takes place. There are no acres classified as Future or Inactive Recreation at Broken Bow Lake.

4.2.9 Water Surface

USACE regulations specify four possible sub-categories of water surface classification. These classifications are intended to promote public safety, protect resources, or protect project operational features such as the dam and spillway. These areas are typically marked by the USACE or lessees with navigational or informational buoys or signs or are denoted on public maps and brochures. The Water Surface Classification map can be found in Appendix A of this Plan. The four sub-categories of water surface classification are as follows:

Restricted

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety, and security purposes. The areas include the water surface immediately surrounding the gate control tower upstream of the Broken Bow Lake Dam, around the water intake structures, just below the dam, below the powerhouse, upstream of the reregulation dam, and at designated swim beaches. There are 21 acres of restricted water surface at Broken Bow Lake.

Designated No-Wake

Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. There are three boat ramps at Broken Bow Lake where no-wake restrictions are in place for reasons of public safety and protection of property. There are 123 acres of designated no-wake water surface at Broken Bow Lake. No-wake areas are typically denoted by buoys in appropriate areas.

Fish and Wildlife Sanctuary

This water surface classification applies to areas with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Broken Bow Lake has no acres of water surface designated as a Fish and Wildlife Sanctuary.

Open Recreation

Open Recreation includes all water surface areas available for year-round or seasonal water-based recreational use. This classification encompasses the majority of the lake water surface and is open to general recreational boating. Boaters are advised through maps and brochures, or signs at boat ramps and marinas, that navigational hazards may be present at any time and at any location in these areas. Operation of a boat in these areas is at the owner's risk. Specific navigational hazards may or may not be marked with a buoy. There are 14,007 acres of water surface at Broken Bow Lake are designated as Open Recreation.

4.2.10 Project Easement Lands

Project Easement Lands are primarily lands on which easement interests were acquired. Fee title was not acquired on these lands, but the easement interests convey to the Federal government certain rights to use and/or restrict the use of the land for specific purposes. Easement lands are typically classified as Operations Easement, Flowage Easement, and/or Conservation Easement.

At Broken Bow Lake there are easement lands where a flowage easement was acquired. A flowage easement, in general, grants to the government the perpetual right to temporarily flood/inundate private land during flood risk management operations and to prohibit activities on the flowage easement that would interfere with flood risk management operations such as placement of fill material or construction of habitable structures. There are 38 total easement tracts at Broken Bow Lake, totaling 633 acres, which includes 31 flowage easement tracts.

CHAPTER 5 – RESOURCE PLAN

5.1 RESOURCE PLAN OVERVIEW

This chapter describes the management plans for each land use classification within the Master Plan. Management plans describe how the project lands and water surface will be managed in broad terms. Management of all lands, recreation facilities, and related infrastructure must take into consideration the effects of pool fluctuations associated with authorized project purposes. Management actions are dependent on congressional appropriations, the financial capability of lessees and other key stakeholders, and the contributions of labor and other resources by volunteers. Acreages shown for the various land classifications were calculated using GIS technology and may not agree with lease documents, prior publications, or official land acquisition records.

5.2 PROJECT OPERATIONS

The Project Operations (PO) classification is land associated with the dam, stilling basin, project office, powerhouse, reregulation dam, maintenance compound, and other areas managed solely for the operation and fulfillment of the primary mission of the project. There are 322 acres of lands under this classification, all of which are managed by the USACE. The Project Operation land management plan consists of continuing to provide physical security necessary to ensure continued operation of the critical operational structures.

Public access to Project Operations lands is restricted although limited recreational access is permitted when lake operations allow. Regardless of any authorized public recreational use of lands that are classified as Project Operations, the operation, maintenance, and safety requirements of the dam and associated lands and infrastructure take priority over any recreational access.

5.3 HIGH DENSITY RECREATION

Broken Bow Lake has 3,431 acres classified as High Density Recreation. These lands were developed for intensive recreational activities for the visiting public including day use and campgrounds. National USACE policy set forth in ER and EP 1130-2-550, Chapter 16, limits recreation development on USACE lands to those activities that are dependent on a project's natural resources and typically include water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps and comprehensive resorts. Examples of activities that are not dependent on a project's natural resources include theme parks or ride-type attractions, sports or concert stadiums, and stand-alone facilities such as restaurants, bars, motels, hotels, and golf courses.

The High-Density Recreation areas at Broken Bow Lake include 10 total park areas with 3 park areas that are managed by USACE and 7 park areas managed by Oklahoma Tourism and Recreation Department (ORTD). The USACE will continue to

review requests and ensure compliance with applicable laws and regulations for proposed activities in all USACE-operated HDR areas. USACE will also continue to ensure that recreation areas are managed and operated in accordance with the objectives prescribed in Chapter 3. Additional best management practices to implement may include the following:

- Monitor the Oklahoma SCORP to ensure that USACE is responsive to outdoor recreation trends, public needs, and resource protection within a regional framework. All plans by others will be evaluated considering USACE policy and operational aspects of Broken Bow Lake. Preserve and restore wildlife habitat in high density recreation areas.
- Continue coordination with Oklahoma Forest Service regarding the management of emerald ash borer and sustaining general tree health in high density recreation areas.
- Work with Tribal Nations to provide educational and informational opportunities to the general public.
- Manage project lands and recreational programs to advance broad national climate change mitigation goals, including but not limited to climate change resilience and carbon sequestration, as set forth in Executive Order 13990 and related USACE policy.

The following is a description of the parks operated by USACE and ORTD on USACE lands at Broken Bow Lake, some of which are highly developed, while others have only basic facilities and limited development. Classifications for the various parks at Broken Bow Lake include Day Use, Class A (highly developed parks) and Class C (parks with basic facilities). Maps showing existing parks and facilities can be found in Appendix A.

5.3.1 Recreation Areas and Facilities

USACE is the largest federal provider of outdoor recreation, managing 12 million acres of lands and waters across the country. The recreation mission and overarching strategy of USACE is to manage and conserve natural resources while continuing to deliver a quality recreation program that is resilient considering today's fiscal realities and be responsive to the changing needs of the American people.

Broken Bow Lake offers a variety of recreational opportunities along the Mountain Fork River Basin and includes facilities managed by the USACE and ORTD. The following section describes each USACE managed High Density Recreation Area followed by those that are outgranted to ORTD.

5.3.2 USACE Managed High Density Recreation Areas

Panther Creek Access Point

Panther Creek is located at the northern reaches of Broken Bow Lake at the mouth of the Mountain Fork River. The area contains a scenic camping area and boat

launch with parking. The 10 primitive campsites do not have electrical or water hookups. Any proposed betterments will be limited to available funding.

Overlook Area

The Overlook is located on Oklahoma Highway 259A on the west side of the dam. Visitors can view the dam, surrounding lake area and the spillway downstream. Parking is provided but no restroom facilities are available. Continued upkeep of the area is scheduled, and any proposed improvements are dependent on available funding.

East Ramp

East Ramp is located at the eastern shoreline of Broken Bow Lake at the mouth of the Mountain Fork River. The area contains a scenic camping area and boat launch with parking. The 10 primitive campsites do not have electrical or water hookups. Any proposed betterments will be limited to available funding.

Biggam Creek Cove

Biggam Creek Cove is a 3.6 acre area designated for future day use recreation. Located on the southeast side of the lake, there are currently no facilities present. The area was never developed under the previous master plan. Future development could include an access road, boat ramp and day use facilities.

5.3.3 Outgranted High Density Recreation Areas

Holly Creek

Holly Creek is a primitive camping area located along the northwestern shoreline of Broken Bow Lake. The area is managed under a lease to ORTD and includes camping, picnicking, fishing, and sightseeing opportunities. There is a boat ramp and the area is surrounded by mountain scenery.

Cedar Creek Golf Course

Located east of U.S. Highway 259, the Cedar Creek Golf Course (Photo 5.1) is operated under a lease to ORTD. The golf course is an 18-hole par-72 course made up of narrow fairways and wooded roughs. The course has a pro shop with cart and club rentals.



Photo 5.1 Cedar Creek Golf Course (Source: USACE)

Carson Creek

Accessed off U.S. Highway 259 from Carson Creek Road on the west side of Broken Bow Lake, the Carson Creek recreation area is managed under a lease to ORTD. Recreation amenities and facilities include group shelters, picnic sites, full and semi-modern RV sites, campsites, primitive campsites, comfort stations, sanitary dump stations, playgrounds, and boat ramps.

Beavers Bend State Park

Beavers Bend State Park (Figure 5.1) is located on both USACE and ORTD fee lands. The portions of the park located on USACE lands are managed under a lease to ORTD. Amenities include the Lakeview Lodge, boat ramps, campsites, picnic shelters, restrooms with showers, hiking trail, sanitary dump stations, and a playground.



Figure 5.1 Beavers Bend State Park map (Source: ORTD)

Stevens Gap

Accessed off U.S. Highway 259 from Stevens Gap Road on the west side of Broken Bow Lake, the Stevens Gap area is one of the primary lake access points managed by ORTD. The area includes the Beavers Bend Marina (Photo 5.2) as well as a zip line, pontoon boat tours, paddle boarding, camping, RV sites, comfort stations, primitive camping, boating, swimming, fishing, hiking, and sightseeing opportunities.



Photo 5.2 Beavers Bend Marina at Stevens Gap (Source: USACE)

River Bend Area

Managed under a lease to ORTD, the River Bend Area (Photo 5.3) is located along Spillway Creek below the Broken Bow Lake Spillway. River water here is cold and clear as it supports a year-round trout fishery. Amenities include campsites, RV sites, hiking trails, canoe rentals, paddle boat rentals, fly fishing shop, riding stables, train ride, and concession stands. Adjacent to this area are additional amenities including a nature center, museum, and camping areas.



Photo 5.3 River Bend Area (Source: USACE)

Mountain Fork Park

Located downstream from the dam near the reregulation dam the ORTD managed Mountain Fork Park (Photo 5.4) offers easy access to the river for canoes and kayaks. Campsite along the banks of the river offer easy access for fishing.



Photo 5.4 Mountain Fork Park campsite (Source: USACE)

5.3.4 Commercial Concession Leases

Concessionaires provide valuable services to the public at USACE lakes across the United States. USACE makes efforts to attract concessionaires that establish suitable, well-maintained businesses offering desirable water-based services to the general public. Presently, the Oklahoma Tourism and Recreation Department (ORTD) is a USACE stakeholder holding Commercial Concession Leases on Broken Bow Lake.

5.4 MITIGATION

The Mitigation classification is applied to lands that were acquired specifically for the purpose of offsetting losses associated with the development of the project. There are no acres at Broken Bow Lake under this classification. USACE lands at Broken Bow

Lake where environmental mitigation activities have taken place in association with real estate easements or other outgrants are not included in lands classified for Mitigation.

5.5 ENVIRONMENTALLY SENSITIVE AREAS

Four (4) distinct areas totaling 890 acres are designated as Environmentally Sensitive Areas (ESA). These are 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 (NHPA), or applicable state statutes. The primary management objective for ESAs is to allow existing uses to continue but to protect sensitive resources from intensive development, use, or disturbance beyond that which currently exists. In general, these areas must be managed to ensure that they are not adversely impacted. With the exception of natural surface pedestrian trails and minimal visitor parking areas, limited or no development of public use facilities is allowed on these lands and no real estate outgrants for easements should be granted unless disturbance can be confined to the boundaries of existing easements. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration or provision of supplemental browse and forage for wildlife. An ESA classification provides the highest level of ecological protection among the various land use classifications. Future management of ESAs includes monitoring and surveillance of cultural resource sites to ensure they are not damaged or destroyed. For a brief description of consultation with Tribal Nations for ESA and land classification changes, see Chapter 6.

The ESAs listed and described in Table 5.1 provide the number of acres for each ESA and a brief description of the ESA. See Appendix A for the map that identifies the ESAs around the lake. Many of the ESAs were designated to protect culturally and/or historically significant sites. Since the purpose of the ESA designation is to protect those sites, many of the ESAs have been expanded well beyond the known cultural site, as to not identify the exact location and due to the likelihood that there may be additional unidentified sites adjacent to those which are being protected. Typically, the ESA table would provide a more detailed description of each ESA and why it is being protected, but due to the sensitivity and significance of many of the sites and the desire to obscure the specific details of the sites, the table only provides a more general description.

Table 5.1 ESA Listing

ESA#	Acres	Location and Description
ESA 1	686	ESA 1 is located on the north end of the lake. The area extends north from Buck Creek and includes areas near Panther Creek Park.
ESA 2	115	ESA 2 is located on the west shoreline, south of Holly Creek Cove.
ESA 3	85	ESA 3 is located on the east shoreline, north of the east ramp and across the lake from Carson Creek and Beavers Bend State Park.
ESA 4	4	ESA 4 is located within the River Bend Area.

5.6 MULTIPLE RESOURCE MANAGEMENT LANDS

Multiple Resource Management Lands (MRML) are, as the name implies, lands that serve multiple purposes, but that are sub-classified and managed for a predominant use. There are no lands sub-classified as Vegetation Management (VM) or Future or Inactive Recreation Areas at Broken Bow Lake. The following paragraph describes the sub-classification, how they are managed, and provides the number of acres in each sub-classification.

5.6.1 Wildlife Management

There are 6,821 acres of MRML – Wildlife Management, which is the dominant land classification at Broken Bow Lake. These are lands designated primarily for the stewardship of fish and wildlife resources but are available for passive recreation use such as natural surface trails, hiking, and nature study. The USACE goals and objectives for these lands is to continue to ensure wildlife management practices are ecologically sustainable and provide the intended public benefits. In general, this land classification calls for managing the habitat to support native, ecologically adapted vegetation, which in turn supports native game and non-game wildlife species, with special attention given to federal and state-listed threatened and endangered species. Future management may include such activities as placement of nesting structures, construction of water features or brush piles, prescribed fire, fencing, removal of invasive species, and planting of specific food-producing plants that may be necessary to support wildlife needs. Additional best management practices may include use of erosion control blankets that do not pose entrapment hazards to wildlife; elimination of open-top vertical pipes that pose an entrapment hazard to wildlife; minimize nighttime lighting and only use down-shielded lighting to prevent disorientation of night-migrating birds; follow USFWS guidelines for building glass to prevent bird collisions; preserve and restore wildlife habitat in high density recreation areas; ensure that mowing practices provide standing tallgrass over winter to provide essential cover for wintering birds; and report sightings of state-listed species and presence of rare vegetative communities to USFWS and ODWC. Priority will be given to the improvement or restoration of existing wetlands, or the construction of wetlands where topography, soil type, and hydrology are appropriate.

Use of available funds for wildlife management must be prioritized to meet legal mandates and regional priorities. While exceptions can occur, management actions will be guided by the following, in order of priority: 1) Protect federal and state-listed threatened and endangered species. 2) Meet the needs of species protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. 3) Meet the needs of rare species and Species of Greatest Conservation Concern. 4) Meet the needs of resident species not included in the above priorities.

Additionally, agricultural leases for grazing or hay production may be employed when such actions are beneficial to long-term ecological management goals. Hunting and fishing activities are regulated by federal and state laws and special restrictions proposed by the USACE and approved through state regulatory processes. Natural

surface pedestrian trails are appropriate for most areas designated as Wildlife Management and can be implemented through partnerships with other agencies.

Oklahoma Department of Wildlife Conservation (ODWC) - Managed Wildlife Management Area

The USACE has licensed and leased a total of 5,420 acres of land to ODWC for wildlife management and facilities related to the operations of the Broken Bow Lake Wildlife Management Area (WMA) (Figure 5.2). The ODWC manages lands are located in McCurtain County. Habitat consists of mixture of hardwood/pine and riparian forests. The riparian forest consists primarily of hardwoods, including sweetgum and black gum, red maple, and elms. The rugged terrain is some of the most beautiful scenery in the state. Approximately 300 acres of the area is subject to prescribed burning on a three year rotation with the remainder of the area left in a natural state.

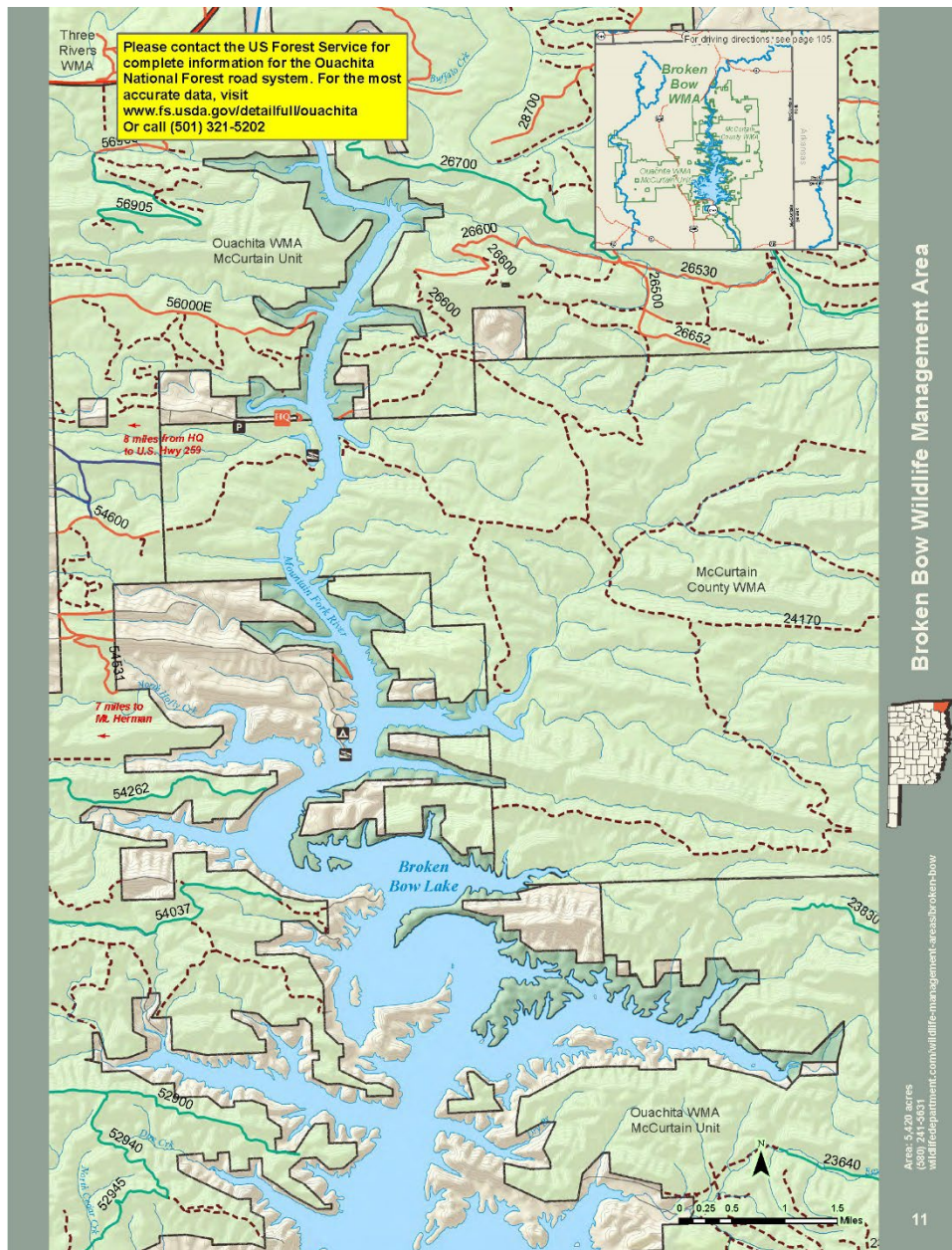


Figure 5.2 Map of Broken Bow Lake WMA (Source: ODWC)

Fishing and Hunting Opportunities

Fishing opportunities at Broken Bow Lake and in the Mountain Fork River (Photo 5.5) are excellent. River species include smallmouth bass and sunfish while the lake is known for its black bass (largemouth, smallmouth, and spotted bass). The lower Mountain Fork River below the Broken Bow Dam is a designated trout area offering year-round fishing for both rainbows and brown trout.



Photo 5.5 Fishing on the lower Mountain Fork River (Source: USACE)

Broken Bow Lake provides hunting opportunities for various game species of interest to include white-tailed deer, turkey, rabbit, and various furbearers. Public hunting maps are available at the Broken Bow Lake Project Office and on the USACE Tulsa District website. State of Oklahoma hunting and fishing laws are enforced on project lands.

5.6.2 Low Density Recreation

There are 2,492 acres of MRML – Low Density Recreation at Broken Bow Lake. These lands have minimal development or infrastructure that support passive public use such as hiking, nature photography, bank fishing, and hunting. Since these lands are typically adjacent to private residential developments, hunting is only allowed in select areas that are a reasonable and safe distance from adjacent residential properties. These lands are typically open to the public, including adjacent landowners, for pedestrian traffic and are frequently used by adjacent landowners for access to the shoreline near their homes. Prevention of unauthorized use on this land, such as trespassing or encroachment, is an important management and stewardship objective for all USACE lands but is especially important for lands near private development. Future management of these lands calls for maintaining a healthy, ecologically adapted vegetative cover to reduce erosion and improve aesthetics. Maintenance of an identifiable property boundary is also a high priority in these areas.

5.7 WATER SURFACE

At conservation pool level of 599.5 NGVD29 there are 14,151 acres of water surface. The USACE is the primary agency responsible for managing the recreational use of the water surface at Broken Bow Lake. Enforcement of water surface rules and regulations is a shared responsibility between the USACE, ODWC, and the Marine Enforcement Division of the Oklahoma Highway Patrol (OHP). Zoning of the water surface is intended to ensure the security of key operations infrastructure, promote public safety, and protect habitat. In accordance with national USACE policy set forth in EP 1130-2-550, the water surface of the lake at the conservation pool elevation may be designated using the following classifications:

5.7.1 Restricted

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations and safety and security purposes. Vessels are not allowed to enter Restricted water surface. The total acreage of Restricted water surface is approximately 21 acres. The Restricted water surface at Broken Bow Lake includes the water surface immediately surrounding the gate control tower upstream of the Broken Bow Lake Dam, around the water intake structures, just below the dam, below the powerhouse, upstream of the reregulation dam, and at designated swim beaches. Future management calls for one or more of the following management measures: placement of buoys; placement of signs near boat ramps and swimming beaches; and describing the areas on maps available to the public.

5.7.2 Designated No-Wake

Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve visitor safety near key recreation water access areas such as boat ramps, swim beaches, and marinas. Designated No-Wake areas at Broken Bow Lake include approximately 123 acres. The following measures to be taken in No-wake Areas: placement of buoys, placement of signs near boat ramps, and describing the areas on maps available to the public

5.7.3 Open Recreation

Open Recreation includes all water surface areas available for year-round or seasonal water-based recreational use. Approximately 14,007 acres of Broken Bow Lake water surface is designated as Open Recreation. Signs at boat ramps warn boaters that navigation hazards such as standing dead timber, shallow water, and floating debris may be present at any time and location and it is incumbent upon boat operators to exercise caution. Boating on the lake is in accordance with USACE regulations and water safety laws of Oklahoma. The USACE encourages all boaters and swimmers to wear lifejackets at all times and to learn to swim well.

5.7.4 Recreational Seaplane Operations

Recreation seaplane landings and takeoffs may occur on water surface areas where this activity is not prohibited. A map depicting areas on Broken Bow Lake where seaplane landings and takeoffs are prohibited can be found in Appendix A. The USACE imposed restrictions that apply to seaplane operations are published by the Federal Aviation Administration in their Notice to Airmen and are also set forth in Title 36 of the Code of Federal Regulations, Chapter III, Section 327.4.

CHAPTER 6 – SPECIAL TOPICS/ISSUES/CONSIDERATIONS

6.1 COMPETING INTERESTS ON THE NATURAL RESOURCES

Broken Bow Lake is a multi-purpose project with numerous authorized purposes. The authorized purposes accommodate the needs of federal, state, and municipal users which have developed over time and have contractual rights that must be honored. The benefits provided by virtue of authorized purposes are critical to the local and regional economies and are of great interest to the public. Aside from operating the reservoir to meet the needs of those entities with contractual rights, there are many competing interests for the utilization of federal lands including recreational users, adjacent landowners, those who own mineral rights, utility providers, and all entities that provide and maintain public roads. A growing population and increasing urbanization places additional stresses on these competing interests through increased demand for water resources and recreation spaces as well as diminishing quality and space for natural habitat and open spaces. Balancing the interests of each of these groups to ensure that valid needs are met while at the same time protecting natural and cultural resources is a challenge. The purpose of this Plan is to guide management into the foreseeable future to ensure responsible stewardship and sustainability of the project's resources for the benefit of present and future generations.

6.2 FLUCTUATING WATER LEVEL

The USACE often receives comments from the public noting how water levels fluctuate rapidly or for long periods, negatively affecting recreation. The Master Plan cannot provide a solution to the problem since water management is outside the scope of master planning, but the Plan acknowledges that the water level has negatively affected water-based recreation. Recreation is one of the authorized purposes of the lake, but the other authorized purposes are also a priority, and the lake must be managed with all authorized purposes in mind and hopefully creates the right balance where the public can still enjoy water-based recreation in spite of less-than-ideal water level throughout the year. The other project purposes are flood risk management, water supply, hydropower, and fish and wildlife, in addition to recreation.

6.3 PUBLIC HUNTING ACCESS

Many public lands operated by ODWC as wildlife management are located on land owned and managed by the USACE. Partnering with ODWC allows for an improved user experience and greater access to the public. Oklahoma has less public land available for hunting than many states, so public access on USACE lands are often the best opportunity for many Oklahoma residents. Hunting at all USACE projects is in accordance with applicable Federal and State regulations. Generally, all USACE hunting areas are open for public hunting of all legal species with the use of any legal weapon for that open season except in areas designated for restricted hunting. Hunting is prohibited in developed recreational areas, lands around dams, and around other structures. Vehicles must remain on established roads, and camping is allowed in

designated areas only. Individuals interested in hunting on USACE lands should visit the Tulsa District Hunting Information webpage or visit the Broken Bow Lake Office for more information. Hunting maps, guidelines, and restrictions are available at the Tulsa District Website and Broken Bow Lake Office.

6.4 CULTURAL RESOURCES AND CONSULTATION WITH TRIBAL NATIONS

It is required for federal agencies to consult with affiliated Native American Tribes on activities that take place on federal land under federal guidance including but not limited to Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (as amended); Archaeological Resources Protection Act (ARPA) of 1979; Native American Graves Protection and Repatriation Act (NAGPRA); and 36 CFR Part 79, Curation of Federally-Owned and Administered Archeological Collections. Implementing regulations for Section 106 of the NHPA and NAGPRA are 36 CFR Part 800 and 43 CFR Part 10, respectively. All cultural resources laws and regulations should be addressed under the requirements of the National Environmental Policy Act (NEPA) of 1969 (as amended), as applicable. USACE summarizes the guidance provided in these laws in ER and EP 1130-2-540. Additionally, Executive Order 13007 states that each federal agency with responsibility for the management of Federal lands shall accommodate access to and ceremonial use of Native American sacred sites by religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

The Tulsa District takes its responsibilities for consultation on a government-to-government basis very seriously and consulted extensively with Native American Tribes on the Broken Bow Lake Master Plan. The Tulsa District consulted with Tribes primarily on developing ESA's and ensuring areas of Tribal concern were addressed. This process has allowed Tribes to become more familiar with Corps property at Broken Bow Lake, and has increased USACE staff awareness of Tribal histories, sites, and concerns in the area. This exchange of knowledge from developing the master plan will allow USACE staff to better engage with Tribes on future projects at Broken Bow Lake and will likely lead to more efficient reviews and better outcomes meeting objectives for both parties.

CHAPTER 7 – PUBLIC AND AGENCY COORDINATION

7.1 PUBLIC AND AGENCY COORDINATION OVERVIEW

The USACE is dedicated to serving the public interests in support of the overall development of land uses related to land management for cultural, natural, and recreational resources of Broken Bow Lake. An integral part of this effort is gathering public comment and engaging stakeholders in the process of planning. USACE policy guidance in ER and EP 1130-2-550 requires thorough public involvement and agency coordination throughout the master plan revision process including any associated NEPA process. Public involvement is especially important at Broken Bow Lake to ensure that future management actions are environmentally sustainable and responsive to public outdoor recreation needs. The following milestones provide a brief look at the overall process of revising the Broken Bow Lake Master Plan.

The USACE began planning to revise the Broken Lake Master Plan in the spring of 2022. The objectives for the Master Plan revision are to (1) revise land classifications to reflect changes in USACE land management policies since the 1979 Master Plan, (2) prepare new resource goals and objectives, and (3) revise the Master Plan to reflect new agency requirements for Master Plan documents in accordance with ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013.

7.2 INITIAL STAKEHOLDER AND PUBLIC MEETINGS

On May 23, 2022 a public open house was held at the Kiamichi Technology Center in Idabel, OK to inform the public of the intent to revise the master plan. The public input period remained open for 30 days from May 23, 2022 to June 23, 2022. At the public information meeting a presentation was given that included the following topics:

- What is a Master Plan?
- What a Master Plan is Not
- Why Revise a Master Plan?
- Overview of the National Environmental Policy Act (NEPA) process
- Master Planning Process
- Instructions for submitting comments

For Broken Bow Lake, USACE received seventy-three (73) comments. These comments and the USACE response can be found in Appendix E.

7.3 PUBLIC AND AGENCY REVIEW OF DRAFT MP, EA, AND FONSI

A public information open house was held for the Broken Bow Lake Master Plan revision at the Southeastern Oklahoma State University, ET Dunlap Center, McCurtain County Campus in Idabel, Oklahoma, 74745 on May 30, 2023. The meeting was attended by 11 individuals. The purpose of this meeting was to provide attendees with information regarding the proposed Master Plan revision as well as to provide them the

opportunity to provide comments on the proposed Draft Master Plan. The open house included the following topics:

- What is a Master Plan?
- What a Master Plan is Not;
- Why Revise a Master Plan?
- Overview of the National Environmental Policy Act (NEPA) process;
- Master Planning Process;
- Proposed Changes to the Master Plan; and
- Instructions for submitting comments.

The public input period remained open for 30 days from May 30, 2023, to June 29, 2023. During the 30-day comment period, the USACE received 8 comments. These comments and the USACE response can be found in Appendix E.

7.4 TRIBAL CONSULTATION

In 2022, the USACE consulted with the Oklahoma State Historic Preservation Officer (SHPO) and the appropriate Tribal Nations on the notice of availability for the scoping effort for this Master Plan and Environmental Assessment seeking their comments and confirmation of interest. A sample letter is included in Appendix B. Seven recognized Tribal Nations have an interest in McCurtain County, Oklahoma.

The following Tribal Nations were consulted in 2022:

- Caddo Nation of Oklahoma
- Chickasaw Nation
- Choctaw Nation of Oklahoma
- Osage Nation
- Quapaw Nation
- United Keetoowah Band of Cherokee Indians
- Wichita and Affiliated Tribes

In 2023, the draft Master Plan and Environmental Assessment were completed. The Cherokee Nation was identified through the Tribal Directory Assessment Tool (TDAT) website in 2023 as possibly having an interest in McCurtain County and were added to the consultation distribution list at that time. A sample letter is included in Appendix B.

The following eight Tribal Nations were consulted in 2023:

- Caddo Nation of Oklahoma
- Cherokee Nation
- Chickasaw Nation
- Choctaw Nation of Oklahoma
- Osage Nation

- Quapaw Nation
- United Keetoowah Band of Cherokee Indians
- Wichita and Affiliated Tribes

CHAPTER 8 – SUMMARY OF RECOMMENDATIONS

8.1 SUMMARY OVERVIEW

The preparation of this Master Plan for Broken Bow Lake followed the USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated January 30, 2013. Three major requirements set forth in the guidance include the preparation of contemporary Resource Objectives, Classification of project lands using the approved classification standards, and the preparation of a Resource Plan describing in broad terms how the land in each of the land classifications will be managed into the foreseeable future. Additional important requirements include rigorous public involvement throughout the process, consideration of regional recreation and natural resource management priorities identified by other federal, state, and municipal authorities, and consultation with local Tribal Nations.

The study team endeavored to follow this guidance to prepare a Master Plan that will provide for enhanced recreational opportunities for the public, improve environmental quality, and foster a management philosophy conducive to existing and projected USACE staffing levels at Broken Bow Lake as also reflected in ER 1130-2-540 change 2 dated July 2005. Factors considered in the Plan development were identified through public involvement and review of regional and statewide planning documents including the 2012 Oklahoma SCORP, Mobility Plans by ODOT, EPA Ecoregion Handbook and descriptions, and the USFWS ICAP website. This Master Plan will guide the long-term sustainability of the outdoor recreation program and natural resources associated with Broken Bow Lake.

8.2 LAND CLASSIFICATION PROPOSALS

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to the updated land classification standards that reflect how lands are being managed now and will be managed in the foreseeable future. The updated land classification standards will also comply with current USACE standards. Public comment was solicited to assist in making these land reclassification decisions. Consultation was also conducted with Tribal Nations to provide input on cultural and natural resources to help inform the land classification decisions. Chapter 7 of this Plan describes the public involvement process and Appendix E provides a summary of public comments received. After analyzing public comment, examining recreational trends, and taking into account regional natural resource management priorities, USACE team members reclassified the Federal lands and waters associated with Broken Bow Lake as described in Table 8.1 and explained in Table 8.2.

Table 8.1 Change from 1979 Land and Water Surface Classifications to 2023 Land and Water Surface Classification

Prior Land Classifications (1979)	Acres	Land Classifications (2023)	Acres	Net Difference
Project Operations	427	Project Operations (PO)	322	(105)
Operations: Recreation – Intensive Use	3,468	High Density Recreation (HDR)	3,431	(37)
		Environmentally Sensitive Areas (ESA)	890	890
Operations: Recreation – Low Density	5,913	Multiple Resource Management – Low Density Recreation (LDR)	2,492	(3,421)
Operations: Wildlife Management	3,222	Multiple Resource Management – Wildlife Management (WMA)	6,821	3,599
Recreation Lands	896			(896)
Not Classified	58			(58)
TOTAL	13,984		13,956	(28)
Prior Water Surface Classifications (1979)	Acres	Water Surface Classifications (2023)	Acres	Net Difference
Permanent Pool	14,151	Open Recreation	14,007	
		Designated No-Wake	123	123
		Restricted	21	21
TOTAL	14,151		14,151	0
TOTAL FEE	28,135		28,107	(28)

* Total Acreage differences from the 1979 total to the 2022 totals are due to improvements in measurement technology, deposition/siltation, and erosion. Totals also differ due to rounding while adding parcels.

Table 8.2 lists the descriptions and justifications for the reclassification of USACE lands at Broken Bow Lake. The team examined numerous parcels that ranged from a few acres to hundreds of acres, and rather than describing how each individual parcel was reclassified, the changes are grouped by classification category. A few examples of changes made to individual parcels are provided to assist in understanding how and why changes were made. The prior land classification Recreation – Intensive Use is

similar to the current HDR classification; the prior Recreation – Low Density is similar to the current MRML – LDR classification; and the prior Wildlife Management classification is similar to the current MRML – WMA classification. The following table shows changes from the prior classification to current but combines the similar classifications for ease of showing changed acres.

Table 8.2 Changes and Justifications for Land Classifications ⁽¹⁾

Land Classification	Description of Changes ⁽²⁾	Justification
Project Operations (PO)	<p>The net decrease in Project Operations lands from 427 to 322 is due to the following:</p> <ul style="list-style-type: none"> • 1 acre REC-IU reclassified to PO. • 114 acres PO reclassified to LDR. • 12 acres PO reclassified to water surface. • 21 acres PO reclassified to WM. • 40 acres Recreation Lands reclassified to PO. • 2 acres water surface reclassified to PO. 	<p>All lands classified as PO are managed and used primarily in support of critical operational requirements related to the primary missions of flood risk management and water conservation, including the expansion of PO near the dam to include quarry access and account for the spillway. Additionally, acres previously classified as PO north of 259A were reclassified to reflect the current use of LDR. Note: Quarry access will be via the spillway location. Acres originally established as Recreation Lands near Overlook were reclassified to PO to appropriately capture current use.</p>
High Density Recreation (HDR)	<p>The net decrease in High Density Recreation Lands from 3,468 to 3,431 is due to the following:</p> <ul style="list-style-type: none"> • 3,043 acres REC-IU reclassified to HDR. • 4 acres LDU reclassified to HDR. • 384 acres Recreation Lands to HDR. <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>The net decrease in HDR is due to an area between the Overlook and River Bend Area. Acres in this area are currently being managed as LDR and PO therefore an update to the land classification was necessary. Additionally, acres near Beavers Bend State Park, Carson Creek, and Cedar Creek Golf Course were reclassified from Recreation Lands to HDR to reflect current naming and use. The reclassification of 3,043 acres by classification name only was necessary. These acres previously classified as REC-IU</p>

Land Classification	Description of Changes ⁽²⁾	Justification
		were reclassified using current policy naming of HDR.
Environmentally Sensitive Areas (ESA)	<p>The classification of 890 acres as Environmentally Sensitive Areas resulted from the following:</p> <ul style="list-style-type: none"> • 4 acres REC-IU reclassified to ESA. • 400 acres REC-LDU reclassified to ESA. • 486 acres OPS: WM reclassified to ESA. 	<p>Reclassification of 890 acres was determined by the study team to be necessary to provide a high level of protection for those areas supporting significant habitat, views, or cultural sites. Classifying these areas as ESA will afford these areas with the highest level of protection from disturbance. The reclassification of these acres will have no effect on current or projected public use.</p>
MRML – Low Density Recreation (LDR)	<p>The net decrease in Low Density Recreation acres from 5,913 to 2,492 is due to the following:</p> <ul style="list-style-type: none"> • 4 acres not previously classified identified as LDR. • 121 acres REC-IU reclassified to LDR. • 400 acres REC-LDU reclassified to ESA. • 4 acres REC-LDU reclassified to HDR. • 1,942 acres REC-LDU reclassified to LDR. • 3,567 acres REC-LDU reclassified to WM. • 4 acres WM reclassified to LDR. • 114 PO reclassified to LDR. • 307 acres Recreation Lands to LDR. 	<p>The largest contributing factor to the decrease in LDR is due to the 3,567 acres previously in LDR which were reclassified to WM. The study team determined large areas on the eastern shoreline of the lake from Otter Creek south to the PO area near the dam were currently managed as WM with no future plans for development. Lands previously identified as REC-IU near the Holly Cove area were reclassified as LDR to reflect current use. Additionally, acres previously classified as Recreation Lands south of 259A and north of the River Bend Area were reclassified to reflect the current use of LDR management in the area.</p>

Land Classification	Description of Changes ⁽²⁾	Justification
MRML – Wildlife Management (WM)	<p>The net increase in Wildlife Management acres from 3,222 to 6,821 is due to the following:</p> <ul style="list-style-type: none"> • 51 acres not previously classified to WM. • 296 acres REC-IU reclassified to WM. • 3,567 acres REC-LDU reclassified to WM. • 486 OPS: WM reclassified to ESA. • 4 acres WM reclassified to LDR. • 2,736 acres OPS: WM reclassified to WM. • 21 acres PO reclassified to WM. • 149 acres Recreation Lands reclassified to WM. 	<p>The largest contributing factor to the increase in WM is due to the 3,567 acres previously in LDR which were reclassified to WM. This change was determined necessary by the study team to capture existing land use and management of these acres. Location details of the area are mentioned above.</p>

(1) The land classification changes described in this table are the result of changes to individual parcels of land ranging from a few acres to several hundred acres. New acreages were measured using more accurate GIS technology, thus total changes will not equal individual changes. The acreage numbers provided are approximate.

(2) Acreages are based on GIS measurements and may vary from net difference detailed in Table 8-1.

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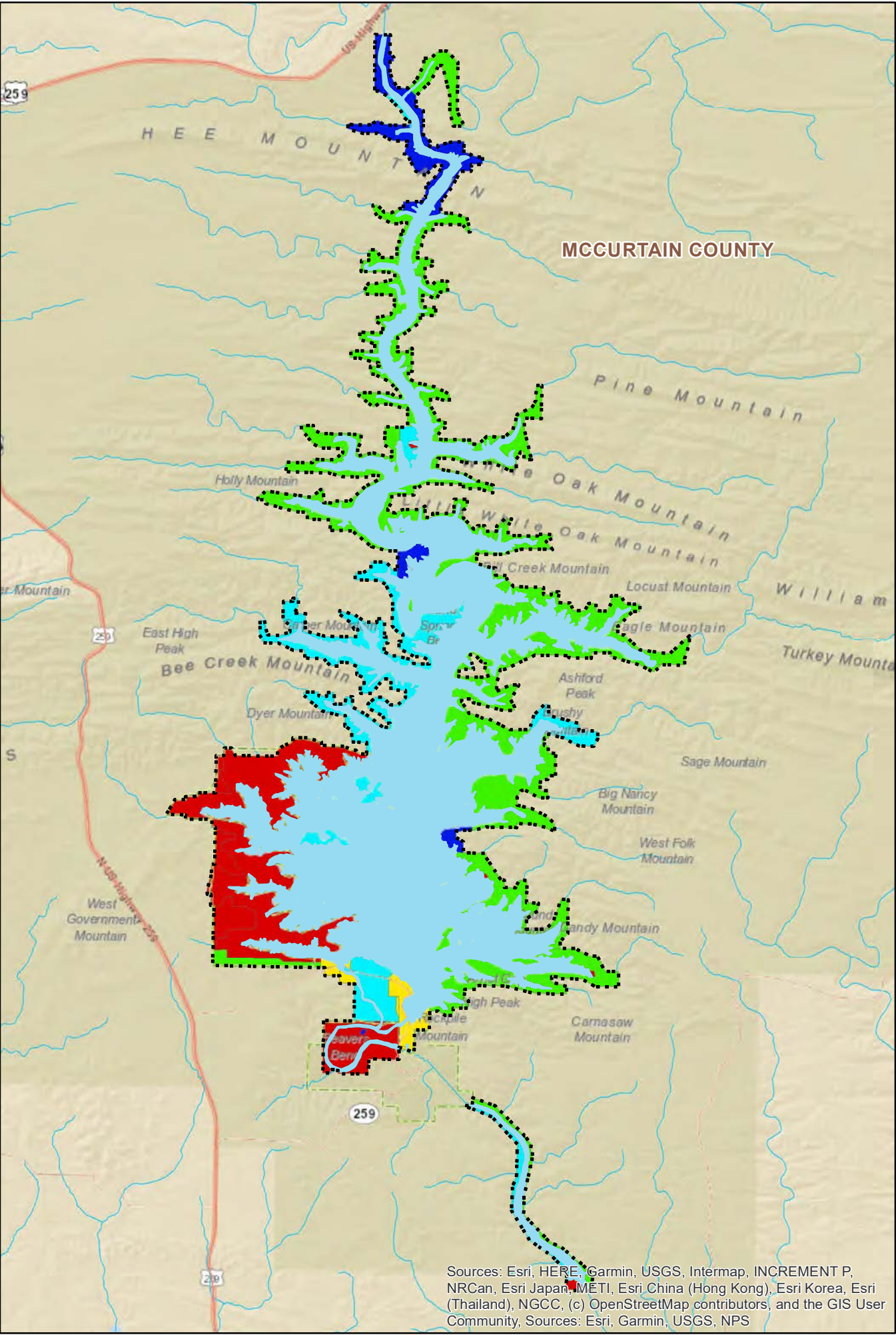
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1967a The E. Johnson Site and Prehistory in Southeast Oklahoma. Archaeological Site Report No. 6, Oklahoma River Basin Survey Project, University of Oklahoma Research Institute, Norman, Oklahoma. Copies available from U.S. Army Corps of Engineers, Tulsa District

1967b Woods Mound Group: A Prehistoric Mound Complex in McCurtain County, Oklahoma. Miscellaneous Report No. 1, Oklahoma River Basin Surveys, Norman, Oklahoma. Copies available from U.S. Army Corps of Engineers, Tulsa District

1968 The Beaver Site and Archaeology of the Broken Bow Reservoir Area, McCurtain County, Oklahoma. Archaeological Site Report No. 9, Oklahoma River Basin Survey Project, University of Oklahoma Research Institute, Norman, Oklahoma. Copies available from U.S. Army Corps of Engineers, Tulsa District

APPENDIX A – LAND CLASSIFICATION, MANAGING AGENCIES, AND RECREATION MAPS



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community. Sources: Esri, Garmin, USGS, NPS

INDEX TO MASTER PLAN MAPS

GENERAL

MAP NO.	TITLE
BB22MP-OI-00	PROJECT LOCATION & INDEX TO MAPS
BB22MP-OM-01	LAND MANAGING ENTITIES
BB22MP-OP-01	SEA PLANE GUIDE
BB22MP-OW-01	WATER SURFACE CLASSIFICATIONS AND MARINAS

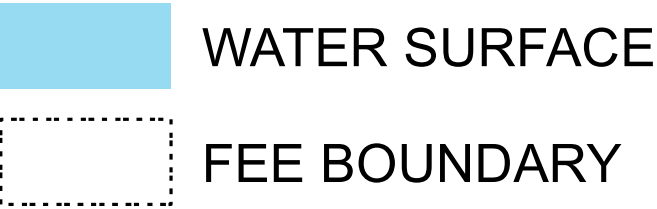
LAND CLASSIFICATION

MAP NO.	TITLE
BB22MP-LC-01	MASTER PLAN REVISION LAND CLASSIFICATION CHANGES
BB22MP-OC-00	LAND AND WATER CLASSIFICATIONS (00)
BB22MP-OC-01	LAND AND WATER CLASSIFICATIONS (01)
BB22MP-OC-02	LAND AND WATER CLASSIFICATIONS (02)
BB22MP-OC-03	LAND AND WATER CLASSIFICATIONS (03)

RECREATIONAL AREAS

MAP NO.	TITLE
BB22MP-OR-0A	MANAGED RECREATIONAL AREAS
BB22MP-OR-0B	PARK PLATE INDEX
BB22MP-OR-01	PANTHER CREEK PARK
BB22MP-OR-02	HOLLY CREEK COVE
BB22MP-OR-03	CEDAR CREEK COVE GOLF COURSE
BB22MP-OR-04	CARSON CREEK RECREATION AREA
BB22MP-OR-05	BEAVERS BEND STATE PARK
BB22MP-OR-06	STEVENS GAP AND OVERLOOK AREAS
BB22MP-OR-07	RIVER BEND AREA
BB22MP-OR-08	MOUNTAIN FORK PARK
BB22MP-OR-09	EAST RAMP

THIS PRODUCT IS REPRODUCED FROM GEOSPATIAL INFORMATION PREPARED BY THE U.S. ARMY CORPS OF ENGINEERS. GIS DATA AND PRODUCT ACCURACY MAY VARY. THEY MAY BE DEVELOPED FROM SOURCES OF DIFFERING ACCURACY. ACCURATE ONLY FOR CERTAIN SCALES, BASED ON MODELING OR INTERPRETATION, INCOMPLETE WHILE BEING CREATED OR REVISED. USING GIS PRODUCTS FOR PURPOSES OTHER THAN THOSE FOR WHICH THEY WERE CREATED MAY YIELD INACCURATE OR MISLEADING RESULTS.

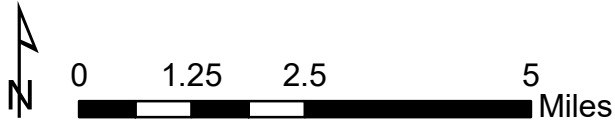


U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT

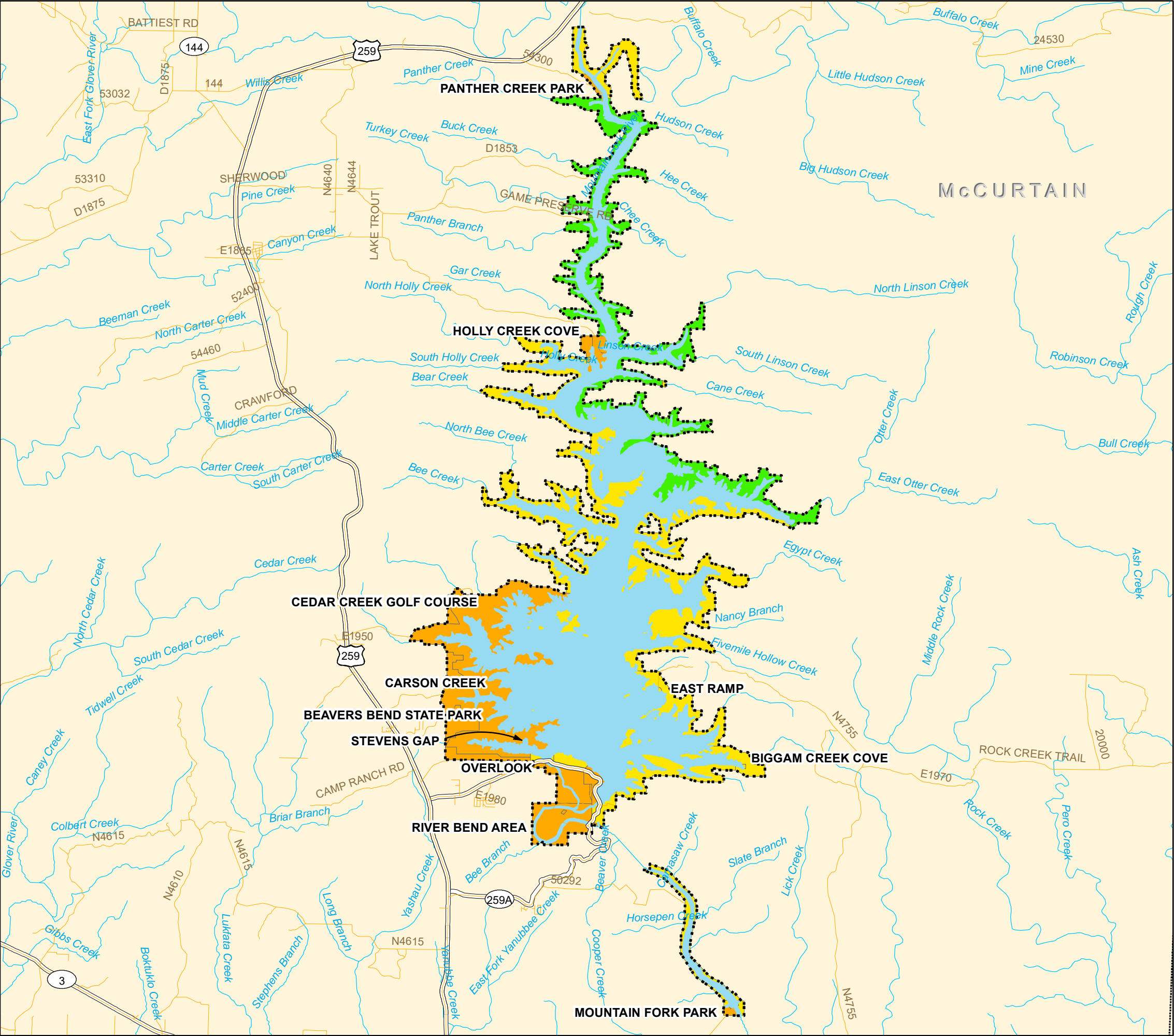
BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA






BROKEN BOW LAKE MASTER PLAN

PROJECT LOCATION AND INDEX TO MAPS



DATE:	MAP NO.
MAY 2023	BB22MP-OI-00



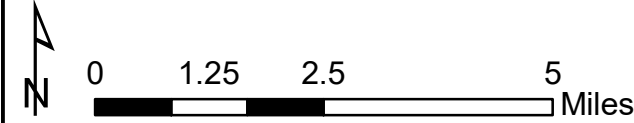
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-  OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION
-  U.S. ARMY CORPS OF ENGINEERS
-  WATER SURFACE
-  FEE BOUNDARY



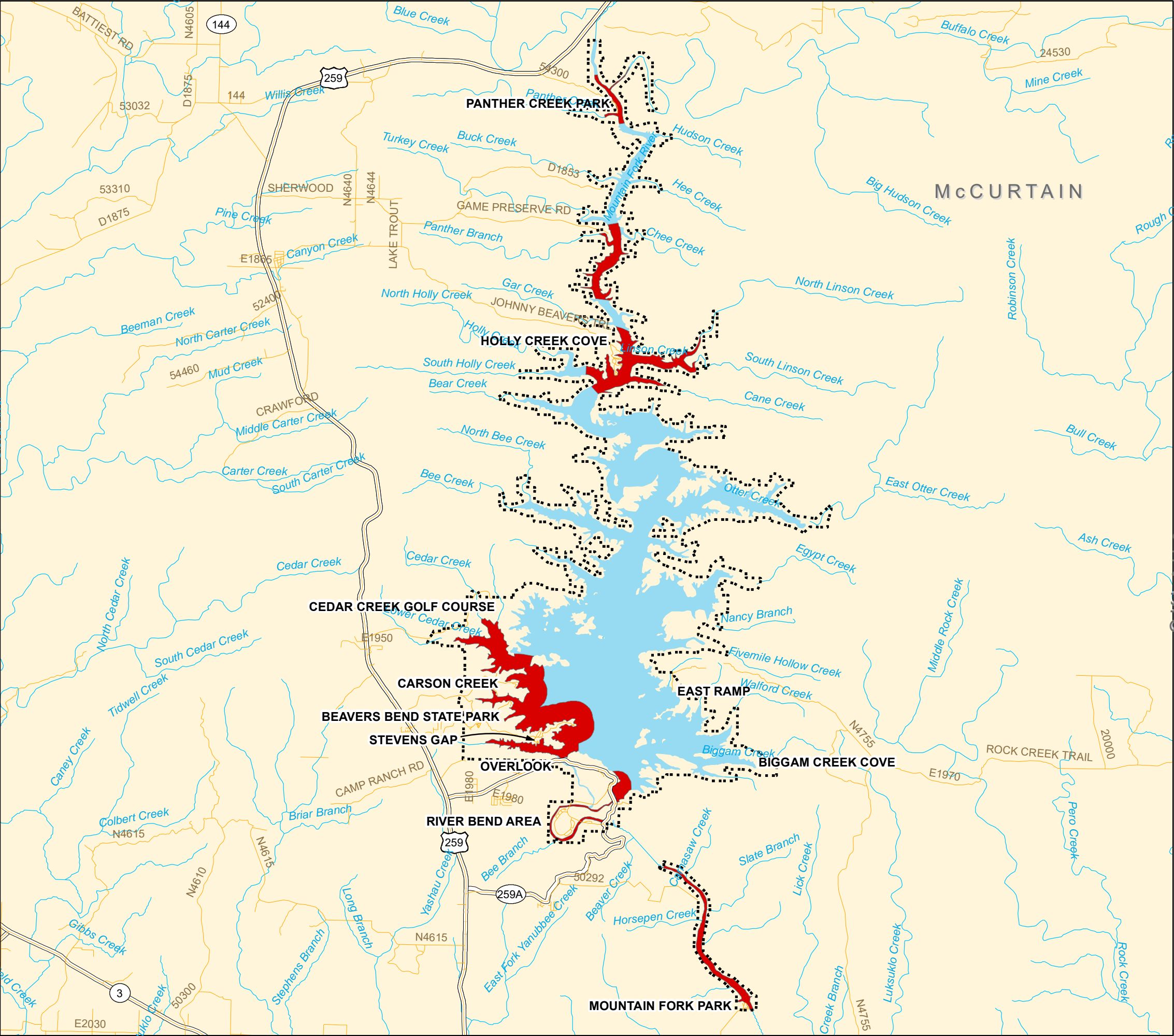
**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**




BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

**BROKEN BOW LAKE MASTER PLAN
LAND MANAGING ENTITIES**




DATE:	MAP NO.
MAY 2023	BB22MP-OM-01



-  RESTRICTED AREAS
-  WATER SURFACE
-  FEE BOUNDARY

**TAKE OFF AND LANDING PROHIBITED
WITHIN 2,000' OF DAM STRUCTURE AND
RECREATION AREAS, ALSO WITHIN
STATE GAME RESERVE BOUNDARIES**

**OPERATION OF A SEAPLANE AT CORPS
PROJECTS IS AT THE RISK OF THE
PLANE'S OWNER, OPERATOR,
AND / OR PASSENGER(S)**



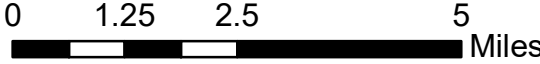

**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

MOUNTAIN FORK RIVER, OKLAHOMA

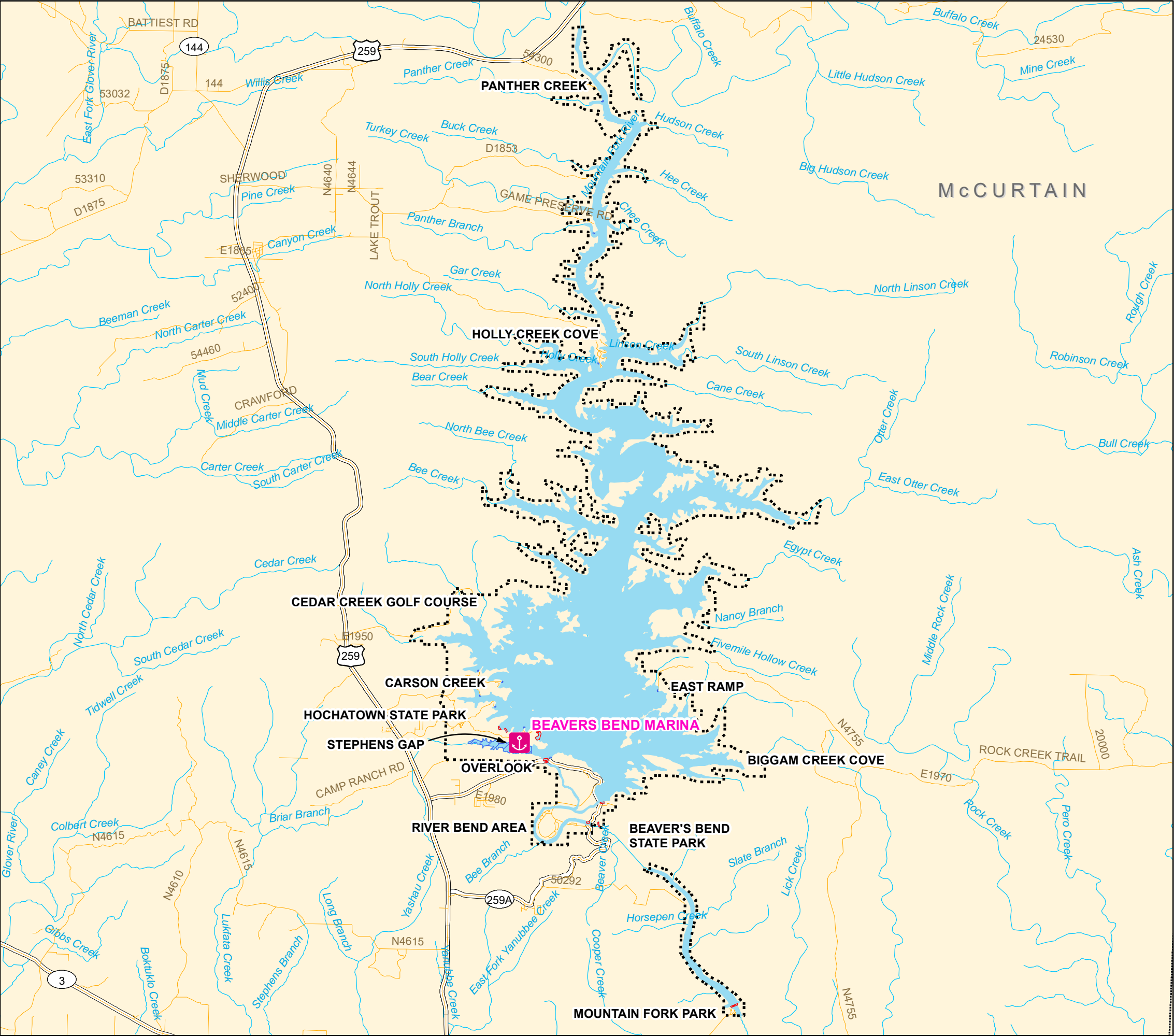
BROKEN BOW LAKE MASTER PLAN






SEA PLANE GUIDE



DATE:
MAY 2023

MAP NO.
BB22MP-OP-01



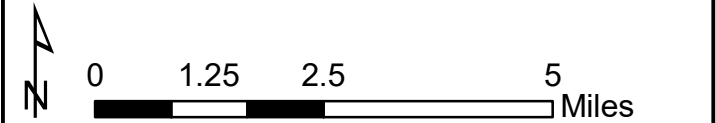
-  MARINAS / CONCESSIONS
-  WATER SURFACE: DESIGNATED NO WAKE
-  WATER SURFACE: RESTRICTED
-  WATER SURFACE: OPEN RECREATION
-  FEE BOUNDARY



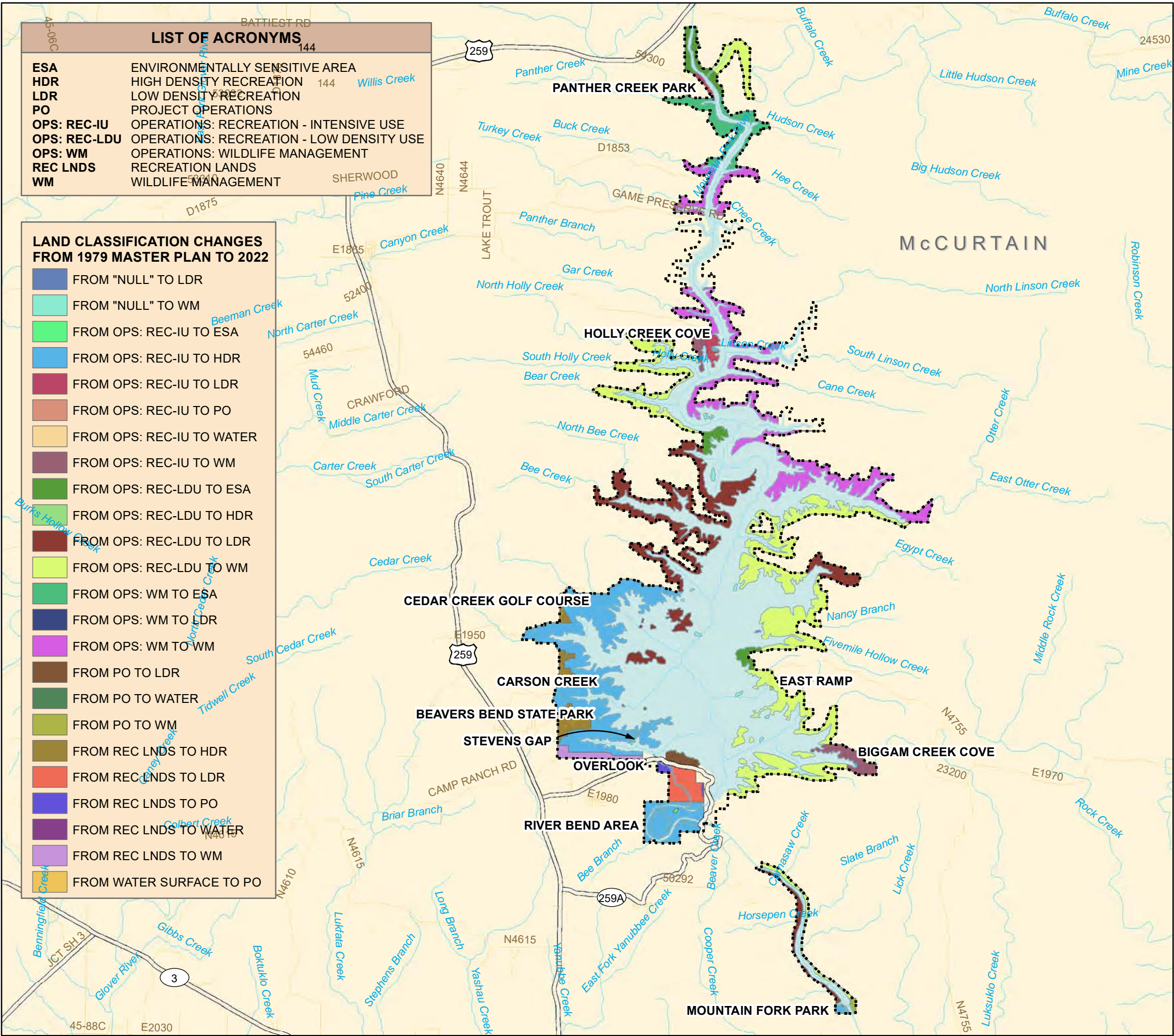
**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

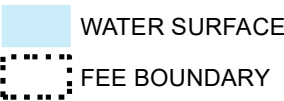
**BROKEN BOW LAKE MASTER PLAN
WATER SURFACE CLASSIFICATIONS
AND MARINAS**



DATE:	MAP NO.
MAY 2023	BB22MP-OW-01



USACE BASE MAP LAYERS



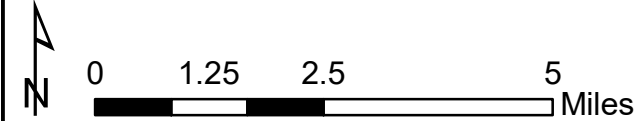
**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

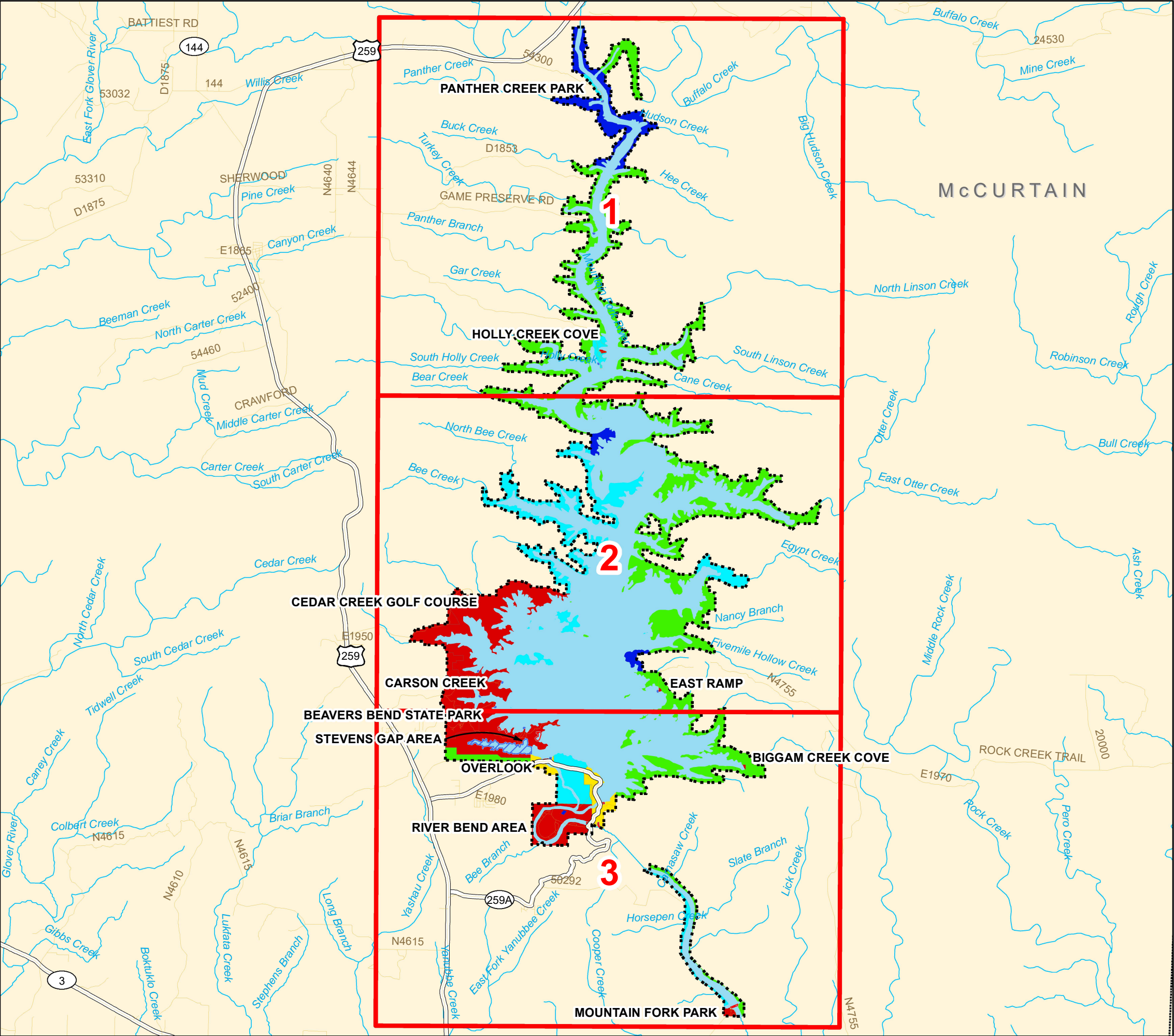
BROKEN BOW LAKE MASTER PLAN

MASTER PLAN REVISION


LAND CLASSIFICATION CHANGES



DATE:	MAP NO.
MAY 2023	BB22MP-LC-01



- INDEX GRID
- ENVIRONMENTALLY SENSITIVE AREA
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- PROJECT OPERATIONS
- WILDLIFE MANAGEMENT
- WATER SURFACE: NO WAKE
- WATER SURFACE: OPEN RECREATION
- WATER SURFACE: RESTRICTED
- FEE BOUNDARY




**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

LAND AND WATER CLASSIFICATIONS
(INDEX SHEET 00)



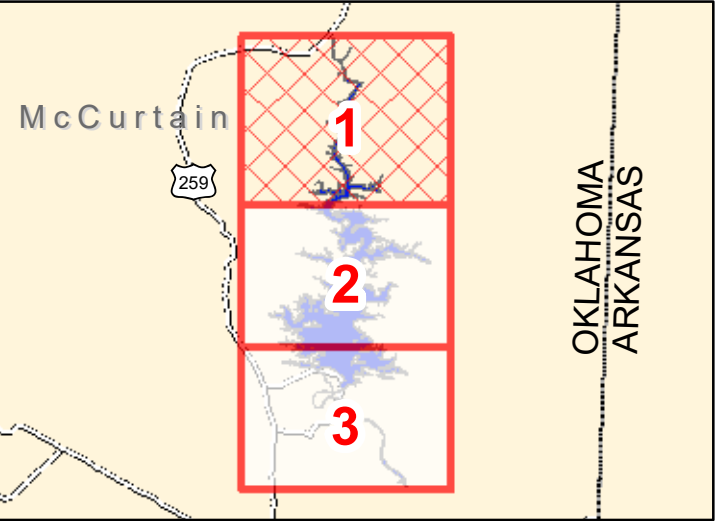
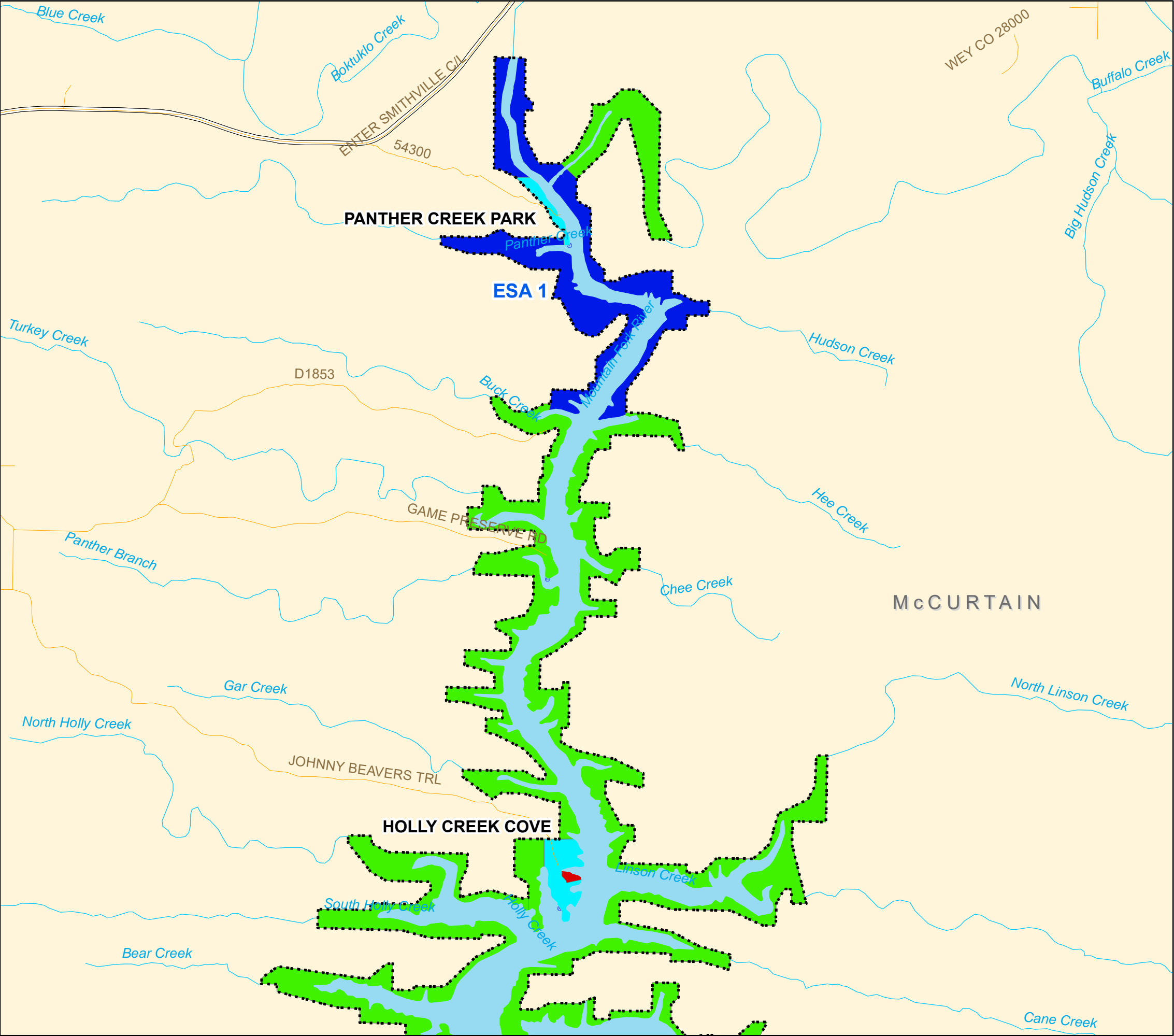
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




DATE:

MAY 2023

MAP NO.

BB22MP-OC-00



-  ENVIRONMENTALLY SENSITIVE AREA
-  HIGH DENSITY RECREATION
-  LOW DENSITY RECREATION
-  WILDLIFE MANAGEMENT
-  WATER SURFACE: NO WAKE
-  WATER SURFACE: OPEN RECREATION
-  FEE BOUNDARY



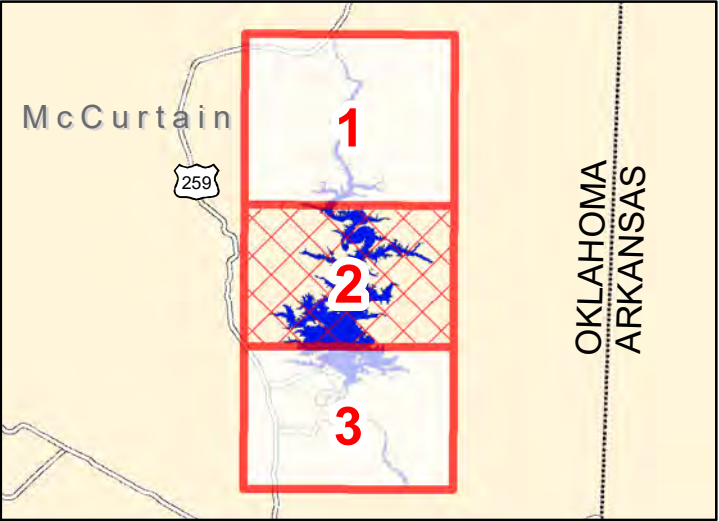
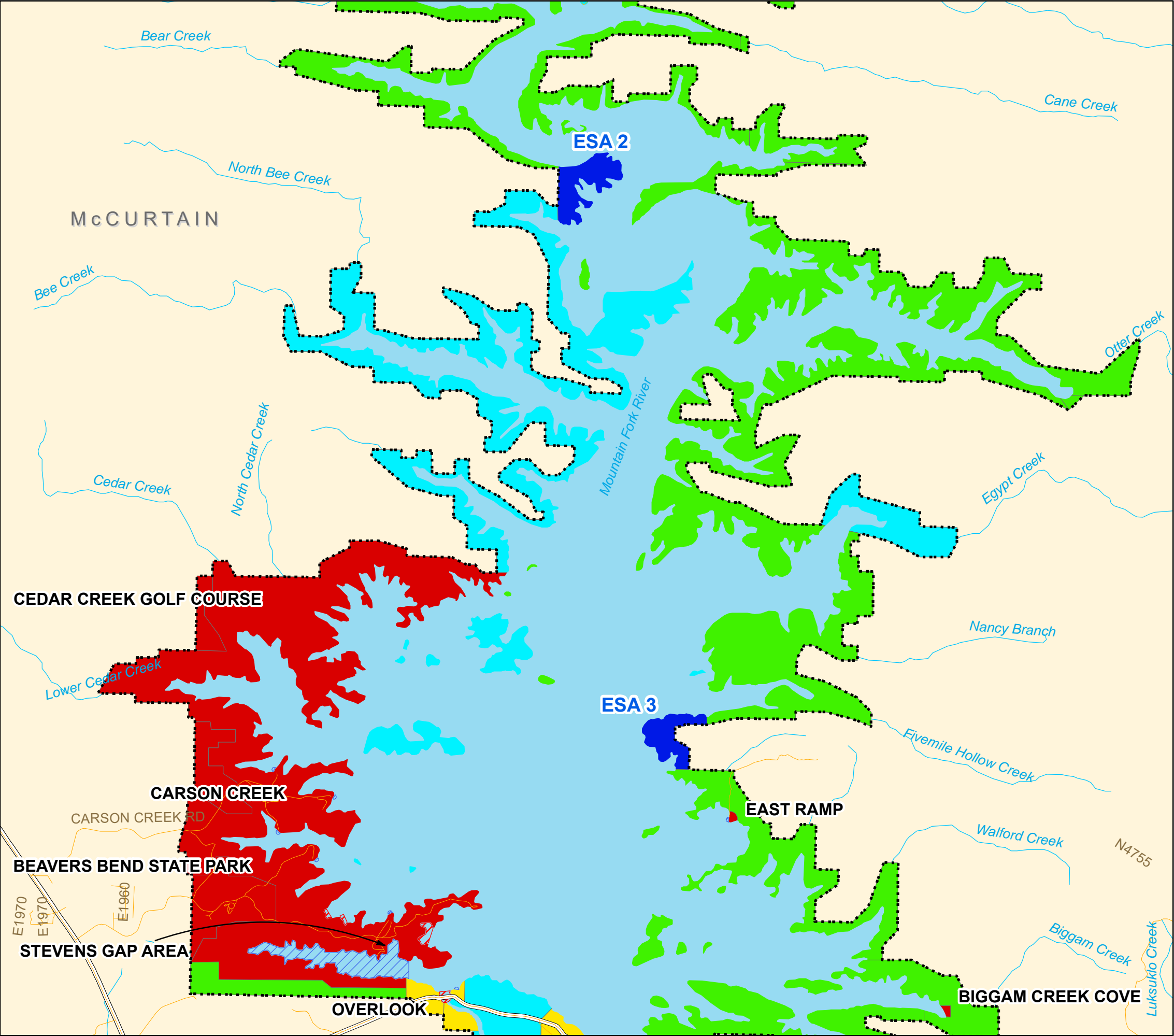
**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**










BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA


**BROKEN BOW LAKE MASTER PLAN
LAND AND WATER CLASSIFICATIONS
(INDEX SHEET 01)**



DATE:	MAP NO.
MAY 2023	BB22MP-OC-01



-  ENVIRONMENTALLY SENSITIVE AREA
-  HIGH DENSITY RECREATION
-  LOW DENSITY RECREATION
-  PROJECT OPERATIONS
-  WILDLIFE MANAGEMENT
-  WATER SURFACE: NO WAKE
-  WATER SURFACE: OPEN RECREATION
-  WATER SURFACE: RESTRICTED
-  FEE BOUNDARY





**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

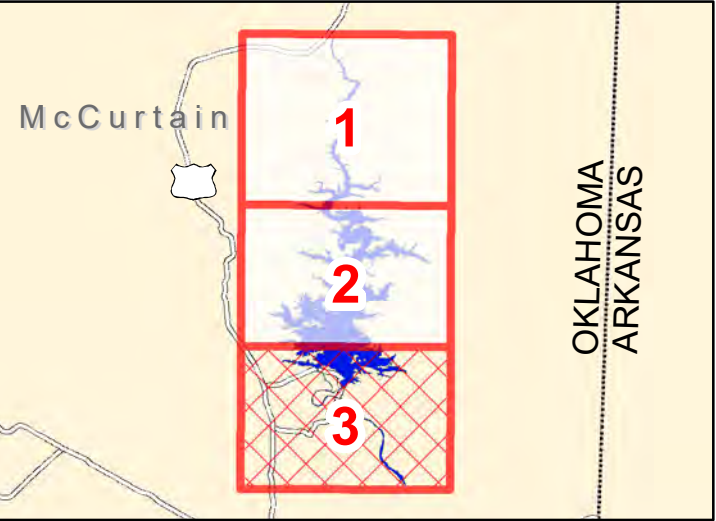
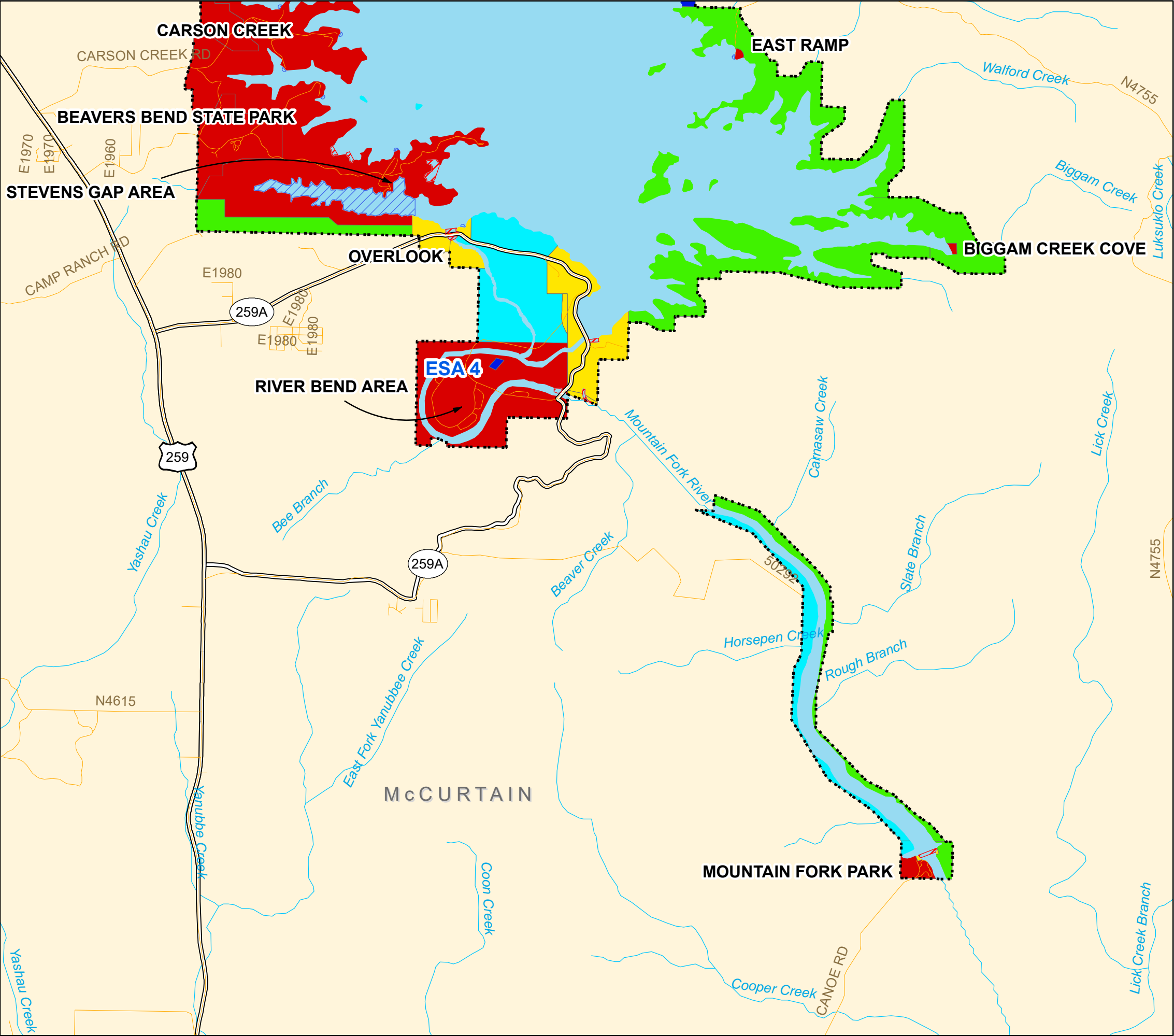
MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN
LAND AND WATER CLASSIFICATIONS
(INDEX SHEET 02)




DATE:
MAY 2023

MAP NO.
BB22MP-OC-02



- ENVIRONMENTALLY SENSITIVE AREA
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- PROJECT OPERATIONS
- WILDLIFE MANAGEMENT
- WATER SURFACE: NO WAKE
- WATER SURFACE: RESTRICTED
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY





**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

MOUNTAIN FORK RIVER, OKLAHOMA

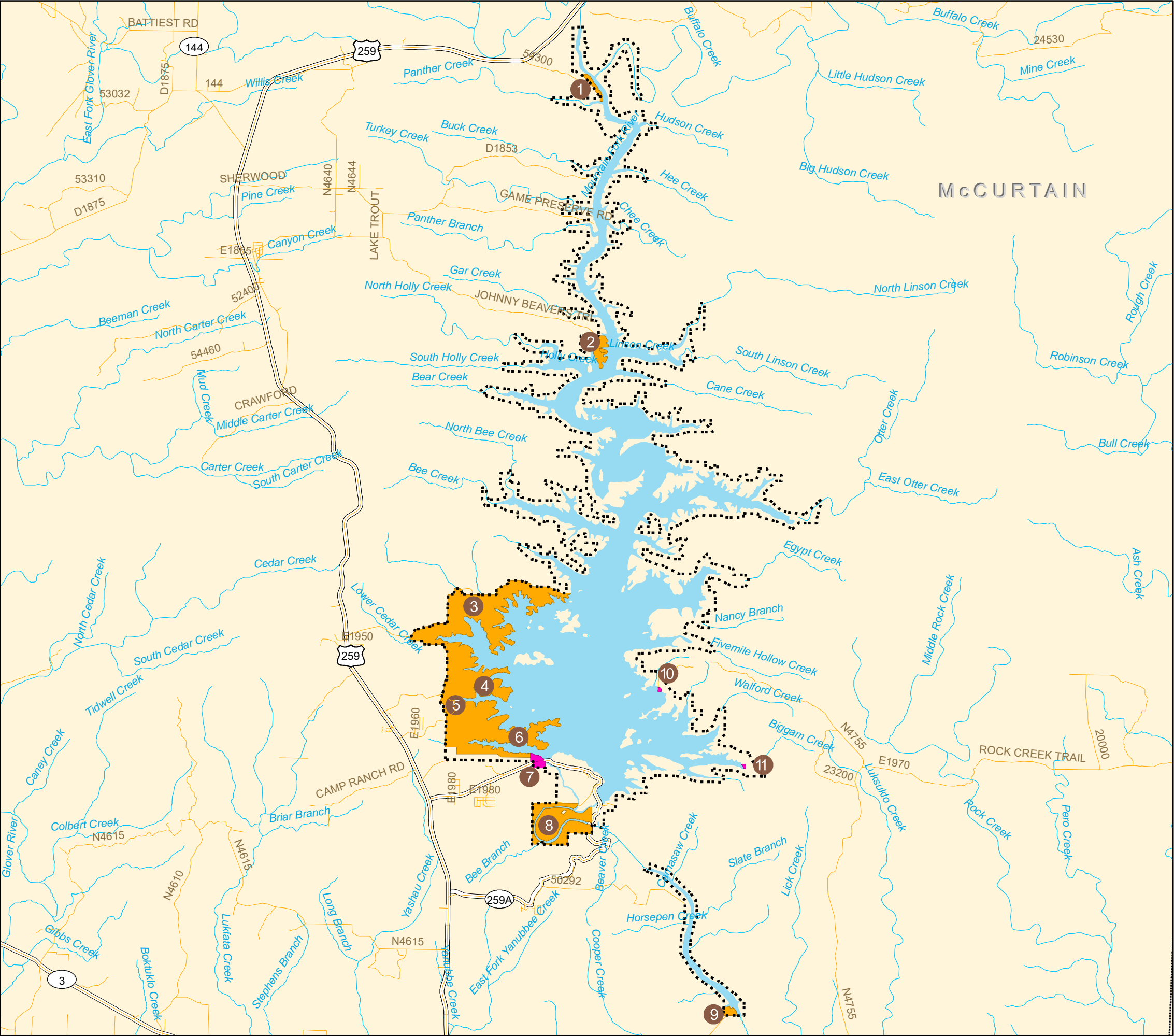
BROKEN BOW LAKE MASTER PLAN



LAND AND WATER CLASSIFICATIONS
(INDEX SHEET 03)




DATE:
MAY 2023

MAP NO.
BB22MP-OC-03



-  OKLAHOMA TOURISM & RECREATION DEPARTMENT
-  US ARMY CORPS OF ENGINEERS

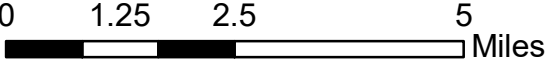

- KEY TO PARKS
- 1 PANTHER CREEK PARK
 - 2 HOLLY CREEK COVE
 - 3 CEDAR CREEK COVE GOLF COURSE
 - 4 CARSON CREEK RECREATION AREA
 - 5 BEAVERS BEND STATE PARK
 - 6 STEVENS GAP AREA
 - 7 OVERLOOK AREA
 - 8 RIVER BEND AREA
 - 9 MOUNTAIN FORK PARK
 - 10 EAST RAMP
 - 11 BIGGAM CREEK COVE



**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN
MANAGED RECREATIONAL AREAS







DATE:
MAY 2023

MAP NO.
BB22MP-OR-0A



ITEM	EXISTING
BOAT RAMP	1
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	10
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	
SHOWERS	
DUMP STATION	

-  BOAT RAMP
-  CAMPSITE
-  PARKING
-  FEE BOUNDARY

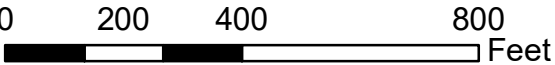


U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT

BROKEN BOW LAKEMOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(PANTHER CREEK PARK)







DATE:	MAP NO.
MAY 2023	BB22MP-OR-01


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	2
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	22
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	8
RESTROOMS	
SHOWERS	
DUMP STATION	

-  BOAT RAMP
-  CAMPSITE
-  VAULT TOILET
-  FEE BOUNDARY




**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

**RECREATIONAL AREAS
(HOLLY CREEK COVE)**



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DATE:






MAY 2023

MAP NO.

BB22MP-OR-02



ITEM	EXISTING
BOAT RAMP	
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	
SHOWERS	
DUMP STATION	

-  GOLF COURSE PRO SHOP
-  PARKING
-  GOLF CART PATH
-  GOLF FAIRWAYS
-  FEE BOUNDARY

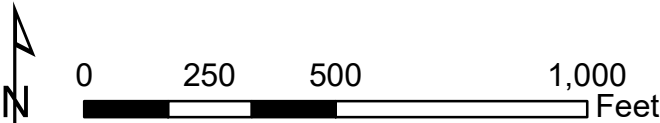


U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT

BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(CEDAR CREEK GOLF COURSE)









DATE:	MAP NO.
MAY 2023	BB22MP-OR-03

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	3
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	69
ELECTRICAL HOOK-UP	23
GROUP PICNIC SHELTER	1
PICNIC SITES	
VAULT TOILET	
RESTROOMS	4
SHOWERS	1
DUMP STATION	1

-  BOAT RAMP
-  CAMPSITE
-  PARKING
-  PICNIC SHELTER
-  PLAYGROUND
-  RESTROOM
-  RESTROOM W/ SHOWERS
-  SANITARY DUMP STATION
-  FEE BOUNDARY

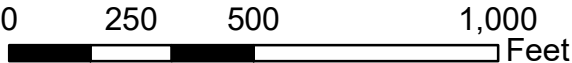


U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT

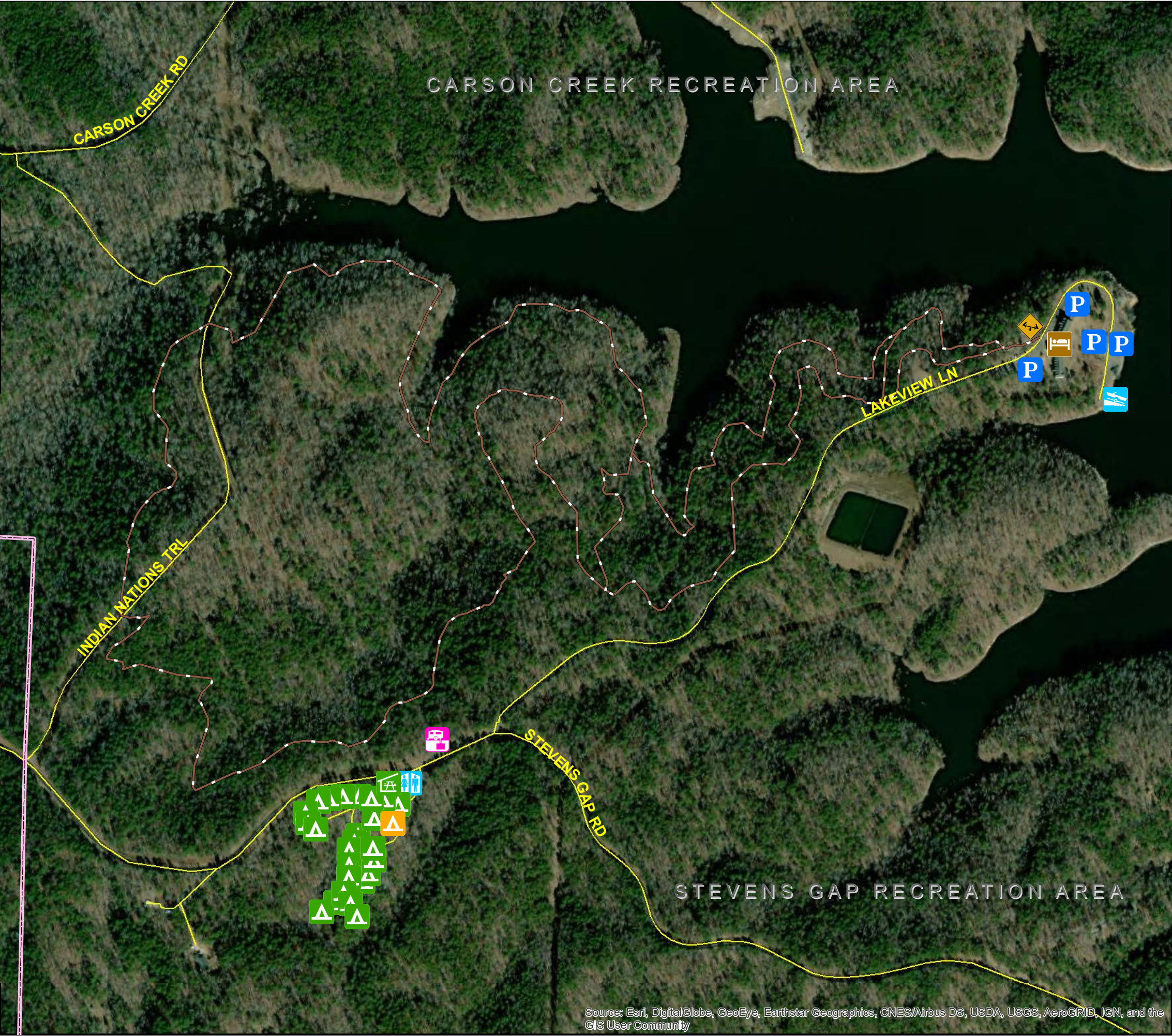
BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(CARSON CREEK
RECREATION AREA)














DATE:	MAP NO.
MAY 2023	BB22MP-OR-04



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	1
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	27
ELECTRICAL HOOK-UP	27
GROUP PICNIC SHELTER	1
PICNIC SITES	
VAULT TOILET	
RESTROOMS	1
SHOWERS	1
DUMP STATION	1

-  BOAT RAMP
-  CAMP HOST
-  CAMPSITE
-  LAKEVIEW LODGE
-  PARKING
-  PICNIC SHELTER
-  PLAYGROUND
-  RESTROOM W/ SHOWERS
-  SANITARY DUMP STATION
-  HIKING TRAIL
-  FEE BOUNDARY

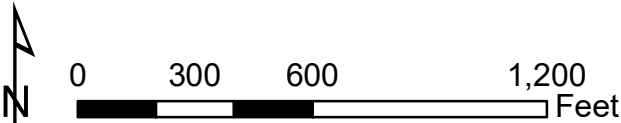


U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT

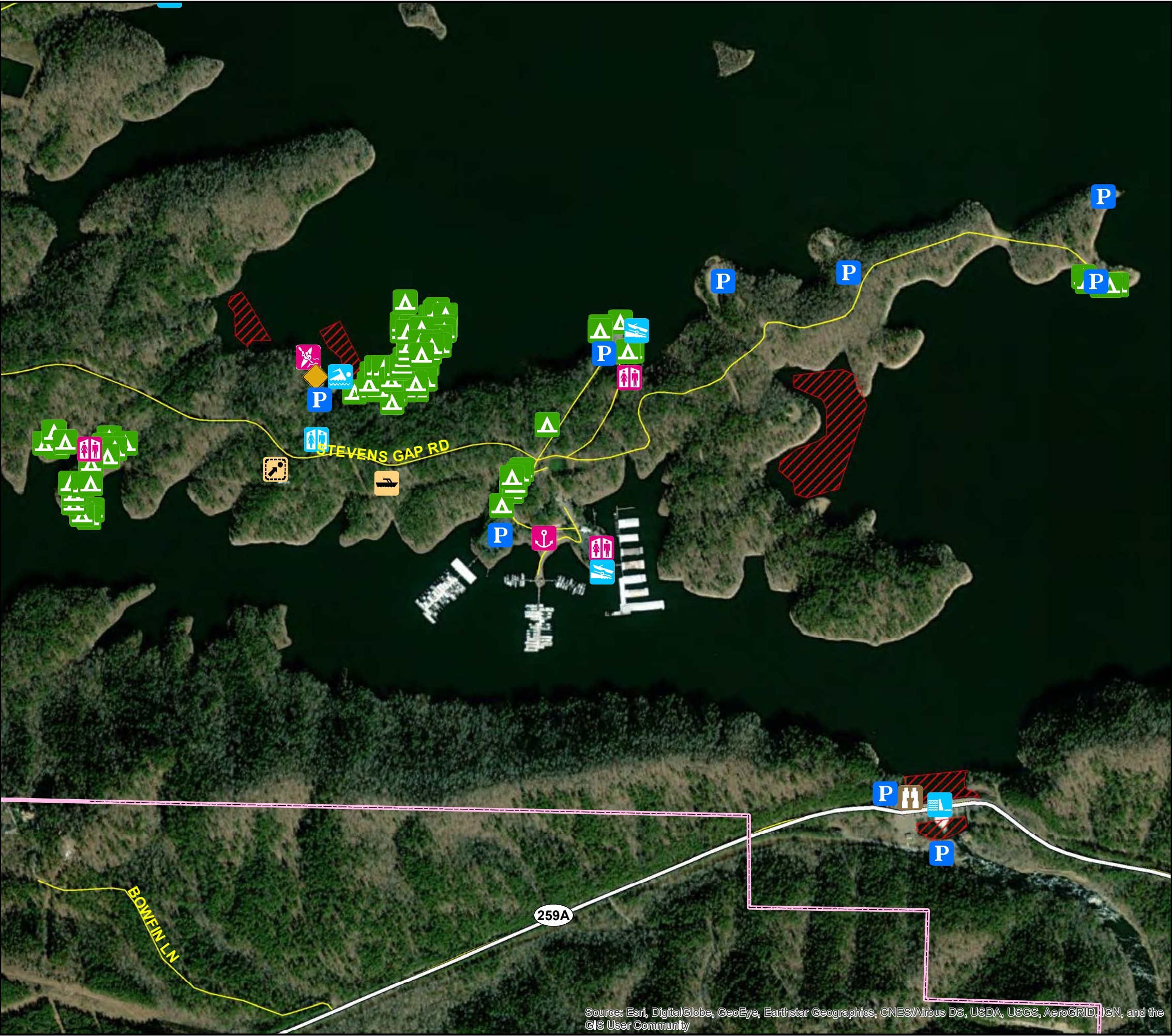
BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(BEAVERS BEND STATE PARK)



















DATE:	MAP NO.
MAY 2023	BB22MP-OR-05



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	2
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	81
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	4
SHOWERS	1
DUMP STATION	

-  BOAT RAMP
-  KAYAK RENTAL
-  MARINA
-  RESTROOM
-  RESTROOM W/ SHOWERS
-  SPILLWAY
-  SWIM BEACH
-  VAULT TOILET
-  ZIPLINE STOREFRONT
-  WATER SURFACE: RESTRICTED
-  FEE BOUNDARY
-  CAMPSITE
-  BOAT LAKE TOURS STOREFRONT
-  PARKING
-  PLAYGROUND
-  OVERLOOK

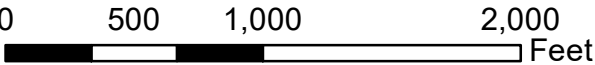


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OF ENGINEERS
TULSA DISTRICT

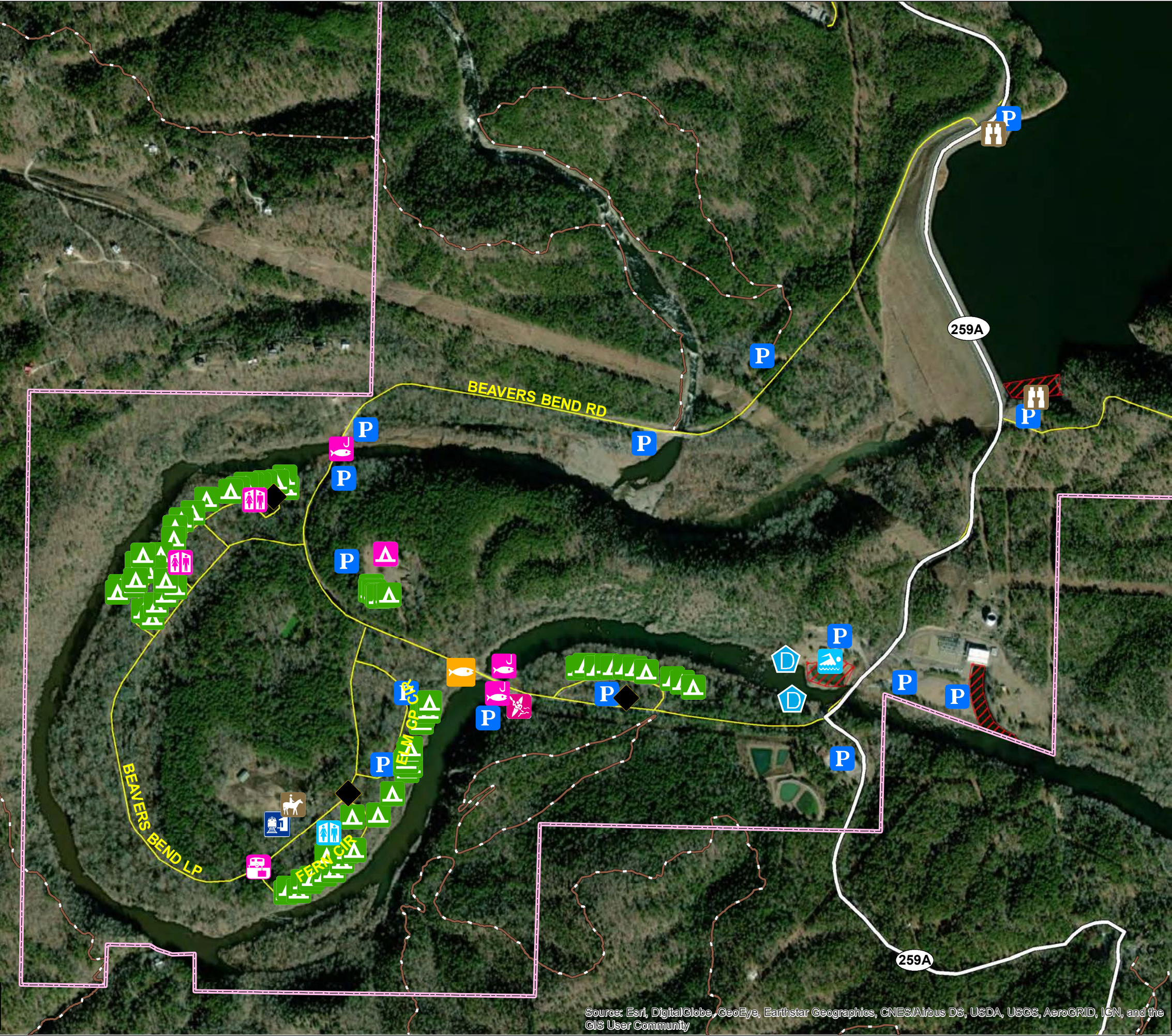
BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(STEVENS GAP AND
OVERLOOK AREA)



DATE:	MAP NO.
MAY 2023	BB22MP-OR-06



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	
COURTESY DOCK	
GROUP CAMPSITES	1
CAMPSITES	72
ELECTRICAL HOOK-UP	20
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	3
SHOWERS	1
DUMP STATION	1

- CAMPSITE

CANOE/KAYAK RENTAL DOCK

FISHING DOCK

FLY SHOP/ PROFESSIONAL

GROUP CAMPSITE

HORSE RIDES

OVERLOOK

PADDLEBOAT DOCK

PARKING

PLAYGROUND

WATER SURFACE: RESTRICTED

FEE BOUNDARY
- SANITARY DUMP STATION

SWIM BEACH

TRAIN STATION

VAULT TOILET

RESTROOM

RESTROOM W/ SHOWERS

HIKING TRAIL

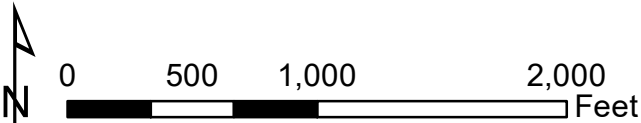


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OF ENGINEERS
TULSA DISTRICT

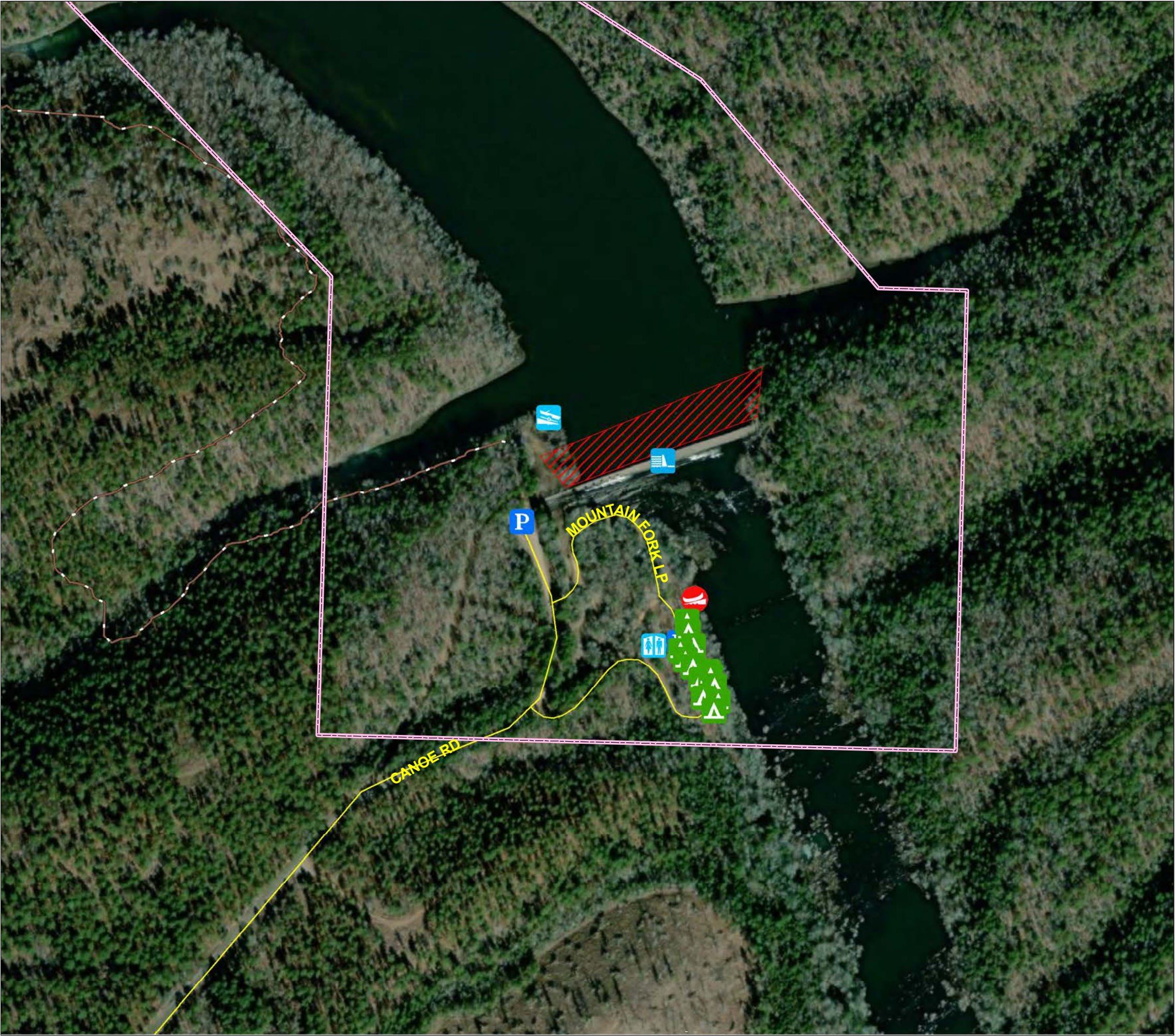
BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(RIVER BEND AREA)




DATE:	MAP NO.
MAY 2023	BB22MP-OR-07



ITEM	EXISTING
BOAT RAMP	1
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	13
ELECTRICAL HOOK-UP	8
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	1
SHOWERS	1
DUMP STATION	

- CANOE/KAYAK RAMP
- BOAT RAMP
- CAMPSITE
- PARKING
- RE-REGULATION DAM
- RESTROOM W/ SHOWERS
- HIKING TRAIL
- WATER SURFACE: RESTRICTED
- FEE BOUNDARY




**U.S. ARMY CORPS
OF ENGINEERS
TULSA DISTRICT**

BROKEN BOW LAKE

MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

**RECREATIONAL AREAS
(MOUNTAIN FORK PARK)**



0200400800
Feet

DATE:

MAY 2023




MAP NO.

BB22MP-OR-08



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

ITEM	EXISTING
BOAT RAMP	1
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
VAULT TOILET	
RESTROOMS	
SHOWERS	
DUMP STATION	

-  BOAT RAMP
-  PARKING
-  FEE BOUNDARY

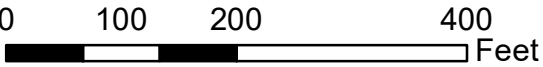


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BROKEN BOW LAKE MOUNTAIN FORK RIVER, OKLAHOMA

BROKEN BOW LAKE MASTER PLAN

RECREATIONAL AREAS
(EAST RAMP)



DATE:	MAP NO.
MAY 2023	BB22MP-OR-09

APPENDIX B – NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DOCUMENTATION

Environmental Assessment for the 2023 Broken Bow Lake Master Plan

Mountain Fork River Basin
McCurtain County, Oklahoma

2023



US Army Corps
of Engineers®
Tulsa District

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) evaluates the potential environmental and socioeconomic impacts of the 2023 Broken Bow Lake Master Plan revision. This EA will facilitate the decision process regarding the Proposed Action and alternatives.

SECTION 1 *INTRODUCTION* of the Proposed Action summarizes the purpose of and need for the Proposed Action, provides relevant background information, and describes the scope of the EA.

SECTION 2 *PROPOSED ACTION AND ALTERNATIVES* examines alternatives for implementing the Proposed Action and describes the recommended alternative.

SECTION 3 *AFFECTED ENVIRONMENT* describes the existing environmental and socioeconomic setting.

ENVIRONMENTAL CONSEQUENCES identifies the potential environmental and socioeconomic effects of implementing the Proposed Action and alternatives.

SECTION 4 *CUMULATIVE IMPACTS* describes the impact on the environment that may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.

SECTION 5 *COMPLIANCE WITH ENVIRONMENTAL LAWS* provides a listing of environmental protection statutes and other environmental requirements.

SECTION 6 *IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES* identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action.

SECTION 7 *PUBLIC AND AGENCY COORDINATION* provides a listing of individuals and agencies consulted during preparation of the EA.

SECTION 8 *REFERENCES* provides bibliographical information for cited sources.

SECTION 9 *ACRONYMS/ABBREVIATIONS*

SECTION 10 *LIST OF PREPARERS* identifies persons who prepared the document and their areas of expertise.

ATTACHEMENT A National Environmental Policy Act (NEPA) Coordination and Scoping

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ENVIRONMENTAL ASSESSMENT

2023 Master Plan

Broken Bow Lake

McCurtain County, Oklahoma

SECTION 1: INTRODUCTION

This Environmental Assessment (EA) has been prepared by the United States Army Corps of Engineers (USACE) to evaluate the 2023 Broken Bow Lake Master Plan (MP). The 2023 MP is a programmatic document that is subject to evaluation under the National Environmental Policy Act (NEPA) of 1969, (Public Law [PL] 91-190). This document provides an assessment of potential impacts that could result with the implementation of either the No Action or Proposed Action and has been prepared in accordance with the National Environmental Policy Act (NEPA, Public Law 91-190) as amended in 2020, the Council on Environmental Quality (CEQ) regulations (40 CFR, 1500–1508), and USACE regulations, including Engineer Regulation (ER) 200-2-2: Procedures for Implementing NEPA (1988).

The 2023 MP is a strategic land use management plan that provides direction to the orderly development, administration, maintenance, preservation, enhancement, and management of all natural, cultural and recreational resources of a USACE water resource project, which includes all government-owned lands in and around a reservoir. It is a vital tool for responsible stewardship and sustainability of the project's natural and cultural resources, as well as the provision of outdoor recreation facilities and opportunities on Federal lands associated with Broken Bow Lake for the benefit of present and future generations. The 2023 MP identifies conceptual types and levels of activities, but does not include designs, project sites, or estimated costs. All actions carried out by the USACE, other agencies, and individuals granted leases to USACE lands must be consistent with the 2023 MP. Therefore, the MP must be revised in order to provide effective guidance in USACE decision-making. The Broken Bow Lake Master Plan was approved in 1979 as "Design Memorandum" and since then has not been revised.

1.1 PROJECT DESCRIPTION

Broken Bow Lake Dam is located at river mile (RM) 20.3 of the Mountain Fork River. The dam site is located in McCurtain County, in southeastern Oklahoma. The lake is located in McCurtain County, Oklahoma (Figure 1-1), and lies within in the Broken Bow Lake watershed of the Mountain Fork Watershed. The Mountain Fork River rises in the mountainous country of Le Flore County in southeast Oklahoma and is 96.4 miles long. From its headwaters in the Ouachita National Forest, it flows east from Le Flore County, into Polk County, Arkansas. At a point approximately 7 miles west of Mena, Arkansas, the Mountain Fork turns southwest to return to Oklahoma at the extreme northeast corner of McCurtain County. Near Smithville, Oklahoma, the river bends south for 35 miles, where it empties into the Little River at RM 87.1. This point of confluence is 6

miles south of Eagletown, Oklahoma. The total drainage area of the Mountain Fork River is 842 square miles.

The major tributaries to the lake are Stephens Creek, Lower Cedar Creek, Cedar Creek, North Cedar Creek, Dyer Creek, Bee Creek, Borth Bee Creek, Bear Creek, South Holly Creek, North Holly Creek, Gar Creek, Panther Branch Creek, Turkey Creek, Buck Creek, Panther Creek, Buffalo Creek, Hudson Creek, Hee Creek, North Linson Creek, South Linson Creek, Cane Creek, Otter Creek, Egypt Creek, Nancy Branch Creek, Walford Creek, and Biggam Creek. Downstream of the Broken Bow Lake dam, the Mountain Fork River meanders until it reaches the Little River.

Broken Bow Lake was authorized for construction by the Flood Control Act of 1958 (Public Law [PL] 85-500, HD 170, 85th Congress, 1st Session) and modified by the Flood Control Act of 1962 (SD 137, 87th Congress, 2nd Session. Modified in Section 102(v) of Water Resource Development Act (WRD) 1992 (106 Stat. 1187), Section 338 of WRDA 1996 (110 Stat. 1808). And further modified to require seasonal adjustments to the top of conservation pool in WRDA 1999.

The construction of Broken Bow Lake and Dam began in October 1961; the final storage began October 1968; and the conservation pool was filled for the first time in June 1970. The first hydroelectric power unit was put online January 1970, and the second unit in June 1970.

Broken Bow Lake is an integral part of the USACE plan for flood control and water conservation in the Red River Basin. The plan presently consists of thirteen major flood control projects, known as Altus Lake, Kemp Lake, Tom Steed Lake, Foss Lake, Ft. Cobb Lake, Waurika Lake, Arbuckle Lake, Hugo Lake, Pat Mayse Lake, Sardis Lake, McGee Creek Reservoir, Broken Bow Lake and Pine Creek Lake. The total river basin is 92,600 square miles within USACE plan, while the drainage area upstream of Broken Bow Lake is 754 square miles. USACE operates and maintains the dam and associated facilities and administers the Federal lands and flowage easements comprising the project through a combination of direct management and leases/licenses for park and recreation purposes.

1.2 PURPOSE OF AND NEED FOR THE ACTION

The purpose of the Proposed Action is to ensure that the conservation and sustainability of the land, water, and recreational resources on Broken Bow Lake comply with applicable environmental laws and regulations and to maintain quality lands for future public use. The 2023 MP is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years.

The Broken Bow Lake Master Plan must be kept current in order to provide effective guidance in decision-making that responds to changing regional and local needs, resource capabilities and suitabilities, and expressed public interests consistent with authorized project purposes and pertinent legislation and regulations. The current 1979 Broken Bow Lake Master Plan is over 40 years old and does not currently reflect ecological, socio-political, and socio-demographic changes that are currently affecting

Broken Bow Lake, or those changes anticipated to occur through 2048. Changes in outdoor recreation trends, regional land use, population, current legislative requirements and USACE management policy have indicated the need to revise the plan. Additionally, increasing fragmentation of wildlife habitat, national policies related to climate change, a growing demand for recreational access, and protection of natural resources are all factors impacting public lands both nationwide and regionally, and have the potential to affect the Broken Bow Lake Project. In response to these continually evolving trends, the USACE determined that a full revision of the 1979 MP is needed.

The following factors may influence reevaluation of management practices and land uses:

- Changes in national policies or public law mandates;
- Operations and maintenance budget allocations;
- Recreation area closures;
- Facility and infrastructure improvements;
- Cooperative agreements with stakeholder agencies (such as Oklahoma Department of Wildlife Conservation [ODWC] and the U.S. Fish and Wildlife Service [USFWS]) to operate and maintain public lands; and
- Evolving public concerns.

1.3 SCOPE OF THE ACTION

This EA was prepared to evaluate existing conditions and potential impacts of proposed alternatives associated with the implementation of the 2023 Master Plan (MP). The alternative considerations were formulated with special attention given to revised land reclassifications, new resource management objectives, and a conceptual resource plan for each land reclassification category. The 2023 MP is currently available and is incorporated into this EA by reference. This EA was prepared pursuant to the National Environmental Policy Act (NEPA), (Public Law 91-190) as amended in 2020. The application of NEPA to more strategic decisions not only meets the Council on Environmental Quality (CEQ) implementing regulations (CEQ 2005) and USACE regulations for implementing NEPA (USACE 1988), but also allows the USACE to consider the environmental consequences of its actions long before any physical activity is implemented. Multiple benefits can be derived from such early consideration. Effective and early NEPA integration with the master planning process can significantly increase the usefulness of the 2023 MP to the decision maker.

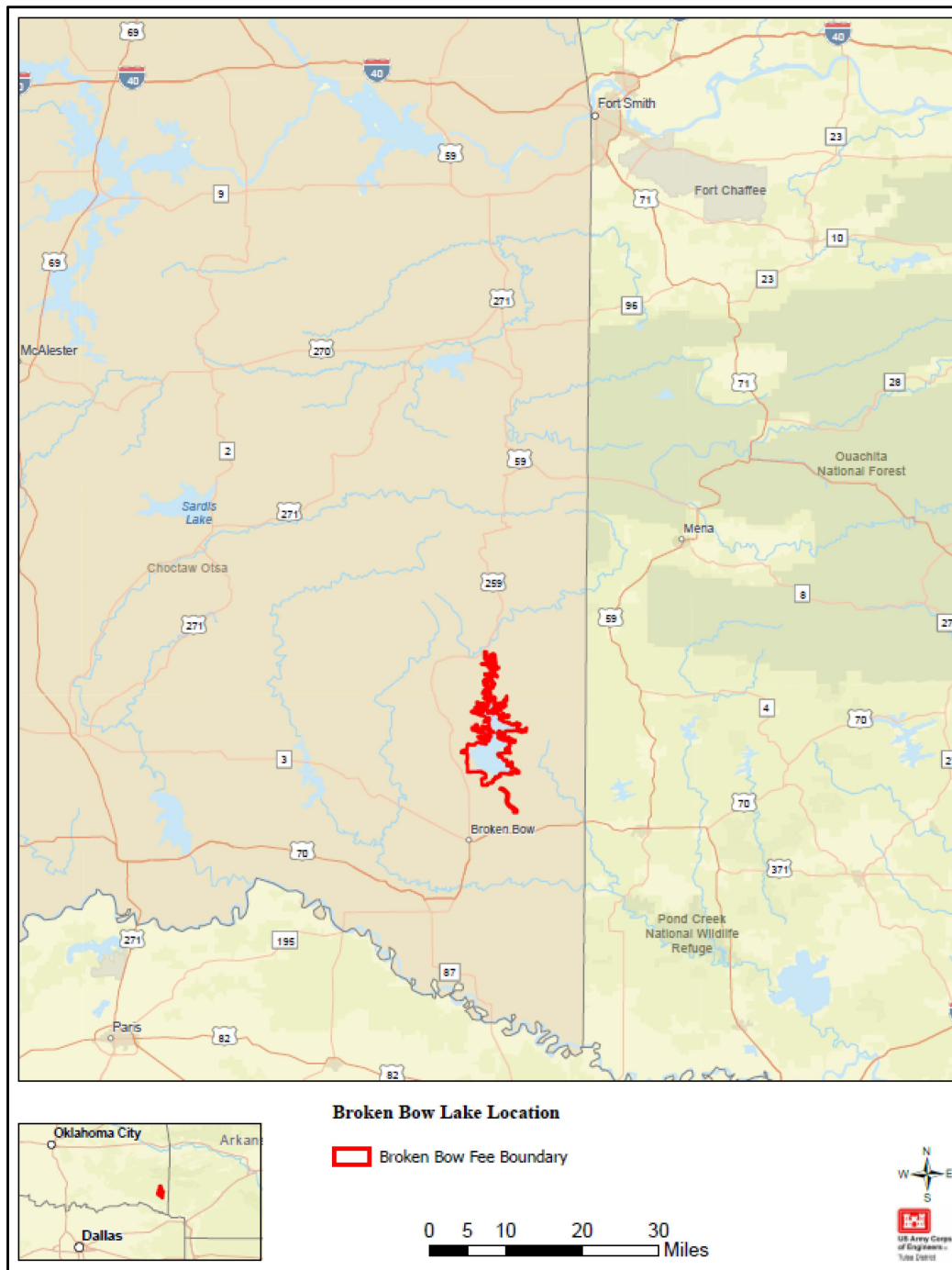


Figure 1-1. Location Map

SECTION 2: PROPOSED ACTION AND ALTERNATIVES

During the alternative development process, the Project Delivery Team (PDT) utilized an iterative process to evaluate different land classes for each parcel of USACE land. This evaluation included consideration of the multiple Congressionally authorized missions of the Project, public and agency comments, USACE staff knowledge, and potential impacts to the social, cultural, and environmental resources, to determine the primary use for each parcel (i.e. land classification). USACE regulations specify five possible categories of land reclassification: Project Operations (PO), High Density Recreation (HDR), Mitigation, Environmentally Sensitive Areas (ESA), and Multiple Resource Managed Lands (MRML). MRML are divided into four subcategories: Low Density Recreation (MRML-LDR), Wildlife Management (MRML-WM), Vegetation Management (MRML-VM), and Inactive/Future Recreation (MRML-IFR) Areas.

Two alternatives were developed in detail and brought forward for evaluation, including a No Action Alternative and a Proposed Action Alternative. The Proposed Action Alternative is the culmination of the iterative evaluation process described above and best meets the Purpose and Need identified in Section 1.2 of this document and Section 1.4 of the 2023 MP revision. The No Action Alternative, while it does not meet the purpose and need, serves as a benchmark of existing conditions against which Federal actions can be evaluated, and, therefore, is included in this EA pursuant to CEQ regulations 40 CFR § 1502.14(c)).

The goals for the 2023 MP include the following:

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

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

GOAL C. Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining the project's natural resources.

GOAL D. Recognize the project's unique qualities, characteristics, and potentials.

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

In addition to the above goals, USACE management activities are also guided by USACE-wide Environmental Operating Principles as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.

- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
- Seek ways and means to assess and mitigate cumulative impacts on the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in USACE activities; listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

Specific resource objectives to accomplish these goals can be found in Chapter 3 of the 2023 MP.

The USACE will not address dam operations or water management of Broken Bow Lake under either the No Action or Proposed Action alternatives. Water management, which includes flood risk management and dam operations, is established in the Red River Basin Master Reservoir Regulation Manual and the Broken Bow Lake Water Control Manual.

2.1 ALTERNATIVE 1: NO ACTION

Under the No Action Alternative, the USACE would not approve the adoption or implementation of the 2023 MP. Instead the USACE would continue to manage Broken Bow Lake's natural resources as set forth in the 1979 MP. The 1979 Master Plan would continue to provide the only source of comprehensive management guidelines and philosophy. However, the 1979 MP is out of date and does not reflect the current ecological, socio-political, or socio-demographic conditions of Broken Bow Lake or those that are anticipated to occur through 2048.

The No Action Alternative, while it does not meet the purpose and need, serves as a benchmark of existing conditions against which Federal actions can be evaluated, and, therefore, is included in this EA pursuant to CEQ regulations 40 CFR § 1502.14(c)).

2.2 ALTERNATIVE 2: PROPOSED ACTION

Under the Proposed Action, the USACE will adopt and implement the 2023 MP, which guides and articulates USACE responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the land, water, and associated resources. The 2023 MP will replace the 1979 MP and provide an up-to-

date management plan that follows current Federal laws and regulations while sustaining the project's natural resources and providing recreational opportunities for the next 25 years. The Proposed Action will meet regional goals associated with good stewardship of land, water, and recreational resources; address identified recreational trends; and allow for continued use and development of project lands without violating national policies or public laws.

The 2023 MP will classify all Federal land lying above elevation 599.5 NGVD29 into management reclassification categories. These management reclassification categories will allow uses of Federal property that meet the definition of the assigned category and ensure the protection of natural resources and environmental stewardship while allowing maximum public enjoyment of the lake's resources.

The land reclassification categories to be used are defined as follows:

- Project Operations: Lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas used solely for the operation of Broken Bow Lake.
- High Density Recreation: Lands developed for the intensive recreational activities for the visiting public including day use and campgrounds. These areas could also be for commercial concessions and quasi-public development.
- Environmentally Sensitive Areas: Areas where scientific, ecological, cultural, or aesthetic features have been identified.
- Multiple Resource Management Lands (MRML): Allows for the designation of a predominate use with the understanding that other compatible uses may also occur on these lands.
 - MRML Low Density Recreation: Lands with minimal development or infrastructure that support passive recreational use (primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
 - MRML Wildlife Management: Lands designated for stewardship of fish and wildlife resources.
 - MRML Vegetation Management: Lands designated for stewardship of vegetative resources.
 - MRML Inactive/Future Recreation: 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.
- Surface Water: Allows for surface water zones.
 - Restricted: Water areas restricted for Broken Bow Lake operations, safety, and security.

- Designated No-Wake: Water areas to protect environmentally sensitive shoreline areas and recreational water access areas from disturbance and areas to protect public safety.
- Open Recreation: Water areas available for year-round or seasonal water-based recreational use.

Table 2-1 shows the reclassifications and acres contained in each reclassification, Table 2-2 shows the water surface reclassifications, and Table 2-3 provides the justification for the 2023 reclassification.

Table 2-1. 2023 Broken Bow Lake Land Reclassifications

Prior Land Classifications (1979 Plan)	Acres	2023 Reclassifications	Acres
Not Classified (Null)	58	Environmentally Sensitive Areas	890
Operations: Recreation – Intensive Use:	3,468	High Density Recreation	3,431
Operations: Recreation - Low Density:	5,913	Low Density Recreation	2,492
Operations: Wildlife Management	3,222	Project Operations	322
Project Operations:	427	Wildlife Management	6,821
Total Land Acres	13,984	Total Land Acres	13,956

Total Acreage differences from the 1979 total to the 2023 totals are due to improvements in measurement technology, deposition/siltation, and erosion. Totals also differ due to rounding while adding parcels.

Table 2-2. Broken Bow Lake Surface Water Reclassifications

Prior Water Surface Classifications (1979 Plan)	Acres	Water Surface Classifications (2023)	Acres
Permanent Pool	14,151	Open Recreation	14,007
----	----	Designated No Wake	123
-----	----	Restricted	21
Total Water Acres	14,151	Total Water Acres	14,151

Table 2-3. Justification for the Land Reclassifications⁽¹⁾

Land Classification	Description of Changes ⁽²⁾	Justification
Project Operations (PO)	<p>The net decrease in Project Operations lands from 427 to 322 is due to the following:</p> <ul style="list-style-type: none"> • 1 acre REC-IU reclassified to PO. • 114 acres PO reclassified to LDR. • 12 acres PO reclassified to water surface. • 21 acres PO reclassified to WM. • 40 acres Recreation Lands reclassified to PO. • 2 acres water surface reclassified to PO. 	<p>All lands classified as PO are managed and used primarily in support of critical operational requirements related to the primary missions of flood risk management and water conservation, including the expansion of PO near the dam to include quarry access and account for the spillway. Additionally, acres previously classified as PO north of 259A were reclassified to reflect the current use of LDR. Note: Quarry access will be via the spillway location. Acres originally established as Recreation Lands near Overlook were reclassified to PO to appropriately capture current use.</p>
High Density Recreation (HDR)	<p>The net decrease in High Density Recreation Lands from 3,468 to 3,431 is due to the following:</p> <ul style="list-style-type: none"> • 3,043 acres REC-IU reclassified to HDR. • 4 acres LDU reclassified to HDR. • 384 acres Recreation Lands to HDR. <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>The net decrease in HDR is due to an area between the Overlook and River Bend Area. Acres in this area are currently being managed as LDR and PO therefore an update to the land classification was necessary. Additionally, acres near Beavers Bend State Park, Carson Creek, and Cedar Creek Golf Course were reclassified from Recreation Lands to HDR to reflect current naming and use. The reclassification of 3,043 acres by classification name only was necessary. These acres previously classified as REC-IU were reclassified using current policy naming of HDR.</p>

Land Classification	Description of Changes ⁽²⁾	Justification
Environmentally Sensitive Areas (ESA)	<p>The classification of 890 acres as Environmentally Sensitive Areas resulted from the following:</p> <ul style="list-style-type: none"> • 4 acres REC-IU reclassified to ESA. • 400 acres REC-LDU reclassified to ESA. • 486 acres OPS: WM reclassified to ESA. 	<p>Reclassification of 890 acres was determined by the study team to be necessary to provide a high level of protection for those areas supporting significant habitat, views, or cultural sites. Classifying these areas as ESA will afford these areas with the highest level of protection from disturbance. The reclassification of these acres will have no effect on current or projected public use.</p>
MRML – Low Density Recreation (LDR)	<p>The net decrease in Low Density Recreation acres from 5,913 to 2,492 is due to the following:</p> <ul style="list-style-type: none"> • 4 acres not previously classified identified as LDR. • 121 acres REC-IU reclassified to LDR. • 400 acres REC-LDU reclassified to ESA. • 4 acres REC-LDU reclassified to HDR. • 1,942 acres REC-LDU reclassified to LDR. • 3,631 acres REC-LDU reclassified to WM. • 4 acres WM reclassified to LDR. • 114 PO reclassified to LDR. • 307 acres Recreation Lands to LDR. 	<p>The largest contributing factor to the decrease in LDR is due to the 3,631 acres previously in LDR which were reclassified to WM. The study team determined large areas on the eastern shoreline of the lake from Otter Creek south to the PO area near the dam were currently managed as WM with no future plans for development. Lands previously identified as REC-IU near the Holly Cove area were reclassified as LDR to reflect current use. Additionally, acres previously classified as Recreation Lands south of 259A and north of the River Bend Area were reclassified to reflect the current use of LDR management in the area.</p>

Land Classification	Description of Changes ⁽²⁾	Justification
MRML – Wildlife Management (WM)	<p>The net increase in Wildlife Management acres from 3,222 to 6,821 is due to the following:</p> <ul style="list-style-type: none"> • 51 acres not previously classified to WM. • 296 acres REC-IU reclassified to WM. • 3,631 acres REC-LDU reclassified to WM. • 486 OPS: WM reclassified to ESA. • 4 acres WM reclassified to LDR. • 2,736 acres OPS: WM reclassified to WM. • 21 acres PO reclassified to WM. • 149 acres Recreation Lands reclassified to WM. 	<p>The largest contributing factor to the increase in WM is due to the 3,631 acres previously in LDR which were reclassified to WM. This change was determined necessary by the study team to capture existing land use and management of these acres. Location details of the area are mentioned above.</p>

(1) The land classification changes described in this table are the result of changes to individual parcels of land ranging from a few acres to several hundred acres. New acreages were measured using more accurate GIS technology, thus total changes will not equal individual changes. The acreage numbers provided are approximate.

(2) Acreages are based on GIS measurements and may vary from net difference detailed in Table 8-1.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

As previously discussed in this Section, other alternatives to the Proposed Action were initially considered as part of the alternative development process for the MP revision. However, none met the Purpose and Need for the Proposed Action, current USACE regulations and guidance, or addressed public and agency comments or concerns. Therefore, no other alternatives are being carried forward for analysis in this EA.

SECTION 3: AFFECTED ENVIRONMENT AND CONSEQUENCES

This section of the EA describes the potential impacts of the No Action and Proposed Action alternatives on the natural, cultural, and social resources found within the USACE Broken Bow Lake Fee Boundary. A description of the existing conditions of resources can be found in Chapter 2 of the 2023 MP". Only those resources that have the potential to be affected by implementation of either alternative will be analyzed in this EA. The following resources were excluded from further impact analysis because the No Action nor the Proposed Action will not have any impact on them: Hazardous, Toxic, and Radioactive Waste.

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.1 [g]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.1 [g]). As discussed in this section, the alternatives may create temporary (less than 1 year), short-term (up to 3 years), long-term (3 to 10 years following the master plan revision), or permanent effects.

In considering whether the effects of the Proposed Action are significant, agencies shall analyze the potentially affected environment and degree of the effects of the action (40 CFR § 1501.3). In considering the potentially affected environment, agencies should consider, as appropriate to the specific action, the affected area (national, regional, or local) and its resources, such as listed species and designated critical habitat under the Endangered Species Act (40 CFR § 1501.3[b](1)). In considering the degree of the effects, agencies should consider the following, as appropriate to the specific action: both short- and long-term effects, both beneficial and adverse effects, effects on public health and safety, effects that will violate Federal, State, Tribal, or local law protecting the environment (40 CFR § 1501.3[b](2)). For the purpose of this analysis, the intensity of impacts will be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected, or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the

resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.

- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term, and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

3.1 Land Use

Please refer to Chapters 1.5, 2.5 and 2.6 of the 2023 MP for existing land use information in and around Broken Bow Lake.

3.1.1 Alternative 1: No Action

Under the No Action Alternative, USACE would not implement the 2023 MP, and thus the land use management would not be updated to reflect current and projected future needs and demands. The operation and maintenance of USACE lands at Broken Bow Lake would continue as outlined in the 1979 MP to the extent that current and future laws and regulations would permit. Management would continue to lag behind the current and future recreational needs identified through scoping efforts and USACE Project staff experience and recommendations. If the 1979 MP is kept and implemented, this would not align with current and future operations and recreation trends or needs for the Lake. This divergence would create a patchwork of management requirements that would be inefficient for Broken Bow Lake staff to implement. The management would also increasingly lack transparency to the public, or alternately create more of a burden to staff to communicate how the lake management differs from that in the 1979 MP. Implementation of the No Action Alternative would have moderate, adverse, short and long term impacts on land use within and on USACE Broken Bow Lake project lands due to conflicting guidance and management of USACE lands.

3.1.2 Alternative 2: Proposed Action

The objectives for revising the 1979 MP describe current and foreseeable land uses while considering expressed public opinion, regional trends, and USACE policies that have evolved to meet day-to-day operational needs. The reclassifications in the 2023 MP were developed to help fulfill regional goals associated with good stewardship of land and water resources that will allow for continued use and development of project lands.

While HDR is technically a new management classification, the bulk of the 3,431 acres of HDR land is from areas previously classified as Recreation Intensive Use. Even though the acreages for HDR and MRML-LDR are decreasing from 3,468 to 3,431

acres and 5,913 to 2,492 acres, recreational opportunities will not be impacted. The change in acreages reflects current and foreseeable recreational trends for the area.

MRML-LDR are lands that have minimal development or infrastructure that support passive public use such as hiking, nature photography, bank fishing, and hunting. Future uses may include designating additional natural surface hike/bike trails. Even though these areas are managed for recreational purposes, this designation provides more protection for wildlife and vegetation than HDR, but less than ESA.

HDR is not the only new management classifications introduced in the 2023 MP. The establishment and reclassification of 890 acres as ESA will allow for greater protection of sensitive habitats and/or cultural resources. Conservation efforts within USACE Broken Bow Lake fee owned boundary will be further aided by the reclassification of 2,492 acres as MRML-LDR and 6,821 acres as MRML-WM.

On the waters of Broken Bow Lake, the 2023 MP will add established surface water use categories in addition to the current ad hoc management of the lake. The establishment of 21 acres as Restricted, 123 acres as No Wake, and 14,007 acres as Open Recreation to the water surface, respectively, will allow for a delineated, and safer management of the lake's waters when the lake is at conservation pool. These reclassifications will help to improve safety of those recreating on and around Broken Bow Lake by restricting boat access and speeds around certain parts of the lake, as well as establishing areas that boating can occur in. The Broken Bow Lake office will still maintain the authority to make ad hoc adjustments as needed by lake level, which will prevent the reclassifications from being overly rigid or even ineffectual in various lake level conditions.

The current and foreseeable land use demand and patterns for Broken Bow Lake does not entail the need of utility corridors, therefore, none will be implemented in the 2023 MP. However, if needed, current USACE policy dictates that all utilities must go around USACE property unless no other feasible alternative exists. If a feasible alternative does not exist, then the utility must go through the NEPA permitting process prior to approval and implementation.

The majority of the land use reclassifications in the 2023 MP will maintain the functional management that is currently occurring. While the terminology updates appear substantial, they have been implemented after considerable public input, and seek to maintain the values the public holds highest at Broken Bow Lake. Additionally, the land reclassifications provide a balance between public use, both intensive and passive, and natural resources conservation. Therefore, the implementation of the Proposed Action will have major, long-term beneficial impacts to land use as the land reclassifications further refine areas for appropriate activities.

3.2 WATER RESOURCES

Please refer to Chapter 2.6 of the 2023 MP for existing water resource information in and around Broken Bow Lake.

3.2.1 Alternative 1: No Action

There are no known water resource related problems occurring at Broken Bow Lake, therefore there would be no impacts on water resources as a result of implementing the No Action Alternative.

3.2.2 Alternative 2: Proposed Action

The reclassifications and resource management objectives required for implementing the Proposed Action will allow land management and land uses to be adjusted for current and reasonably foreseeable future changes in water resources. For example, the establishment of 890 acres as ESA lands will help to stabilize soils through the promotion and restoration of native habitats. In turn, these habitats will help to reduce erosion, and buffer and filter storm runoff before making its way into the lake, thereby reducing water turbidity. The establishment of 890 acres of ESA lands, 2,492 acres as MRML-LDR, and 6,821 acres as MRML-WM, will result in more upland areas and wetlands being protected from erosion and sedimentation. The resource objectives will require that all decision-making processes take into consideration their impacts to Broken Bow Lake flood and conservation pool levels. By doing this, the resource objectives will help to further protect water resources within Broken Bow Lake.

One hundred twenty-three acres of surface waters will be classified as No Wake Designation as part of the Proposed Action Alternative. These areas are near shorelines where wave action can increase erosion. This No Wake Designation classification will be expected to help prevent further erosion and further reduce water turbidity.

Implementation of the Proposed Action will have minor, short- and long- term beneficial impacts on water resources located within USACE project lands.

3.3 CLIMATE, CLIMATE CHANGE AND GHG

Please refer to Chapter 2.2 and 2.3 of the 2023 MP for existing climate, climate change and greenhouse gas information in and around Broken Bow Lake.

3.3.1 Alternative 1: No Action

The No Action Alternative would not result in any change in management of Broken Bow Lake project land. Implementation of the 1979 MP would have no impact (beneficial or adverse) on existing or future climate conditions. Current policy (Executive Orders [EO] 3834 and 13783, and related USACE policy) requires project lands and recreational programs be managed in a way that advances broad national climate change mitigation goals including, but not limited to, climate change resilience and carbon sequestration. Climate Change and GHG policies were not evaluated in the 1979 MP, as such the 1979 MP does not align with current laws and regulations. This non-compliance has no impact on Climate Change and GHG because the 1979 MP does not have any action that impacts existing conditions.

3.3.2 Alternative 2: Proposed Action

The 2023 MP will have negligible positive impacts to climate, climate change and GHG emissions in the region. The impacts will come from the promotion of land management practices and design standards that promote sustainability. Management under the 2023 MP will follow current policy to meet climate change goals as described for the No Action Alternative. Any ground disturbing activities considered under the 2023 MP will go through the NEPA and design processes prior to implementation. During that time, impacts to the climate will be analyzed for those ground disturbing activities.

3.4 AIR QUALITY

Please refer to Chapter 2.4 of the 2023 MP for existing air quality information in and around Broken Bow Lake.

3.4.1 Alternative 1: No Action

The continued implementation of the 1979 MP would not result in any changes to current and reasonably foreseeable future air quality in the region. No new increase in vehicular traffic, mass permanent vegetation removal, or the building of mass industrial facilities would occur as result of implementing this alternative. The No Action Alternative would remain compliant with the Clean Air Act because the 1979 MP includes only guidelines and does not incorporate actions which produce criteria pollutants.

3.4.2 Alternative 2: Proposed Action

As with the No Action Alternative, the 2023 MP will not result in any change to current and reasonably foreseeable air quality in the region. The Proposed Action will not implement any actions (i.e. ground disturbing activities) that directly or indirectly produce criteria pollutants (i.e. total emissions is 0); therefore, implementation of the Proposed Action will remain compliant with the Clean Air Act and State Implementation Plan and is not subject to a conformity determination. Negligible air quality benefits may be realized through the reclassification of 890 acres as ESA lands, 2,492 acres as MRML-LDR lands, and 6,821 acres as MRML-WM lands. The added protection these classifications provide will benefit native vegetation communities that filter and sequester air pollutants.

3.5 TOPOGRAPHY, GEOLOGY, AND SOILS

Please refer to Chapter 2.5 of the 2023 MP for existing topography, geology, and soils information in and around Broken Bow Lake.

3.5.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so there would be no impacts on topography, geology, soils, or prime farmland as a result of implementing the No Action Alternative.

3.5.2 Alternative 2: Proposed Action

The Proposed Action takes into consideration the various topographical, geological, and soils aspects of USACE Broken Bow Lake Project lands. The reduction of HDR land (3,468 acres to 3,431 acres) and LDR (5,913 acres to 2,492 acres), classification of 6,821 acres as MRML-WM lands, and the establishment of 890 acres as ESA, will help to increase the long term preservation and stabilization of the soils within USACE Broken Bow Lake project lands. Implementation of the Proposed Action will have minor, positive, long-term impacts on soil conservation and topography, and geology at Broken Bow Lake.

3.6 NATURAL RESOURCES

Please refer to Chapter 2.9 of the 2023 MP for existing natural resources information in and around Broken Bow Lake.

3.6.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no short- or long-term, major, moderate, or minor, beneficial, or adverse impacts on natural resources would be anticipated as a result of implementing the No Action Alternative.

3.6.2 Alternative 2: Proposed Action

The reclassifications of land classes, improvement of resource management objectives, and the overall improvement of the 2023 MP will improve the ability for USACE Broken Bow Federal Project lands to be better managed in accordance with the Project's authorized purposes. Utilizing the data collected from the Wildlife Habitat Appraisal Procedure (WHAP) (Appendix C of the 2023 MP) completed for Broken Bow Lake will help to establish high quality and unique areas around the lake. The implementation of the new land classifications will allow project lands to continue and further support the USFWS and the ODWC missions associated with wildlife conservation and implementation of operational practices that will protect and enhance wildlife and fishery populations and habitat. The resource objectives will allow for natural resources to be managed with consideration of how they will be impacted from the retention of flood waters, which will further help to protect the natural resources with Broken Bow Lake. The reduction of HDR land (3,468 acres to 3,431 acres) and LDR lands (5,913 acres to 2,492 acres), classification of 6,821 acres as MRML-WM lands, and the establishment of 890 acres as ESA, especially in prime ecological areas, will help protect natural resources from various types of adverse impacts such as habitat fragmentation. Therefore, under the Proposed Action, there will be major short and long term, beneficial impacts on natural resources as a result of implementing the 2023 MP.

3.7 THREATENED AND ENDANGERED SPECIES

The USFWS Information for Planning and Consultation (IPaC) database (USFWS 2023) lists the threatened and endangered species, and trust resources that may occur within the Sardis Lake Federal Fee Boundary (see USFWS Species List and the IPaC

Report in Appendix C of the 2023 MP). Based on the IPaC report, there are 15 federally listed or proposed endangered, threatened, or candidate species that could be found within Broken Bow Lake. A list of these species is presented in Table 3.1. There is current designated Critical Habitat for the Leopard Darter to the northeast of the Broken Bow Lake fee boundary within the Mountain Fork River. The species identified as Threatened, Endangered or Candidate Species by ODWC that are not federally listed are included in Appendix C of the 2023 MP as well as a list of Species of Greatest Conservation Need (SGCN) for the Ouachita Mountains, Arkansas River Valley and West Gulf Coastal Plain Region.

Table 3-1. Federally Listed Threatened & Endangered Species with Potential to Occur at Broken Bow Lake.

Common Name	Scientific Name	Federal Status	State Status
Alligator Snapping Turtle	<i>Machrochelys teminckii</i>	Proposed Threatened	Not Listed
American Alligator	<i>Alligator mississippiensis</i>	Similarity of Appearance (Threatened)	Not Listed
American Burying Beetle	<i>Nicrophorus americanus</i>	Threatened	Not Listed
Harperella	<i>Ptilimnium nodosum</i>	Endangered	Not Listed
Leopard Darter	<i>Percina pantherine</i>	Threatened	Not Listed
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate	Not Listed
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Endangered	Not Listed
Ouachita Rock Pocketbook	<i>Arcidens wheeleri</i>	Endangered	Not Listed
Piping Plover	<i>Charadrius melodus</i>	Threatened	Not Listed
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	Threatened	Not Listed
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Endangered	Not Listed
Red Knot	<i>Calidris canutus rufa</i>	Threatened	Not Listed
Scaleshell Mussel	<i>Leptodea leptodon</i>	Endangered	Not Listed
Tricolored bat	<i>Perimyotis subflavus</i>	Proposed Endangered	Not Listed
Winged Mapleleaf	<i>Quadrula fragosa</i>	Endangered	Not Listed

Please refer to Chapter 2.11 of the 2023 MP for more information on threatened and endangered species within the USACE fee owned boundary.

3.7.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, which have had no effect on federally listed species. USACE has determined that implementation of the No Action Alternative would have No Effect on any federally threatened or endangered species that may occur within the study area.

3.7.2 Alternative 2: Proposed Action

The implementation of the 2023 MP will allow for better cooperative management plans with the USFWS and ODWC that will help to preserve, enhance, and protect vegetation and wildlife habitat resources that are essential to various endangered and threatened species that may be found within USACE Broken Bow Lake federal project lands. To strengthen management opportunities and beneficially impact habitat diversity, the reclassifications in the 2023 MP include 890 acres as ESAs, including several land parcels previously classified as unclassified, Operations-Recreation Intensive Use, Operations-Wildlife Management, and Operations-Recreation Low-Density Use. These parcels were converted to ESA in order to recognize those areas having the highest ecological value and to ensure they are given the highest order of protection among possible land classifications. The resource objectives will require that threatened and endangered species are managed by various ecosystem management principles. Which will further help those species. Any future activities that could potentially result in impacts to Federally listed species will be coordinated with USFWS through Section 7 of the Endangered Species Act. USACE has determined that the implementation of the Proposed Action will have No Effect on any federally listed or proposed threatened, endangered, or candidate species that may occur within the Broken Bow Lake federal fee boundary.

3.8 INVASIVE SPECIES

Please refer to Chapter 2.13 of the 2023 MP for existing information on invasive species within the USACE fee owned boundary.

3.8.1 Alternative 1: No Action

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so Broken Bow Lake would continue to be managed according to the existing invasive species management practices. There would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts from invasive species as a result of implementing the No Action Alternative.

3.8.2 Alternative 2: Proposed Action

The reclassifications of land classes, improvement of resource management objectives, and the overall improvement of the 2023 MP will allow invasive species within USACE Broken Bow federal project lands to be better managed. Implementation of the knowledge gained from the Wildlife Habitat Appraisal Procedure (WHAP) survey done for Broken Bow Lake will help identify high value and unique areas that will benefit

from further protection, thus reducing the opportunity for invasive species encroachment. The reduction of HDR land (3,468 acres to 3,431 acres) and LDR land (5,913 acres to 2,492 acres), classifying 6,821 acres as MRML-WM lands, and the establishment of 890 acres as ESA, especially in prime ecological areas, helps to protect natural resources from various types of adverse impacts such as habitat fragmentation which increases the opportunity for the spread of invasive species. These areas will also receive more invasive species management efforts. The resource goals and objectives will require monitoring and reporting of invasive species, as well as action items to prevent and/or reduce the spread of these species. Therefore, under the Proposed Action, there will be short- and long-term minor, beneficial impacts on invasive species management as a result of implementing the 2023 MP.

3.9 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

Please refer to Chapter 2.15 of the 2023 MP for existing information on cultural, historical, and archaeological resources within the USACE fee owned boundary.

3.9.1 Alternative 1: No Action

There would be no additional short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on cultural, historical, or archaeological resources as a result of implementing the No Action Alternative, as there would be no changes to the 1979 MP.

3.9.2 Alternative 2: Proposed Action

The implementation of the reclassifications of land management classes, improvement of resource management objectives, and the overall improvement of the 2023 MP will allow cultural, historical, and archaeological resources within USACE Broken Bow federal project lands to be better managed and accounted for. Based on previous surveys at Broken Bow Lake, the required reclassifications, resource objectives, and resource plan will not change current cultural resource management plans or alter areas where these resources exist. All future activities will be coordinated with the State Historic Preservation Officer and federally recognized Tribes to ensure compliance with Section 106 of the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. Therefore, the USACE has determined that the Proposed Action has no potential to cause effects on cultural, historical, or archaeological resources as a result of implementing the 2023 MP. Long-term, minor, beneficial impacts may occur as a result of the 2023 MP as lands classified as PO, ESA, MRML-LDR or MRML- WM will generally protect any historic properties within those lands against ground disturbing activities.

3.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Please refer to Chapter 2.16 of the 2023 MP for existing socioeconomic and environmental justice information in and around Broken Bow Lake.

3.10.1 Alternative 1: No Action

The continued implementation of the 1979 MP would result in the existing beneficial socioeconomic impacts to continue, as visitors would continue to come to the lake from

surrounding areas. In addition to camping, many visitors purchase goods such as groceries, fuel, and camping supplies locally, eat in local restaurants, stay in local hotels and resorts, play golf at local golf courses, and shop in local retail establishments. These activities would continue to bring revenues to local companies, provide jobs for local residents, and generate local and state tax revenues. There would be no disproportionate impacts on minority or low-income populations, or children, with the implementation of the No Action Alternative.

3.10.2 Alternative 2: Proposed Action

The implementation of the 2023 MP land reclassifications, resources objectives, and resource plan reflect changes in land management and land uses that have occurred since 1979. Broken Bow Lake offers a variety of recreational opportunities for visitors. The 2023 MP will be beneficial to the local economy through direct and indirect job creation and local spending by visitors as a result of the improved management from the goals, objectives, and land classifications that will help to improve visitors experience of Broken Bow Lake. Beneficial impacts will be similar to the No Action Alternative. After using the Environmental Protection Agency (EPA) Climate and Economic Screening Tool (CEST) (2022), the lake is determined to be surrounded by disadvantaged communities on all sides. These communities are defined by the EPA (2022) as those that meet one or both screening criteria, meet the threshold of burden for the CEST, and or are on land within the boundaries of Federally Recognized Tribes. The CEST provides two burden criteria for disadvantaged communities as being characterized by “(1) at or above the threshold for one or more environmental, climate, or other burdens, and (2) at or above the threshold for an associated socioeconomic burden”. The burden criteria that the communities surrounding Broken Bow Lake meeting are that there are within Federally Recognized Tribes boundaries, climate change, health, transportation, and energy. There will be no adverse impacts to these communities as a result of implementing the 2023 MP because no construction activities will occur as result of implementation that will otherwise impact these communities. There will be no adverse impacts on the economy in the area and no disproportionate impacts on minority or low-income populations, children, or on environmental justice as a result of the Proposed Action.

3.11 RECREATION

Please refer to Chapter 2.17 of the 2023 MP for existing recreation information in and around Broken Bow Lake.

3.11.1 Alternative 1: No Action

Under the No Action Alternative, there would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on recreational resources, as there would be no changes to the 1979 MP.

3.11.2 Alternative 2: Proposed Action

Broken Bow Lake is beneficial to the local visitors and also offers a variety of free recreation opportunities. Even though the amount of acreage available for High Density

Recreation will decrease (3,468 to 3,431 acres) and as well as for Low Density Recreation (5,913 to 2,492 acres) with implementation of the 2023 MP, this land reclassification reflects changes in land management and land uses that have occurred since 1979 at Broken Bow Lake. Passive recreational activities will still be allowed as they are now within all lands, regardless of the land classification. The resource objectives will require that all decisions made in regard to the lake take into consideration their impacts to recreation and will be monitored should adjustments be needed. Therefore, under the Proposed Action, there will be no adverse, short- or long-term impacts on recreation as numerous recreation opportunities will remain in and around Broken Bow Lake to accommodate various outdoor based recreation activities. Moderate beneficial impacts may occur as a result of the 2023 MP meeting the current and future recreational needs and public preferences.

3.12 AESTHETIC RESOURCES

Please refer to Chapter 2.14 of the 2023 MP for existing aesthetic resource conditions in and around Broken Bow Lake.

3.12.1 Alternative 1: No Action

There would be no short- or long-term, minor, moderate, or major, beneficial, or adverse impacts on visual resources as a result of implementing the No Action Alternative, as there would be no changes to the 1979 MP.

3.12.2 Alternative 2: Proposed Action

Broken Bow Lake currently plays a pivotal role in availability of parks and open space in McCurtain County and in the surrounding region. The amount of acreage classified for High Density Recreation will decrease (3,468 acres to 3,431 acres) and as well as for Low Density Recreation (5,913 acres to 2,492 acres) with implementation of the 2023 MP. This land reclassification reflects changes in land management and land uses that have occurred since 1979 at Broken Bow Lake. The conversion of these lands will have no effect on current or projected public use or visual aesthetics as views from natural and recreation areas will remain in place. Furthermore, the classification of 6,821 acres as MRML-WM, and the establishment of 890 acres as ESA, will have positive impacts on aesthetic resources by protecting lands that are aesthetically pleasing and available for passive recreation activity at Broken Bow Lake and limit future development in these areas. Additionally, resource objectives place an emphasis on increasing public education on recreation, nature, cultural resources, and ecology resources at Broken Bow Lake. Therefore, under the Proposed Action, there will be no short- or long-term minor, adverse impacts to aesthetic resources as a result of implementing the 2023 MP.

3.13 HAZARDOUS MATERIALS AND SOLID WASTE

Please refer to Chapter 2.7 of the 2023 MP for information concerning hazardous materials and solid waste in and around Broken Bow Lake fee owned boundary.

3.14 HEALTH AND SAFETY

Please refer to Chapter 2.8 of the 2023 MP for information concerning health and safety in and around Broken Bow Lake fee owned boundary.

3.14.1 Alternative 1: No Action

Under the No Action Alternative, the 1979 MP would not be revised. No adverse impacts on human health or safety would be anticipated.

3.14.2 Alternative 2: Proposed Action

The implementation of the 2023 MP will result in the classification of Restricted Surface Water (21 acres), Designated No-Wake areas (123 acres), and Open-Recreation (14,007). These reclassifications maintain and in some cases, improve boating, non-motorized recreation, and swimming safety near the Broken Bow Lake Dam, water intake structures, and key recreational water access areas such as boat ramps and designated swimming areas.

The project will continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Broken Bow Lake project area will continue to be enforced to ensure public safety. The resource objectives makes it mandatory that various factors that impacts human safety at the lake are monitored and that actions are taken to address, eliminate or reduce those factors. The resource objectives will require that various factors that impacts human safety at the lake will be monitored and that actions are taken to address, eliminate or reduce those factors. Therefore, under the Proposed Action, there will be short- and long-term minor, beneficial impacts on health and safety as a result of implementing the 2023 MP.

3.15 SUMMARY OF CONSEQUENCES AND BENEFITS

Table 3-2 provides a tabular summary of the consequences and benefits for the No Action and Proposed Action alternatives for each of the 13 assessed resource categories.

Table 3-2. Summary of Consequences and Benefits

Resource	Change Resulting from the 2023 Master Plan	Environmental Consequences: No Action Alternative	Environmental Consequences: Proposed Action	Benefits Summary
Land Use	No effect on private lands. Emphasis is on protection of wildlife and environmental values on USACE land and maintaining current level of developed recreation facilities.	Fails to recognize recreation trends and regional natural resource priorities.	Recognizes recreation trends and regional natural resource priorities identified by ODWC, and public comments.	Land classification changes and new resource objectives fully recognize passive use recreation trends and regional environmental values such as protection of riparian zones.
Water Resources Including Groundwater, Wetlands, and Water Quality	Small change to recognize value of wetlands.	Fails to recognize the water quality benefits of good land stewardship and need to protect wetlands.	Promotes restoration and protection of wetlands and good land stewardship.	Specific resource objective promotes restoration and protection of wetlands.
Climate, Climate Change, and Greenhouse Gases	Minor change to recognize need for sustainable, energy efficient design.	Fails to promote sustainable, energy efficient design.	Promotes land management practices and design standards that promote sustainability.	Specific resource objectives promote national climate change mitigation goal. LEED standards for green design, construction, and operation activities will be employed to the extent practicable.
Air Quality	No change	No effect	No effect	No added benefit
Topography, Geology and Soils	Minor change to preserve and stabilize soils.	Fails to implement any effort that would maintain and improve existing conditions.	Changes in land classifications to those that would help to preserve and stabilize soils.	The promotion of land classes that will preserve and stabilize soils.

Resource	Change Resulting from the 2023 Master Plan	Environmental Consequences: No Action Alternative	Environmental Consequences: Proposed Action	Benefits Summary
Natural Resources	Moderate benefits through land reclassification and resource objectives.	Fails to recognize ESAs, and regional priorities calling for protection of wildlife habitat.	Gives full recognition of sensitive resources and regional trends and priorities related to natural resources.	Reclassification of lands included 890 acres of ESA and an increase in lands emphasizing wildlife management.
Threatened and Endangered Species, including SGCN species.	Minor change to recognize both federal and state-listed species.	Fails to recognize current federal and state-listed species.	Fully recognizes federal and state-listed species as well as SGCN listed by ODWC and Rare species listed by ODWC.	The 2023 MP sets forth the most recent listing of federal and state-listed species and addresses on-going commitments associated with USFWS.
Invasive Species	Minor change to recognize several recent and potentially aggressive invasive species.	Fails to recognize current invasive species and associated problems.	Fully recognizes current species and the need to be vigilant as new species may occur.	Specific resource objectives specify that invasive species shall be monitored and controlled as needed.
Cultural Resources	Minor change to recognize current status of cultural resources.	Included cursory information about cultural resources that is inadequate for future management and protection. No effects.	Recognizes the presence of cultural resources and places emphasis on protection and management. No potential to cause effects.	Reclassification of lands included 890 acres of ESA and specific resource objectives were included for protection of cultural resources.
Socioeconomics and Environmental Justice	No change	No effect	No effect	No added benefit
Recreation	Moderate benefits to outdoor recreation programs.	Fails to recognize current outdoor recreation trends.	Fully recognizes current outdoor recreation trends and places special emphasis on trails.	Specific management objectives focused on outdoor recreation opportunities and trends are included.

Resource	Change Resulting from the 2023 Master Plan	Environmental Consequences: No Action Alternative	Environmental Consequences: Proposed Action	Benefits Summary
Aesthetic Resources	Minor benefits through land reclassification and resource objectives.	Fails to minimize activities that disturb the scenic beauty and aesthetics of the lake.	Promotes activities that limit disturbance to the scenic beauty and aesthetics of the lake.	No added benefit Specific management objectives to minimize activities that disturb the scenic beauty and aesthetics of the lake.
Health and Safety	Minor change to promote public safety awareness.	Fails to emphasize public safety programs.	Recognizes the need for public safety programs.	Includes specific management objectives to increase water safety outreach efforts. Also, classifies 21 acres of water surface as restricted and designated no-wake for public safety purposes.

SECTION 4: CUMULATIVE IMPACTS

NEPA regulations updated May 20, 2023 require that cumulative impacts of a Proposed Action be assessed and disclosed in an EA. Council on Environmental Quality (CEQ) regulations define a cumulative impact as *“the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”* (40 CFR 1508.1 (g)(3)). Impacts can be positive or negative.

By Memorandum dated June 24, 2005 from the Chairman of the CEQ to the Heads of Federal Agencies entitled “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis”, CEQ made clear its interpretation that “...generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions...” and that the “...CEQ regulations do not require agencies to catalogue or exhaustively list and analyze all individual past actions.” CEQ guidance also recommends narrowing the focus of cumulative impacts analysis to important issues of national, regional, or local significance.

The initial step of the cumulative impact analysis uses information from the evaluation of direct and indirect impacts in the selection of environmental resources that should be evaluated for cumulative impacts. A proposed action would not contribute to a cumulative impact if it would not have a direct or indirect effect on the resource.

Based on a review of the likely environmental impacts analyzed in Section 3 (Affected Environment and Consequences) the USACE determined that the analysis of cumulative impacts will be limited to: land use, water resources, climate, climate change, GHG, air quality, topography, geology, soils, natural resources, threatened and endangered species, invasive species, cultural resources, historical resources, archeological resources, recreation, aesthetic resources, and health & safety. With respect to the remaining resource topics such as socioeconomic & environmental justice and hazardous, toxic, & radioactive waste, both the No Action and Proposed Action alternatives will either:

1. Not result in any direct or indirect impacts and therefore would not contribute to a cumulative impact; or,
2. That the nature of the resource is such that impacts do not have the potential to cumulate. For example, impacts related to geology are site specific and do not cumulate; or,
3. That the future with or future without project condition analysis is a cumulative analysis and no further evaluation is required. For example, because climate change is global in nature, the future without project condition and future with project condition analysis is inherently a cumulative impact assessment.

For each resource topic carried forward for cumulative impact analysis, the timeframe for analysis is the time since the 1979 Master Plan was implemented (past) and thru the

proposed life of the 2023 Master Plan (25 years – to 2047). The zone of interest for all resources except economy is McCurtain County, Oklahoma. The zone of interest for economics is the same used in Section 3.10.

4.1 PAST IMPACTS WITHIN THE ZONE OF INTEREST

Broken Bow was originally authorized for construction in 1958 as a as a comprehensive plan for flood control, hydroelectric power, water supply, fish and wildlife management, and recreation. The construction of Broken Bow Lake and Dam began in October 1961; the final storage began October 1968; and the conservation pool was filled for the first time in June 1970. The first power unit was put online January 1970, and the second unit in June 1970. The total project area at Broken Bow encompasses 13,956 acres, including the 14,151 acres of surface water at conservation pool elevation of 599.5. The entire 28,113 acres were acquired in fee simple title by USACE with perpetual Flowage Easements on 707 acres.

4.2 CURRENT AND REASONABLY FORESEEABLE PROJECTS WITHIN AND NEAR THE ZONE OF INTEREST

Future management of the -- acres of Flowage Easement Lands at Broken Bow includes routine inspection of these areas to ensure that the Government's rights specified in the easement deeds are protected. In almost all cases, the Government acquired the right to prevent placement of fill material or habitable structures on the easement area. Placement of any structure that may interfere with the USACE flood risk management and water conservation missions may also be prohibited. At the time of this publication, there are not any major projects like road expansion, new industrial centers, neighborhoods being built, and new hiking trails in and around Broken Bow Lake.

At the time of this publication there are not any major projects (e.g., new roads, residential developments), new utility lines planned for in and around Broken Bow Lake.

National USACE policy set forth in ER 1130-2-550, Appendix H, states that USACE lands would, in most cases, only be made available for roads that are regional arterials or freeways (as defined in ER 1130-2-550). All other types of proposed roads, including driveways and alleys, are generally not permitted on USACE lands. The proposed expansion or widening of existing roadways on USACE lands would be considered on a case-by-case basis.

4.3 ANALYSIS OF CUMULATIVE IMPACTS

Impacts on each resource were analyzed according to how other actions and projects within the zone of interest might be affected by the No Action Alternative and Proposed Action. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis the intensity of impacts will be classified as negligible, minor, moderate, or major. These intensity thresholds were previously defined in Section 3.0. Moderate growth and development are expected to continue in the vicinity of Broken Bow Lake and cumulative adverse impacts on resources will not be expected when added to the

impacts of activities associated with the Proposed Action or No Action Alternative. A summary of the anticipated cumulative impacts on each resource is presented below.

4.3.1 Land Use

A major impact would occur if any action were inconsistent with adopted land use plans or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Land use around Broken Bow Lake has experienced major change, it is rapidly being developed from forested hillsides with an occasional mom and pop cabins and no real commercial recreational facilities to entire subdivisions of rental cabins and various commercial recreational facilities. Under the No Action Alternative, land use would not change. Although the Proposed Action will result in the reclassification of project lands, the reclassifications were developed to help fulfill regional goals associated with good stewardship of land resources that would allow for continued use of project lands.

The current and foreseeable land use demand and patterns for Broken Bow Lake does not entail the need of utility corridors, which the 2023 MP will not have any. However, if such a need would arise, current USACE policy dictates that all utilities must go around USACE property unless no other feasible alternative exists. If there is no feasible alternative that exists then the utility must go through the NEPA permitting process prior to approval and implementation.

Therefore, cumulative impacts on land use within the area surrounding Broken Bow Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

4.3.2 Water Resources

A major impact would occur if any action were inconsistent with adopted surface water classifications or water use plans, or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Broken Bow Lake was developed for flood control, water conservation, fish and wildlife, and recreation purposes. The reclassifications and resource objectives required to revise the 1979 MP are compatible with water use plans and surface water classification; further, they were developed to help fulfill regional goals associated with good stewardship of water resources that will allow for continued use of water resources associated with Broken Bow Lake. Therefore, cumulative impacts on water resources within the area surrounding Broken Bow Lake, when combined with past and proposed actions in the region, are anticipated to be minor.

4.3.3 Climate Change and GHG

Under the Proposed Action, current Broken Bow Lake project management plans and monitoring programs will not be changed. In the event that GHG emission issues become significant enough to impact the current operations at Broken Bow Lake, the 2023 MP and all associated documents will be reviewed and revised as necessary. Therefore, implementation of the 2023 MP, when combined with other existing and proposed projects in the region, will result in negligible reasonably foreseeable future impacts on climate, climate change or GHG.

4.3.4 Air Quality

There are not any major highway projects scheduled near the zone of interest for Broken Bow Lake nor are there any other proposed projects that will limit the amount of new emissions that could potentially affect air quality within the region. The Proposed Action will not adversely impact air quality within the area. Vehicle traffic along park and area roadways and routine daily activities in nearby communities contribute to current and future emission sources; however, the impacts associated with the reclassification of lands at Broken Bow Lake under the Proposed Action will be negligible. Seasonal prescribed burning could occur on Broken Bow Lake to help maintain the various forests found throughout the fee boundary, but will have minor, negative impacts on air quality through elevated ground-level O₃ and particulate matter concentrations; however, these seasonal burns will be scheduled so that impacts are minimized. Implementation of the 2023 MP, when combined with other existing and proposed projects in the region, could result in minor adverse and beneficial cumulative impacts on air quality.

4.3.5 Topography, Geology, and Soils

A major impact could occur if a proposed future action exacerbates or promotes long-term erosion, if the soils are inappropriate for the proposed construction and will create a risk to life or property, or if there would be a substantial reduction in agricultural production or loss of Prime Farmland soils. Cumulative impacts on topography, geology, and soils within the area surrounding Broken Bow Lake, when combined with past and proposed actions in the region, are anticipated to be negligible.

4.3.6 Natural Resources

The significance threshold for natural resources would include a substantial reduction in ecological processes, communities, or populations that would threaten the long-term viability of a species or result in the substantial loss of a sensitive community that could not be offset or otherwise compensated. Past, present, and future projects are not anticipated to impact the viability of any plant species or community, rare or sensitive habitats, or wildlife. The establishment of ESA, MRML-VM, and keeping MRML-WM areas, as well as resource objectives that favor protection and restoration of valuable natural resources will have beneficial cumulative impacts. No identified projects will threaten the viability of natural resources. Therefore, there will be major long-term beneficial impacts to natural resources resulting from the revision of the 2023 MP when combined with past and proposed actions in the area.

4.3.7 Invasive Species

The USACE will continue to monitor for zebra mussels and take all practicable measures to prevent them from becoming a nuisance to Broken Bow Lake.

The land reclassifications required to revise the 1979 MP are compatible with Broken Bow Lake invasive species management practices. Therefore, there will be minor long-term beneficial impacts on reducing and preventing invasive species within the area surrounding Broken Bow Lake.

4.3.8 Threatened and Endangered Species

The Proposed Action and No Action Alternatives will not adversely impact threatened, endangered and Oklahoma Natural Heritage Inventory (ONHI) species within the area. Should federally listed species change in the future (e.g., delisting of the American burying beetle or other species or listing of new species), associated requirements will be reflected in revised land management practices in coordination with the USFWS. The USACE will continue cooperative management plans with the USFWS and ODWC to preserve, enhance, and protect critical wildlife habitat resources.

No reasonably foreseeable future impacts on federal and state listed species are anticipated.

4.3.9 Cultural, Historical, and Archaeological Resources

The Proposed Action has been determined to have no potential to cause effects on cultural resources or historic properties, as the master plan revision does not involve any ground disturbing activities. However, ESA and Wildlife Management lands provide additional protection against ground disturbances. Therefore, this action, when combined with other existing and proposed projects in the region, will not result in major, or minor, or moderate cumulative impacts on cultural resources or historic properties.

4.3.10 Recreation

Broken Bow Lake provides regionally significant outdoor recreation benefits including a variety of recreation opportunities. Even though the amount of acreage available for High Density Recreation and Low Density Recreation will decrease as a result of implementing the reclassifications, resources objectives, and resource plan in the 2023 MP, these changes reflect changes in land management and historic recreation use patterns that have occurred since 1979 at Broken Bow Lake. The conversion of these lands will have no effect on current or projected public use. Therefore, the Proposed Action, when combined with other existing and proposed projects in the region, will result in negligible beneficial cumulative impacts on area recreational resources.

4.3.11 Aesthetic Resources

No impacts on visual resources will occur as a result of implementing the reclassifications, resources objectives, and resource plan in the 2023 MP. The Proposed Action, especially the classification of ESAs, in conjunction with other projects in the region, will result in minor beneficial cumulative impacts on the visual resources in the Broken Bow Lake area.

4.3.12 Health and Safety

No health or safety risks will be created by the Proposed Action. The effects of implementing the 2023 MP, when combined with other ongoing and proposed projects in the Broken Bow Lake area, will not be considered a major, or minor, or moderate cumulative effect.

SECTION 5: COMPLIANCE WITH ENVIRONMENTAL LAWS

This EA has been prepared to satisfy the requirements of all applicable environmental laws and regulations, and has been prepared in accordance with the CEQ's implementing regulations for NEPA, 40 CFR Parts 1500 – 1508, and the USACE ER 200-2-2, *Environmental Quality: Procedures for Implementing NEPA*. The revision of the 2023 MP is consistent with the USACE's Environmental Operating Principles. The following is a list of applicable environmental laws and regulations that were considered in the planning of this project and the status of compliance with each:

Fish and Wildlife Coordination Act of 1958, as amended – The USACE initiated public involvement and agency scoping activities to solicit input on the 2023 MP revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. Information provided by USFWS and ODWC on fish and wildlife resources has been utilized in the development of the 2023 MP.

Endangered Species Act of 1973, as amended – Current lists of threatened or endangered species were compiled for the 2023 MP. USACE has determined that there will be No Effect on any federally-listed species with implementation of either alternative.

Executive Order 13186 (Migratory Bird Habitat Protection) – Sections 3a and 3e of EO 13186 direct Federal agencies to evaluate the impacts of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative impacts on migratory birds. The 1979 MP revision will not result in adverse impacts on migratory birds or their habitat. Beneficial impacts could occur through protection of habitat as a result of the 2023 MP revision.

Migratory Bird Treaty Act, as amended – The Migratory Bird Treaty Act of 1918 extends Federal protection to migratory bird species. The nonregulated “take” of migratory birds is prohibited under this act in a manner similar to the prohibition of “take” of threatened and endangered species under the Endangered Species Act. The timing of resource management activities will be coordinated to avoid impacts on migratory and nesting birds.

CWA of 1977, as amended – The Proposed Action will comply with all state and Federal CWA regulations and requirements and is regularly monitored by the USACE and ODEQ for water quality. A state water quality certification pursuant to Section 401 of the CWA is not required for the 2023 MP. There will be no change in the existing management of the reservoir that will impact water quality.

National Historic Preservation Act (NHPA) of 1966, as amended – Compliance with the NHPA of 1966, as amended, requires identification of all properties in the project area listed in, or eligible for listing in, the NRHP. All previous surveys and site salvages were coordinated with the Oklahoma State Historic Preservation Officer. Known sites are mapped and avoided by maintenance activities. Areas that have not undergone cultural resources surveys or evaluations will need to do so prior to any earthmoving or other potentially impacting activities. The USACE has determined that the Proposed Action would have no potential to cause effects on Cultural Resources.

Clean Air Act of 1977, as amended – The USEPA established nationwide air quality standards to protect public health and welfare. Existing operation and management of the reservoir is compliant with the Clean Air Act and will not change with the 2023 MP revision.

Farmland Protection Policy Act (FPPA) of 1980 and 1995 – The FPPA’s purpose is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. There are Prime Farmland and farmland of state importance on Broken Bow Lake project lands, but these will not be impacted.

Executive Order 11990, Protection of Wetlands, as amended – EO 11990 requires Federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in executing Federal projects. The Proposed Action complies with EO 11990.

Executive Order 11988, Floodplain Management, as amended – This EO directs Federal agencies to evaluate the potential impacts of proposed actions in floodplains. Both alternatives comply with EO 11988, as neither will have impacts to the existing floodplain at Broken Bow Lake.

CEQ Memorandum dated August 11, 1980, Prime or Unique Farmlands – Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The Proposed Action will not impact Prime Farmland present on Broken Bow Lake project lands.

Executive Order 12898, Environmental Justice – This EO directs Federal agencies to achieve environmental justice to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review. Agencies are required to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The revisions in the 2023 MP will not result in a disproportionate adverse impact on minority or low-income population groups.

SECTION 6: IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

NEPA requires that Federal agencies identify “any irreversible and irretrievable commitments of resources which will be involved in the Proposed Action should it be implemented” (42 U.S.C. § 4332). An irreversible commitment of resources occurs when the primary or secondary impacts of an action result in the loss of future options for a resource. Usually, this is when the action affects the use of a nonrenewable resource, or it affects a renewable resource that takes a long time to regenerate. The impacts for this project from the reclassification of land will not be considered an irreversible commitment because subsequent MP revisions could result in some lands being reclassified to a prior, similar land classification. An irretrievable commitment of resources is typically associated with the loss of productivity or use of a natural resource (e.g., loss of production or harvest). No irreversible or irretrievable impacts on Federally protected species or their habitat is anticipated from implementing the revisions to the 1979 MP.

SECTION 7: PUBLIC AND AGENCY COORDINATION

In accordance with 40 CFR §1501.7, 1503, and 1506.6, the USACE initiated public involvement and agency scoping activities to solicit input on the revision of the 1979 MP, as well as identifying reclassification proposals and significant issues related to the Proposed Action. The USACE began its public involvement process with a public scoping meeting to provide an avenue for public and agency stakeholders to ask questions and provide comments. This public scoping meeting was held on May 23, 2022 at the Kiamichi Technology Center Seminar Room, Idabel Oklahoma. The USACE, Tulsa District, placed advertisements on the USACE webpage, social media, and print publications prior to the public scoping meeting.

A second public meeting was held on May 30, 2023 at the Southeastern Oklahoma State University; ET Dunlap Center; McCurtain County Campus; 2805 N.E. Lincoln Road; Idabel, Oklahoma 74745. This meeting introduced the public to the draft MP and EA and began the 30-day public review period of the MP, EA and draft Finding of No Significant Impact (FONSI). As with the first public meeting, USACE, Tulsa District, placed advertisements on the USACE webpage, and various social media sites sponsored by adjacent cities. In addition, news releases were sent to area newspapers.

Comments received during the initial scoping period and on the draft MP and EA were incorporated in the documents, and as appropriate in the 2023 MP.

Attachment A to this EA includes the ads published in the local newspaper, the agency coordination letters, and the distribution list for the coordination letters published. The 2023 EA has been coordinated with agencies having legislative and administrative responsibilities for environmental protection.

SECTION 8: REFERENCES

Council on Environmental Quality (CEQ). 2005. Executive Office of the President. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

Environmental Protection Agency (EPA) (2022A) Climate and Economic Justice Screening Tool. Explore the Map. Retrieved from <https://screeningtool.geoplatform.gov/en/>

EPA (2022B) Climate and Economic Justice Screening Tool. Methodology. Retrieved from <https://screeningtool.geoplatform.gov/en/methodology>

United States Army Corps of Engineers (USACE). 2023. Broken Bow Lake Master Plan, Red River Basin, and McCurtain County, Oklahoma. USACE, Tulsa District.

USACE. 1988. *Engineering Regulation 200-2-2, Procedures for Implementing NEPA*. Washington, DC.

USACE. 2023. Broken Bow Lake Master Plan, Mountain Fork River Basin, and McCurtain County, Oklahoma. USACE, Tulsa District.

U.S Fish and Wildlife Service (USFWS). 2023. Information, Planning, and Consultation(IPAC) System, Environmental Conservation Online System. Official Species List. Project Code: 2022-0083524. Created on August 28, 2023. <https://ecos.fws.gov>.

SECTION 9: ACRONYMS/ABBREVIATIONS

%	Percent
°	Degrees
§	Section
ac-ft	acre-feet
AQCR	Air Quality Control Region
BMP	Best Management Practice
BP	Before Present
CAP	Climate Action Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	CO ₂ -equivalent
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DEQ	Oklahoma Department Environmental Quality
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EP	Engineer Pamphlet
ER	Engineer Regulation
ERS	Environmental Radiation Surveillance
ESA	Environmentally Sensitive Area
F	Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
gpm	gallons per minute
HDR	High Density Recreation
HTRW	Hazardous, Toxic, Radioactive Wastes
IFR	Inactive/Future Recreation
IPAC	Information for Planning and Consultation (USFWS)
LDR	Low Density Recreation
MP	Master Plan
MRML	Multiple Resource Management Lands
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NO	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRRS	National Recreation Reservation Service
NWI	National Wetlands Inventory (USFWS)
ODWC	Oklahoma Department of Wildlife Conservation
ONHI	Oklahoma Natural Heritage Inventory
O ₃	Ozone
OAQPS	Office of Air Quality Planning and Standards

ODWC	Oklahoma Department of Wildlife Conservation
Pb	Lead
PCB	Polychlorinated Biphenyls
PCPI	Per Capita Personal Incomes
PL	Public Law
PM _{2.5}	Particulate Matter Less than 2.5 Microns
PM ₁₀	Particulate Matter Less than 10 Microns
PO	Project Operations
RM	River Mile
ROD	Record of Decision
RPEC	Regional Planning and Environmental Center
SGCN	Species of Greatest Conservation Need
SO ₂	Sulfur Dioxide
SUPER	USACE Suite of Computer Programs
SHPO	Oklahoma State Historic Preservation Office
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Group
VOC	Volatile Organic Compounds
WHAP	Wildlife Habitat Appraisal Procedures
WM	Wildlife Management
VM	Vegetation Management
ZOI	Zone of Interest

SECTION 10: LIST OF PREPARERS

Paul E. Roberts - Biologist, Regional Planning and Environmental Center, Fort Worth District- 8 years of USACE experience.

ATTACHMENT A: NEPA COORDINATION AND PUBLIC SCOPING



**DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290**

April 25, 2022

PUBLIC NOTICE

**OPEN HOUSE FOR BROKEN BOW LAKE MASTER PLAN REVISION,
BROKEN BOW LAKE, MOUNTAIN FORK WATERSHED,
MCCURTAIN COUNTY, OKLAHOMA**

The Tulsa District, U.S. Army Corps of Engineers (USACE) is revising the Broken Bow Lake Master Plan (MP). The USACE defines the MP as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. It defines "how" the resources will be managed for public use and resource conservation. The current MP, last approved in 1979, needs revision to address changes in regional land use, population, outdoor recreation trends, and the USACE management policy.

Revision of the MP will not detail the technical or operational aspects of the lake related to flood risk management; the water conservation missions of the project; or the shoreline management program which specifies what private uses are permitted along the shoreline. The MP study area will include Broken Bow Lake proper and all adjacent recreational and natural resources in USACE fee-owned property.

An open house will be held from 6:00 pm to 8:00 pm on May 23, 2022, within the Seminar Room of the Kiamichi Technology Center - Idabel 3205 Lincoln Rd. N.E., Idabel, Oklahoma, 74745. The open house will provide attendees with information regarding the revision content and process and a general schedule. Attendees can view current land use classification maps and ask USACE staff questions.

Key topics to be discussed in the revised MP include revised land use classifications, new natural and recreational resource management objectives, recreation facility needs, and special issues such as invasive species management and threatened and endangered species habitat. A 30-day public comment period will begin May 23, 2022 and end June 23, 2022. During this time the public can send comments, suggestions, and concerns. Public participation is critical to the successful revision of the MP. Information provided at the open house, including the existing MP, may be viewed on the Tulsa District website at the following link beginning May 23, 2022:

<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>

Comments can be submitted in writing at the scheduled open house or mailed to Shae Harrison, Broken Bow Lake Manager, P.O. Box 99, Sawyer, Oklahoma, 74756. Comments can also be submitted via email to: CESWT-OD-RBRBSWT@USACE.ARMY.MIL.

Sincerely,

A handwritten signature in cursive script that reads "Jeffrey Pinsky".

Jeffrey F. Pinsky
Chief, Environmental Branch
Regional Planning and Environmental Center

[Home](#) / [Missions](#) / [Recreation](#) / Master Plans

HOT INFO

The following Master Plans are currently under review Broken Bow, Pine Creek and Sardis Master Plans.

Online Review of Master Plans

The Tulsa District, US Army Corps of Engineers (USACE) is hosting an online review to provide information and receive public input to begin the process of revising the Master Plan for Council Grove, El Dorado, Elk City, & Marion Reservoirs. Normally, USACE would conduct a face-to-face public workshop to announce the start of the revision and to request comments from the public. However, precautions associated with the COVID-19 virus have made it necessary to conduct the public involvement process online instead of hosting a face-to-face workshop. Please watch the following video presentations or download the PDF copy to read the presentation. The PDF copy and video presentation provide the same information.

Please note, Oologah's Master Plan update is also in process and listed below. The public meeting was previously held on February 27 and supporting documents can be found below.

Master Plans

What is a Master Plan?

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 resources project. Revision of the Master Plan will not address in detail the technical operational aspects of the reservoir related to the water supply or flood risk management missions of the project.

What a Master Plan is not.

The Master Plan does not entail facility designs, daily project administration details or any technical discussion regarding flood risk management, water quality, water supply, shoreline management, water level management, hydropower or navigation. Many of these topics are covered in the many other Operational Plans each lake develops separately from the master plan.

Why Revise a Master Plan?



Why Revise a Master Plan?

Most Master Plans at Tulsa lakes are the original document when the lake was built. Over the span of 40+ years, many changes have taken place including major utility and highway construction, urbanization, and evolving recreational uses. The Plan and the land classifications are in need of revision to address changes in regional land use, population, outdoor recreation trends, and USACE management policy. Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs, and special topics such as invasive species management and protection of sensitive wildlife habitat. Public participation is critical to the successful revision of the Master Plan.

[The Master Planning Process](#)

Master Plans Policy & Procedures

This link will take you to the established guidance, procedures and policies for the management of recreation programs and activities, and for the operation and maintenance of U.S Army Corps of Engineers recreation facilities and related structures, at civil work water resource projects.

[Plans & OMP's](#)

Sardis Lake, Jackfork Creek, Oklahoma

March 10, 2022

[Sardis Lake DM No. 20](#) (10.3MB)

[Land Classification Map](#) with imagery

[Land Classification Map](#) street view

[News Release](#)

[Sardis Lake Master Plan Scoping Public Notice](#)

[Comment Form and Instructions](#) **Comment period ended April 23, 2022**

[Presentation](#)

[Sardis Lake Home Page](#)

[Business With Us](#) ▼[Home](#)[About](#) ▼[Missions](#) ▼[Locations](#) ▼[Media](#) ▼[Library](#) ▼[Contact](#) ▼[Careers](#) ▼[Coronavirus](#)[US Army Corps of Engineers](#) [Tulsa District Website](#)[Sardis Lake Master Plan Scoping Public Notice](#)[Comment Form and Instructions](#) **Comment period ended April 23, 2022**[Presentation](#)[Sardis Lake Home Page](#)

Broken Bow Lake, Mountain Fork River, Oklahoma

[Design Memorandum No. 4B Master Plan](#) (37 MB)[Design Memorandum No. 4B Exhibits and Drawings](#) (20 MB)[Design Memorandum No. 4B Appendix A](#) (25.7 MB)[Land Classification Map](#) street view[Land Classification Map](#) with imagery (2.36 MB)[Comment Form and Instructions](#) **Comment period ended June 23, 2022**[Presentation](#) (2.05 MB)[News Release](#)[Public Notice](#)[Moratorium on New Development](#) **Effective 23 August 2022**[Broken Bow Lake Homepage](#)



**US Army Corps
of Engineers®**

Comment Form Instructions

Broken Bow Lake Master Plan Revision

*30 Day Comment Period
May 23, 2022 through June 23, 2022*

The U.S. Army Corps of Engineers is in the process of revising the Broken Bow Lake Master Plan. The master plan revision will guide the land and recreational management of the federally owned property that make up the its flood storage area for the next 25 years. Management activities include protecting natural and cultural resources, providing public land and water recreation, protecting the public, and ensuring reservoir and dam operations. Pertinent information and a copy of the current land use map can be found on the USACE website below.

To add your comments, ideas, or concerns about the future land and recreational management for Broken Bow Lake, please submit comments using any of the following methods:

- Fill out and return a comment form available below or at:
<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>
- Provide comments in an email message or use comment for and send to:
CESWT-OD-RBRBSWT@USACE.ARMY.MIL
- Provide comments in a letter or use comment form and mail to:

U.S. Army Corps of Engineers
Shae Harrison, Broken Bow Lake Manager
P.O. Box 99, Sawyer, Oklahoma, 74756
CESWT-OD-RBRBSWT@USACE.ARMY.MIL

Thank you for your participation in helping develop the Master Plan for Broken Bow Lake.





Comments Due By June 23, 2022

Your input into the master plan revision and related environmental concerns under the National Environmental Policy Act (NEPA) is key to developing a successful master plan for the lake project. Please write your questions, comments, or suggestions in the space provided here and mail or e-mail them to the address below no later than the date of this form. Thank you for your participation!

[illegible]

Name: _____ Affiliation: _____

Address: _____ City: _____ State: _____

Zip code: _____ Phone: _____ Email: _____

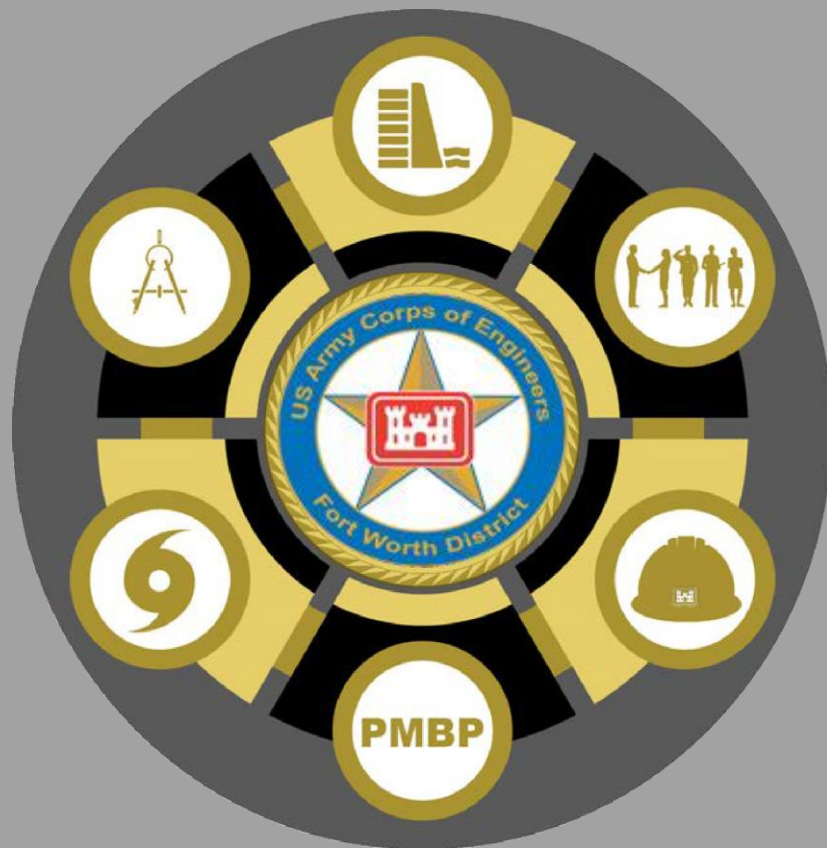
Mail or email comment sheet to the following Point of Contact:

Additional information and comment sheets can be found at the following:
<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>

REVISING THE 1979 BROKEN BOW LAKE MASTER PLAN

Public Workshop
23 May 2022
Idabel, OK

U.S. Army Corps of Engineers, Tulsa District



US Army Corps
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WHAT IS A MASTER PLAN?

- The purpose of a master plan is to establish guidelines for comprehensive management and development of all recreational, natural and cultural resources
- Main focus is stewardship of natural and cultural resources and provision of quality outdoor recreation facilities and opportunities
- Proposed effective life of a Master Plan is 25 years
- Recreational use of the water surface is addressed



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ADDITIONAL KEY POINTS

Key sections of the Master Plan Revision include

- Resource management objectives
- Revised land use classifications
- Conceptual management plan for each land classification

Potential outcomes could be

- Designation of lands for utility corridors, environmentally sensitive areas...

Protection of environmentally sensitive areas is given priority



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WHAT MASTER PLANS ARE NOT

Master Plans **do not** address in detail the technical aspects of:

- Regional water quality
- Water management for flood risk management
- Water supply or water level management
- Shoreline management (Including boat docks, mowing, or other permits)



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WHAT ABOUT DROUGHT/FLOOD?

- Master Plans cannot change how water in the lake is managed, this is addressed in a separate Water Control Plan
- Natural resources and recreation management must be implemented within the constraints of the primary missions of flood risk management and water supply



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Why Revise MASTER PLAN?

- Revision is needed to incorporate any changes in Public Law
- Current Master Plan is dated June 1979 and has exceeded its useful life. The way the Lake is managed today is different from the vision set forth in the 1979 plan
- Need to re-examine Land Classifications
- The Master Plan must be revised to address current and projected future growth in the region



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What Revisions Can You Propose?

- Re-examine the classification of all project lands
- Re-examine the classification of all project water surface
- Resource Management Objectives
- Recreation Management Objectives



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NATIONAL ENVIRONMENTAL POLICY ACT

- The MP Revision process includes compliance with the National Environmental Policy Act (NEPA) of 1969.
- Purpose of NEPA is to:
 - Ensure federal agencies give proper consideration to the environment prior to undertaking a federal action.
 - Involve the Public (scoping) in the decision-making process.
 - Document the process by which agencies make informed decisions.
- NEPA Scoping Process:
 - Opportunity for Public comments and questions on the potential impacts of proposed federal actions.
 - Includes comments by other federal, State, and local governments, and American Indian Tribal Nations.



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NEPA Includes:

- Public exchange of information related to problems to be solved, issues to be addressed, and potential alternatives.
- Identification and evaluation of a broad range of alternatives.
- Identification and quantification of potential impacts.
- Screening of non-relevant issues from analysis.
- Documentation of analysis and coordination through preparation of NEPA documents, such as an Environmental Assessment (EA) or an Environmental Impact Statement (EIS).
- Federal, State, and Public review of NEPA documents.



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What Types of Comments Can You Submit under NEPA?

- NEPA requests your input on the proposed revision of the Broken Bow Lake Master Plan and the potential environmental impacts of that action.
- Broadly, covers any aspect of the natural and human environment.
- Some examples of comment categories might include:
 - Recreation availability and access;
 - Fish & wildlife habitat;
 - Public access to federal land;
 - Economic impacts;
 - Cultural resources; or
 - Water and air quality.



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NEPA RESOURCES

Available on NEPAnet: <http://www.NEPA.gov>

NEPAnet Includes:

- A Citizen's Guide to NEPA— Having Your Voice Heard
- Council on Environmental Quality Regulations for Implementing NEPA (40 CFR Parts 1500-1508)



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THE MASTER PLAN REVISION PROCESS



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How can you participate?

Review the below documents at website:

<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>

- Public Meeting PowerPoint
- Existing Broken Bow Lake Master Plan
- Broken Bow Master Plan Update Comment Instructions
- Broken Bow Lake Master Plan Comment Form
- USACE Master Planning Policies and Procedures

Submit a comment with your input on the proposed MP revision.



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Broken Bow Lake Master Plan Revision Comments

SUBMIT YOUR COMMENTS:

- (1) Using comment forms available at this Public Meeting
- (2) You may download the comment form provided on the website, fill it out electronically, and email it to the Corps using the submit button on the comment form.
- (3) by mail: Shae Harrison, Broken Bow Lake Manager;
P.O. Box 99, Sawyer, OK 74756

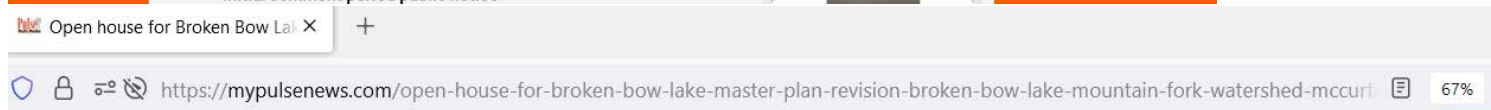
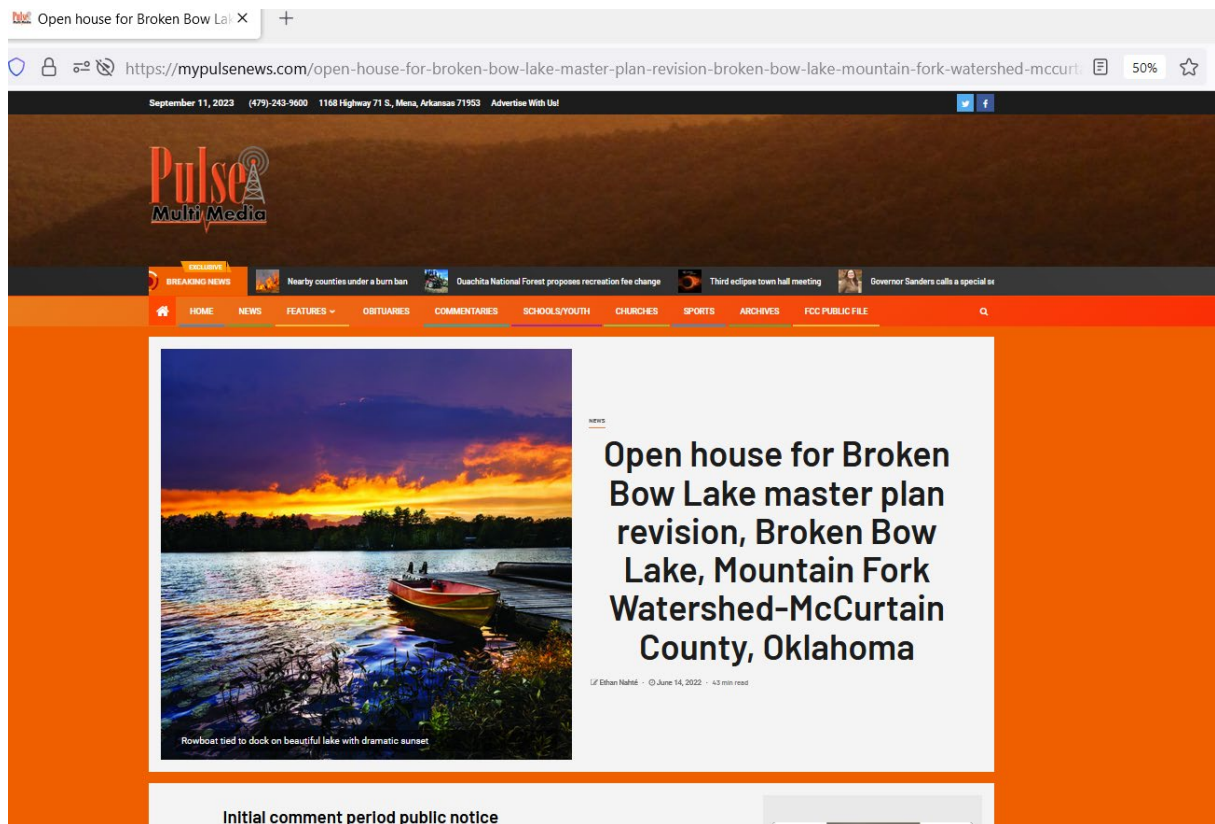
or

- (3) by email: CESWT-OD-RBRBSWT@USACE.ARMY.MIL



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Initial comment period public notice

The U.S. Army Corps of Engineers (USACE) Tulsa District hosted an Open House on May 23, 2022 at the Kiamichi Technology Center in Idabel, Okla. to provide information about the Broken Bow Lake Master Plan revision content and process. This public Open House initiated a 30-day public comment period for the Broken Bow Lake Master Plan revision that will be open through June 23, 2022, during which the public can submit comments, suggestions, and concerns. At this time, no changes or updates have been made to the existing Master Plan.

After the comment period closes, comments will be reviewed and considered during the draft writing phase of the Master Plan process. An additional Open House will be held in May 2023 to present the proposed draft document at which time an additional 30 day comment period will be active.

The current Master plan was last approved in 1979 and needs revision to address changes in regional land use, population, outdoor recreation trends, and the USACE management policy. The USACE defines a Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. It defines how the resources will be managed for public use and resource conservation. The Master Plan study area includes Broken Bow Lake proper and all adjacent recreational and natural resources properties in USACE fee-owned property and not adjacent private land.

The revision of the Master Plan does not address in detail the technical or operational aspects of the lake related to flood risk management, the water conservation missions of the project, or the shoreline management program which specifies what private uses are permitted along the shoreline. Any proposals for future recreation development are reviewed under a separate policy titled "Recreation Development Policy for Outgranted Corps Lands" ER 1130-2-550 and are not part of the Master Plan revision.

Public participation is critical to the successful revision of the Master Plan. Information provided at the Open House, including the existing Master Plan, may be viewed on the Tulsa District website at the following link

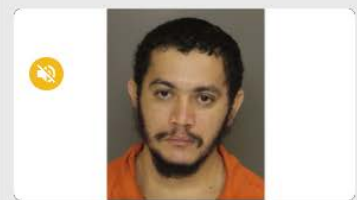
<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>

Comments can be submitted in writing to

Shae Harrison, Broken Bow Lake Manager

P.O. Box 99

Sawyer, Oklahoma 74756



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Kiamichi Technology Criminal Justice student Shakota Witten (right) performs a Standardized Field Sobriety Test on fellow student Logan Polsun (left) during the classes DUI Traffic stop training on the grounds of the Kiamichi Technology Center in Idabel on Tuesday. Head instructor Gabe Morse mentioned that he has 22 students enrolled in the program this year. (Staff photo)

Corps of Engineers to revise master plan for Broken Bow Lake

By Larry Stovall

The Tulsa District U.S. Army Corps of Engineers (USACE) is revising its master plan for Broken Bow Lake and will host an open house event to showcase the changes on May 23.

That meeting will take place from 6-8 p.m. that day at Kiamichi Technology Center in Idabel.

According to Broken Bow Lake Natural Resources Specialist Adam Miller, the meeting will allow attendees the opportunity to provide public comment on how the lake should be managed over the next 25 years.

The lake's master plan is defined by the Corps as the "strategic land-use management document that guides the comprehensive management and development of all recreational, natural and cultural resources throughout the life of the water resource develop-

ment project" and defines how the resources will be managed for public use and resource conservation.

The lake's current master plan was approved in 1979 according to the USACE and "needs revision to address changes in regional land use, population, outdoor recreation trends and the USACE management policy."

"Revision of the (master plan) will not detail the technical or operational aspects of the lake related to flood risk management; the water conservation missions of the project; or the shoreline management program which specified what private uses are permitted along the shoreline," Corps officials stated.

Key topics that will be discussed in the revised master plan include revised land use classifications, new natural and recreational resource management objectives, recre-

ation facility needs and special issues such as invasive species management and threatened and endangered species habitat.

The open house on May 23 will provide attendees with information on the master plan revisions and a general schedule. USACE staff will be on hand for questions and land use classification maps will be available for viewing.

May 23 will also be the first day of a 30-day public comment period on the master plan revisions. From that date until June 23, the public can send comments, suggestions and concerns. USACE described public participation as "critical to the successful revision of the (master plan)".

Information on the revisions will also be posted to the USACE Tulsa District website starting that day.

Construction delays affect school projects

By Bob West

Weather delays continue on U.S. 70 at Valliant where state bulldozers contractors have been clearing trees and grading dirt alongside the roadway for expanded lanes.

The dirt work contractor has had to delay work because of the saturation of the sticky black land soil.

Idabel and Broken Bow bond projects may also have some weather delays. Contractors on Idabel's all-weather foot-

ball and track fields had been making good progress until frequent rains the last few weeks. Broken Bow is in the process of building a new vocational agriculture building with bond funding.

Valliant schools to sell bonds

By Bob West

Valliant school district is scheduled to hold a bond election this summer. Among the projects to be funded are the construction of a new high school and the renovation of the middle school.

The bond election will be held on Wednesday, May 23, at 6 p.m. at the Valliant High School.

By Sheriff Kasbaum
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Broken Bow Master Plan Revision Open House set for May 23

OK, UNITED STATES

04.26.2022

Story by Sara Goodeyon

U.S. Army Corps of Engineers, Tulsa District

Subscribe

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TULSA, Okla. – The U.S. Army Corps of Engineers Tulsa District will host an Open House May 23 to provide information about the Broken Bow Lake Master Plan revision content and process and will provide a general schedule. The event will be held from 6:00 p.m. to 8:00 p.m. in the Seminar Room of the Kiamichi Technology Center, 3205 Lincoln Road NE, Idabel, Okla., 74745.

Current land use classification maps will be available to view and USACE personnel will be available to answer questions. There will be a 30-day comment period for the Broken Bow Master Plan Revision that will be open from May 23 through June 23, 2022, during which the public can submit comments, suggestions and concerns. The current Master Plan was last approved in 1979 and needs revisions to address changes in regional land use, population, outdoor recreation trends, and the USACE management policy. The USACE defines a Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. It defines how the resources will be managed for public use and resource conservation.

The revision of the Master Plan will not address in detail the technical or operational aspects of the lake related to flood risk management, the water conservation missions of the project, or the shoreline management program which specifies what private uses are permitted along the shoreline. The Master Plan study area will include Broken Bow Lake proper and all adjacent recreational and natural resources properties in USACE fee-owned property.

MORE LIKE THIS



CONTROLLED VOCABULARY KEYWORDS

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Tulsa District USACE

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The revision of the Master Plan will not address in detail the technical or operational aspects of the lake related to flood risk management, the water conservation missions of the project, or the shoreline management program which specifies what private uses are permitted along the shoreline. The Master Plan study area will include Broken Bow Lake proper and all adjacent recreational and natural resources properties in USACE fee-owned property. Key topics to be addressed in the revised Master Plan include revised land use classifications, new natural and recreational resource management objectives, recreation facility needs, and special issues such as invasive species management and threatened and endangered species habitat. Public participation is critical to the successful revision of the Master Plan. Information provided at the open house, including the existing Master Plan, may be viewed on the Tulsa District website beginning May 23, 2022.

Comments can be submitted in writing and given to USACE staff at the open house or mailed to Shae Harrison, Broken Bow Lake Manager, P.O. Box 99, Sawyer, OK, 74756. Comments can also be emailed to CESWT-OD-RBRBSWT@USACE.ARMY.MIL.
XXX

LEAVE A COMMENT

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

May 16, 2023

Public Notice
2023 Draft Broken Bow Lake Master Plan and Environmental Assessment
Broken Bow Lake, Mountain Fork Watershed
McCurtain County, Oklahoma

The U.S. Army Corps of Engineers (USACE), Tulsa District, hereby informs the public that the 2023 Draft Broken Bow Lake Master Plan (MP), Finding of No Significant Impact (FONSI), and Environmental Assessment (EA) are available for public review. An open house will be held from 6:00 PM to 8:00 PM on May 30, 2023, within the Southeastern Oklahoma State University, ET Dunlap Center, McCurtain County Campus, 2805 N.E. Lincoln Road, Idabel, Oklahoma 74745. The public open house will give an overview of the proposed changes to the current Broken Bow Lake Master Plan, inform the public on how to submit comments, and provide an opportunity for the public to ask questions and offer feedback. The 30-day public comment period will begin on May 30, 2023, and end on June 29, 2023. For those unable to attend the public open house, the draft MP, EA, FONSI, comment form with instructions, and a presentation covering the same topics covered in the open house will be available for download starting on May 30, 2023, at the following Tulsa District website:

www.swt.usace.army.mil/Missions/Recreation/Master-Plans/

The master plan is a vital tool produced and used by the USACE to guide the responsible stewardship of the USACE administered lands and resources for present and future generations. The master plan provides direction for appropriate management, use, development, enhancement, protection, and conservation of the natural, cultural, and manmade resources at Broken Bow Lake. The master plan presents an inventory and analysis of land resources, resource management objectives, land use classifications, a resource use plan for each land use classification, current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. The most recent Master Plan for Broken Bow Lake was last approved in 1979.

Comments, suggestions, and questions can be submitted in writing and can be given to the USACE staff at the scheduled open house, or mailed to: Shae Harrison, Lower Red River Area Manager, P.O. Box 99, Sawyer, Oklahoma, 74756. Comments can also be submitted via email to: CESWT-OD-RBRBSWT@USACE.ARMY.MIL .

Sincerely,

A handwritten signature in cursive script that reads "Jeffrey F. Pinsky".


Jeffrey F. Pinsky
Chief, Environmental Branch
Regional Planning and Environmental Center


Tulsa District Recreation – Mast

← → ↺ 🏠

🔒 https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/

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HOT INFO

The Broken Bow Draft Master Plan, Sardis Lake Draft Master Plan and Pine Creek Draft Master Plan are available below.

Online Review of Master Plans

The Tulsa District, US Army Corps of Engineers (USACE) is hosting an online review to provide information and receive public input to begin the process of revising the Master Plan for Council Grove, El Dorado, Elk City, & Marion Reservoirs. Normally, USACE would conduct a face-to-face public workshop to announce the start of the revision and to request comments from the public. However, precautions associated with the COVID-19 virus have made it necessary to conduct the public involvement process online instead of hosting a face-to-face workshop. Please watch the following video presentations or download the PDF copy to read the presentation. The PDF copy and video presentation provide the same information.

Please note, Oologah's Master Plan update is also in process and listed below. The public meeting was previously held on February 27 and supporting documents can be found below.

Master Plans

What is a Master Plan?

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 resources project. Revision of the Master Plan will not address in detail the technical operational aspects of the reservoir related to the water supply or flood risk management missions of the project.

What a Master Plan is not.

The Master Plan does not entail facility designs, daily project administration details or any technical discussion regarding flood risk management, water quality, water supply, shoreline management, water level management, hydropower or navigation. Many of these topics are covered in the many other Operational Plans each lake develops separately from the master plan.

Why Revise a Master Plan?

Most Master Plans at Tulsa lakes are the original document when the lake was built. Over the span of 40+ years, many changes have taken place including major utility and highway construction, urbanization, and evolving recreational uses. The Plan and the land classifications are in need of revision to address changes in regional land use, population, outdoor recreation trends, and USACE management policy. Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs, and special topics such as invasive species management and protection of sensitive wildlife habitat. Public participation is critical to the successful revision of the Master Plan.

[The Master Planning Process](#)


Tulsa District Recreation – Mast

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🔒 https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/

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 **US Army Corps of Engineers** Tulsa District Website

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[The Master Planning Process](#)

Master Plans Policy & Procedures

This link will take you to the established guidance, procedures and policies for the management of recreation programs and activities, and for the operation and maintenance of U.S Army Corps of Engineers recreation facilities and related structures, at civil work water resource projects.

[Plans & OMP's](#)

Sardis Lake, Jackfork Creek, Oklahoma

March 10, 2022

[Sardis Lake DM No. 20](#) (10.3MB)

[Land Classification Map](#) with imagery

[Land Classification Map](#) street view

[News Release](#)

[Sardis Lake Master Plan Scoping Public Notice](#)

[Comment Form and Instructions](#) **Comment period ended April 23, 2022**

[Presentation](#)

March 23, 2023

[News Release](#)

[Sardis Lake Draft Master Plan](#)

[Comment Form and Instructions](#) **Comment period March 30, 2023 through April 29, 2023**

[Presentation](#)

[Sardis Lake Home Page](#)

Tulsa District Recreation – Master Plans

https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/

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Broken Bow Lake, Mountain Fork River, Oklahoma

[Design Memorandum No. 4B Master Plan](#) (37 MB)

[Design Memorandum No. 4B Exhibits and Drawings](#) (20 MB)

[Design Memorandum No. 4B Appendix A](#) (25.7 MB)

[Land Classification Map](#) street view

[Land Classification Map](#) with imagery (2.36 MB)

[Comment Form and Instructions](#) **Comment period ended June 23, 2022**

[Presentation](#) (2.05 MB)

[News Release](#)

[Public Notice](#)

[Moratorium on New Development](#) **Effective 23 August 2022**

May 17, 2023

[News Release](#)

[Broken Bow Draft Master Plan](#) (62.2 MB)

[Comment Form and Instructions](#) **Comment period May 30, 2023 through June 29, 2023**

[Presentaion](#) (949 KB)

[Broken Bow Lake Homepage](#)



DEFENSE VISUAL INFORMATION DISTRIBUTION SERVICE

Open House Set for May 30 for Public Review of Draft Broken Bow Lake Master Plan, Finding of No Significant Impact, and Environmental Assessment



IDABEL, OK, UNITED STATES

05.16.2023

Story by Sara Goodeyon

U.S. Army Corps of Engineers, Tulsa District

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TULSA, Okla. – The U.S. Army Corps of Engineers (USACE) Tulsa District will host an Open House May 30 from 6:00 to 8:00 p.m. within the Southeastern Oklahoma State University, ET Dunlap Center, McCurtain County Campus, 2805 N.E. Lincoln Road, Idabel, Oklahoma to allow public review of the 2023 Draft Broken Bow Lake Master Plan, Finding of No Significant Impact, and Environmental Assessment.

The public open house will give an overview of the proposed changes to the current Broken Bow Lake Master Plan, provide instructions on how to submit comments, and provide an opportunity for the public to ask questions and provide feedback.

A 30-day public comment period will begin May 30, 2023, and end June 29, 2023. For those unable to attend the public open house, the draft Master Plan, Finding of No Significant Impact, and Environmental Assessment, comment form with instructions, and a presentation covering the same topics covered in the open house will be available for download beginning May 30, 2023, on the Tulsa District website: <https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>

The Master Plan is a vital tool produced and used by USACE to guide the responsible stewardship of USACE-administered lands and resources for present and future generations. The Master Plan provides direction for appropriate management, use, development, enhancement, protection, and conservation of the natural, cultural, and manmade resources at Broken Bow Lake. It presents an inventory and analysis of land resources, resource management objectives, land use classifications, a resource use plan for each land use classification, current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management.

The most recent Master Plan for Broken Bow Lake was approved in 1979.

Written comments, suggestions, and questions can be submitted to USACE staff at the open house or mailed to Shae Harrison, Lower Red River Area Manager, P.O. Box 99, Sawyer Oklahoma, 74756. Comments can also be emailed to CESWT-OD-RBRBSWT@USACE.ARMY.MIL.

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Tulsa District, U.S. Army Corps of Engineers

May 30

Open House Set for May 30 for Public Review of Draft Broken Bow Lake Master Plan, Finding of No Significant Impact, and Environmental Assessment

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Write a comment...



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Broken Bow Lake Master Plan Revision

Comment Form Instructions

30 Day Comment Period

May 30, 2023 through June 29, 2023

The U.S. Army Corps of Engineers is in the process of revising the Broken Bow Lake Master Plan. The master plan revision will guide the land and recreational management of the federally owned property that make up the flood storage area for the next 25 years. Management activities include protecting natural and cultural resources, providing public land and water recreation, protecting the public, and ensuring reservoir and dam operations. Pertinent information and a copy of the current land use map can be found on the USACE website below.

To add your comments, ideas, or concerns about the future land and recreational management for Broken Bow Lake, please submit comments using any of the following methods by June 29, 2023:

- ***Fill out and return the comment form available below or at:***
www.swt.usace.army.mil/Missions/Recreation/Master-Plans/
- ***Provide comments in an email message, use comment form and send to:***
CESWT-OD-RBRBSWT@usace.army.mil
- ***Provide comments in a letter, use the comment form and mail to:***
U.S. Army Corps of Engineers
Hugo Lake Project Office
P.O. Box 99, Sawyer, OK 74756

Thank you for your participation in helping to develop the Master Plan for Broken Bow Lake. A QR code is provided below for your convenience. Open the camera app on your phone and focus on the QR code. A link to the Broken Bow Lake Master Plan page will appear. Click on the link to be taken directly to the page for more information.





Questions, comments, or suggestions?

[illegible]

Name: _____ Affiliation: _____

Address: _____ City: _____ State: _____ Zip Code: _____

Phone: _____ Email: _____

U.S. Army Corps of Engineers
Hugo Lake Project Office
P.O. Box 99, Sawyer, OK 74756

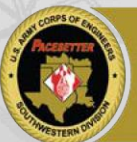
<https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>



BROKEN BOW LAKE DRAFT MASTER PLAN REPORT PUBLIC COMMENT PERIOD ANNOUNCEMENT

Public Workshop
30 May 2023
Idabel, OK

U.S. Army Corps of Engineers, Tulsa District



MISSION / PEOPLE / TEAMWORK



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Purpose

- Announce the availability of the draft revision of the Broken Bow Lake Master Plan and accompanying Environmental Assessment.
- Highlight changes proposed in the revised Master Plan compared to the previous 1979 version.
- The draft Master Plan with Environmental Assessment documents are available for 30-day public comment period beginning May 30, 2023 and closing on June 29, 2023.



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Process Followed to Date

- Initial public involvement presentation was announced and available for viewing on May 23, 2022.
- All comments were considered. See Chapter 7 of the draft Master Plan for comments and Government responses.
- Wildlife Habitat Appraisal Procedure (WHAP) completed for the entire lake area with report included in Master Plan Appendix.
- A draft Environmental Assessment (EA) was prepared and is available in the Master Plan Appendix.



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What is a Master Plan?

- The Master Plan is a 25-year comprehensive land use management guide for recreation, natural, and cultural resources.
- Adheres to Federal Laws to preserve, conserve, restore, maintain, and develop project lands, waters, and associated resources, including the National Environmental Policy Act (NEPA) for environmental stewardship and outdoor recreation.
- Provides land classifications and resource management objectives that are broad and adaptive over time.
- Requires and encourages public involvement.



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What Master Plans are Not

Master Plans **do not** address in detail the technical aspects of:

- Regional water quality
- Water management for flood risk management
- Water supply or water level management
- Shoreline management (Including boat docks, mowing, or other permits)



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Land Classification Definitions

Source: Engineering Pamphlet (EP) 1130-2-550

Land Classification	Definition
Project Operations	Lands required for the dam, spillway, levees, office, maintenance facilities and other areas that are used solely for project operations.
High Density Recreation	Land developed for intensive recreational activities for the visiting public, including day use areas and campground areas for commercial concessions, and quasi-public development.
Multiple Resource Management Lands	Low Density Recreation: Lands with minimal development or infrastructure that support passive public recreational use (e.g., trails, primitive camping, wildlife observation, fishing and hunting).
	Wildlife Management: Lands designated for the stewardship of fish and wildlife resources.
	Vegetative Management: Lands designated for the stewardship of forest, prairie, and other native vegetative cover.
Environmentally Sensitive Areas	Inactive and/or Future Recreation Areas: Recreation areas planned for the future or that have been temporarily closed.
Environmentally Sensitive Areas	Areas where scientific, ecological, cultural or aesthetic features have been identified. These areas must be considered by management to ensure they are not adversely impacted.
Mitigation	Lands acquired or designated specifically for offsetting losses associated with development of the project. Lands allocated as separable mitigation lands can only be given this classification.



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Water Surface Classification Definitions

Source: Engineering Pamphlet (EP) 1130-2-550

Water Surface Classification	Definition
Open Recreation	Those waters available for year-round or seasonal water-based recreational use.
Restricted	Water areas restricted for project operations, safety, and security purposes.
Designated No-Wake	To protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety.
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.



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Proposed Changes in Land & Water Surface Classifications

Prior Land Classifications (1979)	Acres	Proposed Land Classifications (2023)	Acres	Net Difference
Project Operations	427	Project Operations (PO)	322	(105)
Operations: Recreation – Intensive Use	3,468	High Density Recreation (HDR)	3,431	(37)
		Environmentally Sensitive Areas (ESA)	890	890
Operations: Recreation – Low Density	5,913	Multiple Resource Management – Low Density Recreation (LDR)	2,492	(3,421)
Operations: Wildlife Management	3,222	Multiple Resource Management – Wildlife Management (VMA)	6,821	3,599
Recreation Lands	896			(896)
Not Classified	58			(58)
TOTAL	13,984		13,956	(28)
Prior Water Surface Classifications (1979)	Acres	Proposed Water Surface Classifications (2023)	Acres	Net Difference
Permanent Pool	14,151	Open Recreation	14,007	
		Designated No-Wake	123	123
		Restricted	21	21
TOTAL	14,151		14,151	0
TOTAL FEE	28,135		28,107	(28)

* Total Acreage differences from the 1979 total to the 2023 totals are due to improvements in measurement technology, deposition/siltation, and erosion. Totals also differ due to rounding while adding parcels.



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Management Goals & Resource Objectives

- Goals and objectives were developed during the revision process specific to the following categories:
 - Recreation
 - Natural Resource Management
 - Visitor Information, Education, and Outreach
 - General Management
 - Cultural Resources Management
- A complete description of the revised goals and objectives can be found in Chapter 3 of the revised draft Master Plan.



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National Environmental Policy Act

- The MP Revision process includes compliance with the National Environmental Policy Act (NEPA) of 1969.
- Purpose of NEPA is to:
 - Ensure federal agencies give proper consideration to the environment prior to undertaking a federal action.
 - Involve the Public (scoping) in the decision-making process.
 - Document the process by which agencies make informed decisions.
- NEPA Scoping Process:
 - Opportunity for Public comments and questions on the potential impacts of proposed federal actions.
 - Includes comments by other federal, State, and local governments, and American Indian Tribal Nations.



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NEPA Includes:

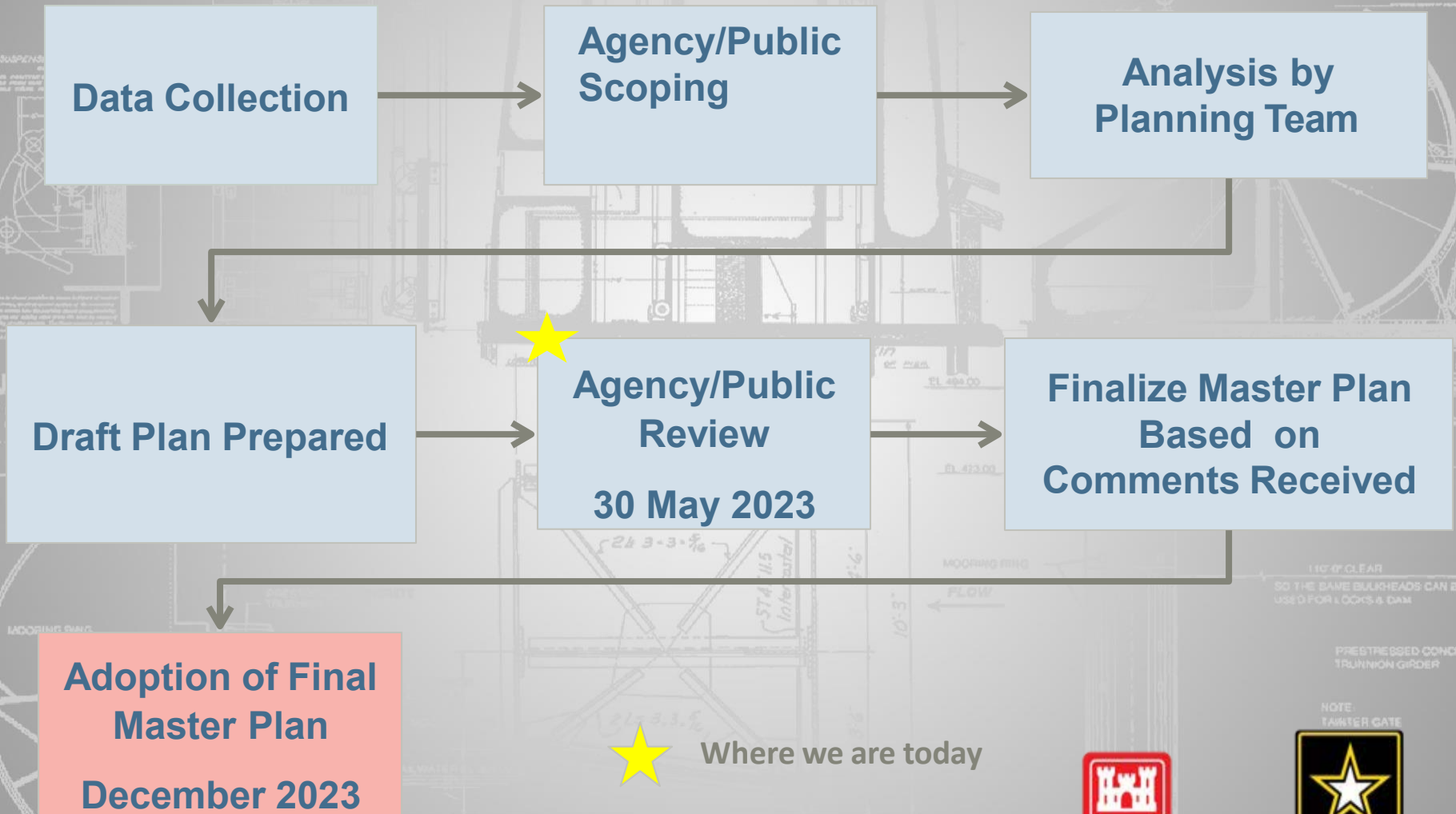
- Public exchange of information related to problems to be solved, issues to be addressed, and potential alternatives.
- Identification and evaluation of a broad range of alternatives.
- Identification and quantification of potential impacts.
- Screening of non-relevant issues from analysis.
- Documentation of analysis and coordination through preparation of NEPA documents, such as an Environmental Assessment (EA) or an Environmental Impact Statement (EIS).
- Federal, State, and Public review of NEPA documents.



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Where are we in the Process?



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How to Participate

Submit written comments!

- Review all documents available on the USACE website:
www.swt.usace.army.mil/Missions/Recreation/Master-Plans/
- Documents available for review on the website include:
 - Master Plan documents
 - Project maps
 - Comment form
 - Presentation
- Spread the word by telling your colleagues, friends, and neighbors to participate.



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How to Submit a Comment?

You can participate in the process by reviewing the documents available on the project website and submit written comments. **The USACE will only accept comments in written format.** The project website (www.swt.usace.army.mil/Missions/Recreation/Master-Plans/) is hosting all the documents relevant to the Regional Master Plan revision, including the draft Master Plan document, project maps, and comment forms with instructions on how to submit a comment.

- You may download the comment form provided on the website, fill it out electronically, and email it to USACE
- Or you may print the comment form provided on the website, fill it out by hand, and mail it to USACE at the address on the comment form
- Or you may write a comment or send an email without using the comment form, and mail or email it to the USACE address provided on the website
- Comments are due on June 29, 2023



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If You Have Questions

Questions about the Master Plan can be addressed by contacting:

Broken Bow Lake Office:
U.S. Army Corps of Engineers
175 White Dove Lane
Valliant, OK 74764

Email: CESWT-OD-RBRBSWT@usace.army.mil

Phone: (580) 933-4239



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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

April 21, 2022

NAME

Tribal Historic Preservation Office

ORGANIZATION

STREET ADDRESS

CITY, STATE, ZIP CODE

Re: Broken Bow Lake Master Plan, McCurtain County, Oklahoma

Dear <NAME>,

The U.S. Army Corps of Engineers, Tulsa District (USACE) is updating the Broken Bow Lake Management Plan (MP) in McCurtain County, Oklahoma. The MP is a document that strategically guides land use management and development of all recreational, natural, and cultural resources at Broken Bow Lake and is updated every 25 years.

USACE will provide an in-person, informal initial public scoping open house to identify general concerns and incorporate them into the draft MP at the Seminar Room of the Kiamichi Technology Center on May 23, 2022 from 6-8pm. The Kiamichi Technology Center is located at Idabel 3205 Lincoln Rd. NE, Idabel, Oklahoma, 74745. All relevant documents will be available and comments will be submitted online at <https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>. The 30 day public comment period will begin on May 23, 2022 and end on June 23, 2022.

The Tulsa District recognizes that Native American Tribes are sovereign nations and are to be consulted on projects through government-to-government consultation rather than as the general public, however we wish to provide every opportunity for Tribal input and encourage your participation in the public meeting if you choose to comment. Attached is a draft public notice that will be published in the near future. As the USACE continues to craft the MP, we will reach out to you again to identify areas of high concern for your Tribe in order to incorporate them into designated Environmentally Sensitive Areas (ESA's) and determine best management practices for these sensitive areas. All information you choose to provide at that time will remain confidential.

If you have questions or require additional information, please contact Jackie Rodgers, Archeologist, Regional Planning and Environmental Center, Environmental Branch at 918-669-4964 or via email at Jacqueline.Rodgers@usace.army.mil.

Sincerely,

Jeff Knack
Chief, Natural Resources and
Recreation Branch



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
2488 EAST 81ST STREET
TULSA, OKLAHOMA 74137-4290

March 13, 2023

NAME

Tribal Historic Preservation Officer

ORGANIZATION

ADDRESS

CITY, STATE, ZIP CODE

Dear<NAME>:

The U.S. Army Corps of Engineers, Tulsa District (USACE), is updating the Master Plan (M.P.) for Broken Bow Lake, located in McCurtain County, Oklahoma. The MP is a document that strategically guides land use management and development of all recreational, natural, and cultural resources at Broken Bow Lake and is updated approximately every 25 years.

A draft of our proposed Master Plan and associated Environmental Assessment is now available for Broken Bow Lake. The USACE will provide an in-person, informal public open house to identify general concerns and incorporate them into the draft MP at the Southeastern Oklahoma State University; ET Dunlap Center; McCurtain County Campus on May 30, 2023, from 4-6 pm. The Southeastern Oklahoma State University; ET Dunlap Center; McCurtain County Campus is located at 2805 N.E. Lincoln Road; Idabel, OK 74745. The 30-day public comment period will begin on May 31, 2023, and end on July 1, 2023. The USACE is seeking your comments for the draft Master Plan to protect cultural and natural resources that are significant to your Tribe. Starting on the first day of the public comment period, all relevant documents, background information, land classification maps, the draft Master Plan, and Environmental Assessment will be available online at <https://www.swt.usace.army.mil/Missions/Recreation/Master-Plans/>. Comments can be submitted online at CESWT-OD-RPCSWT@USACE.ARMY.MIL or mailed to the Hugo Lake Project Office at P.O. Box 99, Sawyer, OK 74756.

The USACE recognizes that Native American Tribes are sovereign nations and are to be consulted on projects through government-to-government consultation rather than as the general public. However, we wish to provide every opportunity for Tribal input and encourage participation in the public meeting if you wish to comment. All information you choose to provide at that time will remain confidential.

If you have questions or require additional information, please contact Jack "Gus" Adamson, Archeologist, Regional Planning and Environmental Center, Branch, via email at Jack.Adamson@usace.army.mil or by telephone at (417) 849-3610.

Sincerely,

Kenneth Shingleton
Chief, Environmental Branch
Regional Planning and Environmental Center

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APPENDIX C – WILDLIFE DOCUMENTS

TRUST RESOURCES REPORT – USFWS

OFFICIAL SPECIES LIST – USFWS

LIST OF SGCN SPECIES

WHAP REPORT

APPENDIX C-WILDLIFE DOCUMENTS

Items included in Appendix C:

IPaC Report-USFWS

SGCN List- ODWC

Rare Species Listing-ODWC

WHAP Report-USACE



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467



In Reply Refer To:
Project Code: 2022-0083524
Project Name: Broken Bow MP Revision

August 28, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oklahoma Ecological Services Field Office

9014 East 21st Street

Tulsa, OK 74129-1428

(918) 581-7458

PROJECT SUMMARY

Project Code: 2022-0083524

Project Name: Broken Bow MP Revision

Project Type: Land Management Plans - NWR

Project Description: The Broken Bow Lake Master Plan (McCurtain County, Oklahoma) is the long-term strategic land use management document that guides the comprehensive management and development of all the project's recreational, natural, and cultural resources within the federal fee boundary. Under the guidance of ER-1130-2-550 Change 7, the Plan guides the efficient and cost-effective development, management, and use of project lands. It is a dynamic tool that provides for the responsible stewardship and sustainability of the project's resources for the benefit of present and future generations. The Plan works in tandem with the Operational Management Plan (OMP), which is the implementation tool for the resource objectives and development needs identified in the Master Plan. The Master Plan guides and articulates the USACE responsibilities pursuant to federal laws. Efforts are under way to revise the current Lake Master Plan. The Master Plan revision will update land classifications, plan for the modernization of existing parks, and inform the management of wildlife and other resource lands within USACE managed property at Broken Bow Reservoir for the next 25 years.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@34.241751300000004,-94.68991861134339,14z>



Counties: McCurtain County, Oklahoma

ENDANGERED SPECIES ACT SPECIES

There is a total of 15 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> There is proposed critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered

REPTILES

NAME	STATUS
Alligator Snapping Turtle <i>Macrochelys temminckii</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened
American Alligator <i>Alligator mississippiensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)

FISHES

NAME	STATUS
Leopard Darter <i>Percina pantherina</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8470	Threatened

CLAMS

NAME	STATUS
Ouachita Rock Pocketbook <i>Arcidens wheeleri</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4509	Endangered
Rabbitsfoot <i>Quadrula cylindrica cylindrica</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5165	Threatened
Scaleshell Mussel <i>Leptodea leptodon</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5881	Endangered
Winged Mapleleaf <i>Quadrula fragosa</i> Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4127	Endangered

INSECTS

NAME	STATUS
American Burying Beetle <i>Nicrophorus americanus</i> Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/66	Threatened
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Harperella <i>Ptilimnium nodosum</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3739	Endangered

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Leopard Darter <i>Percina pantherina</i> https://ecos.fws.gov/ecp/species/8470#crithab	Final

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species

on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bachman's Sparrow <i>Aimophila aestivalis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6177	Breeds May 1 to Sep 30
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Brown-headed Nuthatch <i>Sitta pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jul 15
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31

NAME	BREEDING SEASON
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

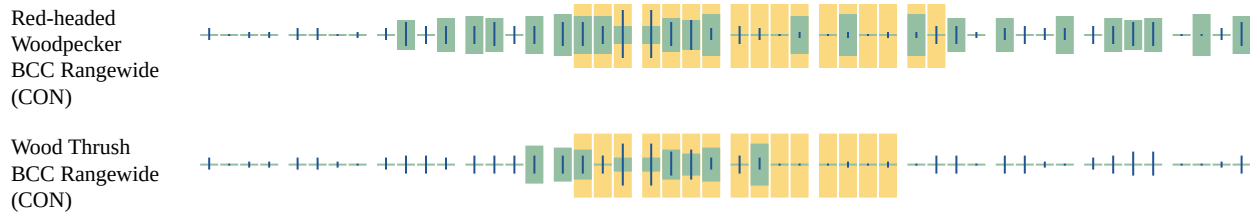
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- [PFO2F](#)
 - [PFO1C](#)
 - [PFO1Ah](#)
 - [PFO1A](#)
-

- [PFO6F](#)
- [PFO1Ch](#)

LAKE

- [L2USC](#)
- [L1UBHh](#)
- [L2USCh](#)

RIVERINE

- [R3UBH](#)
- [R2UBH](#)
- [R4SBC](#)
- [R3USC](#)
- [R2USC](#)
- [R5UBF](#)

FRESHWATER EMERGENT WETLAND

- [PEM1F](#)
- [PEM2F](#)
- [PEM1C](#)

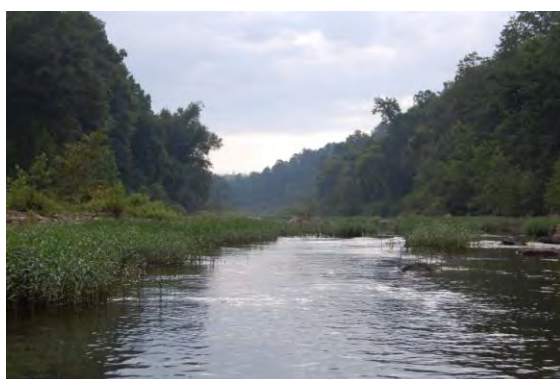
FRESHWATER POND

- [PUBHx](#)
 - [PUBH](#)
 - [PUBHh](#)
-

IPAC USER CONTACT INFORMATION

Agency: Department of Defense
Name: Paul Roberts
Address: 819 Taylor st RM 3A12
City: Fort Worth
State: TX
Zip: 76102-0300
Email: paul.e.roberts@usace.army.mil
Phone: 8178861880

Very High Priority Conservation Landscape: Small River



Figures OM2. and OM3. Upper Mountain Fork River (left), Lower Little River (right) both McCurtain Co.

Five small rivers are found in the region of the Ouachita Mountains, West Gulf Coastal Plain (WGCP) and Arkansas Valley. Each river originates in the Ouachita Mountains then flows either north into the Arkansas River (Poteau River) or south to eventually enter the Red River (Kiamichi, Little, Glover, and Mountain Fork rivers). The Glover and Mountain Fork rivers are tributaries of the Little River, and collectively these three small rivers are known as the Little River system. The three rivers that comprise the Little River system are similar in structure and share many of the same aquatic species including the federally threatened Leopard Darter (*Percina pantherina*) and the endemic Ouachita Mountain Shiner (*Lythrurus snelsoni*).

The upper reaches of all five small rivers are relatively shallow, clear, and fast moving with a substrate of cobble or bedrock. The lower reaches of these rivers are relatively turbid and slow moving and meander over a sandy substrate in broad, forested floodplains. Flow rates are typically greater during the winter and spring and lower during the summer and fall; however, the seasonal variation is less than that which is seen on the Oklahoma's larger rivers. The small rivers contain gravel bars and sloughs but not the dynamic mosaic of sandbars, mudflats, and sloughs found on the larger river systems. Most sloughs along the smaller rivers are dominated by woody vegetation including River Birch (*Betula nigra*), Sycamore (*Platanus occidentalis*), Water Oak (*Quercus nigra*), and Red Maple (*Acer rubrum*). Of special note is the presence of the federally endangered Harperella (*Ptilimnium nodosum*) in the lower reaches of the Mountain Fork River and the potential for it to occur elsewhere in the Little River watershed. Another rare plant found along streams and rivers in the region is the Cumberland Sandreed (*Calamovilfa arcuata*).

The species of greatest conservation need that occupy the small rivers in substantial or manageable numbers are listed in the following table. A narrative description is provided for each species' status within the region that is based upon the existing literature and the professional judgment of the technical experts that were consulted. Each species' population trend was based upon an evaluation of the existing statewide or national data over the past 50 years. The species are sorted alphabetically within larger taxonomic groups: amphibians, birds, fish, invertebrates, mammals, and reptiles for easy reference. Symbols for trends are: D = declining, S = stable, U = unknown, I = increasing and Ex = probably extirpated.

Group	Species of Greatest Conservation Need Common or Scientific Name	Status within the Region	Trend in Population Size
Amph	Lesser Siren	locally common but secretive; found in shallow, heavily vegetated sites within low-gradient reaches of the rivers in the WGCP	U
Amph	Three-toed Amphiuma	rare & secretive species; appears to be limited to the Little River in the West Gulf Coastal Plain	U

Group	Species of Greatest Conservation Need Common or Scientific Name	Status within the Region	Trend in Population Size
Bird	Bald Eagle	uncommon year-round resident along all of the small rivers in the region; common winter resident due to a seasonal influx of birds from northern populations	I
Bird	Canvasback	uncommon winter resident throughout the region	S
Bird	Little Blue Heron	common summer resident in the low-gradient reaches of each small river in the region	U
Bird	Louisiana Waterthrush	uncommon but widespread in the Ouachita Mts. and Arkansas Valley portions of the region	S
Bird	Northern Pintail	uncommon winter resident throughout the region	D
Bird	Prothonotary Warbler	locally common in riparian forests along all of the small rivers in the region	U
Bird	Snowy Egret	common summer resident in the low-gradient reaches of each small river in the region	U
Bird	Solitary Sandpiper	common spring and fall migrant across the region	S
Bird	Wood Stork	rare summer visitor; after the nesting season, birds wander north from their coastal colonies into the West Gulf Coastal Plain	S
Fish	Alabama Shad	probably extirpated from this region; occurred historically in the Little and Poteau rivers	Ex
Fish	Alligator Gar	rare but regularly occurring in the lower Poteau River	D
Fish	Black Buffalo	uncommon in the low-gradient reaches of the Kiamichi, Little and Poteau rivers; difficult to correctly identify	U
Fish	Blackside Darter	rare and known from the Poteau and Little rivers; Oklahoma represents the southwestern edge of its large range; state listed as threatened	U
Fish	Blackspot Shiner	rare and found in the lower reaches of the Kiamichi and Little rivers	U
Fish	Bluehead Shiner	uncommon and only documented in Oklahoma since the early 1980s; found in sluggish backwaters of the lower Little River	U
Fish	Blue Sucker	an uncommon species associated with deeper channels; found in the Poteau River below Wister Reservoir and the Kiamichi River below Hugo Reservoir	U
Fish	Brown Bullhead	rare and limited to the West Gulf Coastal Plain portion of Little River	D
Fish	Creole Darter	rare; likely to occur only in lower Little River and its tributary streams	U
Fish	Crystal Darter	very rare and documented at only a few sites in the Little and Kiamichi rivers	U
Fish	Cypress Minnow	uncommon species found in the backwaters of the lower Mt. Fork & Little rivers	U
Fish	Harlequin Darter	locally common in riffles in the lower Poteau and Little rivers	U
Fish	Ironcolor Shiner	very rare in Oklahoma and restricted to the lower Little River	U
Fish	Kiamichi Shiner	common in the headwaters of the Kiamichi, Little and Poteau rivers	U
Fish	Leopard Darter	uncommon and restricted to the rocky reaches of the Little, Glover and Mt. Fork rivers; endemic to the central Ouachita Mts.; federally listed as threatened	D
Fish	Longnose Darter	potentially extirpated from the region; occurred historically in the Poteau River and its tributaries; state listed as an endangered species	Ex
Fish	Mooneye	uncommon and limited to the Little River system	D

Group	Species of Greatest Conservation Need Common or Scientific Name	Status within the Region	Trend in Population Size
Fish	Mountain Madtom	uncommon in the higher gradient reaches in the Little River system (Glover, Mt. Fork and Little)	U
Fish	Orangebelly Darter	common and widespread in the Red River watershed portion of the region; endemic to Oklahoma and Arkansas	S
Fish	Paddlefish	rare in the lower parts of the Kiamichi, Little and Poteau rivers	S
Fish	Pallid Shiner	rare, occurs in low-gradient reaches of the lower Poteau, Kiamichi and Little rivers	D
Fish	Peppered (Colorless) Shiner	rare species that appears to be limited to the Little River; a small population may occur in the Kiamichi River	U
Fish	Plains Minnow	uncommon and found only in the low-gradient portions of each small river in the region	D
Fish	Rocky Shiner	common in the Kiamichi and Little rivers; endemic to the Red River tributaries in the Ouachita Mts.	S
Fish	Taillight Shiner	uncommon species restricted to backwaters and tributaries of the lower Little River	U
Fish	Western Sand Darter	locally common in river reaches with sandy substrate in the lower Kiamichi River	U
Invert	Black Sandshell	probably extirpated; weathered shells suggest that Black Sandshells may have occurred in the Poteau River prior to modern settlement	Ex
Invert	Butterfly mussel	uncommon; found in the lower reaches of the Kiamichi and Little rivers	D
Invert	<i>Faxonella blairi</i>	Uncommon species that is endemic to the WGCP; has been documented only in the lower Littler River in Oklahoma	U
Invert	Little Spectaclecase	common in the Red River tributaries – the Little, Glover, Mt. Fork and Kiamichi rivers	S
Invert	Louisiana Fatmucket	common in the small rivers that are tributaries of the Red River (e.g. Little and Kiamichi)	D
Invert	Ouachita Creekshell	taxonomic uncertainties surround this species and genetic work suggests that what we call the Ouachita Creekshell in the Little River in Oklahoma may be the Southern Hickorynut	U
Invert	Ouachita Kidneyshell	common in the Glover River, uncommon elsewhere in the Littler River system and the Kiamichi River	U
Invert	Ouachita Rock Pocketbook	very rare and restricted to the Kiamichi River and the lower Little River; federally listed as an endangered species	D
Invert	Ozark Emerald	Locally occurring in the upper reaches of small rivers in the Ouachita Mountains	U
Invert	Plain Pocketbook	common and widespread in all of the rivers in the region	U
Invert	Pyramid Pigtoe	not documented in Oklahoma, but suspected to be present in the Littler River in small numbers based upon mussels with similar shell characteristics	U
Invert	Purple Lilliput	occurrence not confirmed in Oklahoma; potentially occurs as a rare species in the upper Poteau River	U
Invert	Rabbitsfoot	uncommon species; found in the lower Little River; federally listed as a threatened species	U
Invert	Scaleshell	very rare and possibly extirpated; known only from the Kiamichi and Little rivers; federally listed as an endangered species	D
Invert	Southern Hickorynut	locally common in the Kiamichi, Little, Glover and Mt. Fork rivers	U
Invert	Texas Lilliput	not confirmed in Oklahoma but may be present in the Little River watershed	U

Group	Species of Greatest Conservation Need Common or Scientific Name	Status within the Region	Trend in Population Size
Invert	Washboard	common in the Poteau River, uncommon in the Kiamichi and Little rivers	S
Invert	Winged Mapleleaf	a small population is present in the lower Little River; federally listed as an endangered species	D
Mamm	Northern Long-eared Bat	uncommon but widespread in the Ouachita Mountains in LeFlore, Pushmataha and McCurtain counties; forages over rivers and streams; federally listed as a threatened species	U
Mamm	Southeastern Bat	rare and limited to the Little River watershed; often forages over rivers and streams	U
Rept	Alligator Snapping Turtle	rare and secretive; small numbers are found in the low-gradient reaches of the Kiamichi, Little and Poteau rivers	D
Rept	American Alligator	rare but seen with increasing frequency in the lower reaches of the Little and Kiamichi rivers	I
Rept	False (Mississippi) Map Turtle	uncommon but widespread in the low-gradient portions of the small rivers in this region	U
Rept	Ouachita Map Turtle	locally common and widespread throughout the region	D
Rept	Razor-backed Musk Turtle	uncommon and generally found in the higher-gradient reaches of each of the small rivers in the region	U
Rept	River Cooter	common in all of the small rivers throughout the region	D
Rept	Smooth Softshell	uncommon but widespread throughout the region	D
Rept	Spiny Softshell Turtle	locally common and found primarily in the low-gradient reaches of each small river	D

The following conservation issues and actions are listed in general priority order.

Conservation Issues Related to Geomorphic Alteration and Instability of River Channels, Altered Patterns of Flow and Decreasing Water Quantity:

1. River channels normally meander through their floodplains and maintain stable, vegetated banks, but some human activities alter the channel structure of rivers and contribute to bank instability. These actions include:
 - efforts to channelize rivers,
 - in-stream gravel or sand mining,
 - creating channel constrictions at bridges and low water dams, and
 - dredging river channels to make them deeper and narrower to convey water more quickly.

These actions can result in the river cutting a deeper channel and creating a disconnection between the river and its riparian vegetation. Channel cutting erodes gravel and sediment from the river bank and deposits it into the river.
2. In relatively low-gradient reaches of rivers, riparian and flood plain vegetation has been removed and habitat converted to pastureland, pine plantations, and riverside cabin developments. Reduction in riparian vegetation, sloughs and wetlands contribute to river bank instability and facilitates bank erosion.
3. The loss of wetlands and the constriction of floodplains reduce the ability of the land to hold and slowly release water, often resulting in “flashier” stream and river flows in which flow is accelerated during storm events, but then rapidly drops afterward.
4. Reservoir construction on river main stems (e.g. Pine Creek, Broken Bow and Wister reservoirs) and on major tributaries (Sardis Reservoir) alters the historic flooding frequencies and flow patterns of small rivers. Reservoirs have inundated long reaches of rivers and altered these from shallow, flowing habitats to deep, still habitats. Reservoirs hold back water and can alter the seasonal fluctuations in flow downstream by reducing the magnitude of high flow events following storms,



[Home](#) / [Wildlife Diversity](#) / [Threatened and Endangered Species](#)

Threatened and Endangered Species

Federally Threatened

[American Burying Beetle](#)
[Arkansas River Shiner](#)
[Leopard Darter](#)
[Neosho Madtom](#)
[Northern Long-eared Bat](#)
[Ozark Cavefish](#)
[Rabbitsfoot](#)
[Rufa Red Knot](#)

State Threatened

[Blackside Darter](#)

Federally Endangered

[Gray Bat](#)
[Indiana Bat](#)
[Neosho Mucket](#)
[Ouachita Rock Pocketbook](#)
[Ozark Big-eared Bat](#)
[Piping Plover](#)
[Red-cockaded Woodpecker](#)
[Scaleshell](#)
[Whooping Crane](#)
[Winged Mapleleaf](#)

State Endangered

[Longnose Darter](#)
[Oklahoma Cave Crayfish](#)

WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP)
SUMMARY REPORT BROKEN BOW LAKE MASTER PLAN
MCCURTAIN COUNTY, OKLAHOMA

August 2022



**US Army Corps
of Engineers®**

Tulsa District

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Introduction

Habitat assessments were conducted at Broken Bow Lake on May 23-27, 2022 using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure ([WHAP] TPWD 1995). WHAP survey point locations were based on points believed or known to have various habitat types and features based on aerial imagery from existing Geographical Information Systems (GIS) data as well as from local knowledge of the area. A total of 103 WHAP points were surveyed, all within U.S. Army Corps of Engineers (USACE) fee boundary (Figures 1-10).

The purpose of this report is to describe wildlife habitat quality within the USACE Broken Bow Lake fee-owned property in McCurtain County, Oklahoma. This report is being prepared by the USACE Regional Planning and Environmental Center to provide habitat quality information and inform land classifications as part of the Broken Bow Lake Master Plan revision process.

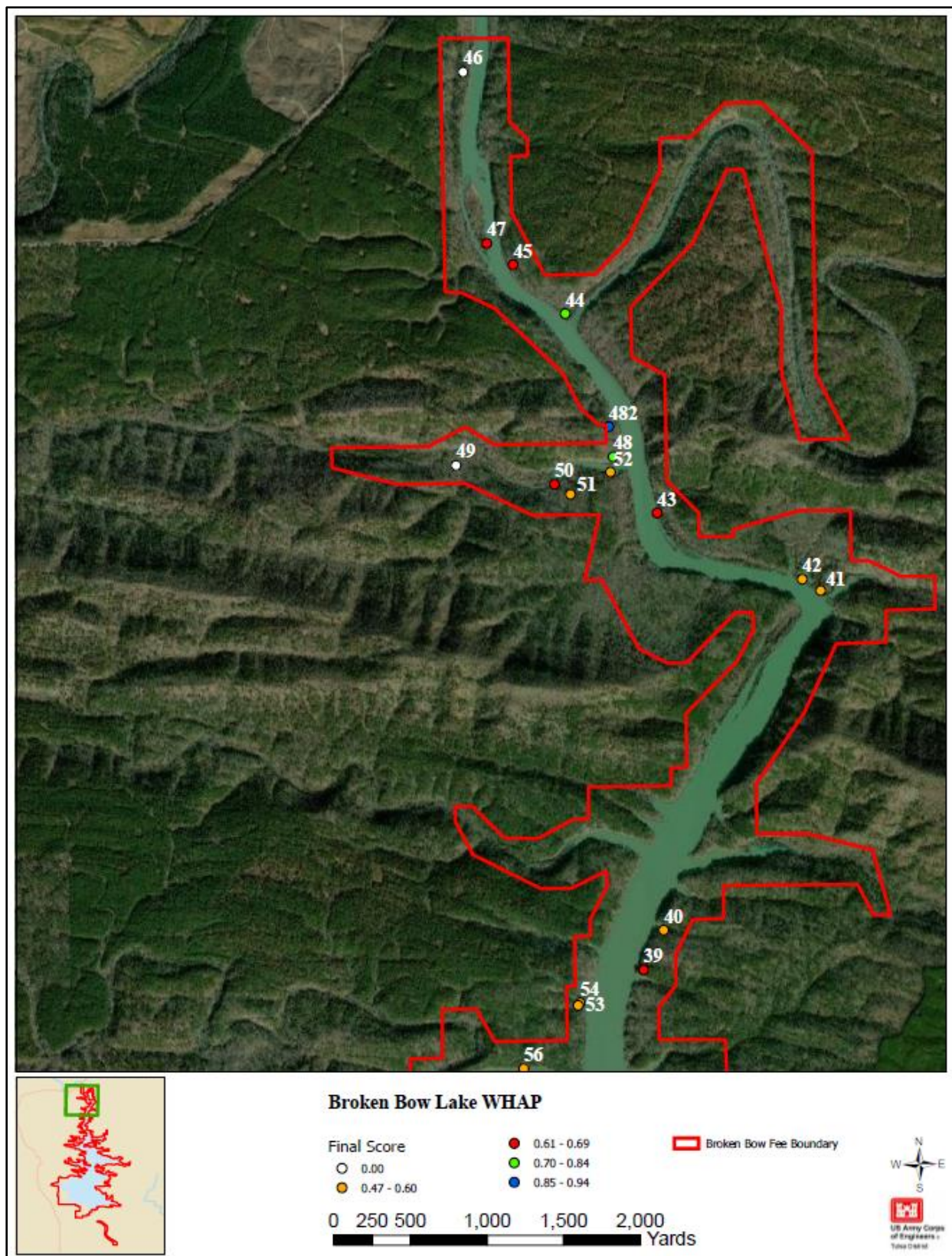


Figure 1. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

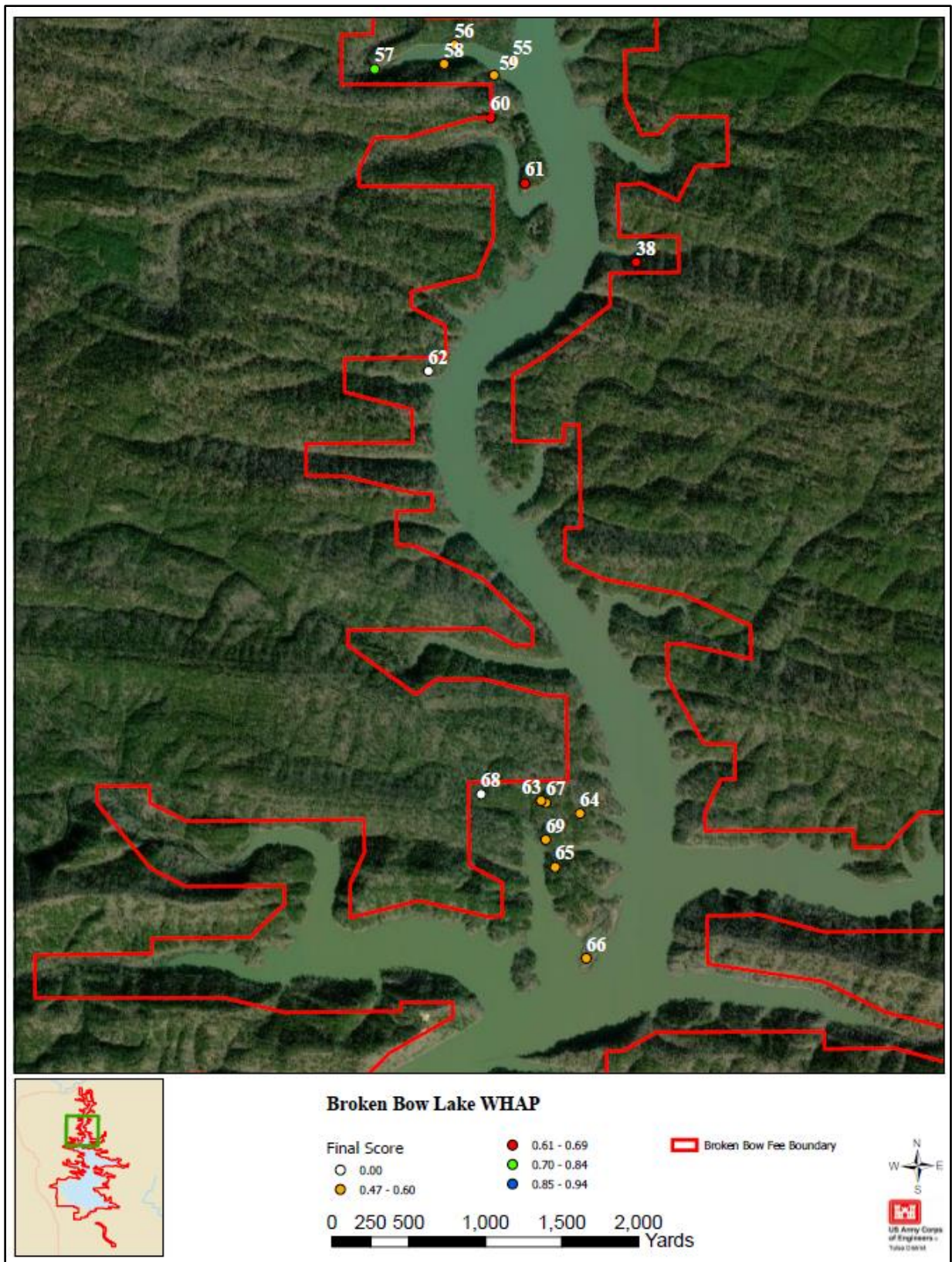


Figure 2. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

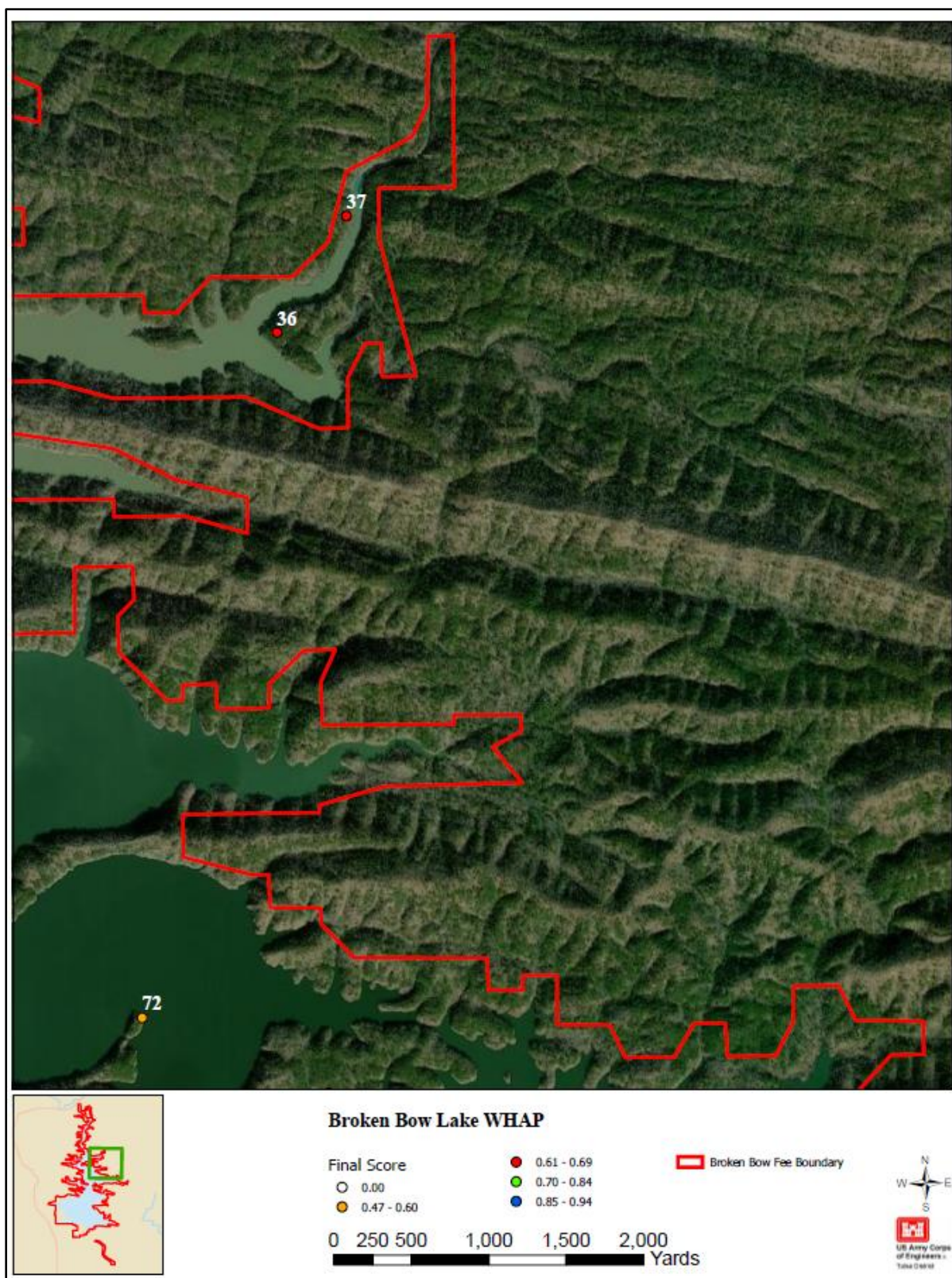


Figure 3. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.



Figure 4. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

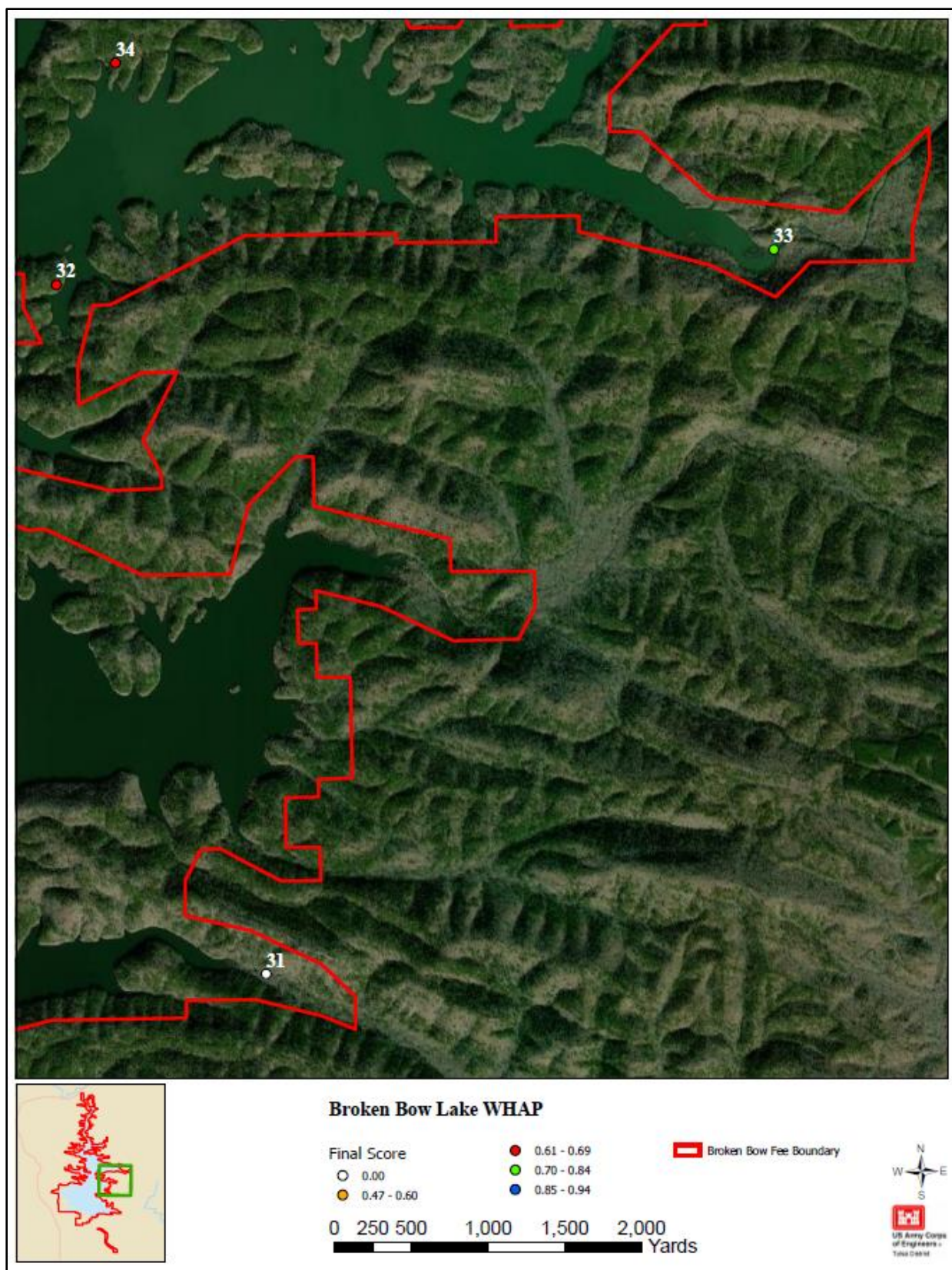


Figure 5. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.



Figure 6. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

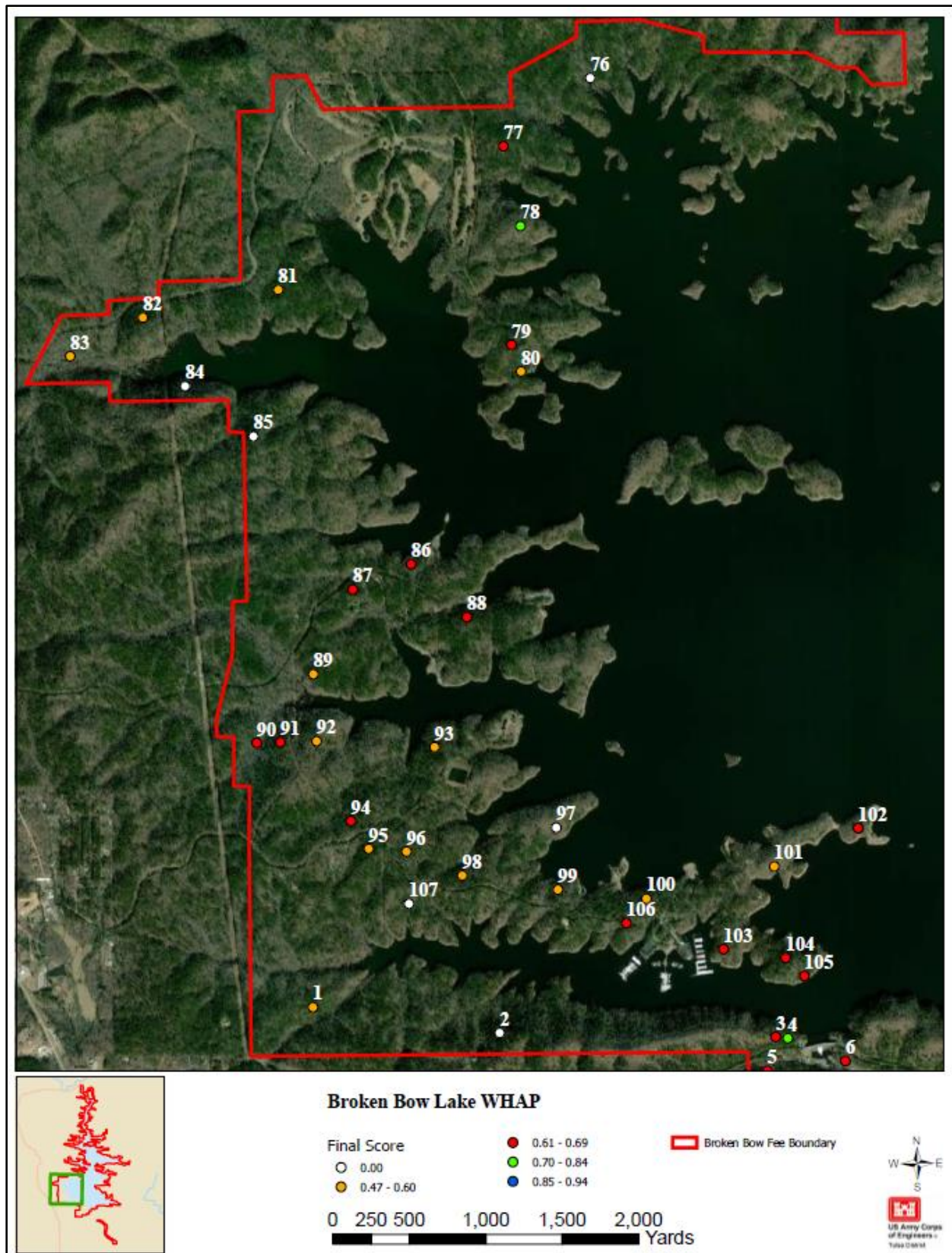


Figure 7. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

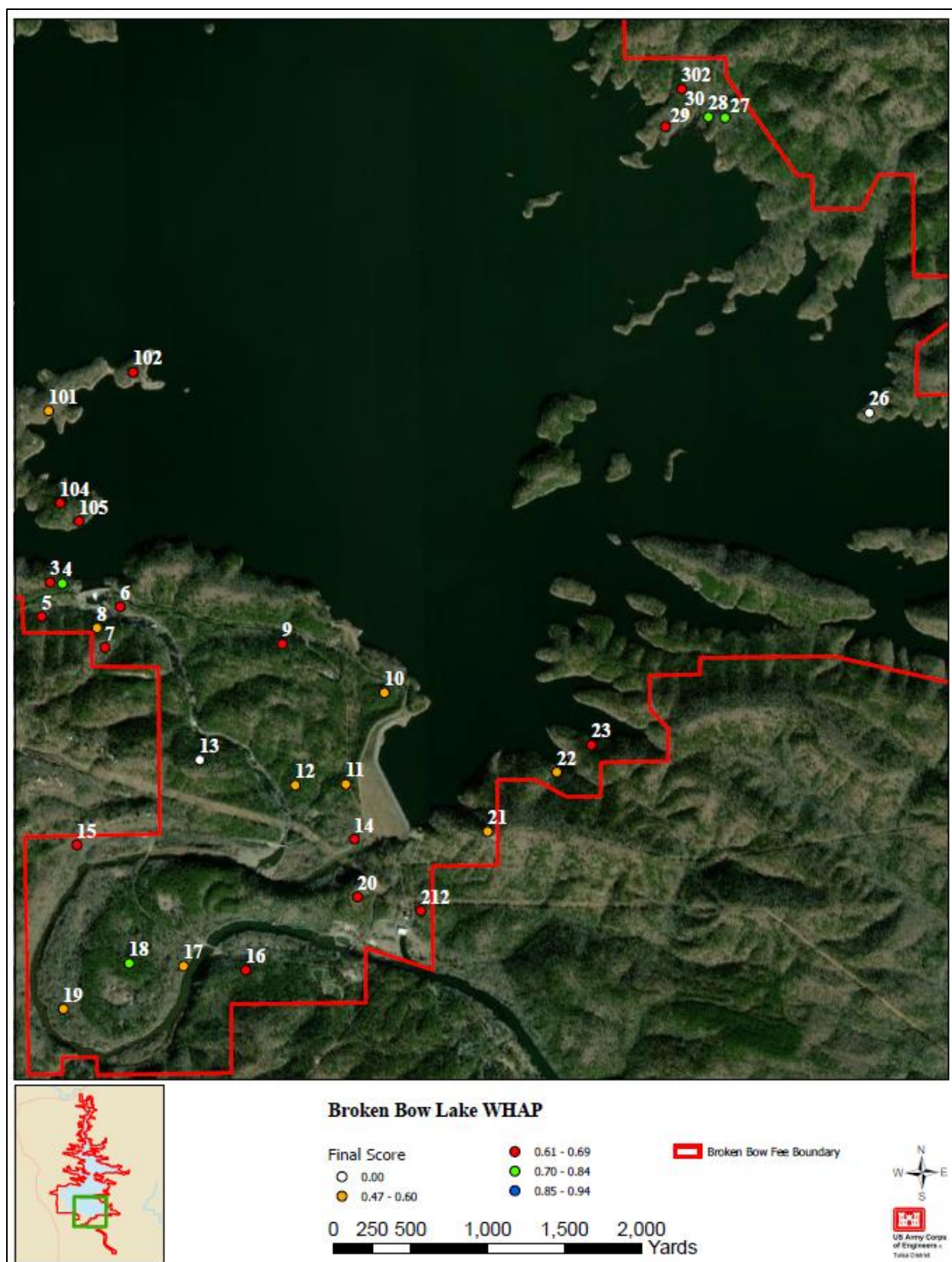


Figure 8. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

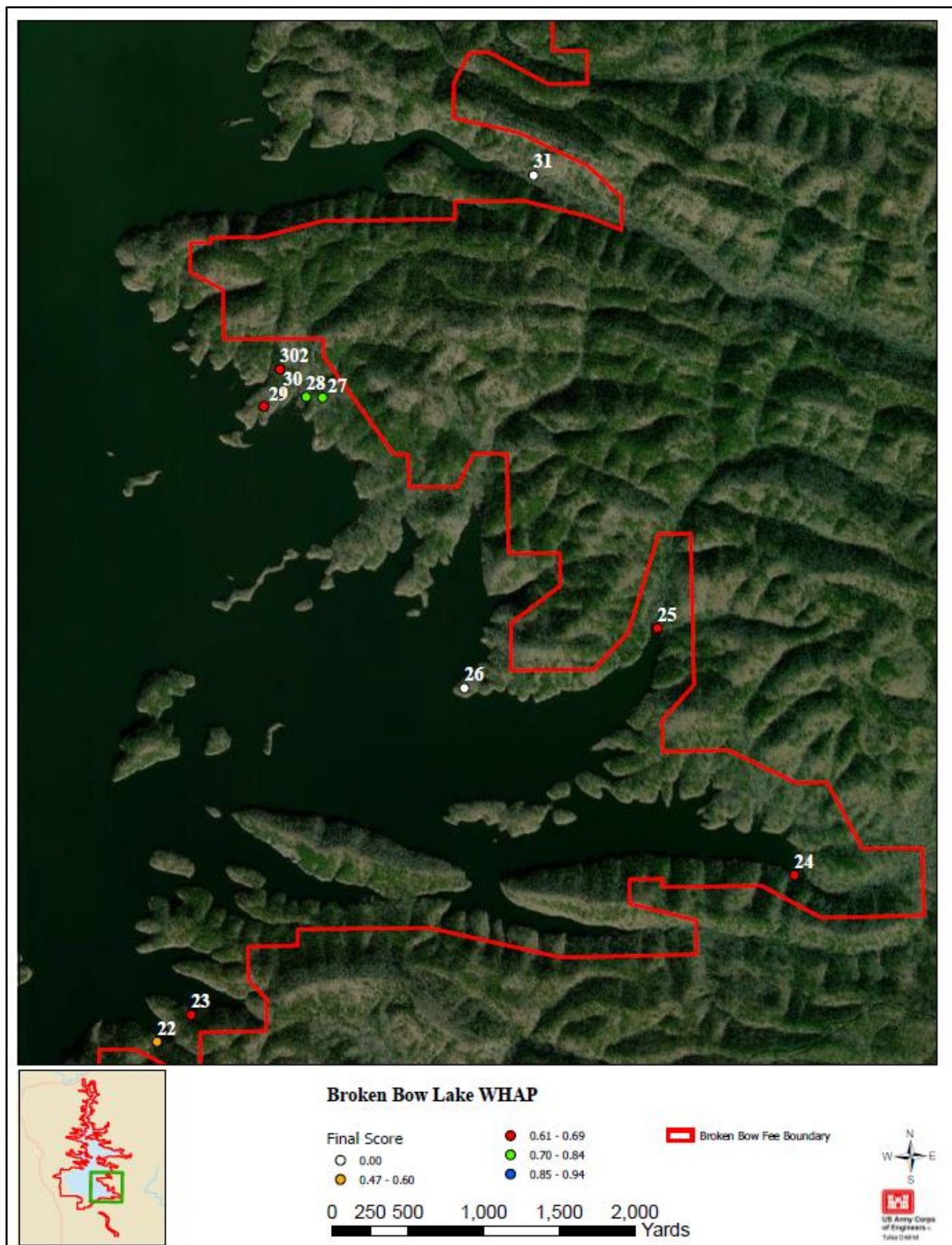


Figure 9. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

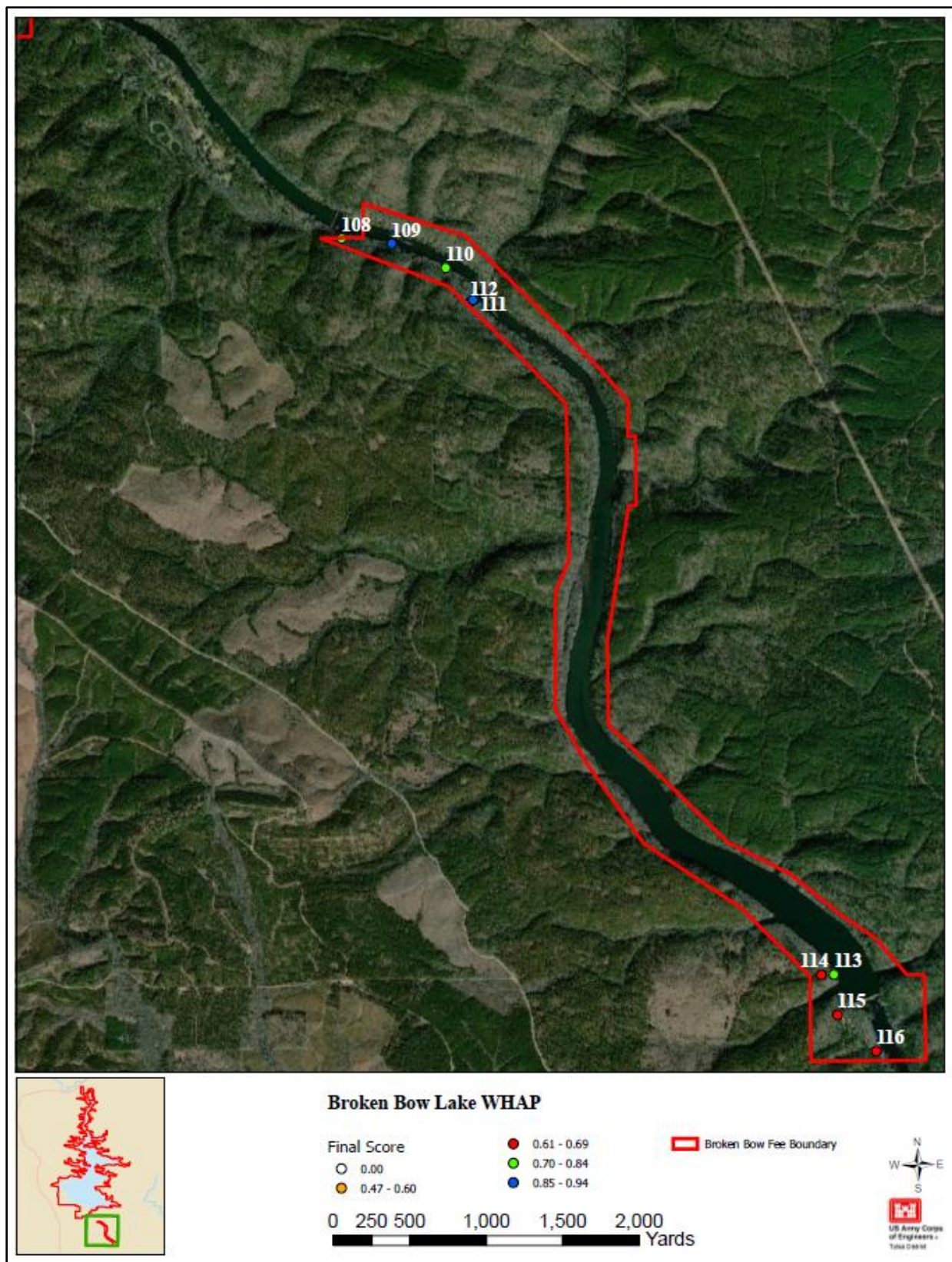


Figure 10. Distribution of WHAP Points and their Associated Scores Within USACE Broken Bow Lake Fee Boundary.

Study Area

USACE fee owned property at Broken Bow Lake, approximately 28,107 acres, is located just north of Broken Bow, Oklahoma in the south eastern portion of Oklahoma as displayed in Figure 4 below. More specifically, the lake sits primarily between the cities of Hochatown and Smithville, Oklahoma within the Ouchita Mountains ecoregions. The lake lies on the Mountain Fork River. The major tributaries to the lake are Stephens Creek, Lower Cedar Creek, Cedar Creek, North Cedar Creek, Dyer Creek, Bee Creek, Borth Bee Creek, Bear Creek, South Holly Creek, North Holly Creek, Gar Creek, Panther Branch Creek, Turkey Creek, Buck Creek, Panther Creek, Buffalo Creek, Hudson Creek, Hee Creek, North Linson Creek, South Linson Creek, Cane Creek, Otter Creek, Egypt Creek, Nancy Branch Creek, Walford Creek, and Biggam Creek. Downstream of the Broken Bow Lake dam, the Mountain Fork River meanders until it reaches the Little River.

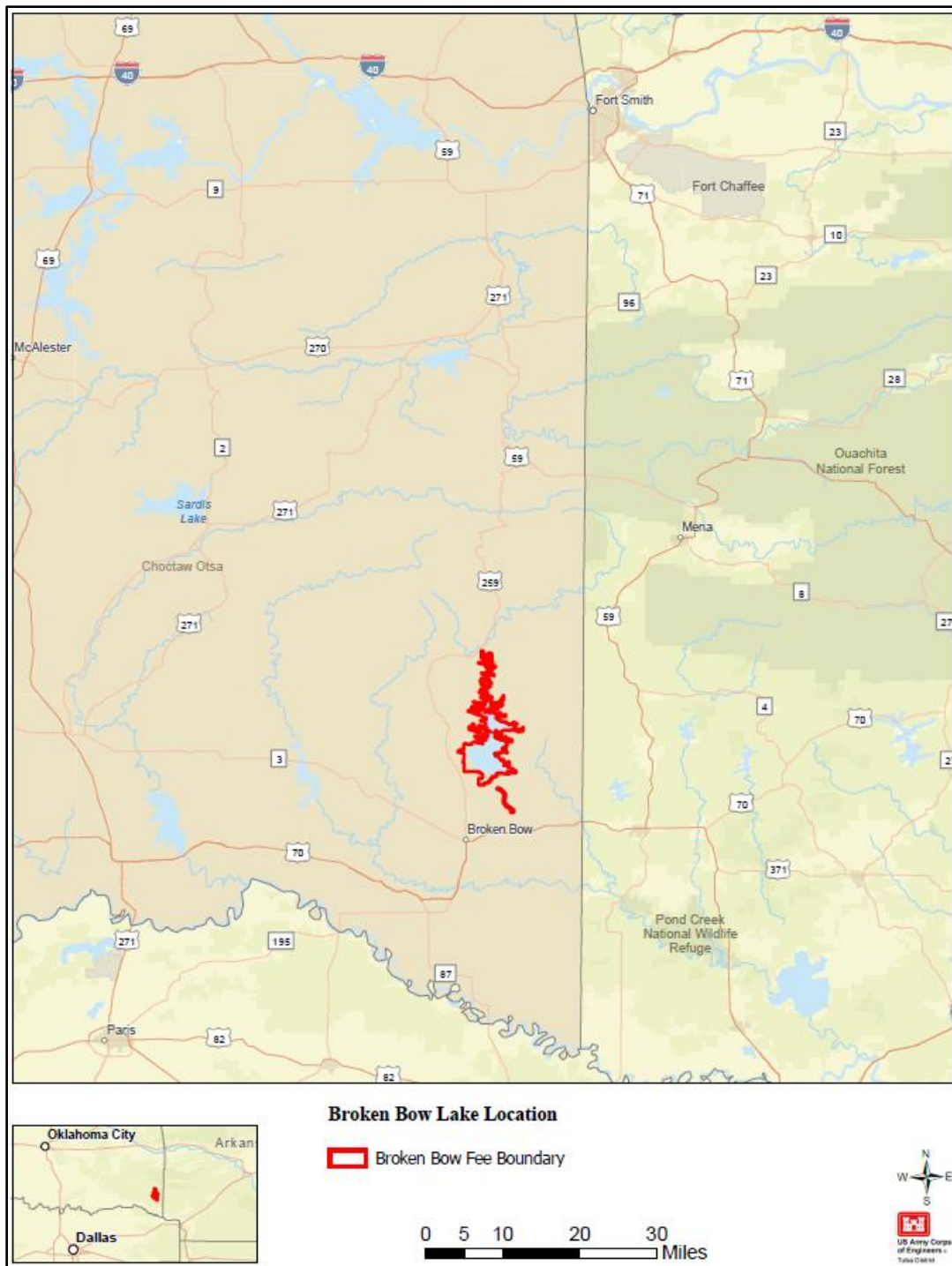


Figure 11. Broken Bow Lake Vicinity Map

Methodology

The WHAP requires evaluating representative sites of each cover type present within an area of interest. For this project, a search area of 0.1 acre (circle with radius of 37.2 feet) was used at each WHAP site to compile a list of plant species occurring at each

site and to complete the Biological Components Field Evaluation Form (TPWD 1995). Field data collected on the form at each WHAP site included the following components:

1. Site Potential
2. Temporal Development of Existing Successional Stage
3. Uniqueness and Relative Abundance
4. Vegetation Species Diversity
5. Vertical Vegetation Stratification
6. Additional Structural Diversity
7. Condition of Existing Vegetation

The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for particular tracts of land statewide without imposing significant time requirements in regard to field work and compilation of data (TPWD 1995). The WHAP was not designed to evaluate habitat quality in relation to specific wildlife species.

The WHAP is based on the following assumptions:

1. Vegetation structure including species composition and physiognomy is itself sufficient to define the habitat suitability for wildlife;
2. A positive relationship exists between vegetation diversity and wildlife species diversity;
3. Vegetation composition and primary productivity directly influence population densities of wildlife species.

As designed, the WHAP is intended to be used for the following applications:

1. Evaluating impacts upon wildlife populations from specific development project alternatives.
2. Establishing baseline data prior to anticipated or proposed changes in habitat conditions for specific areas.
3. Comparing tracts of land that are candidates for land acquisition or mitigation.
4. Evaluating general habitat quality and wildlife management potential for tracts of land over large geographical areas, including wildlife planning units.

At each site, a 1/10th acre plot was evaluated and points were assigned to all applicable components based on field conditions. A habitat quality score, where values range from 0.0 (low quality) to 1.0 (high quality), was then calculated for each site by adding together all points and multiplying by 0.01. Habitat quality was then determined for all sites within the same habitat type. The scores for each site can be found in Attachment A. Photographs were taken at each site and are included as Attachment B.

The WHAP protocol can be used to assess a wide range of habitats; however, it was originally developed to assess and develop mitigation requirements for loss of bottomland hardwoods and other aquatic habitats. Scores can yield higher results for these habitats based on how the scoring is allotted to each WHAP habitat component. Upland forest and grassland habitat types cannot reach a score indicative of high quality habitat, although they may exhibit high quality features. Subsequently, high quality upland habitat may not be identified or can be overlooked.

Grasslands, in particular, fall into this category. The Site Potential component has a maximum score of 0.25 points and allocates more points based on higher hydrologic connectivity. In order to receive the highest score for this component, the area must exhibit at least one of the following: periodically support predominately hydrophytic vegetation, have predominately undrained hydric soil and supports or is capable of supporting hydrophytic vegetation, and/or is saturated with water or covered by shallow water during 1-2 months of the growing season each year. In a grassland setting, when conditions become conducive to hydrophytic plant growth, a successional shift from a grassland to herbaceous wetlands, swamps, or riparian forest is likely to occur. Therefore, grasslands would almost always be limited to a maximum score of 0.12 points (uplands with thick surface layers).

Similarly, grasslands would be limited to a maximum of 0.12 points for the Temporal Development of Existing Successional Stage component, whereas other forested habitats could receive the full 0.25 points.

High value grasslands may not have any woody vegetation, nor vegetation that is more than 12 feet tall, and very little additional structural components. To account for this, total scores for areas categorized as grasslands do not reflect the Vegetation Species Diversity component and makes the maximum score for Vertical Vegetation Stratification component as a value of 4 and Additional Structural Diversity component as 1.

These components regularly exclude grassland habitat from receiving the maximum score of 1.00 on the WHAP point scale. In order to identify the maximum score each habitat type can receive, USACE environmental staff scored each criteria given ideal conditions for riparian/bottomland hardwood forest (BHF), upland forest (includes all non-riparian/BHF forests), grassland, and marsh habitats. The maximum value scores, shown in Table 1, were then used to normalize scores for habitats that are prevented from reaching the maximum WHAP score. This is primarily due to arbitrary low scores in the two WHAP components described above. Normalizing habitat scores will identify high quality habitat that would otherwise not be detected.

Table 1. Cover Types and Maximum Total Scores

Cover Type	Component Number								Maximum Total Score
	1	2	3	4	5	6	7	7B	
Swamp									1.00
	0.25	0.20	0.20	0.15	0.05	0.05	0.05	0.05	1.00
Upland Forest	0.12								0.87
	0.12	0.12	0.20	0.0	0.04	0.01	0.05	0.05	0.59

Riparian/BHF habitats can achieve the maximum score, therefore, no normalization of scores were made for that habitat type. Upland forests and grasslands, however, can only reach within 0.13 and 0.41 points of the maximum WHAP score, even in ideal conditions.

To evaluate all habitat types on an even scoring basis, upland forest and grassland scores were normalized by dividing their original scores by the maximum possible score for their respective habitat types. For example, if a grassland site received an initial score of 0.42, it would be divided by the maximum total points a grassland site can receive, 0.59. The normalized total score used for further analysis for the grassland site would be 0.75.

This adjustment allows habitat type scores to be analyzed and compared to their corresponding habitat type maximum total score. Rather than, for instance, a grassland being evaluated on a bottomland hardwood scoring scale.

All WHAP scores analyzed and discussed from here forward reflect the normalized total scores. As mentioned above riparian/BHF habitat was not normalized because it already can achieve the maximum score. Grassland scores were normalized by dividing initial scores by 0.59, while all upland forest scores were normalized by dividing the initial score by 0.87.

Habitat

Broken Bow Lake lies within the southern extent of the Ouchita Mountains ecoregions (Level IV). The Ouchita Mountains ecoregion vegetation is predominantly of an oak-hickory-pine forest. Specifically, the common tree species are: loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinate*), southern red oak (*Quercus falcata*), scarlet oak (*Quercus coccinea*), black oak (*Quercus ellipsoidalis*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), white oak (*Quercus alba*), pignut hickory (*Carya glabra*), and mockernut hickory (*Carya tomentosa*). What prairies exist are typically confined to managed lands like parks and wildlife management areas, as areas outside of those units had typically evolved into pastures and forests. Bottomland forests and wetlands typically occur in poorly drained areas.

Table 2 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

Table 2. Survey Points per Habitat Type

Habitat Type	Points Surveyed
Riparian/BHF	15
	84
Swamp	4
Total Points Surveyed	103

Results and Discussion

The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. Data analysis highlights are discussed below, while detailed data for each point surveyed can be found in Attachment A: Broken Bow Lake WHAP Summary Results of this report.

Upland forest (84 sampled) and Riparian/BHF (15 sampled) were the most abundant habitat types surveyed. With the recent flooding making some points inaccessible this number would have changed with more riparian/BHF being sampled and the dense underbrush would have allowed for more Upland Forest site sites to be sampled. Upland forest scores ranged from 0.58 to 0.68 while Riparian/BHF scores ranged from 0.62 to 0.82. The lower minimum scores, especially for these normally drier upland habitats, may be partly due to long-term flooding that occurred at Broken Bow Lake in recent years, thus leading to reduced plant diversity. Flooding at lower elevations in the flood pool of Broken Bow Lake almost certainly led to mortality of the typically upland species of herbaceous plant growth. This certainly affected survey metrics within the inundated areas. Long-term flooding of federal lands is a routine occurrence at typical USACE lakes having a primary mission of flood risk reduction.

The average, maximum, and minimum total scores observed for each habitat type surveyed are shown in Table 3.

Table 3. Average, Minimum, and Maximum Scores per Habitat Type

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Riparian/BHF	0.65	0.93	0.47
Swamp	0.80	0.94	0.67
Upland Forest	0.62	0.86	0.49

Figures 1-10 show the range of total scores for all points surveyed (26 sampled) as well as the 16 additional points that were skipped due to inaccessibility. Skipped points show a total score of 0 these figures. Overall, swamp exhibited the highest average total score (0.80) with riparian/BHF and upland habitats exhibiting close values average total score of 0.65 and 0.62. With such a close margin, these two habitats are equal in value, which is proof of how the normalizing of scores helps the sites to be evaluated on an equal basis.

Beyond vegetative diversity, the three major metrics within the WHAP scoring criteria that allocate points are for site potential, successional stage, and uniqueness and relative abundance. Table 4 shows these metrics' average score per habitat type.

Table 4. Average Site Potential, Successional Stage, and Uniqueness and Relative Abundance Scores per Habitat Type

Habitat Type	Average Site Potential	Average Successional Stage	Average Uniqueness and Relative Abundance
Riparian/BHF	0.20	0.10	0.09
Swamp	0.24	0.14	0.18
Upland Forest	0.10	0.11	0.09

Site potential allocates more points based on soil substrates characteristics and hydrologic connectivity that can support hydrophytic habitats, such as marshes, swamps, and bottomland hardwood forests that are often considered to be higher quality, more diverse habitat. This allows areas to score higher even though a recent disturbance, such as fire or flood, may have removed most of the vegetation. Areas scoring high in site potential but low in other metrics can be targeted for management efforts as these areas' vegetation community response should be favorable, thus increasing habitat value. The predominate thick soil surface layer that is common within Broken Bow Lake is the main factor that upland forest sites scored so high in average site potential. WHAP sites with maximum site potential are shown in Figure 12.

Successional stage refers to the age of the vegetative community. Older, mature forests and climax prairies, score higher than younger pole stands or disturbed grasslands because they provide more diverse forage, cover, and niche habitats. These scores are expected to increase across the habitats, except in areas that may not have the soil types to support hydrophytic vegetation or are flooded frequently enough to limit upland forest growth and development.

Uniqueness and Relative Abundance takes into consideration the rarity of a habitat or vegetative community and its abundance in the region. Current and past agricultural and forestry practices have significantly influenced the region's remaining habitat composition.

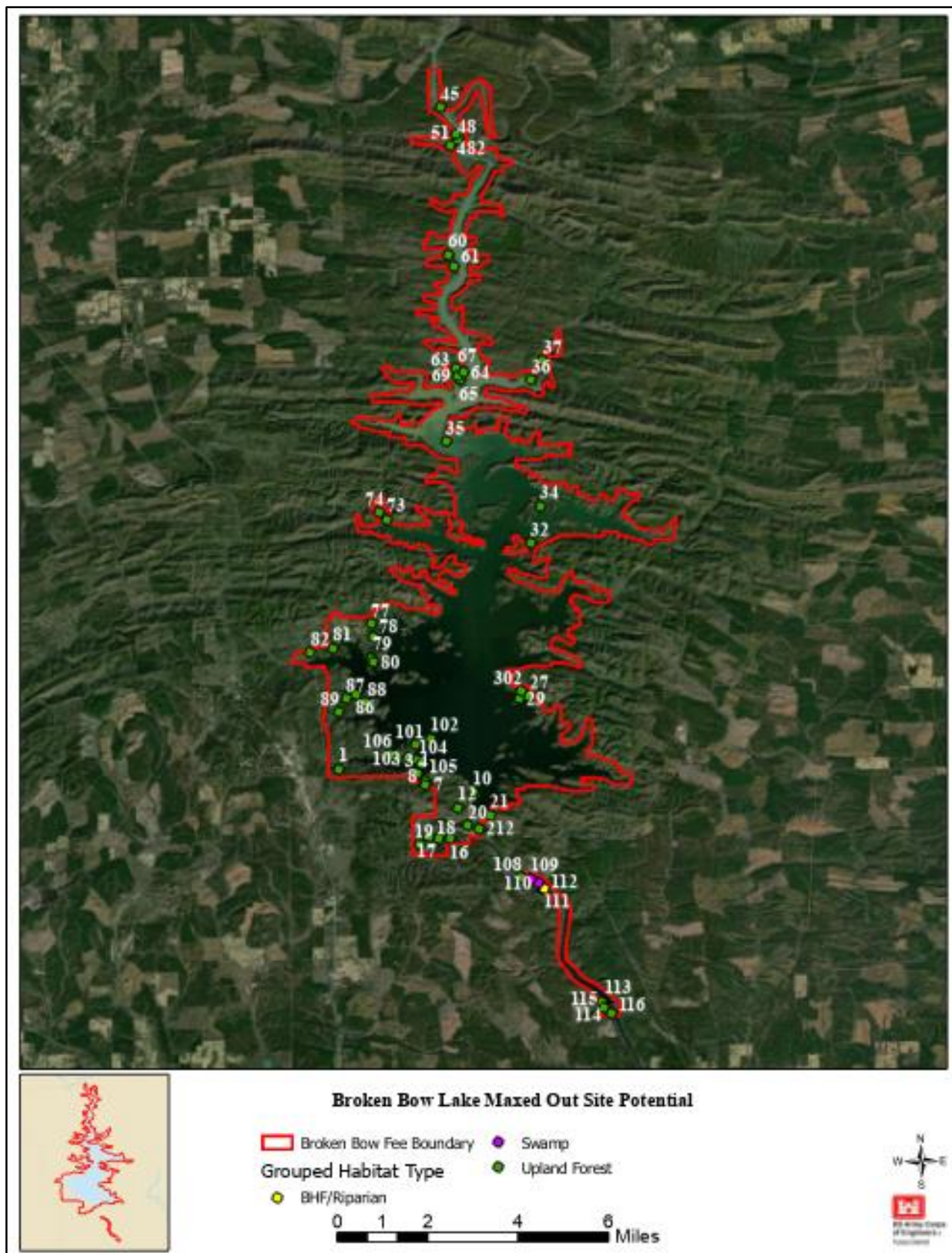


Figure 12. All Sites with Maxed Out Site Potential

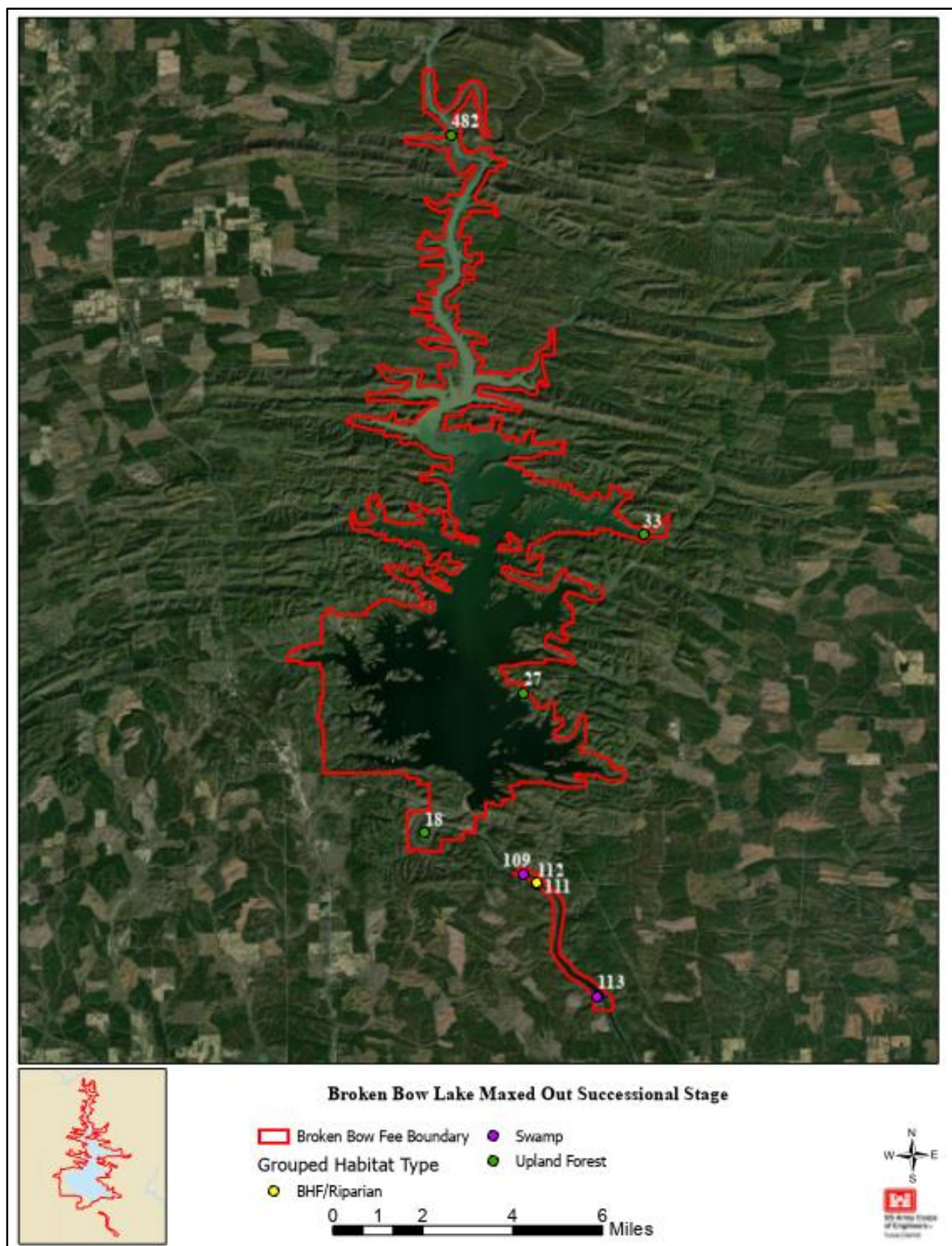


Figure 13. All Sites with Maxed Out Successional Stage

Recommendations

Even with unplanned disturbances, there are several areas with valuable wildlife habitat remaining on USACE fee-owned property at Broken Bow Lake. Habitat management efforts by the USACE and the Oklahoma Department of Wildlife and Conservation has proven effective in maintaining quality wildlife habitat around the lake.

When comparing overall high total WHAP scores between (0.71-0.94) (Figures 1-10) to Maximum Site Potential scores (Figure 13), with the exception of the area below the regulation dam, no one area of the lake was identified, but rather several individual points in various habitat types scattered around the lake (points 4, 18, 27, 48, 73, 78, 108, 109, 110, 111, 112, 113, and 482). These sites are close to or have reached their maximum habitat potential. Most, if not all these areas likely require no management actions to reach their potential, but rather protection from disturbances.

Likewise, sites with low WHAP scores that also have low site potential have likely reached their habitat potential; however minimal it might be. Management actions to improve these sites will likely achieve minimal results.

Conversely, areas with relatively low total WHAP scores between 0.47 – 0.69, but high Site Potential scores have the greatest potential for improvement. Management actions targeting native species diversity through habitat manipulation (e.g. prescribed fire, invasive species control, etc.) will likely result in more diverse, higher quality wildlife habitat. None of the points surveyed meet this criterion.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas with highest maximum scores. The planning team for the Broken Bow Lake Master Plan revision will consider WHAP scores when making land classification decisions.

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Attachment A: Broken Bow Lake WHAP Results Summary

Point Number	Grouped Habitat Type	1) Site Potential	2) Successional Stage	Marsh Successional Stage	3)Uniqueness and Relative Abundance	4A)Diversity of Woody Species	4B)Number of Woody Species	Swamp Diversity of Veg	Marsh Diversity of Veg	5) Vertical Stratification	6) Additional Structural Diversity	7A) Condition of Woody Vegetation	7B) Herbaceous Vegetation	Cropland Condition	Marsh Condition	Total Score before adjustment	Converted to Decimal	Total Score with Adjustment	Final Score	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samaras	Cone	Achene	All Others	Herbaceous Species	Notes
1	Upland Forest	12	12	NA	5	5	3	NA	NA	4	1	5	1	NA	NA	48	0.48	0.55	0.55	poison ivy, cat greenbriar, plum	NA	white oak, blackjack oak, swamp chestnut oak	pignut hickory	white ash	short leaf pine	NA	NA	rosette grass, sedge sp., white bergamot	NA
2	skipped	skipped	skipped	skipped	skipped	skipped	Skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Upland Forest	12	12	NA	10	5	3	NA	NA	5	3	3	3	NA	NA	56	0.56	0.64	0.64	farkle berry, Carolina buckthorn, smilax sp., poison ivy, Virginia creeper, grapevine	clover sp.,	white oak,	hickory sp.,	elm	NA	NA	NA	sedge sp., beebalm., carex sp., skullcap, large whorled pogonia	NA
4	Upland Forest	12	12	NA	10	6	5	NA	NA	5	3	5	3	NA	NA	61	0.61	0.70	0.70	Vine sp., Virginia creeper, poison ivy, smilax sp.,	eastern redbud, clover	water oak, white oak	hickory sp.,	2 elm sp.,	eastern redcedar, short leaf pine	NA	NA	sedge sp., beebalm., goldenrod. Skullcap, goldenrod sp., witchgrass, fern, flowering bluet, sedge sp.,	NA
5	Upland Forest	7	12	NA	15	6	3	NA	NA	5	5	1	3	NA	NA	57	0.57	0.66	0.66	smilax sp., Virginia creeper, poison ivy,	NA	white oak	hickory sp.,	maple, elm	short leaf pine,	NA	sensitive fern		NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
6	Uplan d Forest	7	12	NA	10	5	5	NA	NA	5	3	5	3	NA	NA	55	0.55	0.63	0.63	farkle berry, Virginia creeper, smilax sp., dogwood sp., poison ivy	clover sp.,	whit e oak	NA	elm sp., ash	sho rt leaf pin e, eas tern red ced ar	NA	NA	skullc ap, carex sp., sedge sp., bell flower , clitoria sp., witch grass, aster sp., sedge sp., brome sp., rosett e grass, wood spurge, white bergo mot, skull cap,	NA
7	Uplan d Forest	12	6	NA	10	5	5	NA	NA	5	3	5	3	NA	NA	54	0.54	0.62	0.62	plum, Virginia creeper, wild charry, cat greenbri ar, poison ivy	serice a lespe deza	whit e oak	hickor y sp., pignut hickor y	NA	eas tern red ced ar	NA	NA	but more hicko ry than oak	
8	Uplan d Forest	12	12	NA	5	5	5	NA	NA	4	1	5	1	NA	NA	50	0.5	0.57	0.57	dogwood , muscadi ne, Virginia creeper, hornbea m, holly sp., pawpaw	NA	whit e oak,	NA	map le,	sho rt leaf pin e	NA	fern sp.,	sedge sp., brome sp.,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Wood y Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
9	Uplan d Forest	7	12	NA	10	6	5	NA	NA	4	5	3	3	NA	NA	55	0.55	0.63	0.63	smilax sp., grapevin e, poison ivy, Virginia creeper, farkle berry	NA	whit e oak	hickor y sp.,	elm,	sho rt leaf pin e,	NA	swe etgu m, fern	sedge sp., clitoria sp., aster sp., witch grass, unkno wn herb, wild comfr y	NA	
10	Uplan d Forest	12	12	NA	3	6	5	NA	NA	3	3	5	1	NA	NA	50	0.5	0.57	0.57	Virginia creeper, Smilax sp., poison ivy,	NA	post oak, whit e oak,	hickor y sp.,	whit e ash	sho rt leaf pin e	NA	swe etgu m, fern	sedge sp., carex sp., beeba lm sp.,	NA	
11	Uplan d Forest	7	12	NA	10	5	5	NA	NA	5	3	3	1	NA	NA	51	0.51	0.59	0.59	Virginia creeper, Smilax sp., poison ivy, farkle berry	clover sp.,	post oak, whit e oak,	hickor y sp.,	NA	sho rt leaf pin e	NA	NA	carex sp., sedge sp., beeba lm sp.,	NA	
12	Uplan d Forest	12	12	NA	5	4	3	NA	NA	3	1	5	3	NA	NA	48	0.48	0.55	0.55	farkle berry,	NA	whit e oak, post oak	hickor y sp.,	elm	sho rt leaf pin e, eas tern red ced ar	NA	NA	beeba lm, carex sp., sedge sp., witch grass	NA	
13	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
14	Swam p	20	5	NA	20	NA	NA	6	NA	5	3	5	3	NA	NA	67	0.67	0.67	0.67	persimm on,	serice a lespe deza	NA	water hickor y	NA	NA	sycam ore	black willo w, sweet gum	bullru sh, carex sp., woodl and sunflo wer, 2 sedge sp.,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
18	Uplan d Forest	12	20	NA	10	6	5	NA	NA	5	5	3	3	NA	NA	69	0.69	0.79	0.79	grapevin e, farkle berry, poison ivy, smilax sp., holly sp.,	clover sp., vetch	whit e oak	hickor y sp.,	map le, whit e ash,	sho rtle af pin e	NA	NA	sedge sp., fern, milkw eed, switch grass	NA
NA																													
20	Uplan d Forest	12	12	NA	10	5	3	NA	NA	4	3	5	1	NA	NA	55	0.55	0.63	0.63	Virginia creeper	NA	whit e oak, post oak	mocke rnut hickor y	whit e ash, red map le, sug ar map le, ced ar elm,	eas tern red ced ar,	NA	NA	witch grass, sedge sp., bed straw,	NA
																									chris tmas fern, yucc a, blad der fern	2 sedge sp., wood bedstr aw,	NA		

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
22	Uplan d Forest	7	6	NA	5	8	7	NA	NA	4	5	3	1	NA	NA	46	0.46	0.53	0.53	poison ivy, smilax sp., persimm on,	serice a lespe deza, clover sp.,	red oak, whit e oak	hickor y sp.	red map le, Am eric an elm, silve r map le	eas tern red ced ar, sho rt leaf pin e	sycam ore	butto n bush	mint sp., thistle sp., sedge sp., wild parsle y, 2 sedge sp,	NA
23	Uplan d Forest	7	12	NA	5	7	7	NA	NA	5	5	3	3	NA	NA	54	0.54	0.62	0.62	service berry, Virginia creeper, America n Beauty Berry, poison ivy, muscadi ne, smilax sp.,	serice a lespe deza	red oak, whit e oak, post oak	hickor y sp.,	map le sp., elm sp.,	eas tern red ced ar, sho rt leaf pin e	NA	fern sp.,	sedg e sp., mint sp., witch grass, skull cap,	NA
24	Uplan d Forest	7	12	NA	5	8	5	NA	NA	5	5	5	3	NA	NA	55	0.55	0.63	0.63	smilax sp., hackberr y, persimm on,	serice a lespe deza	whit e oak,	mocke rnut hickor y	red map le,	eas tern red ced ar, sho rt leaf pin e	sycam ore	butto n bush	sedg e sp., mint sp., witch grass, skull cap,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
26	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00		skipped flowering dogwood	skipp ed	skip ped	skippe d	skip ped	skip ped	skip ped	skip ped	skipp ed	NA skipp ed
27	Uplan d Forest	12	20	NA	10	6	5	NA	NA	4	3	5	1	NA	NA	66	0.66	0.76	0.76		roundleaf greenbri ar, plum, poison ivy, cat greenbri ar, summer grape, eastern hawthorn	NA	wate r oak, whit e oak, cher ryba rk oak,	mocke rnut hickor y, maple sp.,	Am eric an elm, win ged elm, Am eric an elm, sug ar map le,	sho rt leaf pin e, lobl olly pin e	NA	swe etgu m	fescu e sp., pasp alum sp.,	NA
28	BHF/ Ripari an	20	12	NA	20	6	7	NA	NA	3	5	5	0	NA	NA	78	0.78	0.78	0.78			NA	whit e oak, turke y oak, whit e oak,	mocke rnut hickor y		sho rt leaf pin e,	NA	swe etgu m,	NA	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Wood y Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
30	BHF/ Ripari an	20	12	NA	5	3	5	NA	NA	3	5	3	1	NA	NA	57	0.57	0.57	0.57	persimmon, poison ivy, red mulberry, muscadi ne, cat greenbri ar, Virginia creeper, sugar berry	black locust	NA	NA	sugar map le, Am eric an elm,	east ern red ced ar, sho rt leaf pin e	NA	Osa ge oran ge,	fescu e sp.,	NA	
31	skipp ed	skip ped	skip ped	skip ped	skip ped	skip ped	Skipp ed	skip ped	skip ped	skip ped	skip ped	skip ped	skip ped	skip ped	skip ped	skip ped	skipp ed	#VA LUE!	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
32	Uplan d Forest	12	12	NA	10	7	5	NA	NA	4	1	3	1	NA	NA	55	0.55	0.63	0.63	dogwood , poison ivy, blueberry , hornbea m	serice a lespe deza	whit e oak, blac kjac oak	hickor y sp.,	ash sp.,	sho rt leaf pin e	NA	swe etgu m,	witchg rass, sedge sp., sedge sp., carex sp., beeba lm sp., broom sted bluest em, witchg rass, peppe r grass	NA	
33	Uplan d Forest	7	20	NA	10	8	7	NA	NA	5	5	5	3	NA	NA	70	0.7	0.80	0.80	poison ivy, smilax sp., persimm on, pokewee d	mimo sa sp., serice a lespe deza, clover sp.,	whit e oak, red oak	hickor y	Am eric an elm,	ced ar sp., sho rt leaf pin e,	syc a mor e	swe etgu m, willo w sp., wild fern		NA	

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sam ar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
34	Uplan d Forest	12	12	NA	10	6	5	NA	NA	5	3	5	1	NA	NA	59	0.59	0.68	0.68	grapevin e, poison ivy, blueberry , hornbea m, persimm on	NA	red oak, blac kjac k oak, whit e oak, willo w oak	hickor y sp.,	elm sp.,	pin e sp.,	NA	swe etgu m	witchg rass, little bluest em,	NA
																						y sp.,							NA
36	Uplan d Forest	12	12	NA	10	5	5	NA	NA	4	3	5	3	NA	NA	59	0.59	0.68	0.68	dogwood , poison ivy, blueberry , persimm on, poke weed	clover sp.,	whit e oak, red oak, post oak	NA	whit e ash	sho rt leaf pin e	NA	NA	beebe lm, white berga mot, witch grass, sedge sp., pussey oot	NA
																				m, cat								mint sp., white berga mot, sedge sp., sedge sp.,	NA
																						y sp.,							

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Sw mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sam ara	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
38	Upland Forest	7	12	NA	10	6	5	NA	NA	4	5	5	3	NA	NA	57	0.57	0.66	0.66	dogwood , persimmon, berry sp., poison ivy	sericea lespedeza, clover sp.,	red oak, white oak	NA	American elm,	eastern redcedar, shortleaf pine, bald cypresses	NA	sweetgum, fern sp.,	ragweed, wild parsley, witch grass, clasping venus looking glass, ryegrass sp., pussyfoot, bedstraw sp.,	NA
																				e, smilax		post oak	hickory sp.,	American elm	shortleaf pine	NA	NA	sedge, witchgrass	NA
40	Upland Forest	7	12	NA	5	7	5	NA	NA	3	3	5	1	NA	NA	48	0.48	0.55	0.55	blueberry, dogwood, persimmon, smilax sp.,	sericea lespedeza	white oak, post oak, red oak	NA	American elm, silver maple,	shortleaf pine, eastern redcedar	sycamore	sweetgum	sedge,	NA

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41	BHF/ Ripari an	20	12	NA	5	6	5	NA	NA	3	3	5	1	NA	NA	60	0.6	0.60	0.60	persimm on, muscadi ne, poison ivy, smilax sp.,	NA	red oak	NA	whit e ash	bal d cyp res s	sycam ore	blac k gum, swe etgu m, butto n bush	sedge	NA
42	BHF/ Ripari an	20	6	NA	5	6	5	NA	NA	5	5	3	1	NA	NA	56	0.56	0.56	0.56	poison ivy, wild grape,sm ilax sp.,	NA	wate r oak	NA	whit e ash, red maple	bal d cyp res s	sycam ore	butto n bush , swe etgu m	sedge sp., nut sedge	NA
43	BHF/ Ripari an	20	12	NA	10	5	5	NA	NA	5	5	5	1	NA	NA	68	0.68	0.68	0.68	wild grape, smilax sp., poison ivy, trump et creeper	clover	NA	NA	whit e ash, red maple,	bal d cyp res s	NA	butto n bush , swe etgu m	sedge sp.,	NA
44	BHF/ Ripari an	20	12	NA	15	4	5	NA	NA	4	5	5	5	NA	NA	75	0.75	0.75	0.75	poison ivy,Ameri can holly, black tupelo, muscadi ne, trump et creeper	NA	whit e oak	black walnut , bitter nut hickor y	Ameri can elm, gree n ash, ced ar elm	NA	NA	NA	morni ng glory, switch cane, sedge , 6 unkno wn herbs	NA
45	Uplan d Forest	12	12	NA	10	7	5	NA	NA	4	1	5	3	NA	NA	59	0.59	0.68	0.68	muscadi ne, saw greenbri ar, poison ivy, America n beautybe rry, black tupelo, America n holly	serice a lespe deza	sout hern red oak, whit e oak	easter n hopho rnbea m,	red maple	sho rtle af pine	NA	swe etgu m	sedge sp., woodl and sunflo wer, bedstr aw, witchg rass, 2 unkno wn herbs	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
46	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	farkle berry, summer grape, Virginia creeper, poison ivy, black cherry, muscadi ne	NA	whit e oak	mocke rnut hickor y	red map le, ced ar elm	eas tern red ced ar, sho rt leaf pin e	NA	NA	4 unkno wn herbs, sedge sp.,	NA
NA																													
48	Uplan d Forest	12	12	NA	10	5	5 Skipp	NA	NA	4	3	5	5	NA	NA	61	0.61	0.70	0.70	saw greenbri ar, hackberr y, black tupelo, Virginia creeper	easte rn redbu d, clover sp., vetch	whit e oak, cher ryba rk oak	easter n hopho rnbea m, bittern ut hickor y	whit e ash, red map le	NA	NA	NA	witchg rass, maya pple, 2 sedge sp., rush sp., 4 unkno wn herbs	NA
NA																													
50	BHF/ Ripari an	20	12	NA	5	5	3	NA	NA	5	5	5	1	NA	NA	61	0.61	0.61	0.61	poison ivy, smilax sp., persimm on,	NA	NA	NA	elm sp.,	sho rt leaf pin e	sycam ore	butto n bush , blac kgu m, swe etgu m	sedge sp., wort sp.,	NA

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51	Uplan d Forest	12	12	NA	5	5	3	NA	NA	3	5	5	1	NA	NA	51	0.51	0.59	0.59	poison ivy, smilax sp., muscadi ne,	NA	NA	hickor y sp.,	elm sp.,	sho rt leaf pin e,	NA	swe etgu m, blac kgu m,	clover , sedge sp., wood spurg e, squarr ose sedge	really old pine
52	BHF/ Ripari an	20	6	NA	5	6	3	NA	NA	5	3	5	3	NA	NA	56	0.56	0.56	0.56	poison ivy, smilax sp., persimm on	serice a lespe deza	NA	hickor y sp.,	elm sp., silve r map le	NA	sycam ore	butto n bush	2 sedge sp., mint sp., thouro ugh wort, squarr ose sedge	NA
53	Uplan d Forest	7	12	NA	5	8	7	NA	NA	4	3	1	3	NA	NA	50	0.5	0.57	0.57	privet, persimm on, poison ivy, muscadi ne, blue berry, smilax sp.,	clover sp., serice a lespe deza	whit e oak, wate r oak, post oak,	hickor y sp.,	whit e ash, elm sp.,	eas tern red ced ar, sho rt leaf pin e	sycam ore	butto n bush , swe etgu m	witch grass, craspi ng venus lookin g glass, wild parsle y, oat grass, mint sp., sedge sp.,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
54	Uplan d Forest	7	12	NA	5	8	7	NA	NA	4	3	1	3	NA	NA	50	0.5	0.57	0.57	muscadi ne, smilax sp., kudzu, poison ivy, privet, persimm on	serice a lespe deza, clover sp.,	post oak, whit e oak,	hickor y sp.,	whit e ash, elm sp.,	east ern red ced ar, shor t leaf pin e	sycam ore	butto n bush , sweetg um	sedge sp., mint sp., wild parsley, witch grass, lettuce, tickseed sp.,	NA
																												witch grass, woodl and oats, sedge sp., lettuc e, brome sp.,	NA
56	Uplan d Forest	7	6	NA	5	8	7	NA	NA	5	5	5	3	NA	NA	51	0.51	0.59	0.59	privet, Virginia creeper, smilax sp., poison ivy, muscadi ne, persimm on	vetch sp., sericia lespe deza, clover sp.,	post oak	hickor y sp.,	elm sp.,	east ern red ced ar, shor t leaf pin e	sycam ore	butto n bush , fern sp.,	wort sp., witch grass, claspi ng venus lookin g glass, mint sp., sedge sp., unkno wn herb., beebalm	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif ication	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
57	BHF/ Ripari an	20	12	NA	15	7	5	NA	NA	5	5	3	1	NA	NA	73	0.73	0.73	0.73	poison ivy, smilax sp., persimm on,	clover	white oak	NA	map le sp., white ash	short leaf pine	sycam ore	butto n bush	ragwe ed sp., sedge sp., wort sp.,	super thick brus,
58	Uplan d Forest	7	6	NA	5	8	7	NA	NA	5	3	5	3	NA	NA	49	0.49	0.56	0.56	muscad ine, smilax sp., poison ivy, persimm on,	serice a lespe deza, clover sp., pussy foot, yellow hawk clover	post oak, white oak,	hickor y sp.,	map le sp.,	ced ar sp., bal d cyp res s	sycam ore	butto n bush , sycam ore , sweet gum, fern sp.,	wild parsle y, clasp ing venus lookin g glass, witch grass, sedge sp., unkno wn grass, mint	NA
59	Uplan d Forest	7	6	NA	5	7	7	NA	NA	5	3	5	5	NA	NA	50	0.5	0.57	0.57	dogwood , muscad ine, poison ivy, smilax, persimm on	2 clover sp., serice a lespe deza	post oak, white oak,	hickor y sp., mocke rnut hickor y,	NA	east ern red ced ar,	sycam ore	butto n bush , sweet gum	mint sp., wort sp., clasp ing venus lookin g glass, 2 sedge sp., wild parsle y, wild oats, 2 unkno wn flower s,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
60	Uplan d Forest	12	12	NA	10	6	5	NA	NA	5	3	3	3	NA	NA	59	0.59	0.68	0.68	cat greenbri ar, Virginia creeper, poison ivy, smilax sp., blueberry , hornbea m,	serice a lespe deza	whit e oak, red oak, blac kjac k oak	hickor y sp.,	map le sp.,	sho rt leaf pin e,	NA	NA	rosett e grass, brome sp., 2 sedge sp., white berga mot	NA
61	Uplan d Forest	12	12	NA	10	5	3	NA	NA	4	3	3	3	NA	NA	55	0.55	0.63	0.63	hucklebe rry, smilax sp.,	NA	whit e oak, red oak	pignut hickor y	NA	sho rt leaf pin e	NA	swe etgu m	rosett e grass, Quee n Anne' s Lace	NA
62	skipp ed	skip ped	skippe d	skippe d	skippe d	skippe d	Skipp ed	skip ped	skip ped	skippe d	skippe d	skippe d	skippe d	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
63	Uplan d Forest	12	12	NA	5	4	3	NA	NA	4	3	5	3	NA	NA	51	0.51	0.59	0.59	cat greenbri ar, dogwood , muscadi ne, poison ivy, smilax sp., pokewee d	NA	whit e oak	hickor y sp.,	NA	sho rt leaf pin e,	NA	NA	rosett e grass, sedge sp., brome sp., white berga mot,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
64	Uplan d Forest	12	6	NA	10	6	5	NA	NA	3	3	3	3	NA	NA	51	0.51	0.59	0.59	cat greenbri ar, smilax sp., hornbea m, dogwood ,	vetch, clover , sericea lespe deza	whit e oak, red oak	hickor y sp.,	Americ an elm,	sho rt leaf pin e	NA	NA	brome sp., sedge sp., rosett e grass, wort sp., claspi ng venus lookin g glass, lantan a, white berga mot	NA
65	Uplan d Forest	12	12	NA	10	4	3	NA	NA	4	1	3	3	NA	NA	52	0.52	0.60	0.60	hornbea m, smilax sp., poison ivy	clover sp.,	whit e oak	NA	NA	sho rt leaf pin e, eas tern red ced ar	NA	NA	rosett e grass sp., annua l ragwe ed, sedge sp., wort sp., fleaba ne,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Speci es	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vegeta tion	7B) Herb aceo us Vegeta tion	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s		
66	BHF/ Ripari an	20	6	NA	5	5	3	NA	NA	3	1	1	3	NA	NA	47	0.47	0.47	0.47	cat greenbri ar, poison ivy, smilax sp., America n hornbea m	serice a lespe deza, clover sp.,	whit e oak,	hickor y sp.,	NA	NA	NA	swe etgu m	rosett e grass, brome sp., thorou ghwor t, annua l ragwe ed, sedge sp., white garlan d-lily	NA		
68	Forest skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	NA	NA	NA	NA	y sp.,	elm. ,	NA	NA	NA	NA	sedg e sp., rosett e sp., lantan a, white berga mot	more hicko ries, fewer oaks
70	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	more hicko ries, fewer oaks, mix of old pines and youn g hicko ry/oa k

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif ication	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
71	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	clasp ing venus lookin g glass, mint sp., sedge sp., witch grass, wort sp., unkno wn herb	NA
72	BHF/ Ripari an	20	6	NA	5	7	5	NA	NA	4	5	5	3	NA	NA	60	0.6	0.60	0.60	persimm on, smilax sp., poison ivy, Virginia creeper	serice a lespe deza	post oak, red oak	sumac sp.,	elm sp.,	sho rt leaf pin e,	NA	butto n bush , swe etgu m	sege sp., beebe lm, unkno wn herb, mint sp., wort sp., tick seed sp., witch grass, rag weed sp., white berga mont	NA	
73	Uplan d Forest	12	6	NA	10	7	7	NA	NA	5	5	5	5	NA	NA	62	0.62	0.71	0.71	berry sp., persimm on, poison ivy, smilax sp.,	serice a lespe deza, clover , sensit ive briar	red oak, blac kjac k oak, whit e oak,	pignut hickor y, mocke rnut hickor y	Am eric an elm. , ash sp.,	sho rt leaf pin e	NA	swe etgu m,	contr ol burn site		

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74	Uplan d Forest	12	12	NA	5	7	5	NA	NA	3	3	5	3	NA	NA	55	0.55	0.63	0.63	cat greenbri ar, Virginia creeper, grape vine sp., muscadi ne, poison ivy, smilax sp.,	sensit ive briar	post oak, whit e oak,	mocke rnut hickor y	whit e ash, elm sp.,	sho rt leaf pin e	NA	swe etgu m	witch grass, sedge sp., white berga mont, beebe lm	contr ol burn site	
75	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	0.00	poison ivy, America n Beautyb erry, flowering dogwood , muscadi ne	vetch	whit e oak	mocke rnut hickor y	NA	sho rtle af pin e	NA	NA	sedge sp.,	NA
76	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
77	Uplan d Forest	12	12	NA	5	6	7	NA	NA	4	1	3	3	NA	NA	53	0.53	0.61	0.61	dogwood , America n privet, muscadi ne, hornbea m, muscadi ne sp., Virginia creeper, cat greenbri ar, poison ivy, american beautybe rry	serice a lespe deza	whit e oak	hickor y sp.,	Ameri ca elm, ar	sho rt leaf pin e, eas tern red ced ar	NA	NA	sedge sp., brome sp., rosett e gras, 2 daisy sp.,	NA	

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
78	Uplan d Forest	12	12	NA	10	7	5	NA	NA	4	3	3	5	NA	NA	61	0.61	0.70	0.70	smilax sp., muscadi ne, poison ivy, Virginia creeper,	clover	whit e oak, post oak	mocke rnut hickor y, pignut hickor y,	Ameri can elm,	east ern red ced ar	NA	fern sp.,	skullc ap, mint sp., bee balm, witch grass, 2 sedge sp., wild parsle y, violet sp., yellow passio n flower , wild comfr ey,	NA
79	Uplan d Forest	12	12	NA	5	6	5	NA	NA	4	3	3	3	NA	NA	53	0.53	0.61	0.61	poison ivy, smilax sp., Virginia creeper	serice a lespe deza	whit e oak,	mocke rnut hickor y, pignut hickor y,	Ameri can elm,	east ern red ced ar, sho rt leaf pin e	NA	NA	sedge sp., St. John wort, wood spurg e, witch grass, clover , skull cap, bee balm,	NA
80	Uplan d Forest	12	12	NA	5	4	3	NA	NA	3	3	5	1	NA	NA	48	0.48	0.55	0.55	smilax sp.,	NA	whit e oak, post oak	mocke rnut hickor y, pignut hickor y	NA	east ern red ced ar, sho rt leaf pin e	NA	NA	sedge sp., skull cap, bee balm	NA

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81	Uplan d Forest	12	6	NA	10	3	5	NA	NA	5	3	3	5	NA	NA	52	0.52	0.60	0.60	hornbea m, dogwood , muscadi ne, hucklebe rry, buckthor n, hawthorn e sp., Virginia creeper	NA	blac kjac k oak, red oak, whit e oak	NA	NA	sho rt leaf pin e	NA	NA	sedg e sp., rosett e grass sp., brome sp., privet sp., germa nder sp., clasp ing venus lookin g glass, prairie fleaba ne, ebony splee nwort	NA
82	Uplan d Forest	12	12	NA	5	5	3	NA	NA	5	3	3	3	NA	NA	51	0.51	0.59	0.59	hornbea m, roundleaf greenbri ar, Virginia creeper, cat greenbri ar	tiny vetch	whit e oak, wate r oak	NA	whit e ash,	sho rt leaf pin e	NA	NA	thin sedg e , brome sedg e , 2 violet sp.,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
83	BHF/ Ripari an	20	3	NA	10	6	5	NA	NA	4	3	5	3	NA	NA	59	0.59	0.59	0.59	hornbea m, poison ivy, Virginia creeper, Carolina milkvine, berry sp.,	NA	NA	hickor y sp.,	whit e ash	sho rt leaf pin e,	syc amo re	swe etgu m	parsl e, woodl and daisy, craspi ng venus lookin g glass, brome sp., rosett e grass sp., corn salad	NA	
84	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
85	skipp ed	skip ped	skippe d	skippe d	skippe d	skipp ed	Skipp ed	skip ped	skip ped	skippe d	skipp ed	skipp ed	skipp ed	skip ped	skip ped	skippe d	#VA LUE!	0	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
86	Uplan d Forest	12	12	NA	10	3	3	NA	NA	5	3	3	3	NA	NA	54	0.54	0.62	0.62	dogwood , hornbea m, poison ivy, Virginia creeper	NA	whit e oak, red oak	NA	NA	sho rt leaf pin e	NA	NA	rosett e grass, sedge sp., honey suckle , white berga mot, violet wood- sorrel	NA	

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s	
	d																			dogwood , Virginia creeper, roundleaf ar, hornbea greenbri ar, hucklebe rry, muscadi ne, poison ivy	locust sp., clover				sho rt leaf				forget me not, woodl and	
88	Uplan d Forest	12	12	NA	10	5	3	NA	NA	5	3	3	3	NA	NA	56	0.56	0.64	0.64	hornbea m, dogwood , Virginia creeper dogwood , muscadi ne, poison ivy, hornbea m, Virginia creeper, roundleaf greenbri ar, cat greenbri ar, hucklebe rry	NA	whit e oak, red oak	hickor y sp.,	Am eric an elm sp., map le sp.,	sho rt leaf pin e	NA	NA	wild comfr ey, 2 sedge sp., splee nwort, dog tongu e, giant forget me not	NA	
89	Uplan d Forest	12	12	NA	5	4	5	NA	NA	4	1	5	3	NA	NA	51	0.51	0.59	0.59			whit e oak, red oak	NA		sho rt leaf pin e	NA	NA	honey suckle sp., 2 sedge sp., rosett e grass sp.,	NA	

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s		
90	Uplan d Forest	7	12	NA	10	7	5	NA	NA	5	5	5	1	NA	NA	57	0.57	0.66	0.66	farkleber ry, Virginia creeper, dogwood , poison ivy, smilax sp.,	serice a lespe deza	post oak	hickor y sp.,	elm sp., map le sp., elm sp.,	sho rt leaf pin e	NA	swe etgu m	wild comfr y, sedge sp., witch grass	NA		
																				y sp.,								NA			
92	Uplan d Forest	7	6	NA	10	5	5	NA	NA	4	3	3	3	NA	NA	46	0.46	0.53	0.53	farkleber ry, poison ivy, smilax sp., Virginia creeper, dogwood	clover sp.,	NA	hickor y sp.,	red map le	eas tern red ced ar, sho rt leaf pin e	NA	NA	wild comfr y, sedge sp., witch grass, beebe lm, forb sp.,	NA		
																				y sp.,								NA	NA	wild comfr ey, sedge sp., witchg rass	NA
94	Uplan d Forest	7	12	NA	10	6	5	NA	NA	5	5	3	1	NA	NA	54	0.54	0.62	0.62	poison ivy, Virginia creeper, smilax sp., farkleber ry	NA	whit e oak	hickor y sp.,	elm sp.,	eas tern red ced ar, sho rt leaf pin e	NA	swe etgu m, fern	wild comfr ey, witchg rass, sedge sp., wild indigo	NA		

Point Number	Grouped Habitat Type	1) Site Potential	2) Successional Stage	Marsh Successional Stage	3)Uniques and Relative Abundance	4A)Diversity of Woody Species	4B)Number of Woody Species	Swamp Diversity of Veg	Marsh Diversity of Veg	5) Vertical Stratification	6) Additional Structural Diversity	7A) Condition of Woody Vegetation	7B) Herbaceous Vegetation	Cropland Condition	Marsh Condition	Total Score before adjustment	Converted to Decimal	Total Score with Adjustment	Final Score	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samaras	Cones	Achenes	All Others	Herbaceous Species	Notes
	Upland Forest																		0.	smilax sp., farkleberry, Virginia creeper		white		elm	eastern short leaf			sp., witchgrass, rattles	
96	Upland Forest	7	6	NA	10	5	3	NA	NA	5	3	3	1	NA	NA	43	0.43	0.49	0.49	holly sp., Virginia creeper, poison ivy, smilax sp.,	NA	bur oak, white oak	hickory sp.,	elm sp.,	shortleaf pine	NA	NA	beeblum, sedge sp., witchgrass	NA
	skipped	skipped	skipped	skipped	skipped	skipped	Skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	0	0	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	
98	Upland Forest	7	12	NA	10	5	3	NA	NA	4	5	3	1	NA	NA	50	0.5	0.57	0.57	holly sp., Virginia creeper, poison ivy	NA	bur oak, white oak	hickory sp.,	elm sp.,	short leaf pine	NA	fern	sedge sp., witchgrass, beeblum	NA
	Upland Forest	7	12	NA	10	5	3	NA	NA	4	5	3	1	NA	NA	50	0.5	0.57	0.57	holly sp., smilax sp., dogwood , poison ivy	NA	bur oak, white oak	hickory sp.,	elm sp.,	short leaf pine	NA	NA	sedge sp., witchgrass	NA
100	Upland Forest	7	12	NA	10	5	3	NA	NA	4	5	3	1	NA	NA	50	0.5	0.57	0.57	holly sp., Virginia creeper, smilax, dogwood , poison ivy,	NA	bur oak, white oak	hickory sp.,	elm	shortleaf pine	NA	NA	sedge sp., witchgrass,	NA
101	Upland Forest	12	5	NA	10	6	3	NA	NA	3	3	5	3	NA	NA	50	0.5	0.57	0.57	plum, Virginia creeper,	NA	post oak, white oak,	mockernut hickory	winged elm	eastern red cedar, short leaf pine	NA	fern sp.,	hummingbird mint, fescue, paspalum sp.,	NA

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102	Uplan d Forest	12	12	NA	10	4	5	NA	NA	4	1	5	3	NA	NA	56	0.56	0.64	0.64	farkle berry, dogwood , Virginia creeper, cat greenbri ar, plum, wild cherry, eastern hawthorn ,	NA	whit e oak	mocke rnut hickor y	win ged elm	NA	NA	NA	wild parsle y, paspalum sp., wood sedge , fescue	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Wood y Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Verti cal Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Wood y Veget ation	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
106	Upland Forest	12	12	NA	10	5	3	NA	NA	3	3	5	1	NA	NA	54	0.54	0.62	0.62	plum, poison ivy	NA	post oak	mocke rnut hickor y	wing ed elm, white ash	shor t leaf pine	NA	NA	paspa lum sp., fescu e sp., unkno wn herb	Future Stephens Gap Parki ng Lot, propo sed
107	skipped	skipped	skipped	skipped	skipped	skipped	Skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	skipped	0	0	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
108	Upland Forest	12	6	NA	20	6	7	NA	NA	4	5	5	1	NA	NA	66	0.66	0.76	0.76	sugarber ry, Virginia creeper, saw greenbri ar, unknown vine, muscadi ne grape, America n beauty berry	NA	water oak, red oak,	black walnut , mocke rnut hickor y, bittern ut hickor y, pignut hickor y	red maple, silve r maple, green ash,	east ern redced ar	NA	2 fern sp.,	sedge sp., unkno wn herb	bald eagle nest near by
109	Swamp	25	20	NA	20	NA	NA	10	NA	4	5	5	5	NA	NA	94	0.94	0.94	0.94	roundleaf greenbri ar, America n hornbea m	NA	NA	water hickor y	river birch, water elm,	bald cypress s	sycamor e	fern	9 unkno wn herbs	NA
110	Swamp	25	10	NA	20	NA	NA	10	NA	4	3	5	3	NA	NA	80	0.8	0.80	0.80	NA	NA	NA	NA	river birch,	bald cypress s	sycamor e	NA	4 herb sp., alligat or weed, arrowl eaf	mostly cypress, hydr opow er influe nced

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111	BHF/ Ripari an	25	20	NA	20	5	7	NA	NA	5	5	5	1	NA	NA	93	0.93	0.93	0.93	mulberry, yaupon holly, cat greenbri ar, roundleaf greenbri ar, saw greenbri ar, muscadi ne, black tupelo	NA	wate r oak, over cup oak	red maple, pignut hickor y	ash sp., Am eric an elm, sug ar map le	NA	NA	swe etgu m	switch cane, rush sp.,	NA
112	Uplan d Forest	12	20	NA	15	5	5	NA	NA	4	3	5	5	NA	NA	74	0.74	0.85	0.85	saw greenbri ar, Virginia creeper, poison ivy, muscadi ne, America n beautybe rry	NA	whit e oak,	red maple, mocke rnut hickor y, unkno wn hardw ood	Am eric an elm,	NA	NA	swe etgu m, fern,	switch grass, sedge , 6 unkno wn herbs	thick short mapl e
113	Swam p	25	20	NA	10	5	3	NA	NA	4	5	5	3	NA	NA	80	0.8	0.80	0.80	muscadi ne	NA	over cup oak	pignut hickor y	wat er elm, river birc h	NA	NA	butto n bush	carex sp., alligat or weed, marsh penny wort, 4 unkno wn herbs,	NA

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif ication	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
114	Uplan d Forest	12	12	NA	10	7	3	NA	NA	5	1	5	3	NA	NA	58	0.58	0.67	0.67	youpon holly, muscadi ne, poison ivy, Virginia creeper, eastern hophorn beam	easte rn redbu d	whit e oak, sout hern red oak	mocke rnut hickor y,	Amer ican elm, red map le	eas ter red ced ar, sho rtle af pin e,	NA	swe etgu m,	spiceb ush, 3 grass sp.,	NA
, Virginia																													
NA																													
116	Uplan d Forest	12	12	NA	10	5	5	NA	NA	4	1	5	3	NA	NA	57	0.57	0.66	0.66	NA	NA	whit e oak, willo w oak	black walnut , bittern ut hickor y, water nut hickor y	ced ar elm, red map le	eas tern red ced ar	NA	swe etgu m, fern	woodl and sunflo wer, comm on rush, witchg rass, 4 unkno wn, indian pink	NA
ced ar, sho rt leaf pin e																													
NA																													
NA																													
switch grass																													
NA																													

Poi nt Nu mb er	Grou ped Habit at Type	1) Site Pot enti al	2) Succe ssion al Stage	Marsh Succe ssion al Stage	3)Uniq uenes s and Relati ve Abun dance	4A)Di versit y of Wood y Speci es	4B)N umb er of Woo dy Spec ies	Swa mp Div ersi ty of Veg	Mar sh Div ersi ty of Veg	5) Vertic al Stratif icatio n	6) Addi tion al Stru ctur al Dive rsity	7A) Con ditio n of Woo dy Vege tatio n	7B) Herb aceo us Veget ation	Cro plan d Con ditio n	Mar sh Con ditio n	Total Score befor e readj ustme nt	Con vert ed to Deci mal	Total Scor e with Adju stme nt	Fi na l Sc or e	Berry Drupe	Legu mePo d	Aco rn	Nut Nutlik e	Sa mar a	Co ne	Ach ene	All Othe rs	Herba ceous Speci es	Note s
302	Uplan d Forest	12	12	NA	10	4	5	NA	NA	3	3	5	1	NA	NA	55	0.55	0.63	0.63	flowering dogwood , plum, blueberry , poison ivy, muscadi ne, cat greenbri ar,	NA	whit e oak, post oak, bitter nut hick ory	NA	map le sp., Am eric an elm, Win ged elm	sho rt leaf pin e, lobl olly pin e	NA	NA	paspa lum, bed straw	NA
482																													very open , real old shortl eaf pine

Attachment B: Broken Bow WHAP Point Photographs

Broken Bow Lake #1	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #3

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #4	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #5	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #6	
Facing North	Facing East
 A photograph showing a wooded area with a large tree trunk in the foreground and a grassy slope leading up to a line of trees. The ground is covered with dry leaves and some green grass.	 A photograph showing a wooded area with a large tree trunk in the foreground and a grassy slope leading up to a line of trees. The ground is covered with dry leaves and some green grass.
Facing West	Facing South
 A photograph showing a wooded area with a large tree trunk in the foreground and a grassy slope leading up to a line of trees. The ground is covered with dry leaves and some green grass.	 A photograph showing a wooded area with a large tree trunk in the foreground and a grassy slope leading up to a line of trees. The ground is covered with dry leaves and some green grass.

Broken Bow Lake #7	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #8	
Facing North	Facing East
 A photograph of a forest floor covered in brown pine needles and fallen leaves. Several tall, slender trees with green foliage are visible in the background. The ground is slightly sloping upwards towards the right.	 A photograph of a forest floor covered in brown pine needles and fallen leaves. Several tall, slender trees with green foliage are visible in the background. A fallen log lies horizontally across the middle ground.
Facing West	Facing South
 A photograph of a forest floor covered in brown pine needles and fallen leaves. Several tall, slender trees with green foliage are visible in the background. The ground is slightly sloping upwards towards the right.	 A photograph of a forest floor covered in brown pine needles and fallen leaves. Several tall, slender trees with green foliage are visible in the background. The ground is slightly sloping upwards towards the right.

Broken Bow Lake #9

Facing North



Facing East



Facing West

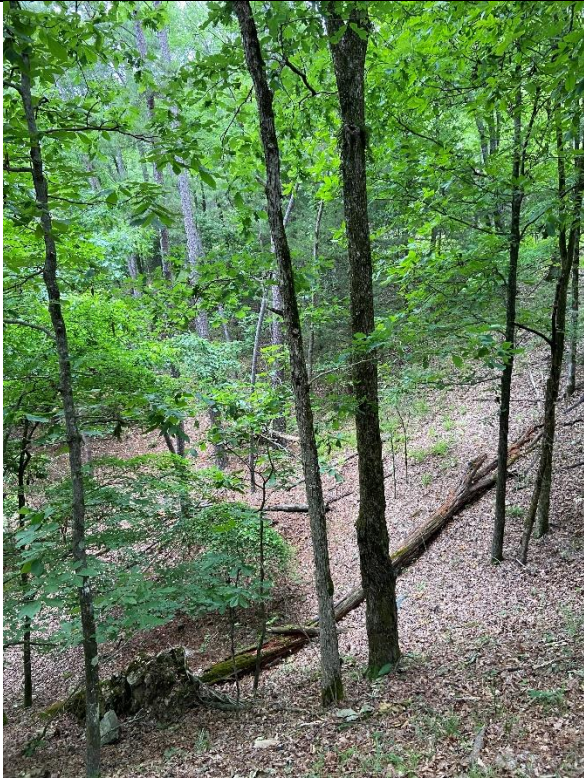


Facing South



Broken Bow Lake #10

Facing North



Facing East



Facing West

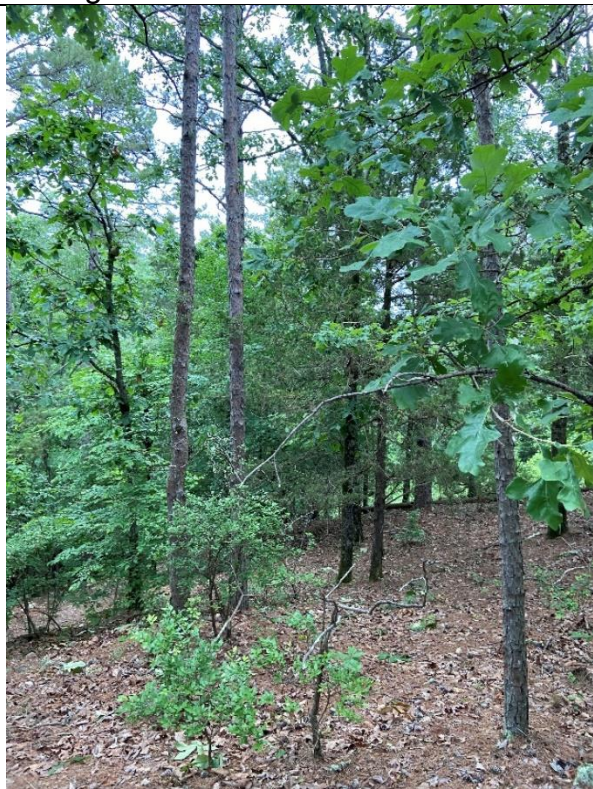


Facing South



Broken Bow Lake #11

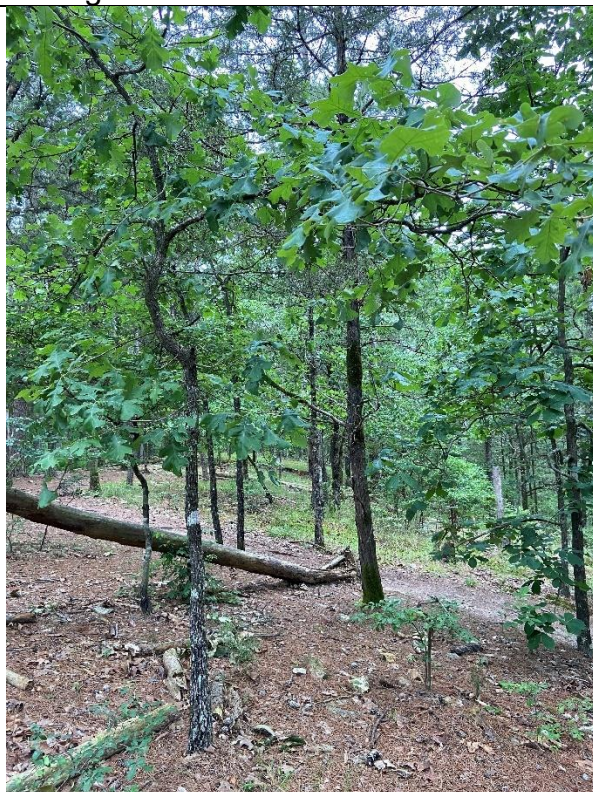
Facing North



Facing East







Facing West



Facing South



Broken Bow Lake #12	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #14	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #15	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #16	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #17

Facing North



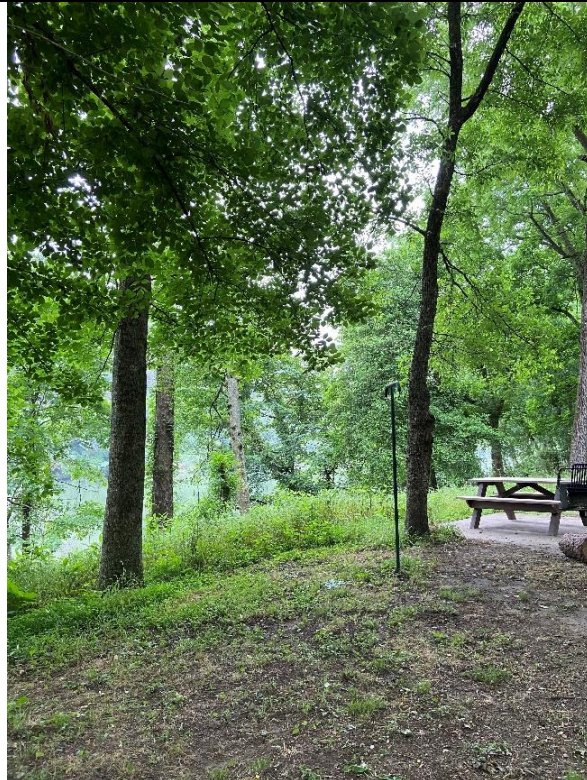
Facing East



Facing West



Facing South



Broken Bow Lake #18

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #19

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #20

Facing North



Facing East







Facing West



Facing South



Broken Bow Lake #21	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #212

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #22	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #23

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #24

Facing North



Facing East



Facing West



Facing South

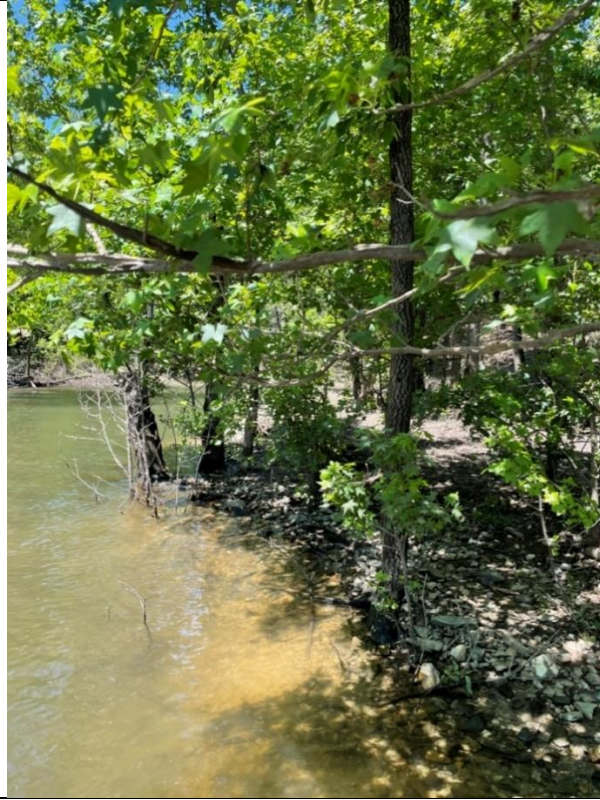


Broken Bow Lake #25

Facing North



Facing East







Facing West



Facing South



Broken Bow Lake #27	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #28

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #29

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #30

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #302

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #32

Facing North



Facing East



Facing West

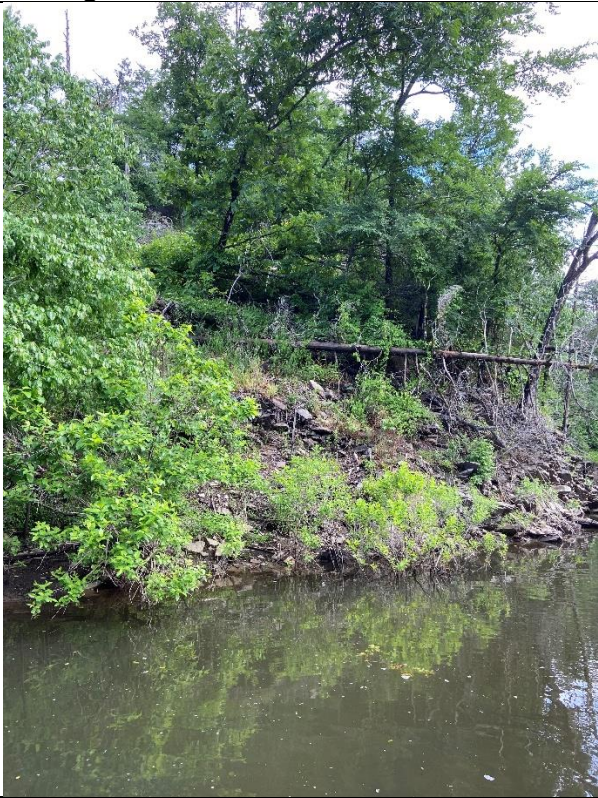


Facing South



Broken Bow Lake #33

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #34

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #35

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #37

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #38

Facing North



Facing East



Facing West

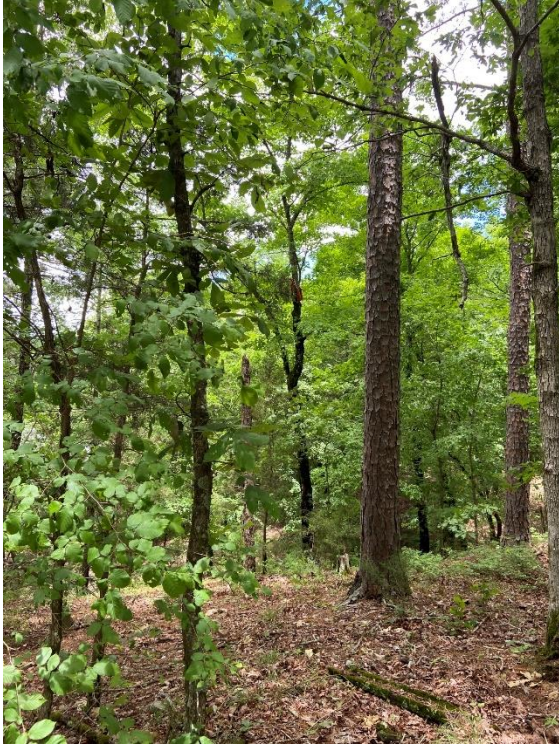


Facing South



Broken Bow Lake #39

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #40

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #41

Facing North



Facing East



Facing West



Facing South

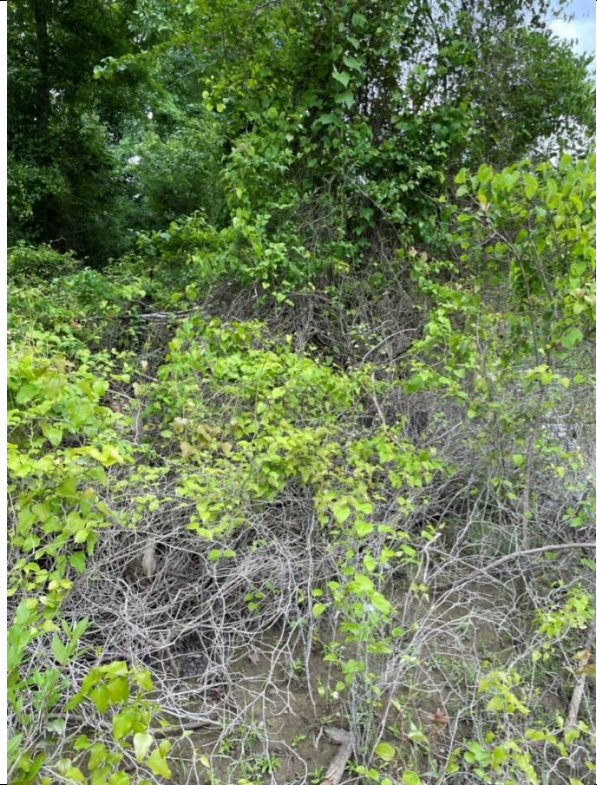


Broken Bow Lake #42

Facing North



Facing East











Facing West



Facing South



Broken Bow Lake #43	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #44	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #45

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #46	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #48

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #482

Facing North



Facing East







Facing West



Facing South



Broken Bow Lake #50	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #51	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #52	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #53

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #54	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #55

Facing North



Facing East




Facing West



Facing South



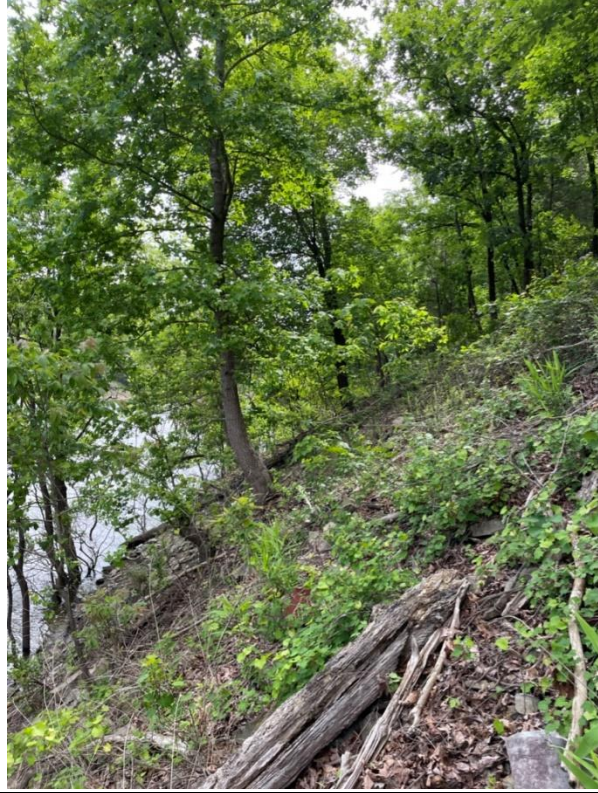
Broken Bow Lake #56	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #58

Facing North



Facing East







Facing West



Facing South



Broken Bow Lake #59	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #60	
Facing North	Facing East
	
Facing West	Facing South
	

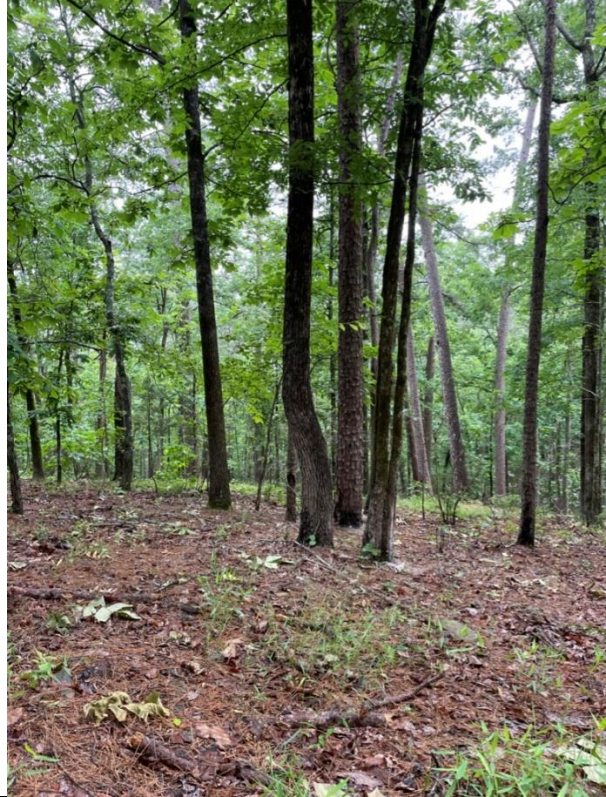
Broken Bow Lake #61	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #63

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #64	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #65	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #66

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #67	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #69

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #72

Facing North



Facing East





Facing West



Facing South



Broken Bow Lake #73	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #74	
Facing North	Facing East
 A photograph of a forest with many thin trees and a fallen log in the foreground. The ground is covered in brown leaves and some green plants are visible.	 A photograph of a forest with a large tree trunk in the foreground and many other trees in the background. The ground is covered in brown leaves and some green plants are visible.
Facing West	Facing South
 A photograph of a forest with many thin trees and a fallen log in the foreground. The ground is covered in brown leaves and some green plants are visible.	 A photograph of a forest with many thin trees and a fallen log in the foreground. The ground is covered in brown leaves and some green plants are visible.

Broken Bow Lake #75

Facing North



Facing East



Facing West




Facing South






Broken Bow Lake #77	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #78	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #79	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #80	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #81	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #82	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #83

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #86

Facing North



Facing East

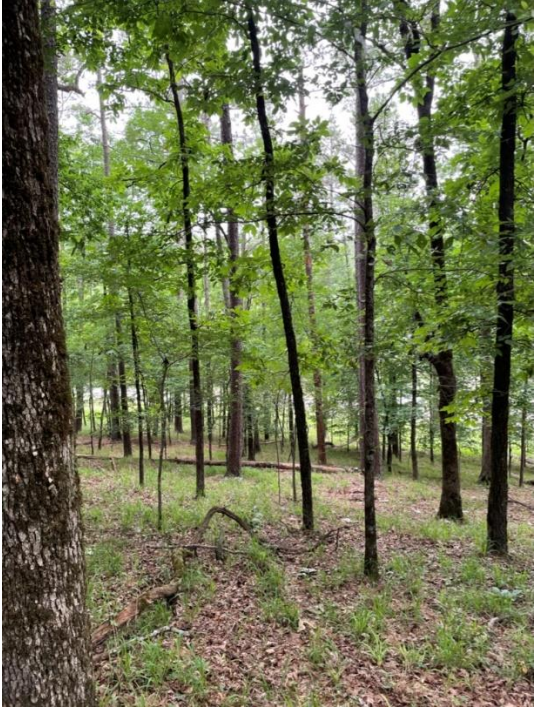




Facing West



Facing South



Broken Bow Lake #88	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #89

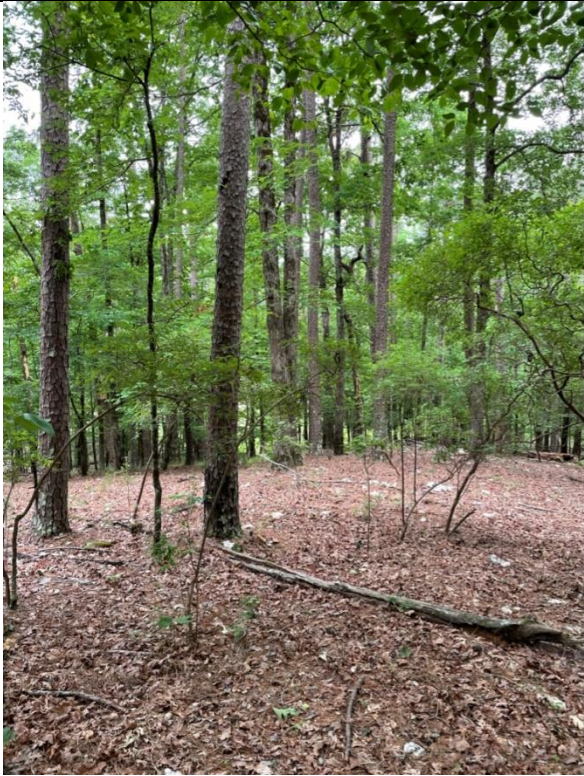
Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #90	
Facing North	Facing East
	
Facing West	Facing South
	

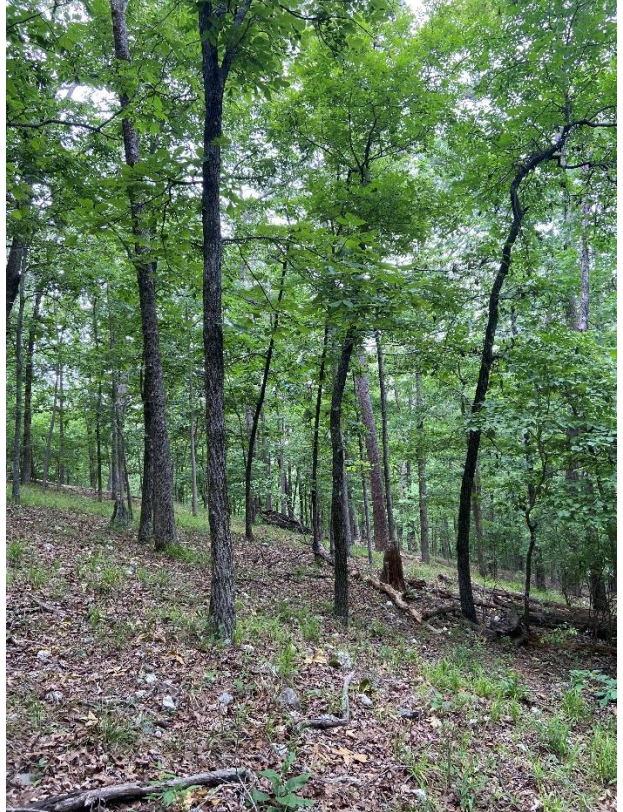
Broken Bow Lake #91	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #92

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #93

Facing North



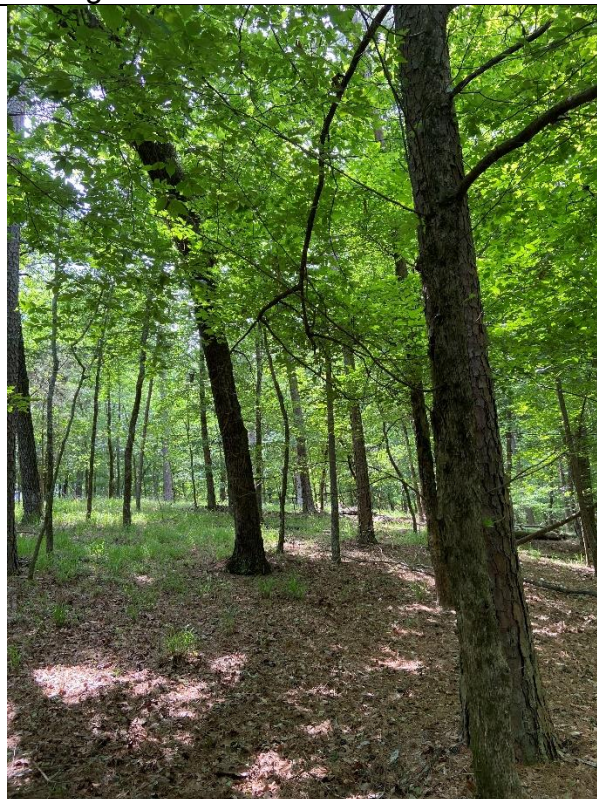
Facing East



Facing West



Facing South



Broken Bow Lake #94

Facing North



Facing East



Facing West



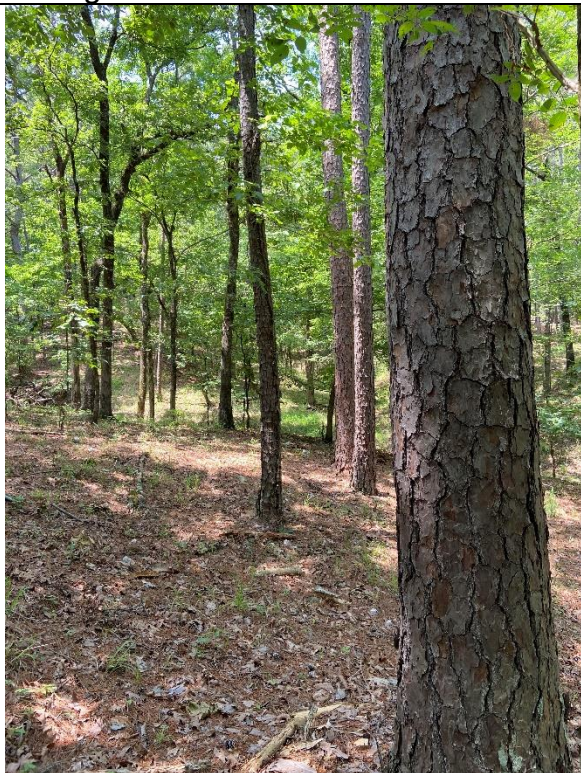
Facing South



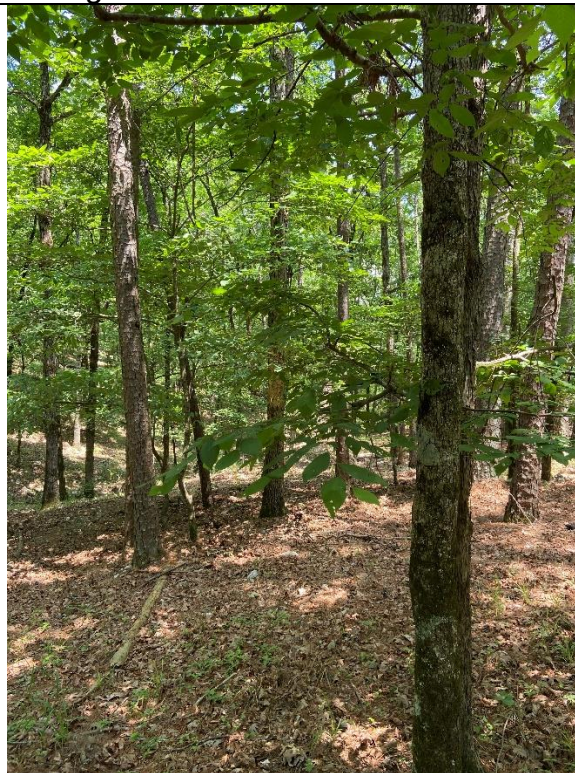
Broken Bow Lake #95	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #96

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #98	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #99	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #100	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #102	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #

Facing North



Facing East



Facing West



Facing South

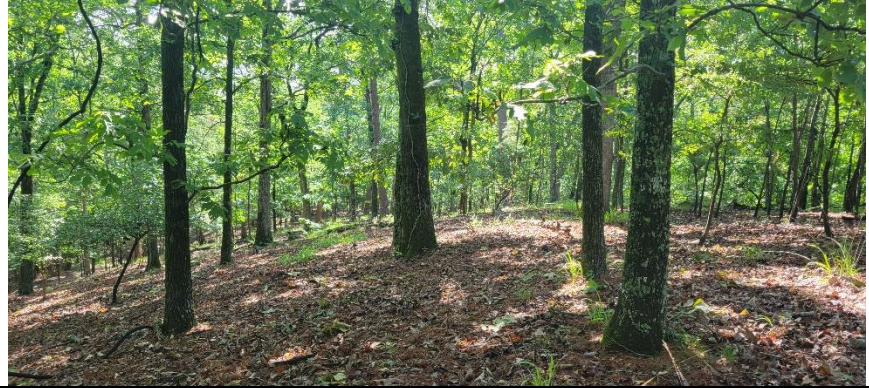


Broken Bow Lake #104

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #105

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #106

Facing North



Facing East






Facing West



Facing South



Broken Bow Lake #108	
Facing North	Facing East
	
	Facing South
	

Broken Bow Lake #109

Facing North



Facing East










Facing West







Facing South



Broken Bow Lake #110	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #111	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #112	
Facing North	Facing East
	
Facing West	Facing South
	

Broken Bow Lake #113

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #114

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #115

Facing North



Facing East



Facing West



Facing South



Broken Bow Lake #116

Facing North



Facing East



Facing West



Facing South



APPENDIX D – PERTINENT LAWS

- Antiquities Act of 1906, Public Law 59-209, 34 Stat. 225, 54 U.S.C. Sections 320301-320303: The first Federal law established to protect what are now known as "cultural resources" on public lands. It provides a permit procedure for investigating "antiquities" and consists of two parts: An act for the Preservation of American Antiquities, and Uniform Rules and Regulations.
- Historic Sites Act of 1935, Public Law 74-292, 49 Stat. 666, 16 U.S.C. Sections 461-467: Declares it to be a national policy to preserve for (in contrast to protecting from) the public historic (including prehistoric) sites, buildings, and objects of national significance. This act provides both authorization and a directive for the Secretary of the Interior, through the National Park Service, to assume a position of national leadership in the area of protecting, recovering, and interpreting national archeological historic resources. It also establishes an "Advisory Board on National Parks; Historic Sites, Buildings, and Monuments, a committee of eleven experts appointed by the Secretary to recommend policies to the Department of the Interior".
- Flood Control Act of 1938, Public Law 75-761: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. Sections 668-668d: This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The Act defines "take" as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.
- Flood Control Act of 1944, Public Law 78-534: Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- River and Harbor Act of 1946, Public Law 79-525: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Flood Control Act of 1946, PL 79-526: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes including construction of Broken Bow Lake. This law amends PL 78-534 to include authority to grant leases to non-profit organizations at recreational facilities in reservoir areas at reduced or nominal fees.
- Flood Control Act of 1954, Public Law 83-780: This act authorizes the construction, maintenance, and operation of public parks and recreational facilities in reservoir areas under the control of the Department of the Army and authorizes the Secretary of the Army to grant leases of lands in reservoir areas deemed to be in the public interest.

- Fish and Wildlife Coordination Act, Public Law 85-624: This act, as amended, sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- Public Law 86-717: This act provides for the protection of forest and other vegetative cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.
- River and Harbor Act of 1962, Public Law 87-874: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Land and Water Conservation Fund Act of 1965, Public Law 88-578: This act established a fund from which U.S. Congress can make appropriations for outdoor recreation. This law makes entrance and user fees at reservoirs possible by deleting the words "without charge" from Section 4 of the 1944 Flood Control Act, as amended.
- Public Law 88-29: Authorized the Secretary of the Interior to inventory and classify outdoor recreation needs and resources and to prepare a comprehensive outdoor recreation plan taking into consideration the plans of the various Federal agencies, State, and other political subdivisions. It also states that the federal agencies undertaking recreational activities shall consult with the Secretary of the Interior concerning these activities and shall carry out such responsibilities in general conformance with the nationwide plan.
- Federal Water Project Recreation Act, Public Law 89-72: This act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at Federal reservoir projects shall be borne by a non-Federal public body. A HQUSACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- Water Resources Planning Act, Public Law 89-80: This act established the Water Resources Council and gives it the responsibility to encourage the development, conservation, and use of the Nation's water and related land resources on a coordinated and comprehensive basis.
- Solid Waste Disposal Act, as amended, Public Law 89-272, 42 U.S.C. Sections 6901 et seq.: This act authorized a research and development program with respect to solid-waste disposal. It proposes (1) to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of natural resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid waste; and (2) to provide

technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal programs.

- National Historic Preservation Act of 1966, Public Law 89-665, 54 U.S.C. Sections 300101 et seq.: This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
- Flood Control Act of 1968, Section 210, Public Law 90-483: Restricted collection of entrance fee at USACE lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.
- National Environmental Policy Act of 1969 (NEPA), Public Law 91-190, 42 U.S.C. Sections 4321 et seq.: NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a "continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. It is Section 102 that requires consideration of environmental impacts associated with Federal actions. Section 101 of NEPA requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony.

Specifically, Section 101 of NEPA declares:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations
- Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings
- Attain the widest range of beneficial uses of the environment without degradation risk to health or safety or other undesirable and unintended consequences
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain wherever possible an environment which supports diversity and variety of individual choice
- Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources

- River and Harbor Act of 1970 and Flood Control Act of 1970, Public Law 91-611: Establishes the requirement for evaluating the economic, social, and environmental impacts of projects.
- Public Law 92-347: This act revises Public Law 88-578, the Land and Water Conservation Fund Act of 1965, to require Federal agencies to collect special recreation user fees for the use of specialized sites developed at Federal expense and to prohibit the USACE from collecting entrance fees to projects.
- Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500: The Federal Water Pollution Control Act of 1948 (PL 845, 80th U.S. Congress), as amended in 1961, 1966, 1970, 1972, 1977, and 1987, established the basic tenet of uniform State standards for water quality. Public Law 92-500 strongly affirms the Federal interest in this area. "The objective of this act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters."
- Federal Environmental Pesticide Control Act of 1972, Public Law 92-516, 86 Stat. 973, 7 U.S.C. Sections 136 et seq.: This act completely revises the Federal Insecticide, Fungicide and Rodenticide Act. It provides for complete regulation of pesticides to include regulation, restrictions on use, actions within a single State, and strengthened enforcement.
- Public Law 93-81: This law amends Section 4 of the Land and Water Conservation Fund Act of 1965, as amended, to require each Federal agency to collect special recreation use fees for the use of sites, facilities, equipment, or services furnished at Federal expense.
- Endangered Species Act of 1973, Public Law 93-205, 16 U.S.C. Sections 1531 et seq.: This law repeals the Endangered Species Conservation Act of 1969. It also directs all Federal departments/agencies to carry out programs to conserve endangered and threatened species of fish, wildlife, and plants and to preserve the habitat of these species in consultation with the Secretary of the Interior. This Act establishes a procedure for coordination, assessment, and consultation.
- Water Resources Development Act of 1974, Public Law 93-251: Section 107 of this law establishes a broad Federal policy which makes it possible to participate with local governmental entities in the costs of sewage treatment plan installations.
- Archeological and Historic Preservation Act of 1974, Public Law 93-291: The Secretary of the Interior shall coordinate all Federal survey and recovery activities authorized under this expansion of the 1960 act. The Federal Construction agency may transfer up to one percent of project funds to the Secretary with such transferred funds considered non-reimbursable project costs. This amends the Reserve Salvage Act of 1960 (PL-86-523).
- Public Law 93-303: This law amends Section 4 of the Land and Water Conservation Fund Act of 1965, as amended, to establish less restricted criteria under which Federal agencies may charge fees for the use of campgrounds developed and operated at Federal areas under their control.

- Safe Drinking Water Act, Public Law 93-523: The act assures that water supply systems serving the public meet minimum national standards for protection of public health. The act (1) authorizes the Environmental Protection Agency to establish Federal standards for protection from all harmful contaminants, which standards would be applicable to all public water systems, and (2) establishes a joint Federal-State system for assuring compliance with these standards and for protecting underground sources of drinking water.
- Public Law 94-422: Expands the role of the Advisory Council on Historic Preservation. Section 201 amends Section 106 of the National Historical Preservation Act of 1966 to say that the Council can comment on activities which will have an adverse effect on sites either included in or eligible for inclusion in the National Register of Historic Places.
- Clean Water Act of 1977, as amended, Public Law 95-217: This Act amends the Federal Water Pollution Control Act Amendments of 1972 and extends the appropriations authorization. The Clean Water Act is a comprehensive Federal water pollution control program that has as its primary goal the reduction and control of the discharge of pollutants into the nation's navigable waters. The Clean Water Act of 1977 has been amended by the Water Quality Act of 1987, Public Law 100-4.
- American Indian Religious Freedom Act, Public Law 95-341: The Act protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objections, and the freedom to worship through ceremonials and traditional rites.
- Endangered Species Act Amendments of 1978, Public Law 95-632: This law amends the Endangered Species Act of 1973. Section 7 directs agencies to conduct a biological assessment to identify threatened or endangered species that may be present in the area of any proposed project. This assessment is conducted as part of a Federal agency's compliance with the requirements of Section 102 of NEPA.
- Archeological Resources Protection Act of 1979, Public Law 96-95: This Act protects archeological resources and sites that are on public and tribal lands and that fosters increased cooperation and exchange of information between governmental authorities, the professional archeological community, and private individuals. It also establishes requirements for issuance of permits by the Federal land managers to excavate or remove any archeological resource located on public or Indian lands.
- Supplemental Appropriations Act, 1983, Public Law 98-63: This Act authorized the USACE Volunteer Program. The United States Army Chief of Engineers may accept the services of volunteers and provide for their incidental expenses to carry out any activity of the USACE, except policymaking or law or regulatory enforcement.
- Water Resources Development Act of 1986, Public Law 99-662: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.
- North American Wetland Conservation Act of 1989, Public Law 101-233: This act directs the conservation of North American wetland ecosystems and requires

agencies to manage their lands for wetland/waterfowl purposes to the extent consistent with missions.

- Americans with Disabilities Act of 1990 (ADA), PL101-336, as amended by the ADA Amendments Act of 2008 (PL110-325): This law prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires reasonable accommodations for persons with disabilities.
- Native American Graves Protection and Repatriation Act, Public Law 101-601: This act requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.
- Water Resources Development Act (WRDA) of 1992 PL 102-580: This act authorizes the USACE to accept contributions of funds, materials and services from non-Federal public and private entities to be used for managing recreational sites and facilities and natural resources.
- Omnibus Reconciliation Act of 1993, Public Law 103-66: Day use fees - authorizes the USACE to collect fees for the use of developed recreational sites and facilities, including campsites, swimming beaches and boat ramps.
- WRDA 1996, PL 104-303: authorizes recreation and fish and wildlife mitigation as purposes of a project, to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of a project.
- Omnibus Parks and Public Lands Management Act of 1996, Public Law 104-333: This act created an advisory commission to review the current and anticipated demand for recreational opportunities at lakes or reservoirs managed by the Federal Government and to develop alternatives to enhance such opportunities for such use by the public.
- Neo-tropical Migratory Bird Conservation Act of 2000, Public Law106-147: This act promotes the conservation of habitat for neo-tropical migratory birds.

APPENDIX E – PUBLIC COMMENT

SCOPING PUBLIC COMMENTS (23 May 2022 through 22 Jun 2022):

Comment	Response
Comments from the Choctaw Nation	
<p>Broken Bow Lake is a special resource within the Choctaw Nation Reservation. It is a resource that holds significant environmental, social, and economic value. It is critical that a sustainable approach to the management of this lake be developed and implemented by the Army Corps of Engineers. We believe that the lake should be enjoyed by the public and used as a resource for families to enjoy time outdoors together. We pray that the Army Corps' consideration for the management of land around Broken Bow Lake strike a balance between the protection of the natural resource while providing for sufficient opportunities for public enjoyment and economic development of the area.</p>	<p>Noted. USACE seeks to address this comment through the goals and objectives for Broken Bow Lake located in Chapter 3 of this MP. Resource goals and objectives were created to target the balance between public needs, environmental sustainability, and project benefits to the greatest extent possible. Additionally, the study team determined proposed land classification changes, see Chapter 8, Table 8.1 and 8.2. These changes are proposed in part based on comments received.</p>
Comments from USFWS	
<p>As stated in the public notice, the presence of federally-listed endangered or threatened species and their habitats comprise a topic that should be considered in revision of the Broken Bow Lake Master Plan. The Service has determined that potential exists for management of Broken Bow Lake, including changes in that management, to affect such species. Potential effects from the lake's management on federally-listed species likely extend outside of the indicated master plan study area; consequently, the Service recommends that the Corps consider increasing the scope of its analysis to all potentially affected areas. In addition, we recommend that the Corps consult with the Service under Section 7(a)(2) of the Endangered Species Act (Act; 87 Stat. 884, as amended 16 U.S.C. 1531 et seq.), in developing its revision of the master plan, to determine the likely effects of its evaluated alternatives. Furthermore, we recommend that the Corps use this exercise as an opportunity to plan for conservation of federally-listed species using the authority granted the agency under Section 7(a)(1) of the Act. These comments are consistent with previous Service communications in which we have recommended Section 7(a)(2) consultation regarding effects on federally-listed species from Corps actions in the Kiamichi, Little, and Red River basins. Such recommendations were recently expressed in a December 22, 2021, letter sent jointly by the Service's Arkansas and Oklahoma field offices to the Corps Little</p>	<p>Noted. USACE will coordinate management of all federally listed endangered and threatened species with the USFWS on USACE fee lands. In addition, consultation with USFWS under Section 7(a)(2) of the Endangered Species Act (Act; 87 Stat. 884, as amended 16 U.S.C. 1531 et seq.) will continue. USACE welcomes any additional information the Service has on the potential to affect listed species as a result of the proposed changes to land management classifications at Broken Bow Lake, including information on the affected species and associated changes in land management, and any affects extending beyond the study area. In response to the referenced letter, On January 7, 2022, the USACE Little Rock District Commander responded to the December 22, 2021, letter from Mr. Melvin Tobin and Ms. Elizabeth Gardiner, USFWS Field Supervisors for Arkansas and Oklahoma, respectively, regarding a mussel mortality event in the Little</p>

Comment	Response
<p>Rock and Tulsa districts. According to our records, the Tulsa District has not replied to that letter.</p>	<p>River downstream of Millwood Lake Dam in southwest Arkansas. The response detailed the coordinated USACE effort across both Districts, and the Tulsa District will continue to engage on this matter moving forward. Please also refer to the November 8, 2022 letter from COL Hudson, USACE Tulsa District Commander, in response to the Service's August 18, 2022 letter regarding the proposed Pine Creek Lake Master Plan revision, also addressing the Service's letter dated December 22, 2021, for additional information.</p>
<p align="center">Comments from Beavers Bend State Park</p>	
<p>Our agency has formed a long lasting and effective partnership with the USACE and I support the US Army Corps of Engineers' management plan to protect natural and cultural resources, provide public recreation areas, public safety, and water management at this facility. It is a privilege to be partners with USACE during this time of change at this unique property that provides an abundance of outdoor, recreational opportunities to millions of visitors every year. With the substantial growth and vast interest in this area, I would like to offer the following comments to further support our combined missions:</p> <p>1.No development of overnight accommodations or private housing on the shoreline of Broken Bow Lake. I feel that this would take away from the natural beauty of the area and the Lake which will in turn not align with our mission of providing a unique outdoor experience for our guests. I feel like this would also pose many environmental challenges as well. From my experience seeing the unregulated private cabin development in other areas nearby. Most private cabins are out of compliance with many federal and state laws regarding building codes and public safety regulations.</p> <p>2.Water Quality (Broken Bow Lake) Plan of Action - Develop a mechanism built into the Master Plan to ensure premier water quality for future generations. Routine testing performed by USACE would give us a method to track water quality trends. I feel that we have some of the best water quality in the nation and provide that resource to our community and visiting guests in an efficient manner, but would like to see a system in</p>	<p>Noted. The partnership between OTRD and USACE at Broken Bow Lake has been successful in creating opportunities for the visiting public to engage in recreation activities unique to the area. Partnerships like this will continue to be important for providing recreational access and programs at Broken Bow Lake. Controlling shoreline access and development and protecting the natural and cultural resources is a USACE objective.</p> <p>1.The fee lands associated with the shoreline of Broken Bow Lake are owned by the USACE and not in private ownership. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state. A unique quality of Broken Bow Lake is the scenic vista and with large tracks of adjacent US Forest Service Land and the McCurtain County Wilderness Area, visitors are provided the opportunity to experience wilderness.</p> <p>2.Water quality although an important topic is not fully addressed in the Master Plan revision. Oklahoma Department of</p>

Comment	Response
<p>place to protect this resource and insure the quality lasts well into the future.</p> <p>3.Consideration of adding additional USACE land to the existing OTRD - Beavers Bend State Park lease, to include islands that are within close proximity to the existing lease area on Broken Bow Lake and the area between Old Park Dam and Re-regulation Dam on the Lower Mountain Fork River. Although it hasn't been discussed, I don't see why it wouldn't be possible to add undeveloped areas on the East side of Broken Bow Reservoir to Beavers Bend leased areas to help us share the public access mission with USACE in an ever expanding tourism area, which I believe would help alleviate some of the stress placed on overdevelopment issues on the West side of the reservoir lands.</p> <p>4.No vessels (to include kayaks, canoes, inflatables, etc.) on Spillway Creek from the spillway downstream to the first bridge (Cold Hole Bridge). A professional kayak team, who are certified to rate levels of rapids in unregulated rivers and streams, submitted a rating of the area described as "very Hazardous" to novice or intermediate kayakers and recommended only highly trained and experienced white water operators have access to this section of USACE land. The ability to gauge experience and training levels of those wanting to participate in the white water experience here, as well as the inability to physically restrict public access to "only" those people, make this proposal very dangerous and impossible to regulate.</p> <p>5.Consideration of any possible improvements to the notification process for powerhouse releases. The Lower Mountain Fork River attracts a high volume of visitors for recreational activities, including fishing and floating. Any improvements to the notification process could potentially increase visitor safety in this area. Advancements in technology, if implemented, should allow people interested in accessing the lower mountain fork river for water related activities "real-time" data to make a better decision before heading out on the river, which could save lives and prevent expensive swift water rescue situations.</p> <p>6.Consideration of parking lot expansions, boat ramp improvements, and courtesy docks at boat ramps. Our lake access areas have become so popular that any summer weekend, and many mid week days will see hundreds of visitors trying to launch water craft and not having any available place to park their vehicle and trailer after launching. Most try to follow state law and</p>	<p>Environmental Quality (DEQ) sets and implements standards for surface water quality to improve and maintain the quality of water in the state, based on various beneficial use categories for the water body. Refer to Section 2.6.5 for more detailed information.</p> <p>3.Two (2) high-intensity recreation areas are being added to the east side of Broken Bow Lake in areas that have roadway access via USFS roads. These areas will permit additional access points to Broken Bow Lake. These two (2) areas are not leased at this time of this masterplan update.</p> <p>4.Visitor safety is of utmost importance. As the lease holder OTRD may identify areas where certain activities are deemed hazardous and as such have authority to restrict those activities within those identified areas. Based on OTRD's assessment and use of independent study Oklahoma State Parks have determined and subsequently restricted boating and floating within Spillway Creek from the Broken Bow Spillway to the cold hole bridge.</p> <p>5. With increases in visitors engaging in water-based activities within the Lower Mountain Fork River downstream of the powerhouse, education and signage will continue to be paramount in notifying the public of swift water conditions.</p> <p>6.Congestion within recreation areas and specifically around boat ramps is noted as being high throughout peak recreational season. This congestion is leading to excessive vehicles parking along the roadway leading to traffic flow constraints and an increase in pedestrians walking the roadway. Visitor safety is of utmost</p>

Comment	Response
<p>rules regarding the proper way to park along a roadway, which is the only option by any weekend afternoon, but many people simply don't care and want to basically put their vehicle and trailer anywhere they like, to include in intersections, by stop signs, on the travel portion of the roadway and in our camping areas. These areas are becoming more dangerous for pedestrian traffic and motor vehicle traffic with each passing summer. Any additional parking and any improvements that can be accomplished will not only provide a better experience for our park guests, but will provide a safer environment for both guests and park employees alike.</p>	<p>importance. The addition or expansion of parking areas would be a solution to this issue. USACE continues to work with lessee and partners to determine the need for and location of additional parking areas within leased lands.</p>
<p>Beavers Bend State Park supports the US Army Corps of Engineers' management plan to protect natural and cultural resources, provide public recreation areas, public safety, and water management at this facility. It is a privilege to be partners with USACE at this unique property that provides an abundance of outdoor, recreational opportunities to millions of visitors every year. With the substantial growth and vast interest in this area, I would like to offer the following comments to further support our combined missions:</p> <ol style="list-style-type: none"> 1.No development of overnight accommodations or private housing on the shoreline of Broken Bow Lake. 2.Water Quality (Broken Bow Lake) Plan of Action - Develop a mechanism built into the Master Plan to ensure premier water quality for future generations. Routine testing performed by USACE would give us a method to track water quality trends. 3.Consideration of adding additional USACE land to the existing OTRD - Beavers Bend State Park lease, to include islands that are within close proximity to the existing lease area on Broken Bow Lake and the area between Old Park Dam and Re-regulation Dam on the Lower Mountain Fork River. 4.No vessels (to include kayaks, canoes, inflatables, etc.) on Spillway Creek from the spillway downstream to the first bridge (Cold Hole Bridge). 5.Consideration of further low impact development to include, but not limited to: trails, back county camping, yurts, and wall tents. 6.Consideration of an established tent campground in Reasoner to offset the loss of flood-prone sites on Broken Bow Lake in the 602.5 elevation summer pool. 7.Consideration of a second marina within the OTRD existing lease. 	<p>Noted. Items 1-4 response above.</p> <p>5. With increases in visitation and new user groups seeking more isolated or unique outdoor experiences such as back county trails and associated back county campgrounds, these activities are noted and feasible at Broken Bow Lake.</p> <p>6. With the seasonal pool adjustment and the subsequent loss of approximately 31 lake side camp sites within Beavers Bend State Park, USACE will work with OTRD to consider the addition of new campsites as OTRD deems feasible.</p> <p>7. The potential need by the visiting public for a second marina is noted and could be built along the areas mapped high intensity recreation.</p> <p>8. With increases in visitors engaging in water-based activities within the Lower Mountain Fork River downstream of the powerhouse, education and signage will continue to be paramount in notifying the public of the dangers of swift water. It is noted that continuous review of how the public is using and accessing the Lower Mountain Fork River in</p>

Comment	Response
<p>8.Consideration of any possible improvements to the notification process for powerhouse releases. The Lower Mountain Fork River attracts a high volume of visitors for recreational activities, including fishing and floating. Any improvements to the notification process could potentially increase visitor safety in this area.</p> <p>9.Consideration of parking lot expansions, boat ramp improvements, and courtesy docks at boat ramps.</p>	<p>relation to ever improving notification protocol.</p> <p>9. USACE will continue to work with lessee and partners to determine the need for and location of additional parking and improvements to boat ramps to include courtesy docks.</p>
Comments from the Oklahoma Tourism and Recreation Department	
<p>The Oklahoma Tourism and Recreation Department (OTRD) supports the USACE's development of resource and recreation management objectives that protect the environmental integrity of Broken Bow Lake while providing adequate and appropriate recreational opportunities for current and future populations of lake users. Intensity of land use classifications should be stratified and limited so as to provide protection from over-development or inappropriate development of the lakeshore and adjacent lands. In order to protect the natural landscape that people flock to Broken Bow Lake to enjoy, plan objectives must prohibit any additional shoreline development, require any new development to have an adequate natural buffer between the improvements and the shoreline, as well as limit potential conflicts between incompatible uses and activities. Additionally, OTRD supports the development of objectives that promote low-impact recreational activities including, but not limited to, backcountry camping, hiking and use of non-motorized watercraft. OTRD recommends limiting facility development that supports high-intensity or high environmental impact activities such as water parks, floating attractions, non-native expanses of landscaping, residential development and incompatible commercial uses.</p>	<p>Noted. Refer to responses above.</p>
Comments from the Southwestern Power Administration	
<p>First and foremost, any updates made to the Master Plan should not negatively impact current hydroelectric power operations at the Broken Bow project. Hydroelectric power is one of the original Congressionally authorized purposes of the project, and Southwestern applies the power sales revenues collected each year to repaying the U.S. taxpayers' original investment and ongoing reinvestment, plus interest, as well as annual operation and maintenance costs for the Broken Bow hydroelectric power plant and for an allotted portion of the joint-use infrastructure and</p>	<p>Noted. Updates to the master plan do not have any changes that are projected in any way to negatively impact hydroelectric power operations at the Broken Bow project.</p> <p>It is noted that information should be provided to any one or agency operating or planning to operate on</p>

Comment	Response
<p>project facilities. Therefore, other project uses should not receive additional benefits to the detriment of hydroelectric power. Both the Corps' Public Notice and PowerPoint presentation for the May Open House note that the Master Plan does not address technical or operational aspects of the lake such as flood risk management or water level management, which are addressed in the project's Water Control Plan. However, lake users should be made aware in the Master Plan revision that lake levels will fluctuate depending on a variety of factors, including rainfall (or lack thereof), flood control operations, water supply withdrawals, and power demand. Prior to the construction of additional facilities in or around Broken Bow Lake, developers should be informed of these routine and sometimes significant fluctuations. Finally, while there is currently no scheduled work at the Broken Bow hydroelectric power plant that is anticipated to require an increase in the footprint of the Broken Bow powerhouse and switchyard facilities, future modifications and upgrades may do so. A sufficient buffer around the current powerhouse and switchyard should be included as project operations land to allow for potential expansion. With the growing interest in outdoor activities, Southwestern also recommends increasing the signage, press releases, and all other means to inform the public of the risk of death and injury as a result of recreating in or near the Lower Mountain Fork River downstream of the powerhouse.</p>	<p>USACE land to best inform them of the large fluctuations in lake level.</p> <p>Project staff working directly with Oklahoma State Park staff have been engaged in an aggressive push for education, signage, and the establishment of vendors operating in these areas, all with the goal of preventing visitors from being in the water during periods of swift water or out of the water in restricted areas. It is noted to continue to inform the public of the dangers of swift water and maintain a continuous review of how the public is using and accessing the Lower Mountain Fork River in relation to ever improving notification protocol. Adding press releases to the current suite of tools being implemented to reduce injury or loss of life resulting from swift water conditions is noted and will be advised to our partners advertising in the area.</p>
<p>Comments from the Oklahoma Department of Wildlife Conservation</p>	
<p>The Department is concerned that this process will open some areas to recreational activities that they were not open to previous, specifically, canoeing and kayaking on Spillway Creek. It is the position of the Department that opening this area to this type of recreational activity would negatively impact the fishery there. Increased recreational use downstream has created congestion and user conflicts between anglers and recreational watercraft users. While the Department supports this existing usage paradigm, we do not support opening Spillway creek to additional recreational access. Spillway Creek is much smaller and has become the last place for anglers to experience the only year-round trout fishery in Oklahoma unimpeded by watercraft traffic. Millions of dollars have been invested to establish and maintain the Lower Mountain Fork River trout fishery. We ask that the master plan revision process prioritize</p>	<p>The partnership between ODWC and USACE at Broken Bow Lake has been successful in creating unique trout fishing opportunities for the visiting public. This partnership will continue to be important for the continuation of the Lower Mountain Fork River trout program at Broken Bow Lake.</p> <p>Visitor safety is of utmost importance. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has restricted boating and floatation within the segment of Spillway Creek from the Broken Bow</p>

Comment	Response
<p>the maintenance and protection of this fishery. The Department remains ready to work with the Corps to cooperatively conserve this resource. We thank you for the invitation to comment and look forward to further communications.</p>	<p>Spillway to the Cold Hole Bridge. Under this authority and based on their assessment and independent study OTRD is restricting those activities within this stream segment.</p>
Comments from the General Public	
<ol style="list-style-type: none"> 1. No more privatization of the lakeshore for either commercial or residential use. 2. No further development on lakeshore or land leading to the lake for public use without environmental impact assessments. 3. Continued public access and use of all areas of the lake and shoreline. 4. Rescinding permits/allowances of private businesses to monopolize shoreline areas for personal financial gain, which deprives the public from both the use of these areas and financial gains of their use. 5. Protection of local wildlife habitats on the lakeshore, especially bald eagle nesting sites. 6. No private business use of lakeshore or lake itself. 7. More trash bins and litter collection on the lakeshore. 	<p>Noted. Given the broad range of topics within the comment, USACE encourages the full review of the master plan by all. The master plan addresses specific topics, however there are some topics that the master plan does not address due to policy.</p>
<ol style="list-style-type: none"> 1.No more privatization of the lakeshore for either commercial or residential use. 2. No further development on lakeshore or land leading to the lake for public use without environmental impact assessments. 3. Continued public access and use of all areas of the lake and shoreline. 4. Rescind permits/allowances of private businesses to monopolize shoreline areas for personal financial gain, which deprives the public from both the use of these areas and financial gains realized by the use of public land. 5. Protection of local wildlife habitats on the lakeshore, especially bald eagle nesting sites. 6. No private business use of lakeshore or on the lake itself. 7. More trash bins and add recycle bins as well as litter collection by paid staff on the lakeshore. 8. Boat launch fee and boat inspection for out of state vessels. 9. Free access to lake and shoreline by Tribal Citizens. Over the course of the past decade, Hochatown and surrounding areas have experienced exponential growth in tourism and development. The financial boon in this growth has not been shared equally by all 	<p>Noted. Given the broad range of topics within the comment, USACE encourages the full review of the master plan by all. The master plan addresses specific topics, however there are some topics that the master plan does not address due to policy.</p>

Comment	Response
<p>members of the community. Like anywhere else in the U.S., when massive amounts of capital come in, those living near or below the poverty line experience the brunt of ill effects and very little of the gains. While all of this growth and development has created a small number of decent paying jobs and a larger number of low paying ones for the locals, it has mostly just made a minority of our citizenry, as well as a larger number of already wealthy Texans, very rich, while the rest of us pay the price in terms of increased traffic, homelessness, environmental degradation, pollution, and higher costs for housing, food, and other essentials. Any further development, especially on the lakeshore itself, will exacerbate these inequalities. You have to look no further than California in general and the Lake Tahoe region in particular to witness the disastrous effects overdevelopment, environmental degradation, and rampant financial speculation have had on local communities. As Hochatown is in an unincorporated area of McCurtain County, there has been little to no oversight or regulation on this development, nor any official measurement of the subsequent environmental impact that has occurred as a result. The land in Hochatown is very rocky, yet every single building in the area uses septic tanks for wastewater discharge. This means that the wastewater quickly fills up the tanks, can not be absorbed into the ground, and overflows into the environment. This happens thousands of times a day. This wastewater eventually finds its way into animal habitats, including Mt. Fork River, it's streams, and Broken Bow Lake itself. There is more and more litter on the lakeshore and in the water due to the increase in tourism. There are very few trash bins around the lake and no one ever picks up the litter that is left behind. It just blows around on the banks and in the woods until it makes its way into the lake, where this plastic waste eventually breaks down into smaller particles without actually decaying, thus creating a deluge of micro plastics and toxic chemicals used in their manufacture that flow into and degrade the water quality. If the Army Core of Engineers is responsible for managing the use of the shoreline, they need to be responsible for the waste management of debris created by those using the lake for recreation. The lake, shoreline, and forested hills that surround it are important wildlife habitats to many indigenous species. Every day large swathes of forest are cleared as building sites for McMansion size cabins, thereby depleting the forest cover available as</p>	

Comment	Response
<p>wildlife habitats. As animals are pushed out of their natural habitats, they come into contact with humans more and more. I have myself seen a sharp increase in the number of dead animals around the county, largely due to vehicular strikes from the increased traffic. This includes the deaths of beavers, something that never used to happen, both in rural, sparsely populated areas of the county as well as right outside Beavers Bend State Park. Back in the 1970's, the bald eagle population in this area of Oklahoma was used to help repopulate other areas of the country where the habitats for these majestic birds had been so destroyed by overdevelopment, pollution, and other human activity that they went either nearly or completely extinct in those regions. Many of these eagles nest in trees right on the lakeshore. Any further development would likely send their population numbers into rapid decline. Currently McCurtain County is experiencing some of the most extreme biodiversity loss in endemic species comparatively, both within the state and the region. https://www.popsoci.com/environment/map-endangered-species-us/</p> <p>Commercial and residential development right on the lakeshore would exacerbate these environmental problems.</p> <p>As a resident of McCurtain County, I want the Broken Bow Lake Master Plan Revision for land use management to reflect the needs of all of our local citizens, not just a handful of wealthy, land speculators and the deluge of big moneyed interests from the Dallas metroplex.</p> <p>What are the primary purposes of the lake? Is it not for flood control, shoring up potable water supplies, and public recreation use? These tenets are at odds with commercialization and privatization.</p> <p>Why is the Marina a privately owned business on the lakeshore? Why is the Broken Tiki business allowed to privatize a public area of shoreline in the Deer Run area for their own financial gain, depriving the limited shoreline access and parking space they hoard from free use by the public? Why was Rugaru Adventures allowed to cut down trees and build platforms leading to and on the lakeshore, as well as other structures within the park grounds, to operate a private business on public land? Why were the deals for these private businesses executed and implemented without much, if any, public input or oversight from the community?</p>	

Comment	Response
<p>Considering the recent fiasco arising from Swadley's Restaurants misappropriation of public funds occurring as the result of shady business deals and the quite high possibility of nepotism, embezzlement, and corruption in connection with the Governor's office surrounding this scandal, it seems any sort of private business on public land is highly suspect.</p> <p>These businesses, especially the marina, should be publicly owned, either through the Army Core of Engineers or the State so that any revenue gains from its operation fund the maintenance of the dam and public areas within the park. The roads to the various camping and boat ramp areas of the lake are in terrible shape. Parking in both Stephens Gap and Carson Creek areas of the lake are inadequate for the level of traffic/demand. Why aren't out of state boats charged a fee to launch from the shoreline? Why aren't these vessels inspected before they are allowed to launch so that invasive species, such as zebra mussels don't find their way into our lake and damage the ecosystem? These are needs that should be funded by the tourism and use of lake facilities rather than the revenues going to enrichment of private individuals and groups.</p> <p>Finally, as this lake is on tribal lands, with the affirmation of reservation status for the Choctaw Nation and other indigenous communities through the McGirt decision, all tribal members should be allowed free access to the lake and shoreline without being subject to the recently created parking fees.</p>	
<p>Knowing the Broken Bow area is growing in all directions for the coming 25 years, we feel it's important for the Corps of Engineers to consider growth in other areas of the lake and not only focus on the West side near Hochatown. We would love to see lake access provided for the East side of the lake as well. This will help with traffic flow on the West side since access is already congested and will only be more congested on that side as tourism growth continues. My suggestions include: Change land classification of Burke's Landing to (RED) Recreation – Intensive Use Burke's Landing – would love someone to improve the road leading to Burke's landing and install a floating boat dock in order to improve access from the lake. Blacktop the landing, and designate parking would also be ideal at a minimum.</p>	<p>Noted. The study team determined some land classifications changes were necessary based on current and future uses. Chapter 8 of the master plan provides a detailed description of the proposed changes.</p>

Comment	Response
<p>Biggam Creek – would also love to see a marina go in here, along with road improvement leading to this area, boat ramp, boat docks, marina shop with gas available, bathrooms, parking, boat slots for rental. (This comment was received twice.)</p>	
<p>Grew up in Broken Bow and was swimming and water skiing on Broken Bow Lake by the time I was 9 or 10 years old. In the past, Broken Bow Lake has always been a place of peace and solace for me and my family. However, due to the huge increase in tourism, especially from Texas, it is no longer so.</p> <p>Here are the things I wish the U.S. Corps of Engineers would consider in their Revision of the Master Plan for Broken Bow Lake:</p> <ul style="list-style-type: none"> • Make parking at the Oklahoma Lakes and Parks free to Oklahoma Residents; we already pay property taxes and state taxes; the out-of-state visitors should pay an appropriate fee for access to these areas. • Stop allowing private businesses to operate from Corp properties. These greedy private businesses do nothing for our nice clean lake areas, except clutter and pollute; and take valuable land space that should be open to the public by way of boat ramps, parking, swimming, etc. If they want these types of activities, they should go to the cities where they have water parks! • Build more boat ramps and provide more parking. We can no longer go to the Broken Bow Lake on weekends because there is no parking available and trucks with boat trailers line the sides of the boat access roads, making it very dangerous. In addition, the wait times to load and unload are just awful, especially setting there in the hot sun. • Build more areas that are for swimming access and parking only. So many families can't afford boating, but want to access the lake and take their families. Area "E" is especially dangerous because swimmers get too far out between the tip of the area and the island going South towards the Broken Bow Marina. Swimming should not be allowed in this area! There needs to be "boat-free" areas for swimmers only. • Broken Bow Marina – the authority of the Marina management needs to be reined in. They make their own rules for boat owners and charge overly exorbitant fees for slips and fuel. Only the "Texas" rich can now afford to keep their boats docked at the Marina. The Marina should have oversight that the marina operators have to adhere to and get approval from for fee increases. 	<p>Noted. USACE continues to work with lessee and partners to determine the need for additional parking and designated swimming areas. Marina operations are defined within a lease agreement and outside of the scope of the master plan.</p>

Comment	Response
<ul style="list-style-type: none"> • No Sale of Water!! We want to keep our rivers flowing and our Lake full of water. The water coming from Mt. Fork River should only supply McCurtain County and no other areas. • Water pollution is of great concern with no oversight in the Hochatown area; and the small acreages in which septic systems are utilized for waste. There needs to be state or federal intervention in this area or the run-off to our natural water systems will be disastrous. 	
<p>I work for the state of Oklahoma and am employed as a game warden. I've proudly served the sportspersons of Oklahoma for nearly 20 years in that position. Over the years, I have witnessed a unprecedented change in the usage of Broken Bow reservoir.</p> <p>As a child, we were able to go enjoy most every use area around the project. It was a rare occurrence to see someone from out of state visiting. Due to the recent years, the area's booming tourism industry has limited the access to one of the reasons we enjoy this country. There is NO MORE ROOM, in the state park for recreational use, especially as day use goes. Even if you were to remove the visitors from the lake area in the state park, it takes AN HOUR, to navigate what use to be a 20 minute drive. This alone has created more discourse between the local people, the state park, the USACOE, and the tourist. As a former summer ranger for the lake Texoma project, I know the challenges that you face. You have a list of demands and a limited budget(not to mention all the hoops of NEPA, ARPA, etc.). I'm not condemning any actions or inaction taken by the project managers or planners. I want to give my personal request. We have several "historic day use areas" that once were used by local people to avoid the crowds of the west side of the lake. These are places like: Bigham Creek, Burke's Landing, 5 Mile Hollow, Egypt Creek, and Otter Creek. These are places that at a time, you could drive a family sedan to. Over the years, the roads have deteriorated and or have been closed by the US Forest Service.</p> <p>What would it take for a cooperative effort/project between the USACOE AND THE USFS to open these roads and areas to more day use areas as they once were? Maybe not all of them, but one or two? I've spoken to several local residents around the county and there has been an overwhelming support for a project to open up local day use access. I think this</p>	<p>Noted. Roads previously maintained by timber companies are USFS roads and would need to be further maintained by USFS.</p>

Comment	Response
<p>would be worthwhile to the entire project as well to the surrounding area.</p>	
<p>Thank you for the opportunity for public comment regarding the following items of the Broken Bow Lake and Mountain Fork River Master Plan. The recreation availability and access are mostly excellent. I'd like to propose additional parking, picnic tables, and trash cans. The fish & wildlife habitat also seem to be well-managed. I hear complaints that more trout should be provided in light of the number of anglers. Public access to federal land has always been good. However, in your efforts to coordinate with other agencies, I'm concerned about the recent gating of roads by USFS, limiting access and what those reasons are. I agree with limited access or temporarily limiting access to alleviate over-use. In particular the waterfall at Cedar Creek Golf Course Road has experienced riparian erosion and litter due to overuse and disrespect. The waterfall on Bee Branch trail has endured vegetative degradation in the areas near the waterfall, and the hiking path has been rerouted by overuse to the waterfall. I believe these two areas need more protection. This goes lockstep with the need for water and air quality. We are fortunate to have good quality – moonshine making worthy quality – water and clean air. The economic impact of rural tourism has surely surpassed all projections. The entire McCurtain County area is experiencing increased prosperity due to nature-based tourism. Part of this appeal for nature includes a direct interest in cultural tourism and a revitalized interest in Native American / Caddo / Choctaw cultural history. Hochatown was the second community founded in McCurtain County; Eagle Town (Eagletown) was the first. Hochatown is a cultural resource that was probably not given a fair deal for preservation during the lake building. I would like to see a priority given to re-evaluate the lack of publicly available data regarding the historical, archeological, and cultural importance of our community. I would like to see adequate funding to compensate for the lack of importance placed on the antiquities and culture during the building phase. Excavation of seven of 62 “known” sites is woefully inadequate.</p> <p>A decision was made to market the entire park as Beavers Bend State Park. I WOULD LIKE TO REQUEST THAT THE HOCHATOWN STATE PARK BE RETURNED TO THE SIGNAGE AND MARKETING OF OUR SPECIFIC PARK. The Hochatown historical buoy placed in the lake is an excellent first step in</p>	<p>Noted. Given the broad range of topics within the comment, USACE encourages the full review of the master plan by all. The master plan addresses specific topics, however there are some topics that the master plan does not address due to policy. USACE acknowledges the importance of cultural resources and plans to address a Cultural Resources Management Plan as funding becomes available.</p>

Comment	Response
<p>acknowledging the community that was sacrificed for the reservoir. Politics aside, the horrible Swadley signage that is still within 36 inches(?) of the 259-A South by the Beavers Bend Wildlife Museum is an egregious affront to the community residents that live on that property. The sign should be removed. All park signage should be reevaluated for rustic aesthetics and ease of understanding: Food, swimming, train, horses, nature center, hiking, fishing, paddleboats, etc. Simple signs that point visitors to their desired destinations. I would like to see a more concerted effort for collaboration with the developing “Town of Hochatown,” projected to be in place by 2022. This collaboration would include police, fire, water, and sewer services that could be beneficial to the Broken Bow Lake recreational areas, the Choctaw Nation entertainment center (scheduled for 2023), and the reestablished town of Hochatown. The master plan was pretty good for not having the crystal ball to the 50-year future. Ironically, one of the biggest misses was the expected use by neighboring counties in OK, AR, and TX. Clearly, the Dallas Fort Worth metroplex and northeast Texas surprised us with their affinity for outdoor recreation. If recreation was anticipated to represent 28% of the use. We can now anticipate that percentage will be far greater during the next fifty years. Non-consumptive water use has rarely been given any economic value. I implore you to factor this in during your planning. Also, with water supply accounting for an expected five percent usage, I encourage protection of strict guardianship of anticipated water sales to the Oklahoma City or north Texas metropolitan areas. Water that is withdrawn from the basin of origin will have devastating impacts for our community.</p>	
<p>1. Local Public is keenly interested in water issues and land-use issues. 2. Significant local concerns with Texas trying to acquire water from the Reservoir and with outsiders trying to gobble up land for various economic ventures. 3. Method of communication is a barrier – Public largely does not have access to internet and primary means of communication is still oral, not written. 4. Public that did attend the recent meeting was expecting more substance in terms of explanation and draft results. 5. Corps may be starting at a disadvantage with the Locals – first assumption among many may be that we are going to ship water out of state to Texas and allow out development by out of state interests. 6. Local Public may need assurance</p>	<p>Noted. USACE strives to accurately inform all members of the public through news releases in both print and on social media. Water rights are not covered under the scope of the master plan and should be addressed to the responsible state agencies.</p>

Comment	Response
that Broken Bow will not turn into another "Grand Lake."	
Water quality is critical. Maintaining a low impact to the shoreline and associated uploads is important for drinking water and fish/wildlife. Access-Improve the quality and safety of road access to developed recreation sites. Swim beach opportunities on the lake-most swim areas very rocky. Developing dedicated swim beaches would benefit visitors.	Noted.
I'm a lifelong resident of McCurtain County. I am currently employed at Eagletown Schools. I would like to see more access on the east side of the lake. Maybe open up primitive sites at Egypt creek, 5 mile Holler, Otter creek, and/or Bigham creek. My students are really missing out on access to the lake and the outdoors in general. A lot of the kids aren't allowed to drive in Hochatown traffic and I don't blame their parents. East side access would help out a lot, especially if it was lower down CC road. Thanks	Noted. The study team determined some land classifications changes were necessary based on current and future uses. Chapter 8 of the master plan provides a detailed description of the proposed changes.
Inadequate boat trailer parking. In 1960's parking was designed for 2-door pickups and 14 or 15 ft boat trailers, no with the suburbans and 23 ft boat trailers there just isn't enough room. More parking for simple automobiles. Parking! Parking! Parking!	Noted. USACE continues to work with lessee and partners to determine the need for additional parking.
I would like to request that the area called Burkes Landing on the East side of the lake be rezoned from Low Density use to High Density Use. The location already has a good road all the way down to the shore as well as a functioning boat ramp. The location would make an excellent future camping area or recreation site. It already sees a good deal of traffic. I visit at least once a year with a large group and we pick up a lot of trash each time. I have been speaking with the Natural Resources Specialist about this request for this last two years and he is familiar with the area I am speaking about. Referencing the Broken Bow MP Land Classification map, the area I am referring to is NW of Walkford Creek and accessed via road N4755.	Noted. The study team determined some land classifications changes were necessary based on current and future uses. Chapter 8 of the master plan provides a detailed description of the proposed changes.
I believe the majority of people in our area all agree the most unique aspect of our beautiful lake is the undeveloped shorelines. If this were to change, everything that is loved about our area will change. There are less and less places in America that have this wonderful quality of nature and beauty. I love to be on my boat and look at this beauty and feel the peacefulness. I'm afraid you will also find many people in our community will not know how to submit their comments and have their voices heard or understand	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state.

Comment	Response
there are proposed changes or what they mean. Please leave the lake as it was intended - managed by the Corp to protect it's natural beauty from development.	
My family has lived in the area since before there was a lake-in fact my husband's grandparents lived in original Hochatown-now covered by BB Lake. Additionally, I own property adjoining the park and am concerned how changes to the master plan might adversely affect my enjoyment/use of the property as well as market value. I believe that the popularity of BB Lake as a destination is due in large part to the fact there is NO DEVELOPMENT on the water. It allows for enjoyment of the natural beauty of the area without being concerned with homes, businesses, etc. being located lake front and thereby restricting the use and enjoyment of the lake by the public. I AM STRONGLY OPPOSED TO ANY LAKE FRONT (ON/ADJOINING WATER) DEVELOPMENT.	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state.
Leave the land classifications as they are. Do not allow more development along the lakeshore, keep it natural as that is the main appeal of the lake. The area near the lake has obviously been highly developed and I am sure there is pressure to allow some development adjacent to the lake shore, but please do not allow this. Keep this lake the diamond it is with its natural undeveloped shoreline. It would be nice t have some day use access along the river below the park other than mountain fork park , but I realize the "Tragedy of Commons" that would come along with that.	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state.
We hear about the recent meeting and "future plans". We were so afraid you might mean structures around our shores! We are one of very few to not have lakeside houses, etc. on our shores! It's a place of true beauty - peace - and quiet. Please! Let's leave it protected! The "not legible" in this silly, chaotic world - some peace! Our lake gives that! Whether families boating, skiing, and picnic- fishermen fishing-or people just beach combing and wandering around-- B. Bow lake is truly uncluttered and beautiful! We need wider, better access roads - Traffic Control - More and "bigger" boat and vehicle parking etc. That being said- we live in Hochatown, have raised our 3 sons, etc. on our lake! We love it!! Without a lot of changes.	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state. USACE continues to work with lessee and partners to determine the need for additional parking.
I am a former Biologist for USDA/ NRCS and I hope no development on the shores of Broken Bow Lake will ever happen now or in the future. As the saying goes if a few developments are allowed it will be the straw that broke the camel's back in my opinion. The non -	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to

Comment	Response
existence of any structures is part of what makes it great. Broken Bow Lake is a clear and natural lake and construction I believe would be detrimental to wildlife, turbidity, and water drinking quality. Please keep Broken Bow Lake the way it is now in 2022 in natural and pristine condition.	keeping the shoreline of Broken Bow in its natural undeveloped state.
Has the water control master plan been revised or is it being revised to accommodate A) The construction of Bois D'Arc Lake in Texas resourcing water flows, in the red B) Global climate change reducing natural flows from the West and/or increasing precipitation in the Ark/LA/TX c) Possible expansion of L. Bennet Johnston Navigation Project from Shreveport to Texarkana D) The effect, if any, of the McCirr (?) decision on Choctaw water rights? It would seem that any discussion on a land use plan for the lake area would necessarily derive from the Corps' primary mission of promoting and protecting commercial navigation on the Red River and the effect that would have on retention and release of the water from behind the dam. If the shoreline becomes less certain this is greatly effected land USF planning.	Water control is outside of the scope of the master plan document and therefore not addressed.
I would like to make it known that my family objects to allowing construction of homes or businesses along the shoreline of Broken Bow Lake. Ours is one of the few lakes left that is still natural. They have already ruined the Beavers Bend area with those houses above the river. Please don't allow the lake to be ruined too.	Noted. The fee lands associated with the shoreline of Broken Bow Lake are owned by the United States under custody and control of USACE. USACE is committed to keeping the shoreline of Broken Bow in its natural undeveloped state.
The ACC believes that the MP should be updated to reflect that one of the project structures in the Broken Bow Lake project, the Broken Bow Spillway, represents a rare and beneficial public waterway resource for whitewater boating, and consistent with the policy of "optimizing" the use of the project's developed resources, the resource objectives of the MP should be updated to optimize whitewater boating opportunities on the Broken Bow Spillway. The recreational resource management objectives of the MP should be updated to optimize modern recreational waterway uses including whitewater boating on the Broken Bow Spillway. 2. The Broken Bow Spillway should be classified as "Operations Recreation" or other classification that optimizes modern recreational waterway uses including whitewater boating on the spillway. 3. The land adjoining the Broken Bow Spillway should be classified as "Recreational Lands" (which	Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the

Comment	Response
<p>would retain its current classification) to accommodate ingress and egress into the spillway for modern recreational waterway uses including whitewater boating on the spillway. 4. The Public Safety Plan in the MP should be updated reflect the policy objective of allowing the public to receive the optimum benefits of the recreational resource objectives of the MP in a safe and responsible manner including plans that: a. Optimize modern recreational waterway uses including whitewater boating on the Broken Bow Spillway; b. Discourages blanket prohibitions on any such beneficial use; and c. Requires transparency and opportunity for public comment for any safety measures that prohibit such compatible beneficial uses or renders them infeasible.</p>	<p>determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>In my experience, whitewater boating class IV and V sections has become tantamount to skiing black diamond runs at ski resorts in the rockies. The equipment we have with safety placed at the forefront provides a safe recreational avenue for outdoor enthusiasts. It is universally accepted that safety gear like helmets and life jackets are required gear when paddling. Many years ago I personally boated the spillway at broken bow lake. I had a team of 3 and managing our way down the rapids was fun as there were points between each rapid to pull to the bank and scout with each other. Allowing for a safe approach to each rapid before we became all too familiar with them. We set safety on the bigger rapids as one would go after another. All of a sudden I heard from friends as signs were posted seemingly out of the blue that boating was not allowed. It was unclear who had posted them and where their authority lay. I had personally spoken with park rangers years ago who seemed to welcome the activity, viewing it as a fun and exciting avenue to experience the spillway. When the spillway was supposedly closed to boating access the question began to arise as to who had devised such a scheme. As the only other users of the spillway, the trout fisherman immediately came to mind. As neither I nor any of my fellow boaters had ever been entangled in a fisherman's line it didn't seem to be a justfully placed charge. The fisherman seem to be the only other frequent recreational enthusiast of this great spillway. It was always all smiles as I floated past their lines. It seems there was a sense of endangerment felt</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which</p>

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<p>by these fishermen, possibly thinking that boating (which sits as one of the main objectives of the Master Plan) would take over "their" spillway. This couldn't be further from the truth. Boating the spillway is not only safe but seems to be in alignment with the entire objective of this outdoor area. It would be a generational tragedy if these signs were left in place and a false narrative about boating be told. Let it be known, kayaking the spillway has been safely performed. There are released rivers I've personally boated in Tennessee that take much more skill and have greater challenges. None of these are close to home however. A continuation of the misguided prohibition of boating directly contradicts the current objectives of the lake's master plans.</p>	<p>supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am a whitewater boater who lives in Fayetteville, Arkansas. I travel to other states, including Oklahoma, to kayak (and sometimes raft) whitewater and for recreational purposes.</p> <p>I write in support of the comments submitted by the Arkansas Canoe Club on or about June 13, 2022 related to revisions to the Master Plan for the Broken Bow spillway. I support revising the Master Plan to make recreational boating of the spillway a pillar of the plan and to tailor the plan to specifically allow same. A few point:</p> <ul style="list-style-type: none"> - Kayaking the spillway is not a 'high risk activity' for trained whitewater kayakers who should have access to paddle the spillway pursuant to the plan. - Recreational tourism (including mountain biking and watersports) is the future of the Oklahoma-Arkansas corridor and revisions to the Master Plan will align with this direction. - The technology for whitewater boats that has been advanced in the last 4+ decades since the 1979 revisions to the Plan is astounding - while whitewater boats at that time were primitive, the boats now are technology advanced and light-years ahead. 	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and</p>

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<p>I am writing to express support for the Master Plan updates proposed by the Arkansas Canoe Club for the Broken Bow Lake Spillway. I have never boated the spillway but have participated in paddling several managed recreational releases over the years, both whitewater and flatwater, and feel it is a valuable resource that all boating and recreational users deserve managed access to – both boater and fisherman. I can attest first-hand to the river stewardship of regional Canoe and Kayaking clubs, both in the Oklahoma/Arkansas area, as well as further</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken</p>

Comment	Response
<p>East in Tennessee and North Carolina, when given an opportunity to participate in recreational boating via dam releases. I have participated in several river clean up events on the Ouachita, Cossatot, Mulberry, Caddo, and Buffalo rivers sponsored by the Arkansas Canoe Club and feel confident if given access, the club's Oklahoma Chapter will adopt this stretch of river and the boaters aide in removal of litter from its shores and waters. Finally, whitewater kayaking and canoeing interests can co-exist with the fishing interests. Ideal river conditions for whitewater kayaking mean typically poor fishing conditions, especially when considering dam releases. Regardless, I feel this is a resource that can be enjoyed by all interested recreational parties, and sincerely hope that consideration is taken in adopting the Arkansas Canoe Club's proposed changes to the Master Plan. Thank you for your time and consideration.</p>	<p>Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing to lend my full support to the June 13 comments submitted on behalf of the Arkansas Canoe Club's Conservation Officer, in regards to proposed revisions to the Broken Bow Lake Master Plan. Mr Fletcher lays out multiple reasons why it seems to be a no-brainer to open this spillway up for recreational whitewater paddlers. I live in Little Rock, Arkansas and I assure you I'd be inclined to drive hours to get to this area to spend a weekend or two each year paddling this magnificent spillway. I am also a Board Member of the Arkansas Canoe Club, and currently I am the volunteer director of our ACC School of Whitewater Paddling, arguably the largest whitewater training event in the mid-south/midwest. We are in our 46th year of holding this event and I can attest that the quality of boats and the skills of the paddlers have increased dramatically in my 30 years as an ACC member. The average class III+ whitewater paddler in the Arkansas Oklahoma, Texas, Louisiana area is just more skilled than in years and decades past. This to me suggests that those who would paddle the Broken Bow spillway would in most cases be easily qualified to navigate the stream safely. Dam controlled streams all across the country allow for recreational use on class III and up</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD</p>

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<p>streams routinely to the benefit of paddlers and local non-paddlers alike. It's truly a win-win. Furthermore, having this accessible resource would suggest that we'd be able to hold training classes for paddlers and others such as first-responders and who might be called upon in the event of a swift water rescue situation. This would not only increase skills further and make people even safer on the stream, it could result in training that could save lives.</p>	<p>has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing in support for the comments submitted by the letter dated June 13, 2022, by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan. I have been a member of the Philadelphia Canoe Club since 2003 and have been a Certified Whitewater Kayak instructor by the American Canoe Association since 2005. In 2019, my family relocated to TX and now paddle in the NE Texas, SE Oklahoma, and SW Arkansas area. I have been safely paddling Class III to V whitewater for nearly 2 decades now. Access to the Broken Bow Spillway area, would be highly beneficial for dependable Class II-III whitewater flow, allowing for safe and organized paddling. Relocating from PA to TX has been challenging due to the lack of dependable dam released Whitewater, and this section of whitewater flow would be a great benefit to the entire region.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>

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<p>I wish to go on record that I oppose the idea of allowing kayaks and canoes on the Spillway section of the Lower Mountain Fork River. This area is only one of 2 year around trout streams in the State of Oklahoma. Having kayak and or canoes constantly passing by anglers that have come for the trout fishing for many miles away to be disrupted by paddlers and floaters would be a very bad thing.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I wish to go on record that I oppose the idea of allowing kayaks and canoes on the Spillway section of the Lower Mountain Fork River. This area is only one of 2 year around trout streams in the State of Oklahoma. Having kayaks and or canoes constantly passing by anglers that have come for the trout fishing for many miles away only to be disrupted by paddlers and floaters would be a very bad thing. This river does not operate like any other tailwater river. I have no problem with whitewater floats and kayaking because I love doing it my self, but this is just not the place for it. This river is designed completely different then most tailwater rivers, It all sounds good in theory to bring in</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational</p>

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<p>white water kayaking to the lower mountain form but the dynamics of how this river operates are drastically different from how a normal tailwater operates including other trout fishery's. Trout fishing is what brung the attraction to broken bow, rafting, tubing, and kayaking have been prohibited for many years so why allow it now?</p>	<p>opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>As a frequent visitor to the Broken Bow area and a frequent user of the resources and facilities around Broken Bow Lake, I sincerely appreciate the opportunity to comment on the Master Plan. I strongly encourage that whitewater boating on the Broken Bow Spillway be designated a recreational resource management objective. I also request that the Public Safety Plan reflect this resource objective and involve the public in managing safe and appropriate access to this resource. To be sure, whitewater boating is a huge attraction. There are any number of whitewater park projects that illustrate the tremendous potential that exists. It is possible to include this activity, manage it safely and promote the overall enjoyment of the incredible Broken Bow area.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the</p>

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<p>Allowing boating along the Spillway Creek is totally inappropriate for one of the only two year-round Trout streams in Oklahoma. The conflict with fishermen and women would be impossible to control, and the large majority of users of this stream would... no doubt.. be the fishers. I can understand the desire of the Ark. Kayak Club for a waterway on which to run their craft, but a very popular Trout Stream is not a good choice. Maybe they can consider the proposed kayaking run planned for the new Ark. River dam at Tulsa.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am AGAINIST kayakers, tubers etc on LMF for MANY reasons. I love WW . I love Fly fishing. BUT MOST OF ALL I LOVE LOWER MOUNTAIN FORK RIVER. If you</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational</p>

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<p>don't spend a lot of time there and haven't been going there for 50+ years you can't see what has happened to that ecosystem. The horseshoe kayaking is a disaster. I have been run over, knocked down , lost my flies, saved people in kayaks , ran for my life as 40 kayakers headed for me while I was fishing. If spillway is opened it is opening a whole can of (omitted). It WONT BE JUST THE WW PEOPLE. It will be tubers and amateurs that will end up dying up by those falls. SO WHEN THE WW PEOPLE LEAVE THE PEOPLE WHO MAKE THEIR LIVING WILL SUFFER THE CARNAGE. I know that ENTIRE river like the beating of my heart. I would rather drive another 45 minutes to the Cossatot or the Ouachita to WW. It's not AGAINIST WW it's the carnage that door will open when WW ARE NOT THERE. The guides who work with the Wounded Warriors, the elderly , the kid who has NEVER fly fished are the people who will suffer.</p>	<p>opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>First let me say thank you for having a huge part in managing one of Oklahoma's most beautiful recreation areas. Secondly I feel passionately about not opening the spillway to kayakers and other white water PWC. It is one of the two fisheries in our state where trout are thriving year round. Please consider my comments as a no to making any changes. Keep the water sports supports safe in upholding the current spillway regulations. Keep the trout sustained as years of time have been put into this treasure as a fishery.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon</p>

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<p>I wish to go on record that I oppose the idea of allowing kayaks and canoes on the Spillway section of the Lower Mountain Fork River. This area is only one of 2 year around trout streams in the State of Oklahoma. A large area of the river has already been minimalized for fishing due to tubing and kayaking activities. Not only do they scare the fish, but I have literally seen kayaks strike people fishing in the river.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the</p>

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<p>It is my desire to express extreme opposition to the request by the Arkansas Canoe Club (ACC) to access Spillway Creek of the Lower Mountain Fork River for whitewater rafting. Spillway Creek is located at Beavers Bend State Park near Broken Bow, Oklahoma. The water subject to the ACC request is one of only two (2) year-round trout streams in the State of Oklahoma and is the ONLY year-round trout fishery that supports a reproducing rainbow and brown trout population. The ability for Spillway Creek to support a reproducing trout population has come at an immense amount of work and considerable expense by the residents of Oklahoma. It is this trout reproduction that makes Spillway Creek a unique and special place in North America. The allowance of canoes and/or kayaks along Spillway Creek will have a devastating affect, both economically and environmentally, on this waterway. As such, it respectfully requested that the requested access by ACC be denied.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I as a avid outdoorsman and regularly use a canoe and kayak am not in favor of the use of any kayaks or vessels in this area. I believe it will cause numerous confrontations between fishermen and boater. I believe the use of kayaks will degrade the enjoyment of</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and</p>

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<p>everyone else that uses the river. Thank you for your consideration.</p>	<p>future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I strongly OPPOSE revising the Broken Bow Lake Master Plan to allow kayaks and canoes on Spillway Creek. I am a fly fisherman and Spillway Creek is unique in the state. There is no other fly fishing water like it in Oklahoma. I do not believe the small water can be used by both fly fishers and kayakers. People come from all over Oklahoma, Texas, southern Arkansas, and northern Louisiana to fly fish Beavers Bend. Please do not let a small group of kayakers take this unique water from the fly fishers.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in</p>

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<p>I'm a member of Trout Unlimited here in Oklahoma and I frequent the Spillway Creek area very often. I'm reaching out to let my stance be on record that I believe regulations should stay the same and boaters of any kind should not be allowed on the stretch that is Spillway Creek.</p> <p>From a conservation point of view, this would threaten what is a very, very special stream in the state. It is unique in that it is the only wild trout stream in the state, is the only year round trout stream that isn't at the mercy of generation, and is very fragile with how heavily trafficked it already is.</p> <p>Boaters would pose a risk to not just themselves, but also to the wild trout population due to the added traffic over redds (trout spawning beds) and waste from boaters that might end up in the stream. I hope this is taken into consideration with the new master plan.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating</p>

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<p>This proposal simply ignores the aspect of tourists and average people floating down the spillway creek. I don't know how it could be policed for only certified III and IV class kayakers to be allowed on it. Once someone sees someone else on a kayak on it, they will want to do it, just as they have at the Cold Hole and Evening Hole. Have you looked at these areas on a Saturday? These used to be my favorite places to fly fish. Being older, they were easy accessible for me and I felt safe. Now I can't fish them at all during the summer months due to the swimmers, tubers and kayakers. It is very sad and heartbreaking to see the places I love covered in trash after a weekend of tourist. The spillway creek is already trafficked heavily by all the fisherman and hikers. It is extremely fragile in that it is supporting spawning trout and wild fish. This is the ONLY stream in the ENTIRE state that is this unique and special. From a conservation point of view, this would only harm the ecosystem of the stream. The group fighting for the change fail to realize that this would effectively be open season for ANY boater/floater. Not just the Whitewater kayakers that would only visit once every couple years when the flow is desirable for them.</p> <p>Increased waste, more traffic over redds and fish habitat, and overcrowding would only be a detriment to something already fragile. Relying on the honor system simply isn't good enough, which is all I've seen proposed. I voice my opinion as a fly fisherman and as a kayaker. As a person who retired and moved here 4 years ago for the beauty of the area, fly fishing and kayaking. Opening the spillway creek up to kayakers would be so detrimental. The safety issues alone would be astronomical. I have kayaked from the re-reg dam many many times. Even as a seasoned kayaker, I would never consider kayaking spillway creek. I am not even hardly able to fish it myself due to age and knee issues, but it would break my heart for my fellow fisherman to lose this stream and what a disaster it will be if we don't do everything to protect this.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am reaching out today on the subject of the Broken Bow Lake master plan and recreational use of Spillway Creek. A little about me. I live in Texarkana Ar. I was an avid whitewater boater for over 25 years, and have traveled coast to coast and Border to Border to paddle.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was</p>

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<p>The Lower Mt Fork was where I cut my teeth. Spillway Creek offers a unique opportunity that really does not exist between the Rockies and Appalachian mountains. Every year whitewater boaters from Arkansas, Texas, Louisiana, Oklahoma, Missouri. And Kansas make 4-5 trips a year either east or west in order to paddle scheduled recreational releases for whitewater boating. The rivers in which they travel to are equal to or greater in difficulty than that of Spillway Creek. Most of those rivers are pretty much dewatered other than the times of which water is released for flood control, or boating releases. With Spillway Creek running at a minimal flow of around 120-140CFS, 24-7 year round and then bumping up to 170-180 CFS during the hotter months of summer in order to keep the trout cool, boating opportunities exist. In the summer of 2018 (when there were no signs) and we were actually told we could boat the creek, over 150 combined runs were made from beginner to advanced boaters. This was at what would be considered a minimal level of around 170CFS. While I would love to see recreational releases, It would be great if it was just legal!! The state of Oklahoma has spent Millions and f dollars trying to create artificial whitewater close to what you guys already have. Actually, what you have is so much better for many different reasons. It's a shame to see this resource be limited to one user group.</p>	<p>created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing this letter to express my support for the comments submitted by the letter, dated June 13, 2022, by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan.</p> <p>I have boated (kayaked) the Broken Bow spillway numerous times, up until the "No Kayaking" signs were placed on the spillway. In fact, two of my runs were at the invitation of Broken Bow park officials. They asked for our review of the spillway and we gave them our answer. It is a class 3 whitewater run with all of the features and risks of any typical class 3 whitewater run.</p> <p>I have kayaked a great number of whitewater rivers and streams across the United States, as well as North and South America, from Class 1 to Class 5. Many of these runs have been on dam release rivers. Such as the Class 5 Gauley River in West Virginia. The Class 5</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the</p>

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<p>Cheoah River in North Carolina. The Class 4 Ocoee River in Tennessee, and the Class 3 Nantahala River in North Carolina. The Nantahala River is particularly important, as it is a widely known "World Class" trout stream that supports both whitewater boaters and trout fishermen, much like many other rivers and streams across the United States. As an Oklahoman, I feel that our state's natural resources should be enjoyed by everyone. If the activity is safe for the environment, treats the area and others with respect, and the participants possess the skillset required in that activity, there is no reason to deny this accessibility to whitewater boaters when and if water levels make it feasible. I am an ACA trained and sanctioned Level 4 Whitewater Kayak instructor, in Tulsa, Oklahoma. I am also the President of the Tulsa Chapter of the Arkansas Canoe Club. We conduct Whitewater Kayaking instruction, as well as Swiftwater Rescue instruction throughout the region. We have conducted several clinics on the Lower Mountain Fork River, below Re-regulation Dam, as well as other locations throughout the region. We have also facilitated river clean-ups throughout the region. We strive to practice and teach stewardship of our waterways in our organization. We are composed of members that paddle, cherish, and protect our rivers, streams, and lakes across our region and strive to educate others to those ideals as well. We would welcome the opportunity to speak directly with the park service and the USACE to determine if there is a way that we can assist with paddlesports education, swiftwater education, and stewardship of our waterways.</p>	<p>determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>This proposal simply ignores the aspect of tourists and average people floating down the spillway creek. I don't know how it could be policed for only certified III and IV class kayakers to be allowed on it. Once someone sees someone else on a kayak on it, they will want to do it, just as they have at the Cold Hole and Evening Hole. Have you looked at these areas on a Saturday? These used to be my favorite places to fly fish. Being older, they were easy accessible for me and I felt safe. Now I can't fish them at all during the summer months due to the swimmers, tubers and kayakers. It is very sad and heartbreaking to see the places I love covered in trash after a weekend of tourist. The spillway creek is already trafficked heavily by all the fisherman and hikers. It is extremely fragile in that it is supporting spawning trout and wild fish. This is the ONLY stream in the ENTIRE state that is this</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken</p>

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<p>unique and special. From a conservation point of view, this would only harm the ecosystem of the stream. The group fighting for the change fail to realize that this would effectively be open season for ANY boater/floater. Not just the Whitewater kayakers that would only visit once every couple years when the flow is desirable for them.</p> <p>Increased waste, more traffic over redds and fish habitat, and overcrowding would only be a detriment to something already fragile. Relying on the honor system simply isn't good enough, which is all I've seen proposed. I voice my opinion as a fly fisherman and as a kayaker. As a person who retired and moved here 4 years ago for the beauty of the area, fly fishing and kayaking. Opening the spillway creek up to kayakers would be so detrimental. The safety issues alone would be astronomical. I have kayaked from the re-reg dam many many times. Even as a seasoned kayaker, I would never consider kayaking spillway creek. I am not even hardly able to fish it myself due to age and knee issues, but it would break my heart for my fellow fisherman to lose this stream and what a disaster it will be if we don't do everything to protect this.</p>	<p>Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>Regarding the possibility of opening up Spillway Creek to Kayaks & Canoes, I think this is not only dangerous, but also would negatively impact the only stretch of truly viable trout water on the Lower Mtn Fork River. There is already a substantial amount of water for kayaking and canoeing. The area between the Evening Hole bridge and the Fly Shop bridge is almost 2 miles and Zone 3 exceeds 4 miles not counting what lies below the highway 70 bridge. If the decision is made to allow Kayaking direct below the Spillway, that would essentially make it impossible for anglers to fish for trout for at least 6 months out of the year. The Kayakers are also very hard on the habitat. As crowded as the river is at this point, a decision to allow this would be detrimental to the trout and basically all but eliminate the only area that anglers can go to avoid the Kayakers and Canoers. Spillway Creek is a great stretch of water with a thriving Brown Trout and Stream-born rainbow trout population. They do get a ton of pressure as it is. It would be a shame to turn this section of the river into an area for watercraft and destroy the last good section of angling water.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the</p>

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<p>I am writing this letter to state that I DO NOT SUPPORT the request by Arkansas Canoe Club's request to allow whitewater boating on the Broken Bow Spillway. The Spillway's current signage, "Canoe, kayak, inflatables and other watercraft are prohibited." Is there for a reason. The vast majority of park visitors are not trained in water safety, let alone trained in whitewater skills. The fly shop owner has relayed incidents to me where people have ignored these signs and have subsequently drowned. It seems that boating in the Spillway may have once been permitted, but has since been prohibited. Did the change perhaps come about after the floods in 2015/2016? The flood changed a lot of the waterway, and perhaps the Corps of Engineers determined then that the Spillway was no longer safe for watercraft use.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I'm a member of the Arkansas Canoe Club residing in Fort Worth, TX and am emailing to show my support of the letter sent on behalf of the club's members dated</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational</p>

Comment	Response
<p>June 13, 2022 regarding the proposed revisions to the Broken Bow Lake Master Plan. I've only recently moved up from recreational flatwater paddling to whitewater paddling and love how this activity gives me another way to enjoy the natural world. A big part of my growth as a paddler has been due to the whitewater community in the State of Oklahoma and the Arkansas Canoe Club as an organization. I'm indebted to them for all that I've learned about safety and proper stewardship of the natural world. I've heard stories from some of the older paddlers that were able to run the spillway prior to it becoming restricted and it's definitely something that I and other North Texas boaters would love the opportunity to experience one day. I realize whitewater boating is not something most people are familiar with but I assure you those of us participating are only doing so after receiving the proper training and taking the time to develop our skills to the proper level. One very valid concern I've seen voiced in various online forums is that of the untrained and unskilled boaters. My response to them is that my experience has been that the type of personality that would attempt an activity such as this without proper training is the same personality that will break the law/restrictions to do it anyways. I'm still new to the whitewater community, but in many forums and discussions it has been the whitewater boaters of Oklahoma and the Arkansas Canoe Club that have told others about this area being restricted and also told them to not violate that restriction. The boating community has been patiently waiting for this opportunity to officially request that restrictions be removed for responsible boaters with appropriate training and equipment.</p>	<p>opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am an Oklahoma whitewater kayaker and I am writing this letter to express my support of the comments submitted by the letter, dated June 13, 2022, by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan. Here are some of my own thoughts. I have personally never kayaked Spillway creek below Broken Bow lake simply because it has been illegal for as long as I can remember. Why this beautiful section of whitewater has been illegal to kayak has always been a mystery to me. I have been told that the fishermen in the area feel that it would "ruin" the fishing. I strongly disagree with this assumption! Furthermore I fully believe that if this is handled correctly both fishing and whitewater kayaking can utilize this unique state resource without a large impact on one another. I say this because I have seen</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon</p>

Comment	Response
<p>the two co-exist on many similar dam release streams across the country. Examples include but are far from limited to Taylor river CO, Gunisson river CO, and the Nantahala river NC,. These are just a few examples off of the top of my head. With the Spillway creek running at its base flow, it is a little low to serve as a quality whitewater run. The base flows would not attract many seasoned whitewater kayakers. This is why I would request that there be a few pre-determined dates that the flow be increased to somewhere between 600-1200cfs. We could potentially create a whitewater festival that would attract whitewater paddlers from multiple states to enjoy this quality whitewater run. My point is there are many possibilities to utilize the spillway creek for Oklahoma tourism other than just for fishing. With that being said, I respect that Broken Bow spillway is a high quality trout fishing stream and I want to see it remain that way. My proposals are all about finding ways to utilize the stream with minimal impact on the fishing. I want to add that in the past the spillway run has been considered "too dangerous" to be kayaked safely. This assumption is totally incorrect! I ask you to please look at states that utilize whitewater kayaking/rafting as a tourism industry (Colorado, Tennessee, North Carolina, Arkansas, Idaho, ect.) They all have whitewater runs that are considerably more difficult and dangerous than the Broken Bow spillway run (e.g. North Fork Championships, North Fork Payette, Idaho, Class V+, and the Green River Narrows Race, Green river North Carolina, class V+) . The Spillway is a class IV run at the higher flows (e.g. 800-1200cfs), and a class III run at lower flows (<800cfs). With our state being centrally located in the U.S., Oklahoma has a unique opportunity to have something special in the whitewater world. There are places like Broken bow spillway out there for whitewater kayakers, but nothing like this is in the South central U.S. I also would like to add that Oklahoma city now has a world class whitewater center (In Riversport Rapids) that is also a Olympic training facility. There are several international events held at Riversport every year. We could potentially build upon this success with having events that coincide with events at Riversport. Having international level competitions at Broken Bow would be a huge feather in the cap for local tourism. I beg of you to please consider diversifying Broken Bow Spillway to allow whitewater kayaking. I know if we all sit down and think</p>	<p>completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>

Comment	Response
<p>this through we can come up with a plan that will benefit all involved. Thank you for your time.</p>	
<p>I wish to go on record that I support allowing kayaks and canoes on the Spillway Creek section of the Lower Mountain Fork River within the boundaries of Beavers Bend State Park. The growth of recreational kayaking in Oklahoma, Arkansas, Texas requires the necessity to reevaluate use of states natural resources to support a wider range of activities. While there are many bodies of water within the state that support recreational kayaking there are very few that can be categorized as "whitewater" which typically refers to a stream flow class rating of III or higher. The area know as "Spillway Creek" and is one of the limited stream resources in the State of Oklahoma that have consistent class III/IV whitewater and could be considered navigable to the 3rd bridge downstream from of the face of Broken Bow dam. This section of river does present multiple navigation hazards that are beyond the scope of the average recreational kayaker or canoeist but to skilled person it allows for a challenging but rewarding section of flowing water to enjoy their pursuit. Within my support for this measure I recommend that kayaking in the flowing waters from the downstream face of Broken Bow dam to the second bridge in the state park be authorized by permit only. Permitted access would allow control of the numbers of kayakers allowed on that section of river on a given day and provide accountability to those who request access to river/creek.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>As a recreational whitewater kayaker and member of the North Texas River Runners chapter of the Arkansas Canoe Club, I would like to submit my comment on the Broken Bow Lake Master Plan, specifically on the recreational use objectives for the Broken Bow Spillway Creek, which begins about a hundred yards below the dam and ends at its confluence with the Mountain Fork River in Beave's Bend park. Currently there are signs posted which indiscriminately prohibit all forms of water vessels on the spillway creek, while allowing other forms of recreation, such as fishing, hiking, and</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken</p>

Comment	Response
<p>mountain biking along its banks. I believe these signs should be removed and equal access to spillway creek for whitewater paddlers, not only allowed, but promoted as legitimate recreational use by the USACE in its revision to the Broken Bow Lake Master Plan. The popularity of whitewater kayaking has been steadily increasing in recent years. Modern innovations in boat design, safety equipment, and technique make class III-V whitewater much safer and more enjoyable than ever. By comparison, Spillway Creek is given a class II-III rating by American Whitewater. Furthermore, the ubiquitous availability of competent local paddling clubs and professional instruction by https://americancanoe.org/education/for-aca-instructors/, support the development of competent whitewater boaters. Myself and other North Texas boaters routinely drive past Broken Bow, OK, many weekends per year, to paddle the class III-IV rapids on the Cossatot River in Arkansas. We also make annual pilgrimages to destinations such as the Ocoee river in Tennessee, which has many rapids comparable to those of spillway creek and also offers predictable recreational dam releases. If the USACE were to offer scheduled releases for Spillway Creek, it would become not only a similar, but preferable destination for whitewater paddlers between the Appalachians and the Rockies. I hope that you sincerely consider my comment on revising the Broken Bow Lake Master Plan to allow and promote recreational use of whitewater kayaking on Spillway Creek.</p>	<p>Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>Please rethink the plans to allow kayaks below the spillway at broken bow lake. It will ruin the best trout fishing in the state.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in</p>

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<p>Please accept this email as my OPPOSITION to the letter dated June 13, 2022, submitted by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan.” The idea of allowing kayaks, canoes and any other flotation devices on the Spillway section of the Lower Mountain Fork River is an extremely short sided idea. This area happens to be only one of two year round trout streams in the State of Oklahoma that can be enjoyed by fly fishermen and anglers alike. Allowing this area to be accessed by kayakers, canoes and floaters would be very disruptive to the stream, the fish themselves, and would be detrimental to the environment for the surrounding area as well. Many individuals come to the LMF each year specifically for the opportunity to access the trout fishing and the pristine environment of the spillway section, myself included. There are other sections of the LMF that are available to the recreational boating community and I am not challenging those use areas. My objective is to ask that the Spillway section remain a fishing only area and completely restrict the usage of recreational boating from that area at all times throughout the year.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating</p>

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	in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.
<p>My family and I have spent over 10 years traveling to Beavers Bend state park and fly fishing the beautiful waters of the spillway. It is my opinion that any whitewater boating/kayaking on these waters will disturb the delicate ecosystem that is required for the trout population in the river, as well as being in direct conflict with the it's use for fly fishing. This stretch of water provides a unique opportunity for fly fishing in the state of Oklahoma and I believe all changes to the area should reflect the commitment to creating a world class stream for fly fishing only. So much more could be done to turn this stream into a more pure fly fishing destination and I would like to see those projects move forward rather than one that would bring a recreation type to the stream that is notorious for disturbance and pollution. I love paddle boarding and kayaking myself and do it fairly often, but that recreation can take place in more appropriate areas that don't push against the already we'll developed fly fishing community that has long supported this area.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing to express my support for the comments submitted by the Arkansas Canoe Club on June 13, 2022 in the proposed revisions to the Broken Bow Lake Master Plan. There was a short period where kayaking the spillway was permitted by the park a few years ago and I was one of several experienced whitewater kayakers that utilized the releases on the Broken Bow spillway for recreational kayaking during this time frame. The resource that Beavers Bend State Park has</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety.</p>

Comment	Response
<p>in this spillway is like nothing else between the Appalachian and Rocky Mountains in terms of accessibility, quality, and controllable water levels. I have taken swift water rescue courses and safely kayaked class III and IV whitewater for about 10 years now. Examples of similar parks with successful whitewater use can be found at the Cossatot River State Park about an hour away in Arkansas.</p>	<p>Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing this letter in regard to the proposal put forth by the Arkansas Canoe Club on 6/13/2022 to revise the Broken Bow Lake Master Plan. The Club's desire is to allow boating, kayaking, and floatable rafting on the stretch of the Lower Mountain Fork River called Spillway Creek within Beavers Bend State Park. This stretch consists of some very narrow, fast, and vertically challenging water, which sounds like some great floatable water but is in fact a very treacherous section. It is very difficult to hike this stretch much less float this stretch. This stretch is also very pristine in the sense that very few people access this portion because of the difficult hiking conditions, thus minimizing the human footprint. I believe that allowing access to public outfitters to this stretch would have a terrible impact on the ecosystem as well as the overall safety of park visitors. Although the "No boating" signs may not be there now, there was a reason why they put them up to begin with.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density</p>

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<p>I am writing this letter to express my support for the comments submitted by the letter, dated June 13, 2022, by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan. I moved to north texas three years ago from the Philadelphia area. I was an active member of the Philadelphia Canoe Club from 2008 until we moved in 2019. During that time I boated class I through IV rivers along the east coast. I have taken CPR and swiftwater rescue courses and safely and responsibly boated in inflatable and hard kayaks. I also assisted with training. I believe that having a place to enjoy, practice, and teach safe whitewater boating would benefit the area. It would draw regular visitors to the area benefiting the local economy. It would also provide great pleasure to boaters looking for whitewater closer to the North Texas area. Broken Bow is a popular attraction to North Texans and having a regular dam release would provide another activity for tourists.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and</p>

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	currently there are no plans to allow boating in the area.
<p>This email is in reference to a recommendation by the Arkansas Canoe Club on June 13th of this year regarding the Broken Bow Lake Master Plan. I and my family fully support the recommendation regarding recreational boating. Having been fortunate enough to kayak the spillway run over 5 times when it was allowed by park officials, I can attest that it is well within the capabilities of intermediate whitewater boaters. It was with dismay that we noted the signs posted regarding illegal boating. While I do understand safety concerns, the improvements in boats, equipment and training in the last 10 years have made this one of the least risky adventure sports. The spillway run managed correctly would bring additional individuals to the area for enjoyment and recreation along with the added revenue to local businesses. My family has enjoyed the area since the 1980's. Ironically the Lower Mountain Fork run was instrumental in driving our desire of river running. Since those days we have paddled class 3-5 whitewater all over the country especially enjoying dam release rivers such as the Ocoee in Tennessee, the Green River in North Carolina, and the Taylor River in Colorado. These, like the Broken Bow Spillway run could be, are simply a joy for paddlers during all months of the year. Along the way I have become an accomplished whitewater kayaker and rafter while attaining an American Canoe Association level 4 certification in whitewater kayaking and a level 5 certification in Swiftwater Rescue.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>Salutations, I am a concerned citizen and state employee. I am sending this email in regards to the plan to open the spillway twice a year for recreational rafting. I know that if this happens there will be damage caused to Beavers Bend State Park, Corps of Engineer Lands, and personal property further down the river. Its is best to only open the gates for emergencies only. For example of what will happen just look back to the Flood of 2015. I feel if the Corps was to spend time and money it would best used on high water boat ramps and parking lot expansions.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken</p>

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<p>Greetings, I am a state employee working at Beavers Bend State park, I am concerned with the plan to open the spillway gates of Broken Bow Lake two days out of the year, for the recreation of white water rafting, I am concerned for a plethora of reasons, but I will only state my main concerns. I know that if this plan were to come to fruition, it would cause damage to our state park and her natural resources, we have experienced extreme damage to our infrastructure and recreational areas back in 2015, during the flooding in 2015 areas farther below Beavers Bend experienced high water situations in result of the opening of the spillway gates, I understand that in 2015 the opening of the gates was a necessity, due to the dangers of the Lake rising above its capacity, but it is not a necessity now. I believe that there are more productive and safe additions to the Corps of Engineers master plan that will help all people instead of hindering most of us for the enjoyment of a small minority others.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD</p>

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<p>I am writing this letter to express my support for the comments submitted by the letter, dated June 13, 2022, by the Arkansas Canoe Club on the proposed revisions to the Broken Bow Lake Master Plan. I am a TX resident and a landowner in the Kiamichi Wilderness area. Prior to the restricted access signs where posted I had the opportunity to Kayak the spillway river and had a joyus time paddling wonderful whitewater in Oklahoma. This spillway is a gem not only for the local trout fisherman but for whitewater paddlers as well. While there might not be a lot of days that the water is releasing adequately for whitewater kayaking it would be wonderful to have the opportunity to paddle this spillway during those times. I have paddled many dam release spillways from Texas to Maine and while many of the rivers have safety warnings, some even requiring the proper gear, we are able to safely paddle these rivers. Please let whitewater paddlers enjoy this gem along with all the hikers and fishermen.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>

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<p>I just wanted to show my support for the kayakers wanting to have fair and equal access to this area. I know many good boaters that have run it in the past with no issue. At the levels a white water kayaker would find it enjoyable, it's a relatively safe run. Arguably safer than the esse or the falls on the cassatot. The ONLY people protesting this fair and equal access are the fishermen, which have access. Go figure. If a couple of kayaks floating by every couple of hours effect their livelihood to any degree, they shouldn't be guiding anyway. There is no data suggesting that white water kayaking has any negative impact on fish populations. Yall have an opportunity to open up a very unique run and the only reason you would not open it is the politics of the fishing community. And that's not right, its not fair, and there is no reasonable justification for it. Reach out to the Rangers that patrol the cossatot. Ask them their opinion of the white water community. They are always happy to see us. We are self supported and leave the river cleaner than we found it.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>The Lower Mountain Fork River Foundation is aware of a movement to open up Spillway Creek for kayak use. As an entity that has spent the past twenty years in promoting the state park and specifically the trout stream we are opposed to this proposition. As you are aware, the tailwater stream was federally mandated to provide habitat for trout and water outflow from the dam is controlled by the ODWC. There is no provision to allow additional water flows for other recreational use. The USACE, state park system and the ODWC have always been opposed to any type of floating devices in that part of the river. It is very remote for most of its distance to the cold hole bridge and access for medical</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational</p>

Comment	Response
<p>assistance would be very limited. It has a high potential for danger to anyone but a very experienced user. Our membership has spent thousands of hours and not a small amount of money to ensure that this tailwater fishery remains healthy and sustainable. It is the only stream in Oklahoma that has natural reproduction of both rainbow and brown trout species.</p>	<p>opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I just want to be able to do fun things in the state I live in on natural features without having to drive to Arkansas and spend my money there. I think if done correctly this would greatly benefit the local community as well as the greater community of outdoor enthusiasts like myself. Thank you for considering this. Broken bow spillway.</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the</p>

Comment	Response
	<p>segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am writing in support of the letter provided by the Arkansas Canoe Club on June 13th. The Broken Bow Lake Spillway provides excellent opportunities for whitewater recreation which are nearly impossible for many of us south and west of the area to otherwise enjoy during the dry summer months. It is a shame to see the spillway closed to boaters even when the lake is well below flood stage. Other areas I have paddled where safety is a concern have found a middle ground for ensuring safe usage by requiring proper outfits such as: - A type III or type V PFD - A whitewater-rated kayak or inflatable with at least three independent chambers. -A whitewater-rated helmet. I believe that clear expectations on required equipment for use will help bridge the gap such that recreation users can safely enjoy the gem without opening the creek to unprepared users. I hope that such a policy will be considered moving forward!</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>I am very opposed to the request by the ACC to access Spillway Creek for whitewater kayaking. This stream is the only trout stream in Oklahoma that is a year round</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational</p>

Comment	Response
<p>fishery and that supports rainbow and brown trout reproduction. There is not another like it in the state. I know this has come about after a lot of work and money since the flood of 2015 of which I am so grateful. This delicate ecosystem will be sorely damaged if this is allowed and make all the efforts of the last 7 years for naught. I don't think the ACC realizes the aftermath this will cause, or they would not even be making this request. I speak as a kayaker and a fisherman. I have so many places to kayak here and in Arkansas. I only have Spillway Creek as our last source to have clean water, no trash and quality fishing. Please continue to protect the spillway creek as you have done for years.</p>	<p>opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>
<p>As the owner of two of the largest recreational paddle sport stores in the world, and myself a whitewater boater, I would like to offer a few things to be added to conversation. The spillway creek run is as unique to whitewater kayakers as it is to the trout fishing community. This run is not replicated by the run offered below the reregulation dam, nor any other run nearby. Advocating for anything which would cause an increase in kayak related accidents to end up in the news would not be good for my business. My friends and customers have affectionately dubbed me "safety captain [NAME REDACTED]." They regularly accuse me of making people wear lifejackets on hiking trips. Ha! Whitewater kayakers are some of the most highly trained and safety certified users groups on the water. They are often the one's federal, state, and local</p>	<p>Noted. As part of the Master Plan revision process, the study team considered the vast recreational opportunities offered at Broken Bow Lake. A resource objective was created to consider existing and future potential recreational opportunities for multiple user groups while ensuring visitor safety. Resource goals and objectives can be found in Chapter 3 of the Broken Bow Lake Master Plan. The consideration of recreational opportunities for multiple user groups is also addressed in Chapter 6 of the Master Plan. Upon</p>

Comment	Response
<p>agencies call on when competent leaders are required for search and rescue, or safe rescue and recovery around the water is required. It is time to include them in the conversation for Broken Bow Lake, as is required by recreational managers on FERC, Corps, and other federally authorized dams. To not do so, while allowing other user groups, will ultimately result in solutions involving administrative law courts. We would much rather work with managers, under limited trial basis period to demonstrate that this is a feasible and responsible user group which will not impact the fishery or fisherman. While, humbly, I do not like, nor tend to ring my own bell, I do feel it is important to establish my lifetime track record protecting wildlife and habitat in Oklahoma. As an award winning naturalist and summa cum laude biologist, I have spent 38 years working on conservation matters in Oklahoma. ([NAME REDACTED] and I once were honored as conservationist of the year at the same Wildlife Federation Banquet.) I value protecting our limited resources more than making a buck or pleasing customers. I can honestly say that I am certain these principals will not be compromised in advocating for this stretch of water to be opened to skilled boaters. Similar runs are safely open to properly trained kayakers all over the country with zero impact on fisheries. Allowing the safest group on the river also helps to educate those unaware folks on the proper training and equipment required to do such waters. My biggest customer group at OKC Kayak and Tulsa Kayak is fishermen. I understand the fears of ruining one of the best trout fisheries in the state. I feel this is based in the lack of understanding of the sport and what is being requested. Note, we do not think this run is appropriate for the weekend warrior, or recreational kayaker. This alone, limits spillway creek to a very select and small number of boaters who would enjoy this run at times when the releases are not conducive to fishing anyways. I would ask you to consider myself and others in the conversation as planning progresses for the master plan.. We became one of the largest providers of kayaks worldwide, by our commitment to safety, and respect towards other user groups. May we get the user groups together to gain a better understanding of what is being proposed? I feel this would eliminate a lot of the heated and quite frankly incorrect rhetoric regarding this matter.</p>	<p>completion of the dam at Broken Bow Lake the Corps made the determination to restrict boating in the spillway in the interest of public safety. As the lease holder of the land classified as high-density recreation land that borders the Lower Mountain Fork River, OTRD has continued the restriction of boating and floatation within the segment of Spillway Creek from the Broken Bow Spillway to the Cold Hole Bridge. To further support the restriction, the current lessee (OTRD) performed a study which supports the determination. Boating in the spillway creek has never been an approved activity and currently there are no plans to allow boating in the area.</p>

DRAFT MASTER PLAN PUBLIC COMMENTS (30 May 2023 through 29 Jun 2023):

Comment	Response
Comments from Town Of Hochatown Trustee	
<p>1. We desperately need a 2nd marina. I'm sure you are aware of the amount of visitors we have to our area. We offer more than 3000 rental cabins in the Hochatown area. The Marina and the parking area at the Marina is just too small to handle this huge tourist area.</p> <p>2. Environmental protection of rare and endangered species from noise, light, air, riparian land, and water pollution. With the amount of "traffic" we receive from guests visiting our area, we are certainly concerned about the environmental protection desperately needed for our lake and lake areas.</p> <p>3. Need for Hochatown municipal water supply and storage rights. We struggle to maintain a constant water flow to our rental cabins. We desperately need our own water supply/storage system which will be operated and maintained by the Town of Hochatown.</p>	<p>Noted. A marina is required to be located in a high density recreation (HDR) land classification. The master plan revision has adequate space available to allow for such an activity to occur. A boating survey to determine the current level of boating at Broken Bow is programmed to begin in fiscal year 2024. Results from the boating survey will be used to determine the carrying capacity of safe boating levels on Broken Bow lake.</p> <p>Protection of the environment is a USACE goal reinforced in the master plan through resource objectives, land classifications, and resource plans.</p> <p>The master plan does not address issues related to water supply. More information regarding the process to acquire water supply storage is available from Tulsa District.</p>
Comments from General Public	
<p>Please see my comments below in regards to Master Plan changes impacting the East side of Broken Bow Lake. Knowing this review is only executed once every 25 years, I'd like to ensure we plan sufficiently for future growth.</p> <p>EAST RAMP/BURKE'S LANDING I feel that the allocated size of 3.7 acres is too small to really do anything with. Also if you look at the FEMA flood zone map of that area, the designated space is largely within the flood zone. (included screenshot below) I would like to propose a larger space allocated, including ample space for parking above the flood zone. In addition, all current RV or camp site usage is within the flood zone. It would be nice to have space outside of the flood zone to allow higher ground for folks to enjoy nature.</p>	<p>Noted. The East Ramp and Biggam Creek are considered day use and primitive camping areas with minimal development and no utilities. The areas are planned to remain day use with primitive camping use and boat ramp access. The two areas are sized taking into account the consensus to keep the shoreline undeveloped and pristine but allowing day use access and primitive camping amenities along this portion of the lake shoreline. As rapid growth is a concern to the area, limiting development on federal lands is a public concern. The master plans allocated HDR land on the east side of the lake will provide for the</p>

Comment	Response
<p>This area needs to be large enough to provide space for 40+ future cabin owners from Lake Ridge Estates, ferry service across the lake, and local usage. Locals do come down that road to boat, fish, camp, hang out. I was up there last weekend, and there were several locals with RV setups and boats. I'd imagine with future improvement, locals or visitors would appreciate an improved space to enjoy, especially being away from the West side crowds.</p> <p>Need enough space to build what is needed in the future. Locals don't want the traffic of 259 to go to those West side boat ramps. Plus the future build out of the I-35 highway in Arkansas, that may drive more visitors to the East side of BB lake at some point. Need enough land allocated to provide enough opportunity for ROI on the investment for boat launching improvements, floating dock, possible boat slips, camping/RV spots, etc.</p> <p>I don't know what the right "size" is, but just request that you please make it large enough to really do something with, above the flood zone, ample parking, etc.</p> <p>BIGGAM CREEK BIGGAM CREEK area appears to have been shrunk from over 100 acres down to 3.6 acres, which is too small to really do anything with. Especially when looking at the flood zone map for this area as well. What's the harm in keeping it designated with more space (or at least a happy medium), in case future use is needed? If this lake planning is only every 25 years, that's a LONG time and knowing growth will continue in all directions, it would be a good idea to keep this area large enough to be available for future use. This location is also closer to utilities, electric, water, etc. I also like this area better if there were to be a small marina built out in the future. Due to the shape of the long cove, it is more protected from the weather/wind vs. East Ramp location. It would be nice to have options.</p> <p>From a planning perspective, I just want to ensure enough space is allocated for ample parking, RV/Camp sites, possible boat ramp addition, etc. In my opinion, it's better to have more space allocated vs. not enough and then you can't do much with it.</p>	<p>possibilities of day use and primitive camping amenities to include improved parking surfaces and bathrooms.</p>
<p>Please take into consideration, my comments below in regards to Master Plan changes impacting the East</p>	<p>Noted. The East Ramp and Biggam Creek are considered day use and</p>

Comment	Response
<p>side of Broken Bow Lake for the next 25 years. To benefit the growing area and increasing tourism, I would like see the proposed suggestion added to the Master Plan.</p> <p>I find the currently allocated size of 3.7 acres inadequate for meaningful utilization. Furthermore, upon examining the FEMA flood zone map of the area, it becomes apparent that a significant portion of the designated space falls within the flood zone (refer to the included screenshot). Therefore, I propose an expanded allocation that includes ample parking areas situated above the flood zone. Additionally, all existing RV or camp sites are currently located within the flood zone. It would be advantageous to have space outside the flood zone to offer individuals a higher ground to appreciate the natural surroundings.</p> <p>In order to accommodate the needs of over 40 future cabin owners from Lake Ridge Estates, as well as local usage and a ferry service across the lake, a larger area is necessary for access. Local residents frequently traverse the road to engage in activities such as boating, fishing, camping, and socializing. During my recent visit to the area, I observed several locals with RV setups and boats. Considering future enhancements, it would be highly valued by both locals and visitors to have an improved space available, particularly one that is separate from the bustling West side.</p> <p>It is essential to allocate enough space to cater to future requirements. Local residents are averse to the idea of directing traffic from Highway 259 towards the West side boat ramps. Moreover, with the potential future expansion of the I-35 highway in Arkansas, there may be an increase in visitors to the East side of BB lake. Therefore, it is crucial to allocate a sufficient amount of land that provides abundant opportunities for return on investment in terms of boat launching improvements, a floating dock, potential boat slips, camping/RV spots, and other amenities.</p> <p>While I cannot determine the exact dimensions required, I kindly request that the allocated space be sufficiently large to enable meaningful development. This entails being situated above the flood zone, incorporating ample parking facilities, and so on.</p>	<p>primitive camping areas with minimal development and no utilities. The areas are planned to remain day use with primitive camping use and boat ramp access. The two areas are sized taking into account the consensus to keep the shoreline undeveloped and pristine but allowing day use access and primitive camping amenities along this portion of the lake shoreline. As rapid growth is a concern to the area, limiting development on federal lands is a public concern. The master plans allocated HDR land on the east side of the lake will provide for the possibilities of day use and primitive camping amenities to include improved parking surfaces and bathrooms.</p>

Comment	Response
<p>BIGGAM CREEK</p> <p>The BIGGAM CREEK area seems to have undergone a significant reduction in size, from over 100 acres to a mere 3.6 acres. Such a small allocation limits its potential for meaningful utilization, especially when considering the corresponding flood zone map. It is worth considering the benefits of maintaining a larger designated area (or at least a reasonable compromise) to accommodate any future needs. Given that lake planning occurs only once every 25 years, and considering the ongoing growth in all directions, it would be wise to ensure that this area remains sufficiently spacious for future purposes. Moreover, this location enjoys proximity to utilities such as electricity and water, making it even more favorable. From the perspective of potential development, I also find this area preferable for a small marina in the future. The elongated cove shape offers better protection from adverse weather conditions and wind compared to the East Ramp location. Having options and flexibility would be highly beneficial.</p> <p>In terms of planning, it is essential to allocate enough space to accommodate ample parking facilities, RV/camp sites, and the possibility of adding a boat ramp, among other considerations. In my view, it is preferable to err on the side of allocating more space rather than too little, as this ensures greater potential for utilization and recreational usage.</p> <p>Thank you for your consideration of my comments to improve Broken Bow Lake, for the area residents and to provide ample space and amenities for tourist growth.</p>	
<p>I am writing to express my comments and suggestions regarding the proposed changes to the Master Plan for the East side of Broken Bow Lake over the next 25 years. As the area continues to experience growth and increasing tourism, I believe it is crucial to incorporate the following proposal into the Master Plan.</p> <p>EAST RAMP/BURKE'S LANDING</p> <p>Firstly, the currently allocated size of 3.7 acres is inadequate for meaningful utilization. Upon reviewing the FEMA flood zone map, it is evident that a significant portion of the designated space falls within the flood zone (please refer to the attached screenshot). To address this concern, I strongly recommend an</p>	<p>Noted. The East Ramp and Biggam Creek are considered day use and primitive camping areas with minimal development and no utilities. The areas are planned to remain day use with primitive camping use and boat ramp access. The two areas are sized taking into account the consensus to keep the shoreline undeveloped and pristine but allowing day use access and primitive camping amenities along this portion of the lake shoreline. As rapid growth is a</p>

Comment	Response
<p>expanded allocation that includes ample parking areas situated above the flood zone. Additionally, all existing RV or camp sites are currently located within the flood zone. It would be advantageous to provide space outside the flood zone, offering visitors and residents a safer and more enjoyable experience in the natural surroundings.</p> <p>In order to cater to the needs of over 40 future cabin owners from Lake Ridge Estates, as well as accommodate local usage and a ferry service across the lake, it is necessary to allocate a larger area for access. The road leading to the area is frequently utilized by local residents for activities such as boating, fishing, camping, and socializing. During my recent visit, I noticed several locals with RV setups and boats. Considering the potential for future enhancements, both locals and visitors would greatly appreciate an improved space that is separate from the bustling West side.</p> <p>To adequately meet future requirements, it is essential to allocate a sufficient amount of land. Local residents strongly oppose directing traffic from Highway 259 towards the West side boat ramps. Moreover, with the potential expansion of the I-49 highway in Arkansas, there is the likelihood of increased visitors to the East side of Broken Bow Lake. Therefore, it is crucial to allocate enough land that provides ample opportunities for return on investment, including boat launching improvements, a floating dock, potential boat slips, camping/RV spots, and other amenities.</p> <p>While I cannot determine the exact dimensions required, I kindly request that the allocated space be sufficiently large to allow for meaningful development. This should include being situated above the flood zone and incorporating ample parking facilities, among other considerations.</p> <p>BIGGAM CREEK Regarding the BIGGAM CREEK area, I would like to express my concern over its significant reduction in size from over 100 acres to a mere 3.6 acres. Such a small allocation severely limits its potential for meaningful utilization, particularly when taking into account the corresponding flood zone map. It is important to recognize the benefits of maintaining a larger designated area (or at least finding a reasonable</p>	<p>concern to the area, limiting development on federal lands is a public concern. The master plans allocated HDR land on the east side of the lake will provide for the possibilities of day use and primitive camping amenities to include improved parking surfaces and bathrooms.</p>

Comment	Response
<p>compromise) to accommodate potential future needs. As lake planning occurs only once every 25 years and considering the ongoing growth in all directions, it is prudent to ensure that this area remains sufficiently spacious for future purposes. Furthermore, its favorable proximity to utilities such as electricity and water makes it an ideal location. In terms of potential development, I believe this area holds great potential for a small marina in the future, as its elongated cove shape provides better protection from adverse weather conditions and wind compared to the East Ramp location. Having options and flexibility would be highly advantageous.</p> <p>In conclusion, I emphasize the importance of allocating enough space in the planning process to provide ample parking facilities, RV/camp sites, and the potential for a boat ramp addition, among other considerations. It is my belief that it is better to err on the side of allocating more space rather than too little, as this will ensure a greater potential for utilization and accommodate the recreational needs of the area.</p>	
<p>I am writing to express my comments and suggestions regarding the proposed changes to the Master Plan for the East side of Broken Bow Lake over the next 25 years. With the aim of benefiting the growing area and accommodating the increasing tourism, I strongly advocate for the inclusion of the following suggestion in the Master Plan.</p> <p>EAST RAMP/BURKE'S LANDING</p> <p>Firstly, I must emphasize that the currently allocated size of 3.7 acres is inadequate for meaningful utilization. Upon reviewing the FEMA flood zone map, it becomes evident that a significant portion of the designated space is within the flood zone (please refer to the attached screenshot). Therefore, I propose an expanded allocation that encompasses ample parking areas situated above the flood zone. Additionally, all existing RV or camp sites are currently located within the flood zone. It would be highly advantageous to have a space outside the flood zone that provides elevated ground for individuals to enjoy the natural surroundings.</p> <p>To adequately meet the needs of over 40 future cabin owners from Lake Ridge Estates, as well as local residents and a potential ferry service across the lake, a larger area is essential to ensure proper access. The local community frequently utilizes the road for activities</p>	<p>Noted. The East Ramp and Biggam Creek are considered day use and primitive camping areas with minimal development and no utilities. The areas are planned to remain day use with primitive camping use and boat ramp access. The two areas are sized taking into account the consensus to keep the shoreline undeveloped and pristine but allowing day use access and primitive camping amenities along this portion of the lake shoreline. As rapid growth is a concern to the area, limiting development on federal lands is a public concern. The master plans allocated HDR land on the east side of the lake will provide for the possibilities of day use and primitive camping amenities to include improved parking surfaces and bathrooms.</p>

Comment	Response
<p>such as boating, fishing, camping, and socializing. During my recent visit to the area, I noticed numerous locals with RV setups and boats. Considering future enhancements, it would be greatly appreciated by both residents and visitors to have an improved space available, particularly one that is separate from the bustling West side.</p> <p>Furthermore, it is crucial to allocate sufficient space to accommodate future requirements. Local residents strongly oppose directing traffic from Highway 259 towards the West side boat ramps. Additionally, with the potential expansion of the I-35 highway in Arkansas, it is foreseeable that there will be an increase in visitors to the East side of BB Lake. Therefore, it is of utmost importance to allocate an ample amount of land that offers abundant opportunities for return on investment, including boat launching improvements, a floating dock, potential boat slips, camping/RV spots, and other amenities.</p> <p>While I am unable to determine the exact dimensions required, I kindly request that the allocated space be sufficiently large to facilitate meaningful development. This entails ensuring the area is situated above the flood zone and includes ample parking facilities, among other considerations.</p> <p>BIGGAM CREEK</p> <p>Now, turning to the matter of BIGGAM CREEK, I would like to express my concern over the significant reduction in its size, from over 100 acres to a mere 3.6 acres. This considerable reduction severely limits its potential for meaningful utilization, especially when considering the corresponding flood zone map. It would be wise to carefully consider the advantages of maintaining a larger designated area (or at least reaching a reasonable compromise) to adequately accommodate future needs. Given that lake planning occurs only once every 25 years and considering the ongoing growth in all directions, it is prudent to ensure that this area remains sufficiently spacious for future purposes. Furthermore, the proximity to utilities such as electricity and water makes this location even more desirable. From a developmental standpoint, I believe this area would be ideal for a small marina in the future, as its elongated cove shape offers better protection from adverse weather conditions and wind compared to</p>	

Comment	Response
<p>the East Ramp location. Having options and flexibility would greatly benefit the overall plan.</p> <p>In terms of planning, it is essential to allocate enough space to accommodate ample parking facilities, RV/camp sites, and the potential addition of a boat ramp, among other considerations. In my opinion, it is preferable to err on the side of allocating more space rather than too little, as this ensures greater potential for utilization and recreational usage.</p>	
<p>Sorry it took so long. I wanted to firmly advocate never opening the shoreline for development. Don't allow the East side of the lake to be developed! The Lakeview Lodge is okay, no need to remove that which already exists, but the reason this lake is so beautiful is the scenery.</p> <p>I've been focusing on understanding the ecology of this area, with an eye towards managing these forests in the best possible way. I hike a lot (no where near as much as I'd like.) I'm trying to make a career out of hiking, so my theory has been to try to make the most use of the hikes as I can, by learning about the environment. Trees are the keystone species, everything else falls in line based on their stoic stature. They were clearcut or select cut in the early 1900s, a novel phenomenon for such forests -- humans took some of the biggest and best trees. Then they've been mismanaged, in a sense, in that no management really seems to have occurred. The pine knot needs to be removed, so forest fires are less intense, and fire lines should be created intermittently, so when fires break out, it's easier to stop them. I'd advocate allowing "free range" for those lands to cattlemen, so that herbicides need not be used, letting the cattle's hooves stomp down the nascent trees.</p> <p>I'd suggest allowing my company to remove rot-resistant timbers, like white oaks, chestnuts, honey locust, black locust, and red cedar, while leaving the other species for wildlife (like 90% of amphibians not in streams live in and under logs), but what would be really fun is a control group, leaving 30% with the rot resistant logs, to see how that alters ecology. I don't trust anyone else to adequately monitor ecology.</p> <p>The forests need to be thinned. I think certain species should be favored. For instance, the near loss of the ozark chinquapin should be a primary focus, as it was a</p>	<p>Noted. The protection of the environment is a USACE goal reinforced in the master plan through resource objectives, land classifications, and resource plans. USACE in partnership with ODWC manages project resources to include ecosystem management, forest management, and recreational opportunities. A forest management program focused on forest health and wildlife habitat improvement at Broken Bow Lake is under development.</p>

Comment	Response
<p>main food species for almost every mammal. I assert that its loss is the primary reason that white oaks haven't regenerated. Chestnuts have consistent production, unlike most mast trees, so in their absence, mammals have had to favor white oaks more heavily. Or the chinquapin oak, the best of all the white oaks, doesn't respond well to clear cuts, so it should be favored when possible. I also want to search the area for the best trees, since this was basically the last Southern Forest to be harvested, it has the greatest percentage of old growth, and thus the greatest genetic diversity. So large, old trees from here are more valuable than some large trees of similar size in, say, Baltimore. Two trees next to each other on a street in Baltimore would likely be far more closely related than two large trees of the same species in this area.</p> <p>Also as the only major East-West Mountain chain (hardwoods on north facing slopes, conifers on south facing slopes), paired with the unique varied geology of the area means there's a much higher probability of endemic species restricted to a single 1/8th acre (like the Franklin Tree! Or Texas Wild Rice!) It is the 3rd most ecologically sensitive region in the US (after Southern Appalachia, and the Sierra Nevadas), according to BONAP maps, but is also significantly less studied than those two. It's geologically older, less touched/altered, and more geographically separated from other similar environments.</p> <p>I would hate to see the East side of the lake developed for those reasons! Development must be restricted to the West side of the lake for scientific reasons! I mean, the Nature Conservancy has shown that Hottonia Bottoms has a mile-per-mile equivalent amount of biological diversity as rain forests! (Rarely do I use exclamation points. I'm not crazy, I'm just essentially the only intelligent person who lives here who knows how to phrase it that way. Everyone else probably just talked about its beauty, which comes from those reasons!)</p> <p>The Ozark Emerald Dragonfly has one of three known breeding spots on the East side of the lake, and the Red Cockaded woodpecker is in the McCurtain County Wildlife Refuge.</p> <p>It took me like 30 minutes to write this, I'm sure I'm leaving stuff out. (Like the Rich Mountain Earthworm.) Ouachita Witchhazel, Ouachita hawthorn, Chalk Maple,</p>	

Comment	Response
<p>Maple Leafed Oak, Arkansas Oak, American Yellowwood, American Burying Beetle, etc. I'm not wrong. This is one of the most important environments not just in the United States, but all of Earth. I'm an expert.</p> <p>I've been looking into carbon credits. I'd like to study this land. The deepness of the lake makes it great for hydropower. Another lake was almost built, Lake Sherwood, that would have been just as deep, around Hee Mountain. If it were built, it would make Broken Bow lake colder. That could improve the walleye fishery, but would simultaneously harm a unique environment, but could also allow for pumped storage. But it could lead to a lake Mead/Powell situation. The difference in temperature in the Antlers aquifer and Broken Bow lake could have applications for energy. Perhaps data storage.</p>	
<p>It is my understanding that the Master Plan for Broken Bow Lake is being updated. I have spoken with [NAMES REDACTED] and after our conversation I would like to offer the following input. In the past, I owned Cookson Bend Marina on Lake Tenkiller from 2010 until 2018. During that period of time, we removed the old marina that had been in existence since the Mid 1950's and constructed a new marina with 120 covered boat slips. The relationships that we made with customers along with the working relationship with the Corps of Engineers was an experience that I will cherish for the rest of my life. Since the Master Plan is only reviewed every 25 years, I wanted to say that due to the increase in boating and recreation over the past 15 to 20 years, the need for more marinas, especially on a lake that only has one marina, is very much needed. On Tenkiller lake, as you are aware, there are ten marinas and over the past few years have gone under major expansions to keep up with the demand. The need for boat slips and camping sites go hand in hand. From the information that I have received, the two areas that you are considering to expand on Broken Bow Lake, are only going to have approximately 3 to 4 acres of land in the lease. Due to the increase in dock construction cost, revenue collected on marina income alone will not service the debt incurred. Transient trailer spaces would be a good additional revenue source to bring in sufficient revenue to remedy this. There should be sufficient acreage within the lease that would make this venture successful.</p>	<p>Noted. A marina is required to be located in a high density recreation (HDR) land classification. The master plan revision has adequate space available within the HDR areas to allow for such an activity to occur. A boating survey to determine the current level of boating at Broken Bow is programmed to begin in fiscal year 2024. Results from the boating survey will be used to determine the carrying capacity of safe boating levels on Broken Bow lake.</p> <p>The East Ramp and Biggam Creek areas are to provide the potential for the public to gain lake access through a small day use and primitive camping areas on remote areas along the east side. This allows for access to the east side of the lake with minimal development to maintain the undeveloped vista and wildlife habitat of the east side of Broken Bow Lake.</p>

Comment	Response
<p>I know that I am only one person and that there are a lot of factors to be considered but I feel that this increase in acreage needs to be one of the major factors in expanding tourism on Broken Bow Lake.</p>	

APPENDIX F – ACRONYMS

ac-ft	Acre Feet
AQI	Air Quality Index
BMP	Best Management Practices
CAP	Climate Action Plan
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DC	District Commander
DF	Deciduous Forest
DQC	District Quality Control
DQCB	District Quality Control Board
DM	Design Memorandum
EA	Environmental Assessment, NEPA Document
EMS	Ecological Mapping System
EOP	Environmental Operating Principles
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Area
°F	Degrees Fahrenheit
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination act of 1958
GIS	Geographical Information Systems
HDR	High Density Recreation
HQ	USACE Headquarters (also HQUSACE)
IH	Interstate Highway
IPaC	Information for Planning and Consultation
LDR	Low Density Recreation
LEED	Leadership in Energy and Environmental Design
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act, 1970
NGVD/NGVD29	National Geodetic Vertical Datum (1929)
NHPA	National Historic Prevention Act
NRHP	National Register of Historic Places
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NRHP	National Registry of Historic Places
NVCS	National Vegetation Classification System
NWI	National Wetland Inventory
ODWC	Oklahoma Department of Wildlife Conservation
O&M	Operations and Maintenance
OK	Oklahoma

OMB	Office of Management and Budget
OMBIL	Operations and Maintenance Business Information
OMP	Operations Management Plan for a specific lake Project
OPM	Operations Project Manager
OTRD	Oklahoma Tourism and Recreation Department
PDT	Project Development Team
PL	Public Law
PM	Project Management or Project Manager
PMP	Project Management Plan
PO	Project Operations
RBLH	Riparian Bottomland Hardwoods
RBS	Recreational Boating Survey
RIFA	Red Imported Fire Ant
RPEC	Regional Planning and Environmental Center
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SGCN	Species of Greatest Conservation Need
SH	State Highway
SHPO	State Historical Preservation Office
SMPS	Shoreline Management Policy Statement
SIP	State Implementation Plan
SWA	State Wildlife Area
U.S.	United States (also US)
USACE	United States Army Corps of Engineers
USFWS	U. S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VM	Vegetative Management Area
WDA	Workforce Development Area
WHAP	Wildlife Habitat Appraisal Procedure
WM	Wildlife Management