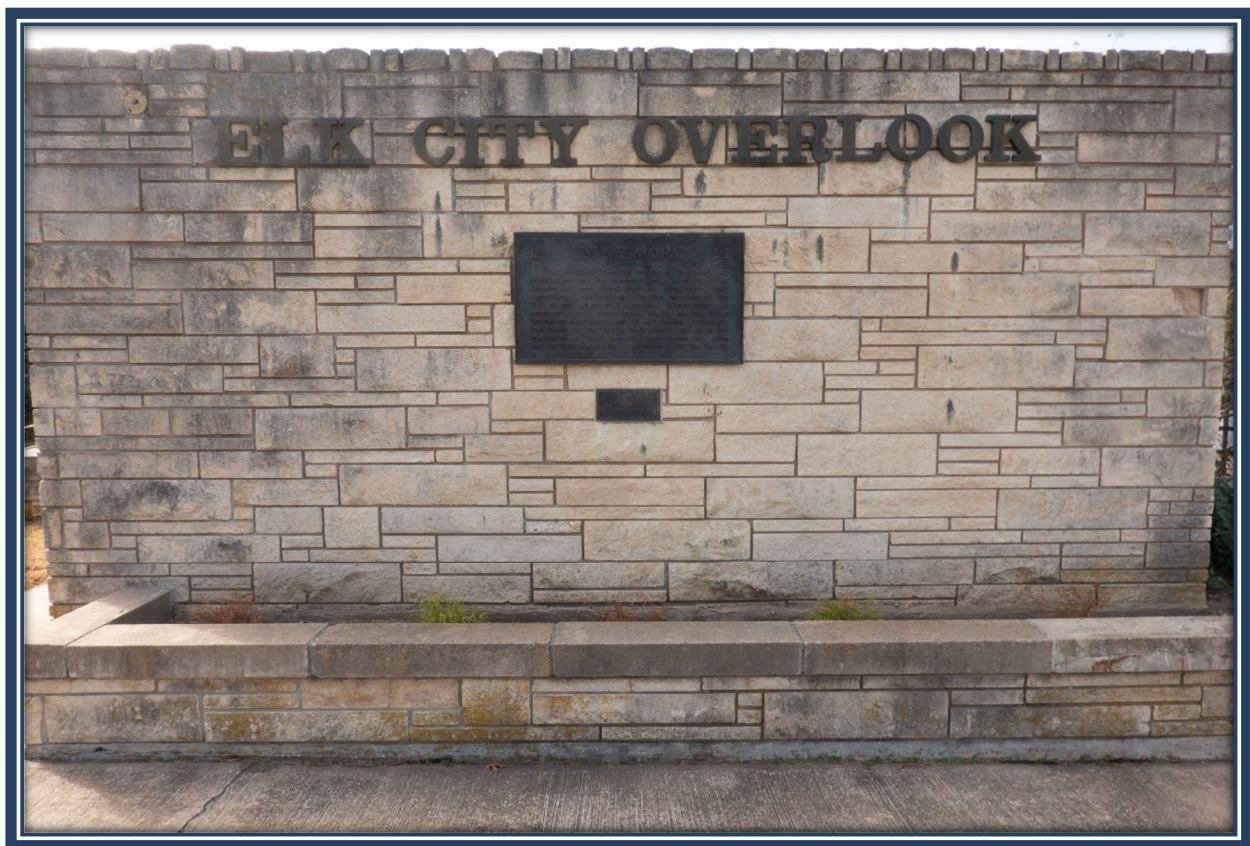


# ELK CITY LAKE MASTER PLAN

VERDIGRIS RIVER BASIN  
MONTGOMERY COUNTY, KANSAS

NOVEMBER 2021



**US Army Corps  
of Engineers**  
Tulsa District

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# **EXECUTIVE SUMMARY**

## **Elk City Master Plan**

U.S. Army Corps of Engineers

Prepared by Tulsa District and the Regional Planning and Environmental Center

November 2021

### **PURPOSE**

The revision of the Elk City Lake Master Plan (Plan or Master Plan) is a framework built collaboratively to guide appropriate stewardship of U.S. Army Corps of Engineers (USACE) administered resources at Elk City Lake over the next 25 years. The 1988 Supplement Number 2 was an update of the original 1977 Master Plan and has served well past its intended 25-year planning horizon. In addition to the primary mission of flood risk management, water supply, water quality, recreation, and wildlife, USACE also carries out the inherent mission of environmental stewardship on the Federal lands and water surface at Elk City Lake.

During the 2021 Master Plan update, Geographic Information System (GIS) mapping technology was utilized to verify the 1988 acreage for all fee land. Noting discrepancies between the acreage documented in the 1988 Master Plan Supplement Number 2 and the recalculation of acres using current mapping technology, this document reflects the recalculated 1988 acres. The acres are shown below in Table 1.

Currently, Elk City Lake encompasses 14,634 acres of land and 3,863 acres of surface water at conservation pool elevation 796.0 feet NGVD (National Geodetic Vertical Datum), operating as part of a multiple reservoir system to protect lands downstream from the dam through flood mitigation and low-flow regulation for water quality on the Verdigris River while providing water for agriculture and town water supply, as well as conserving habitat for fish and wildlife conservation and providing opportunities for public recreation. This Plan with its supporting documentation provides an inventory, analysis, goals, objectives, and recommendations for USACE lands and water surface at Elk City Lake, Kansas.

### **PUBLIC INPUT**

To ensure a balance between operational, environmental, and recreational outcomes, public and agency input toward the Master Plan was obtained. An Environmental Assessment (EA) was completed in conjunction with the Master Plan Revision to evaluate the impacts of alternatives. The EA is included as Appendix B.

The USACE is dedicated to serving the public interests through collaborative development of land use classifications intended to manage for cultural, natural, and recreational resources of Elk City Lake. This Plan also establishes a classification of surface waters related to outdoor recreation. 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 environmental assessment process. Public involvement is especially important at Elk City Lake to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs in the region while supporting the primary missions of the Lake. The following milestones provide a brief look at the overall process of revising the Elk City Lake Master Plan.

The USACE began the revision process for the Elk City Lake Master Plan in the Fall of 2019. The objectives for the master plan revision are to (1) revise existing land classifications and develop natural resource management objectives to reflect changes in the USACE land management policies since 1977, and (2) update 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.

## RECOMMENDATIONS

The following land classifications changes (detailed in Chapter 8) resulted from the inventory, analysis, and synthesis of data, documents, and public and agency input. In general, 6,469 total acres were reclassified, with fee and conservation pool acreage changes due in part to siltation and improvements in measurement technology using Geographical Information System (GIS) technology. This software allows for more finely tuned measurements and thus acreages may vary slightly from official land acquisition records.

**Table 1 - Prior and Current Land and Water Classifications and Acreage**

Prior Land Classifications (1988)	Acres	New Land Classifications (2021)	Acres	Net Difference
Project Operations	2,946	Project Operations (PO)	625	(2,231)
Recreation – Intensive Use	1,452	High Density Recreation (HDR)	650	(802)
		Environmentally Sensitive Areas (ESA)	764	764
Recreation – Low Density	948	Multiple Resource Management – Low Density Recreation (LDR)	1,174	226
Wildlife Management	9,288	Multiple Resource Management – Wildlife Management (WM)	11,421	2,133



		Multiple Resource Management – Vegetation Management (VM)	0	0
		Future/Inactive Recreation Areas	0	0
<b>TOTAL</b>	<b>14,634</b>	<b>TOTAL</b>	<b>14,634</b>	<b>0</b>
<b>Prior Water Surface Classifications (1977)</b>	<b>Acres</b>	<b>New Water Surface Classifications (2021)</b>	<b>Acres</b>	<b>Net Difference</b>
Water Surface	<b>3,550</b>	Open Recreation	3,621	71
		Designated No-Wake	6	6
		Fish and Wildlife Sanctuary	234	234
		Restricted	2	2
<b>TOTAL</b>	<b>3,550</b>	<b>TOTAL</b>	<b>3,863</b>	<b>313</b>
<b>TOTAL FEE</b>	<b>18,184</b>	<b>TOTAL FEE</b>	<b>18,497</b>	<b>313</b>

\* **Note:** Acreage figures were measured using GIS technology and may vary slightly from official land acquisition records.

## PLAN ORGANIZATION

Chapter 1 of the Master Plan presents an overall introduction of Elk City Lake. Chapter 2 consists of an inventory and analysis of project resources. Chapters 3 and 4 lay out management goals, resource objectives, and land allocation and classification. Chapter 5 is the resource plan that identifies how project lands will be managed through a resource use plan for each land use classification. This includes current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. Chapter 6 details topics that are unique to Elk City Lake. Chapter 7 identifies the coordination 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 EA analyzing alternative management scenarios for Elk City Lake has been prepared in accordance with 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.

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The EA evaluated two alternatives as follows: 1) No Action Alternative, and 2) Proposed Action. The EA analyzed the potential impact the No Action and Proposed Action would have on the natural, cultural, and human environments. Because the Master Plan is conceptual, 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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# **1 INTRODUCTION**

## **1.1 GENERAL OVERVIEW**

Elk City Lake is a multipurpose water resources project constructed and operated by the U.S. Army Corps of Engineers (USACE), Tulsa District. The lake and associated federal lands are in Montgomery County, Kansas (KS). Elk City Dam is situated at river mile 8.7 on the Elk River, a tributary of the Verdigris River, KS. The dam is located about 5 miles northwest of the town of Independence, KS. The USACE is the operating and regulatory agency for Elk City Lake.

Elk City Lake is an integral unit of the multi-purpose plan for flood control, generation of hydroelectric power, navigation, and other beneficial water uses on the Arkansas River and its tributaries in Kansas, Arkansas, and Oklahoma. Elk City Lake is operated along with Toronto, Fall River, and Big Hill Lakes to provide maximum flood risk management benefits to the upper limits of Oologah Lake, Oklahoma. Construction began in January 1962 and final storage began in March 1966. The conservation pool was filled in June 1967.

All recreation facilities are administered by USACE except for Elk City State Park which is managed by the Kansas State Parks through the Kansas Department of Wildlife and Parks (KDWP). Kansas also has a license to approximately 12,240 acres of project land for wildlife management and public hunting.

This 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 Elk City Lake. The Plan does not address the flood risk management, or water supply purposes of Elk City Lake (see the USACE Water Control Manual for Elk City Lake for a description of these project purposes). The 1977 Elk City Lake Master Plan was last updated with a supplement in 1988, which is well past the intended planning horizon.

## **1.2 PROJECT AUTHORIZATION**

Elk City Lake was authorized by the Flood Control Act (FCA) dated 18 August 1941 (Public Law 77-228, 77th Congress, 1st Session). It added the Verdigris River in Kansas by modifying the FCA of 28 June 1938 to include reservoirs in the Verdigris River Basin, in accordance with the recommendations of the Chief of Engineer's in House Document Number 440, dated 5 July 1939, 76<sup>th</sup> Congress, 1<sup>st</sup> Session.

Recreation facilities were authorized by the Flood Control Act of 22 December 1944, Section 4.

## **1.3 PROJECT PURPOSE**

Elk City Lake is a multi-purpose water resource project constructed and operated by USACE. Elk City Lake has the following primary purposes:

- Flood Risk Management
- Water Supply
- Water Quality
- Recreation
- Wildlife

Environmental stewardship, though not listed as a primary project purpose, is a major responsibility and inherent mission in the administration of federally owned lands. 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 Conservation Act, place emphasis on the environmental stewardship of Federal lands and USACE-administered Federal lands, respectively.

## **1.4 PURPOSE AND SCOPE OF MASTER PLAN**

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. This revision of the Elk City Lake 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 planning period of 2021 to 2046 (i.e., 25 years).

The Elk City Lake 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 Elk City Lake project. It is a vital tool for responsible stewardship and sustainability of the project's natural and cultural resources. It makes provision for outdoor recreation facilities and opportunities on federal land associated with Elk City Lake for the benefit of present and future generations. The Plan guides and articulates the 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 Elk City 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 four primary components, as follows:

- Regional and ecosystem needs
- Project resource capabilities and suitability

- Expressed public interests that are compatible with Elk City Lake's authorized purposes
- Environmental sustainability elements.

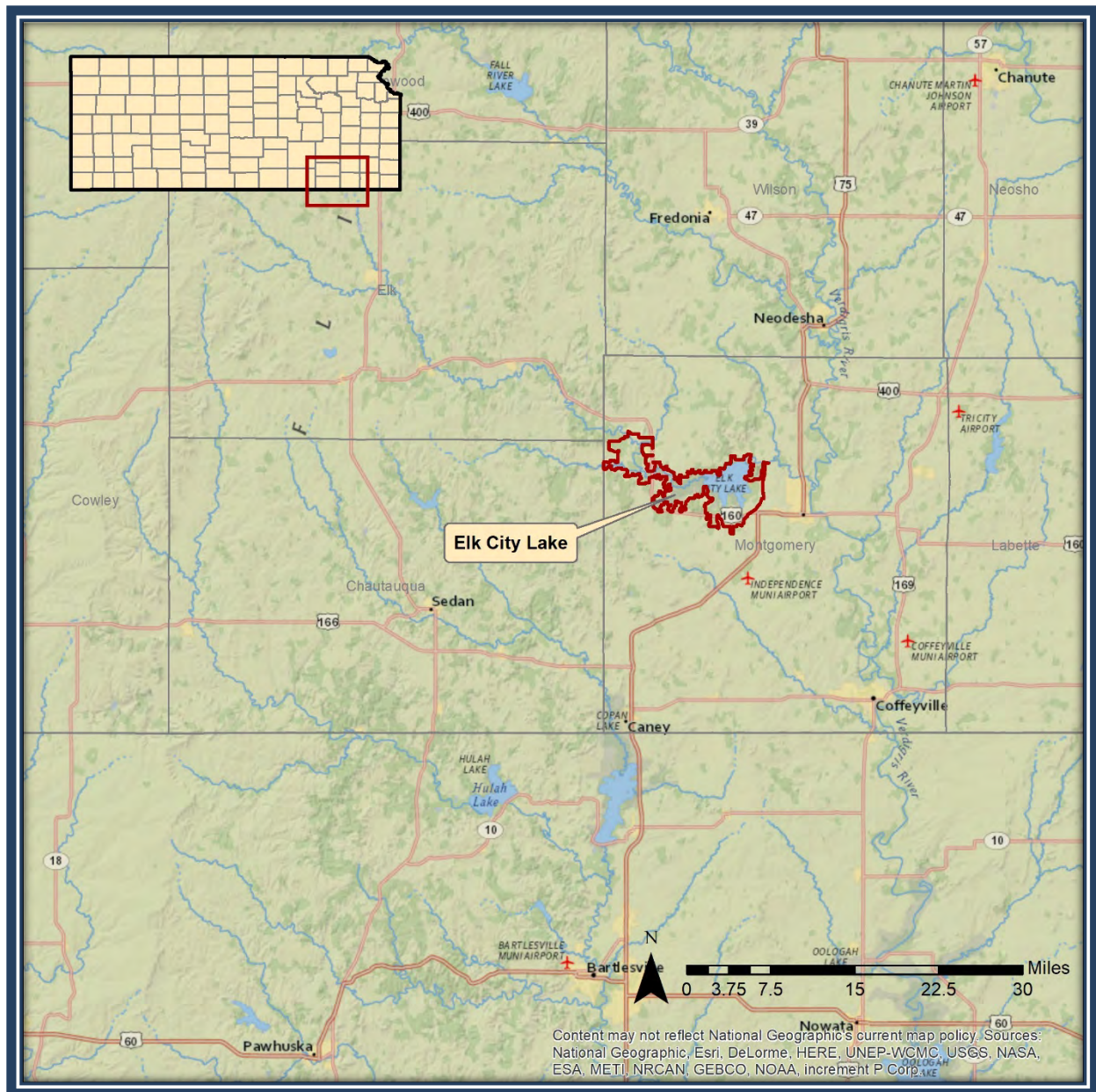
It is important to note what the Master Plan does not address. As noted in Section 1.1, the Plan does not address the flood risk management or water supply purposes of Elk City Lake. Not addressed in this plan are details of design; management and administration; and implementation, but these are addressed in the Elk City Lake Operational Management Plan (OMP). The OMP is a task oriented, budget linked, 5-year plan that implements concepts set forth in the Master Plan. In addition, the Master Plan does not address the specifics of regional water quality, shoreline management, or water level management. Shoreline management is a USACE program that sets forth policy and rules governing private uses at a USACE lake. The operation and maintenance of primary project operations facilities, including but not limited to the dam, spillway, and gate-controlled outlet, are not included in this Plan.

The 1977 Master Plan, with subsequent supplements, was sufficient for prior land use planning and management. Changes in outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy have occurred over the past decades. Additionally, increasing fragmentation of wildlife habitat, national policies related to land management, and growing demand for recreational access and protection of natural resources are all factors affecting Elk City Lake and the region in general. In response to these continually evolving trends, USACE determined that a full revision of the Elk Lake Master Plan is required as set forth in this Plan.

## **1.5 BRIEF WATERSHED AND PROJECT DESCRIPTION**

The Verdigris River rises in the Flint Hills of Chase County, Kansas, and flows generally southeast from the vicinity of Madison to Neodesha, Kansas, and then in a southerly direction to its confluence with the Arkansas River. The Verdigris River basin is roughly oval in shape, with a total area of 8,303 square miles. The principal tributaries are Fall River and Elk River. The Elk River Sub-Basin is also oval and has an area of 634 square miles. The Elk River valley floor varies from an elevation of approximately 735 feet NGVD near the Verdigris confluence to 1,400 feet NGVD in the upper reaches of Elk County, Kansas. The slope of the Elk River averages about 5.0 feet/mile.

The embankment is a rolled, earth-filled structure consisting of random fill with an impervious core. The crest of the embankment is at elevation 849.0 feet NGVD and has a maximum height of 107 feet above streambed. The embankment has a crest length of 4,840 feet. The upstream slope of the embankment is protected by 24 inch riprap on backing material and the downstream slope is grass covered. The right embankment rim dike has a top elevation of 849.0 feet NGVD, a crest width of 12 feet, and a maximum height of 43 feet. A separate dike 29 feet high and 10,000 feet long protects Elk City.



**Figure 1 - Elk City Lake Vicinity Map**

The spillway is an uncontrolled, concrete, gravity, ogee weir type structure with a net length of 400 feet, and a crest elevation of 825.0 feet NGVD. The structure is located in a saddle approximately two miles southeast of the main embankment. Spillway discharge at maximum pool is 120,800 cubic feet per second (cfs).

Low-flow releases are provided by a 24 inch diameter low flow pipe. A diesel-powered generator is provided for emergency use in the event of power failure. Discharge capacity of the outlet works at the top of the conservation pool is 9,020 cfs with minimum tailwater conditions. The low-flow pipe discharges 89 and 26 cfs at pool elevations 796.0 feet NGVD and 764.0 feet NGVD, respectively. Bank-full capacity



below the dam site is about 8,800 cfs and on the Verdigris River below the mouth of Elk River near Independence, Kansas, is 21,000 cfs.

A rolled, earth-filled rim-dike 21,712 feet long is located along the right rim of the reservoir. A rolled, earth-filled dike 10,286 feet long is located on three sides of Elk City, Kansas.



**Photo 1 - Elk City Dam (USACE)**

**Table 1-1 - Elk City Lake Construction Activities and Dates**

Activity	Date
Construction Start	30 January 1962
Date of Diversion	2 July 1965
Final Storage Start	17 March 1966
Conservation Pool Full	12 June 1967

## **1.6 DESCRIPTION OF RESERVOIR**

Elk City Lake has a conservation pool covering 3,515 acres (elevation 796.0 feet NGVD) and inundates a total of 13,286 acres at flood control pool elevation 825.0 feet NGVD (Table 1-2) as calculated using GIS technology. The lake has approximately 50 miles of shoreline at the top of the conservation pool.

The flood control pool ranges between elevation 796.0 – 825.0 feet NGVD and covers between 3,515 and 13,286 water surface acres. The conservation storage totals 37,422 acre-feet. The flood risk management storage totals 224,418 acre-feet. The inactive storage pool totals 28.97 acre-feet at elevation 764.0 feet NGVD (Table 1-2). Streambed elevation is 742.0 feet NGVD.

At the top of conservation pool, the Elk City Lake extends approximately seven miles upstream from the dam. The lake has arms extending up the valleys of tributaries to form an irregular shaped body of water.

## **1.7 PROJECT ACCESS**

The USACE and the State of Kansas maintain parks and access points on Elk City Lake. The project is accessible by improved State and Federal highways. US Highway 160, the major east-west highway through Elk City and Independence, skirts the south edge of the lake and provides access from the east and west. US Highway 75 provides access from the south. Similarly, the north shoreline is accessible from US 75 and State Highway 39. At this time, no major roads are planned for this area.

Portions of wildlife areas are open to public hunting. Gravel, township, and county dirt roads provide access to the areas. No hunting is permitted in developed recreational areas on the lake or in the vicinity of the dam and other project structures.

Three park areas offer picnicking and camping sites (with and without electricity), swimming areas, boat launching ramps, water hydrants, sanitary facilities, showers, fireplaces, playgrounds, and group shelters.

Boat ramps are sited in old river channels or other areas having adequate water depths under drawdown conditions. Swimming is available at Elk City State Park.

Elk City Lake has seven scenic trails: The Eagle Rock Mountain Bike Trail, Table Mound Hiking Trail, Post Oak Self-Guided Nature Trail, Green Thumb Nature Trail, Elk River Hiking Trail, Timber Ridge Hiking Trail, and Osage Lowlands Trail, which is a multi-purpose, all-weather trail. Nature trails are provided in the public use areas as an interpretive and recreational feature. Foot trails are provided for recreational hiking, to provide intra-and and inter-use area access, and access to remote tent camping sites.

Nationwide, USACE manages shoreline use of public property to provide maximum benefits to the public. There are no existing private facilities on Elk City Lake. No future private facilities will be permitted in accordance with ER 1130-2-406, dated 31 October 1990.



## 1.8 PRIOR DESIGN MEMORANDA

Design Memorandums (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 Elk City Lake, Elk River, Kansas, Design Memorandum No. 6b, Master Plan dated June 1977, presents a program for development and management of the Elk City area for recreation and other land and water uses. The following are DMs for Elk City Lake:

- Design Memorandum No. 1, Hydrology, dated February 1957
- Design Memorandum No. 2, Economics, dated March 1957
- Design Memorandum No. 3, General Design, dated March 1959
  - Supplement #1 dated March 1960
- Design Memorandum No 4, Geology, Soils & Structural Foundations, dated April 1959
  - Supplement #1 dated March 1960
- Design Memorandum No. 6-1 Preliminary Master Plan, dated July 1959
- Design Memorandum No. 6B, Master Plan, dated June 1977
- Design Memorandum No. 7, Construction of Project Buildings & Access Road, dated January 1960
- Design Memorandum No. 8, Relocation of Sinclair Pipeline Company 8-Ince Products Line, dated July 1960
- Design Memorandum No. 9 & 10, Outlet Works & Embankment, dated December 1962
- Design Memorandum No. 11, Relocation of Atchison, Topeka & Santa Fe Railway Company Facilities, dated June 1962
- Design Memorandum No. 13, Rim Dike & Saddle Spillway, dated January 1963
- Design Memorandum No. 14, Relocation of Service Pipe Line Company Facilities, dated June 1962
- Design Memorandum No. 16, Relocation of U.S. Highway 160, dated September 1962
- Design Memorandum No. 17, Relocation of Montgomery & Chautauqua County Roads, dated May 1963
- Design Memorandum No. 18, Relocation of Southwestern Bell Telephone Company Facilities, dated March 1963
- Design memorandum No. 19, Relocation of Kansas Gas & Electric Company Facilities, dated April 1963

- Design Memorandum No. 20, Relocation of Totah Telephone Company Facilities, dated September 1963
- Design memorandum No. 21, Protection for Elk City, dated April 1963
- Design Memorandum No. 22, Relocation of Radiant Electric Cooperative Inc. Facilities, dated April 1963
- Design Memorandum No. 26, Reservoir Clearing, dated July 1964
- Design Memorandum No. 27, Sedimentation & Degradation, dated May 1964
- Design Memorandum No. 28, Relocation of Caney Valley Electric COOP, INC Facilities, dated November 1964
- Design Memorandum No. 29, Relocation of Cities Service Gas Company Facilities, dated September 1965

## 1.9 PERTINENT PROJECT INFORMATION

Pertinent information regarding operational pool elevations and existing reservoir storage capacity at Elk City Lake is provided in Table 1-2. Data is based upon the 2010 sedimentation survey.

**Table 1-2 - Elk City Lake Pertinent Data**

Feature	Elevation (feet NGVD)	Area (acres)	Capacity (acre-feet)	Equivalent Runoff (inches) <sup>(1)</sup>
Top of Dam	849.0	29,628	768,327	22.73
Maximum Pool	842.84	24,690	577,074	17.1
Top of Flood Control Pool & Spillway Crest	825.0	13,286	261,840	7.75
Flood Control Storage	796.0 - 825.0	-	224,418	6.63
Top of Conservation Pool	796.0 <sup>(2)</sup>	3,515	37,422	1.11
Conservation Storage	764.0 - 796.0	-	37,393 <sup>(3)</sup>	1.10
Top of Inactive Pool	764.0	19.09	28.97	0.00
(1) From a 634-square-mile drainage area above the dam. (2) Seasonal pool plans are usually proposed on an annual basis by the State of Kansas.				

(3) Includes 32,126 acre-feet (86%) for Water Supply (10 mgd yield) and 5,266 acre-feet (14%) for Water Quality control (7.4 mgd yield).

Current acreages for the various land classifications at Elk City Lake are shown in Table 1-3. These land classifications are standard throughout USACE and are set forth in EP 1130-2-550 dated 15 November 1996, as amended. Acreages have been revised and updated from the previous Master Plan, as amended in 1988, to reflect current and projected land use and resource management objectives. These acreages were calculated using Geographic Information Systems (GIS).

**Table 1-3 - Acreage by Land Classification**

Classification	Acres
Project Operations	625
High Density Recreation	650
Environmental Sensitive Areas	764
Multiple Resource Managed Lands:	
Low Density Recreation	1,174
Wildlife Management	11,421
Vegetative Management	0
Future/Inactive Recreation Areas	0
Water Surface:	
Restricted	2
Designated No-wake	6
Fish and Wildlife Sanctuary	234
Open Recreation	3,621
<b>Total Acreage in Fee</b>	<b>18,497</b>
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.	

## 2 PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT

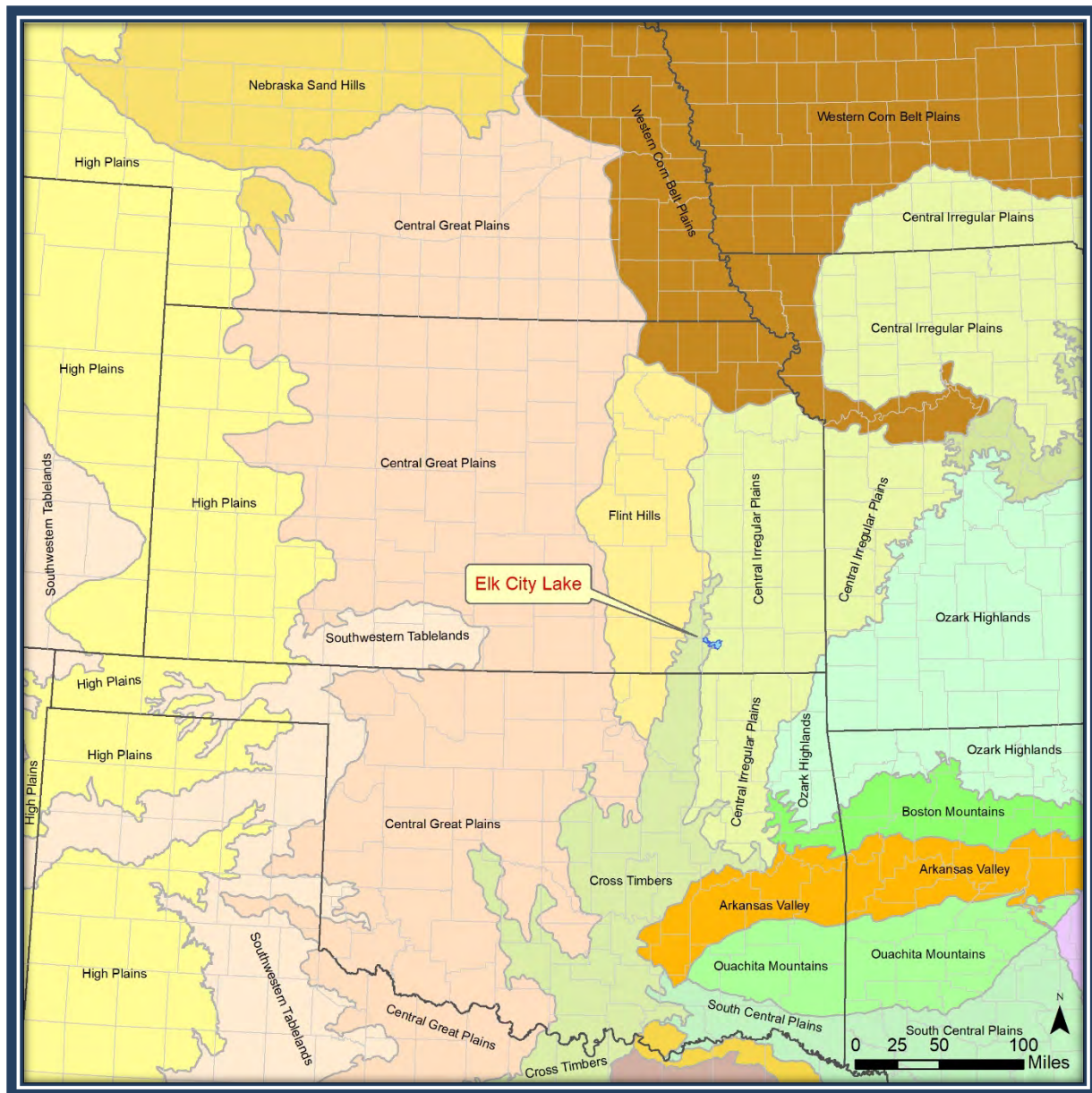
### 2.1 PHYSIOGRAPHIC REGION

#### 2.1.1 Ecological Setting

Ecoregions denote areas of general similarity in ecosystems and in the type, quantity, and quality 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.

Elk City Lake lies at the northeastern edge of the Cross Timbers ecoregion (Level IV) and the western edge of the Central Irregular Plains ecoregion (Level IV). The Cross Timbers area extends through eastern Oklahoma into northern Texas. In Kansas, this region is known as the Chautauqua Hills and has a diversity of habitat that includes upland woodlands on sandstone outcrops dominated by post oak and blackjack oak, surrounded by terraces of prairie and gently rolling terrain gradually sloping to the water's edge.

The Central Irregular Plains area is characterized by irregular undulating plains of sandstone, limestone, and shale, then shifting from a mosaic of prairie and woodland to extensive woodlands, moving to flat erosional areas poorly drained and less fertile soils. Topography is distinct from the more dramatic rolling hills of the Flint Hills to the west. Potential natural vegetation ranges from a mosaic of mostly tallgrass prairie in the west to a mixture of tallgrass prairie and oak-hickory forest in the east, with floodplain forests along streams. Where forests stand, density generally increases from west to east.



**Figure 2 - Ecoregions of Elk City Lake (Source: EPA)**

### 2.1.2 Climate

The climate of the region in which Elk City Lake is characterized by moderate winters and comparatively long summers with relatively high temperatures. Summer rains generally occur as thunderstorms with very intense rainfall of short duration and limited areal coverage. Winter rains are generally of low intensity but cover a large area and are of considerably longer duration. The Gulf of Mexico is the source of much of the precipitation which falls on the basin.

Most major storms in the Elk City 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 high runoff events in the basin. The largest storm in the 68 years of records was the September 26 to October 4, 1986 storm which produced an average of 9.93 inches of rainfall over the basin. This storm was the combination of a stalled cold front and the remnant of a hurricane. Time of year and antecedent soil moisture conditions are major factors that determine the amount of runoff from a given storm. Thus, some lesser rainfall storms have resulted in runoff as great as or greater than storms of higher rainfall.

**Table 2-1 - Temperature and Precipitation**

Temperature. Independence Kansas Period of Record (1930 - 1991)	
Mean annual	57.7°F
Maximum	113° F (1954)
Minimum	-21° F (1982)
Precipitation	
Mean Annual Rainfall (Period of record 1930 - 1991)	35"
Maximum Annual Rainfall (record)	57" (1961)
Minimum annual Rainfall (record)	21" (1956)
Percent rainfall during growing season (April through September)	68%
Mean Annual Snowfall (Period of record 1930 - 1991)	16.8"
Maximum Annual Snowfall (record)	30" (1987)
Minimum Annual Snowfall (record)	0" (multiple)

Source: 1995 Elk City Water Control Manual

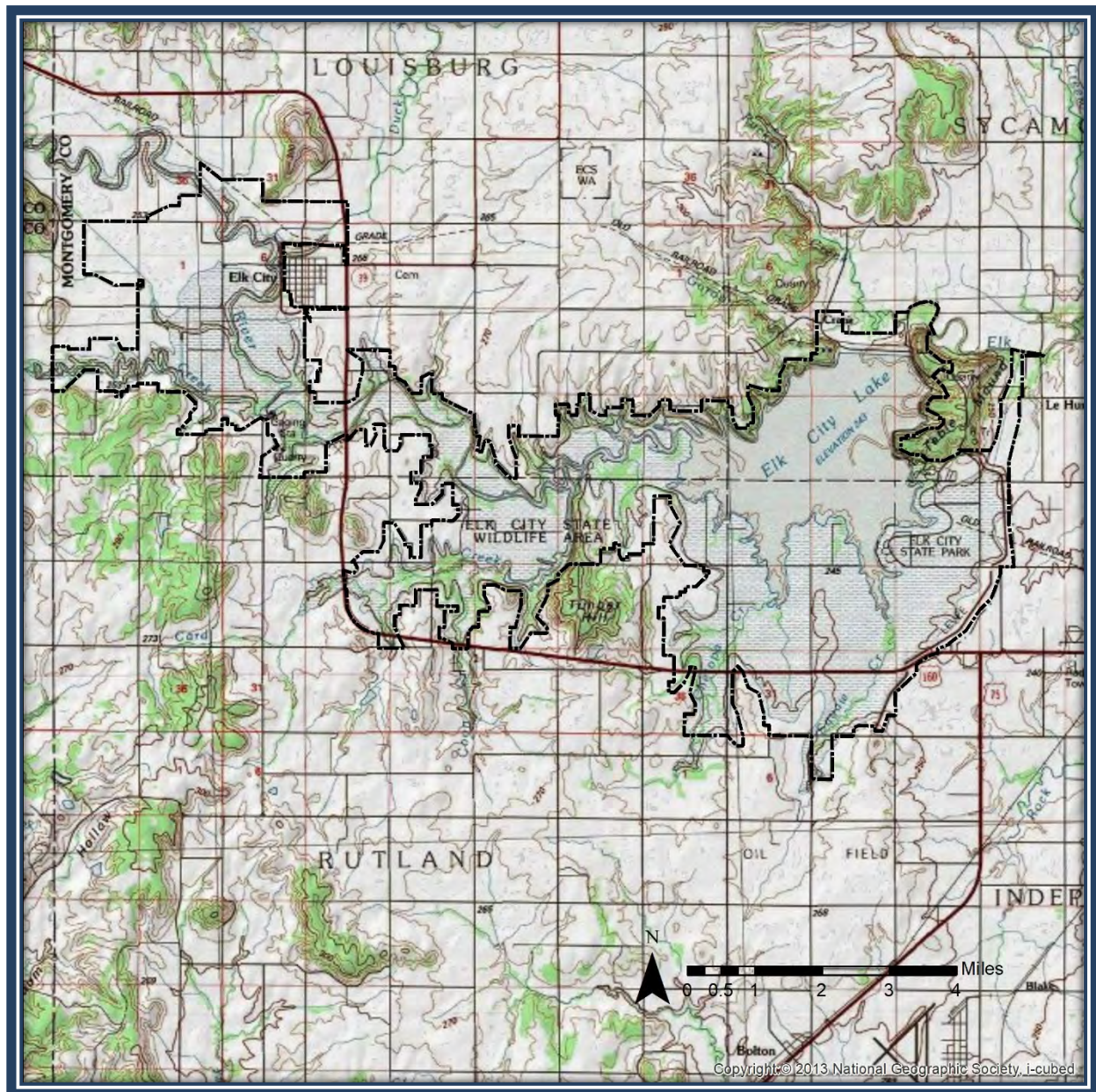
### 2.1.3 Geology

Elk City Lake is located in the Cherokee Plains subdivision of the Prairie Plains physiographic province. The bedrock strata are shale and limestone of Pennsylvanian age. Geologic formations on the project lands are some of the area's most important scenic resources. The rock bluff along the northwest and east shore of the lake is limestone and contains fossils and strata of interest to the student of geology. The area is also of interest to the explorer-hiker because of its many formations and crevices.



### 2.1.4 Topography

The greater portion of the Elk River watershed is formed by the hills of Elk County, Kansas and undulating plain near the Verdigris confluence. The terrain is rough and broken, with elevations rising to 1,500 feet. The valley side slopes are relatively steep, with most of the valley in cultivation or pastureland. Wooded areas are prevalent along channels and in the river bottoms.



**Figure 3 - Elk City Lake Topography (Source: ESRI)**

Elk City Lake is located in the "Chautauqua Hills" region of the Verdigris River Basin. Topography in the area varies from steep wooded slopes to broad rolling open crop and

pastureland. Land in the vicinity of the lake to the north of Elk River is very flat and is primarily devoted to agricultural and livestock production. Prominent features of the landscape are the precipitous rock bluff and the tableland that mark the north margin of the river valley for several miles above the dam site. In this area, the banks along Elk City Lake are from 30' to 40' in height, generally stable, and thickly covered with trees and brush. To the east, the terrain is rather steep in some areas and rugged with rocks jutting out along the hillside. Along the flat areas of the lake shore, a fluctuation in the vertical pool elevation results in a large horizontal fluctuation.

#### 2.1.5 Hydrology and Groundwater

Elk River Watershed is in southeastern Kansas and drains areas of Elk and Montgomery counties with small drainage areas originating in Butler, Greenwood, Wilson, and Chatauqua counties. The primary waterway is the Elk River which includes numerous creeks and tributaries that flow into the river. Elk City Lake is the single major lake located in the watershed. The Elk River Watershed is a portion of the larger Verdigris Basin that includes the Verdigris River and supplies water to Lake Oologah in Oklahoma.

The general shape of the 634 square mile Elk River drainage basin above Elk City Dam is elliptical, approximately 45 miles long and 15 miles wide. Generally, the storms common to the drainage basin are not of uniform intensity. Floods in this area of Kansas generally peak faster than those on the Lower Verdigris. This is partly due to the steep slopes and impervious soils. In the hilly western reach between Butler County, Kansas, and Elk Falls, the area widens and there are many lesser tributaries which converge on Elk Falls. The river bottoms in this reach are generally farmed. Below Elk Falls, the wooded overbanks tend to attenuate peak flows and prolong flood duration. Base flow in the Elk River is low, and periods of zero flow have been observed. The time from beginning of runoff to peak flow into Elk City Lake is about 24 hours. However, this time is highly dependent on the storm pattern and time of year.

#### 2.1.6 Soils

A soil survey by the Natural Resource Conservation Service (NRCS) shows there are eight possible general classifications (Classes I through Class VIII) occurring in the reservoir area. The erosion hazards and limitations for use increase as the class number increases. Class I has few limitations, whereas Class VIII has many. The soil class data for project lands is provided in Table 2-2. This data is compiled by the NRCS and is a standard component of natural resources inventories on USACE lands. This, and other inventory data, is recorded in the USACE Operations and Maintenance Business Information Link (OMBIL).

**Table 2-2 - Soil Classes**

Soil Class	Acreage	Soil Class	Acreage
Class I	588	Class V	128
Class II	8,427	Class VI	1,889
Class III	2,092	Class VII	517
Class IV	327	Class VIII	51

A general description of the soils at Elk City Lake and the land capability classes are described below.

- *Class I* soils have slight limitations that restrict their use.
- *Class II* soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
- *Class III* soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.
- *Class IV* soils have very severe limitations that restrict the choice of plants or require very careful management, or both.
- *Class V* soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
- *Class VI* soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
- *Class VII* soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.
- *Class VIII* soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or Water Supply or for aesthetic purposes.

The predominant soils at Elk City Lake in order of prevalence are Class II, III and VI. In general, the soils in the watershed have moderate to severe limitations reducing vegetation variety and which may require special conservation practices. Detailed information on all soil types surrounding Elk City Lake is available on websites maintained by the NRCS, U.S. Department of Agriculture.



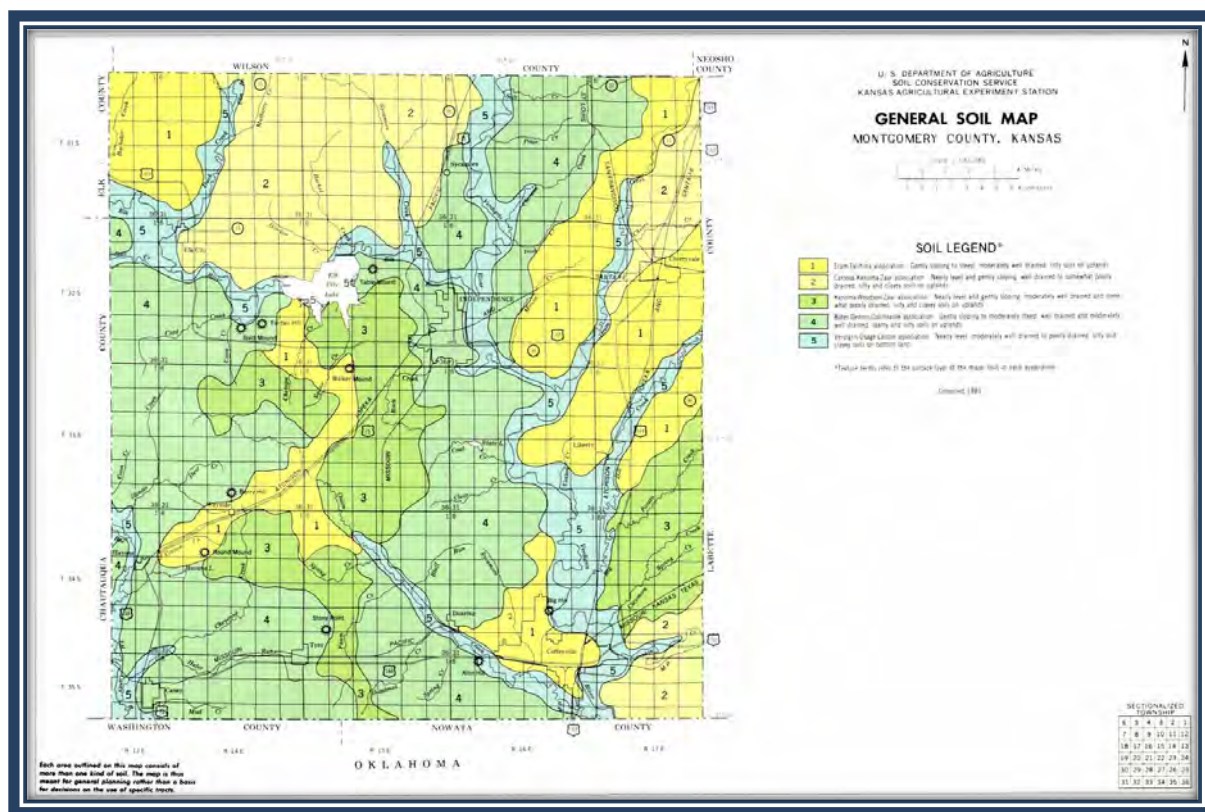


Figure 4 - General Soils Map, Montgomery County (Source: NRCS)

## 2.2 ECOREGION AND NATURAL RESOURCE ANALYSIS

Natural resources present at Elk City Lake include the waters, wetlands, soils, vegetation, and fish and wildlife, including those species listed as endangered or threatened by the US Fish and Wildlife Service (USFWS) and the State of Kansas. The stewardship of natural resources on USACE administered lands adheres to ecosystem management principles as described in USACE regulations ER and EP 1130-2-540. Effective stewardship is imperative to the sustainability and use of project resources. The baseline analysis of the natural resources on USACE-administered lands relied heavily on the information provided in the 2016 Kansas Wildlife Action Plan (WAP).

### 2.2.1 Vegetative Resources

USACE regulations and policy require a basic inventory of the vegetation at all operational projects. This inventory, referred to in *EP 1130-2-540* as a Level 1 inventory, classifies the vegetation in accordance with the National Vegetation Classification System (NVCS) down to the Sub-Class level, which is a very broad classification level. The inventory data, presented in Table 2-3, is recorded in the USACE national database referred to as the OMBIL and is useful in providing a general

characterization of the vegetation on all operational projects. Daily management of USACE lands requires more detailed knowledge of the vegetation down to the Association level within the NVCS, and for most management prescriptions, down to the individual species level of dominant vegetation.

**Table 2-3 - Vegetation Classification and Condition 2019 Inventory**

Division	Order	Class	Sub Class	Total Sub Class Acreage	Sustainable Areas	Transitioning Acres	Degraded Acres	Total Conditioned Acres
<b>NON-VEGETATED</b> (includes open water surface of the lake and eroded shoreline)	Non-Vegetated	Non-Vegetated	Non-Vegetated	4,860	4,860	0	0	4,860
<b>VEGETATED</b>	Herb Dominated	Herbaceous Vegetation	Annual graminoid or forb vegetation	500	100	300	100	500
<b>VEGETATED</b>	Herb Dominated	Herbaceous Vegetation	Perennial forb vegetation	1,800	250	1,300	250	1,800
<b>VEGETATED</b>	Herb Dominated	Herbaceous Vegetation	Perennial graminoid vegetation (grasslands)	4,500	700	3,500	300	4,500
<b>VEGETATED</b>	Shrub Dominated	Shrubland (Scrub)	Deciduous shrubland (scrub)	2,200	250	2,000	250	2,500
<b>VEGETATED</b>	Tree Dominated	Closed Tree Canopy	Deciduous closed tree canopy	2,500	250	2,000	250	2,500
<b>VEGETATED</b>	Tree Dominated	Open Tree Canopy	Deciduous closed tree canopy	2,109	2,109	0	0	2,109
<b>Totals</b>				<b>18,469</b>	<b>8,519</b>	<b>9,100</b>	<b>1,150</b>	<b>18,769</b>

Note: Classification information derived from the National Vegetation Classification System

As described in the WAP, the Chautauqua Hills Ecological Focus Area (EFA) is in southeast Kansas just east of the Flint Hills. This area is the Kansas portion of a larger area often referred to as the Cross Timbers that extends south through Oklahoma and into Texas. The Chautauqua Hills are rolling uplands with sandstone bedrock underneath. Blackjack and post oaks are interspersed throughout the tallgrass prairie habitat. An open savannah landscape was probably more common before fire suppression occurred and may have kept the oak stands from becoming dense. This

EFA is defined by the Physiographic Province boundary (Kansas Geological Survey 1997).

The Verdigris EFA is comprised of the Central Oklahoma/Texas Plains and part of the Central Irregular Plains. Kansas contains the northern extent of the region. The Cross Timbers area separates this region from the tallgrass prairie of the Flint Hills, and the mosaic of oak-hickory forest and tallgrass prairie of the Osage Cuestas to the east.

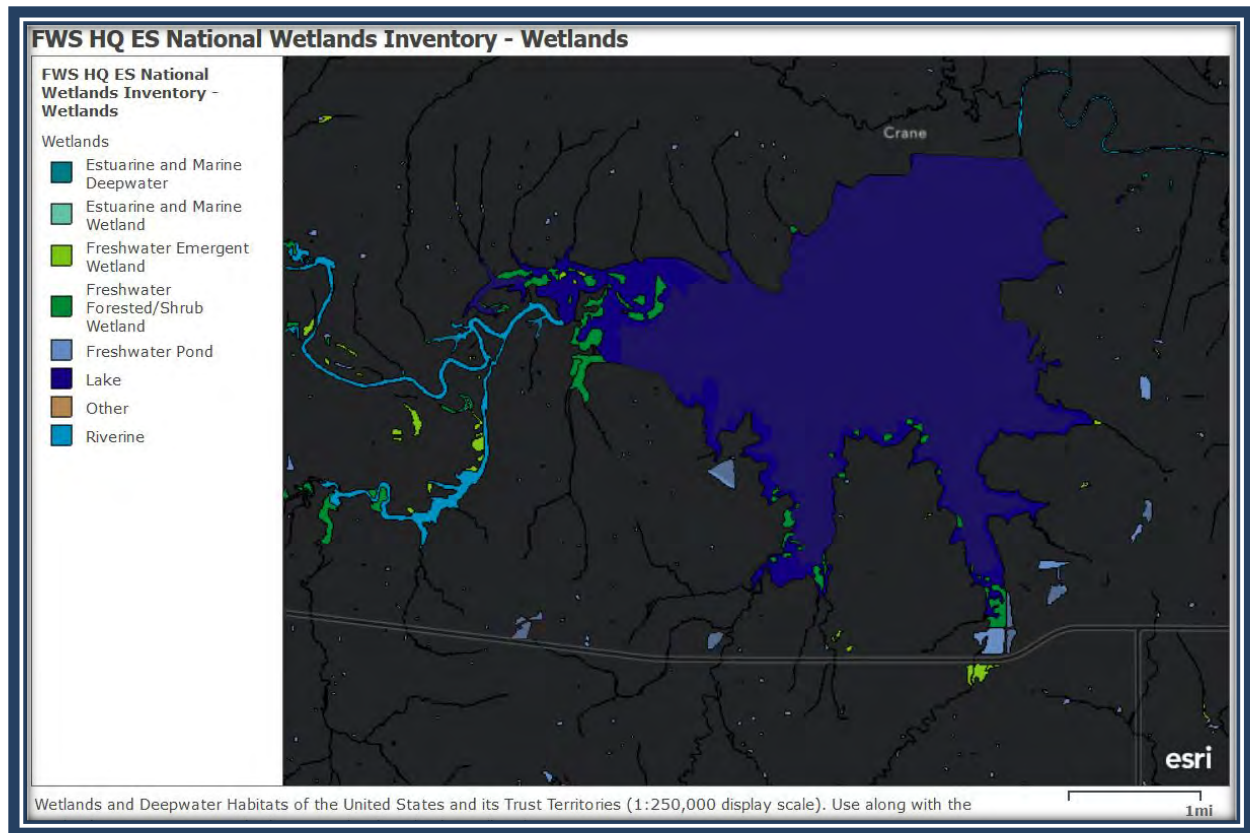


**Photo 2 - Elk River below dam (Source: USACE)**

### 2.2.2 Wetlands

In accordance with national USACE policy, wetlands at operational projects are inventoried using the protocol established by the USFWS in their Classification of Wetlands and Deepwater Habitats of the United States. The majority of wetlands in the vicinity of Elk City Lake are Lake, Freshwater Forested / Shrub Wetland, and Freshwater Emergent Wetland. There are some Freshwater Ponds and Riverine in the coves and up tributaries.





**Figure 5 - USFWS Wetland Inventory for Elk City Lake (Source: USFWS)**

Within these systems (palustrine, lacustrine, and riverine), wetlands have been further classified as limnetic and littoral (lacustrine); emergent aquatic vegetation, forested, scrub-shrub, unconsolidated bottom, and unconsolidated shore (palustrine); and lower perennial (riverine). Many of the wetland types have been further classified as diked/impounded or excavated, indicating that they formed under conditions created by humans. The wetlands in the vicinity of Elk City Lake are also subject to different hydrologic regimes, including seasonally flooded, semi-permanently flooded, and permanently flooded.

Table 2-3 lists the acreages of various types of wetlands present at Elk City Lake. Data was retrieved from the 2019 Project Wetland Classes reported in OMBIL. As noted in Table 2-3, all USACE land at Elk City Lake has been inventoried.

**Table 2-4 - Wetland Classification 2019 Inventory**

System	Sub-System	Class	Class Acres
<b>Palustrine</b>	NO SUB-SYSTEM	Unconsolidated Bottom	1
<b>Palustrine</b>	NO SUB-SYSTEM	Unconsolidated Shore	1
<b>Riverine</b>	Lower Perennial	Unconsolidated Bottom	100
<b>Palustrine</b>	NO SUB-SYSTEM	Forested Wetland	118
<b>Lacustrine</b>	Limnetic	Unconsolidated Bottom	4318
<b>Palustrine</b>	NO SUB-SYSTEM	Emergent Wetland	65.5
<b>Palustrine</b>	NO SUB-SYSTEM	Aquatic Bed	77.3
<b>Palustrine</b>	NO SUB-SYSTEM	Scrub-Shrub Wetland	8

Source: OMBIL

### 2.2.3 Fish and Wildlife Resources

Elk City Lake provides habitat for an abundance of fish and wildlife species. The lake provides a quality fishery, as well as quality wildlife habitat on public land associated with the project. The following is a description of the fish and wildlife resources found at Elk City Lake.

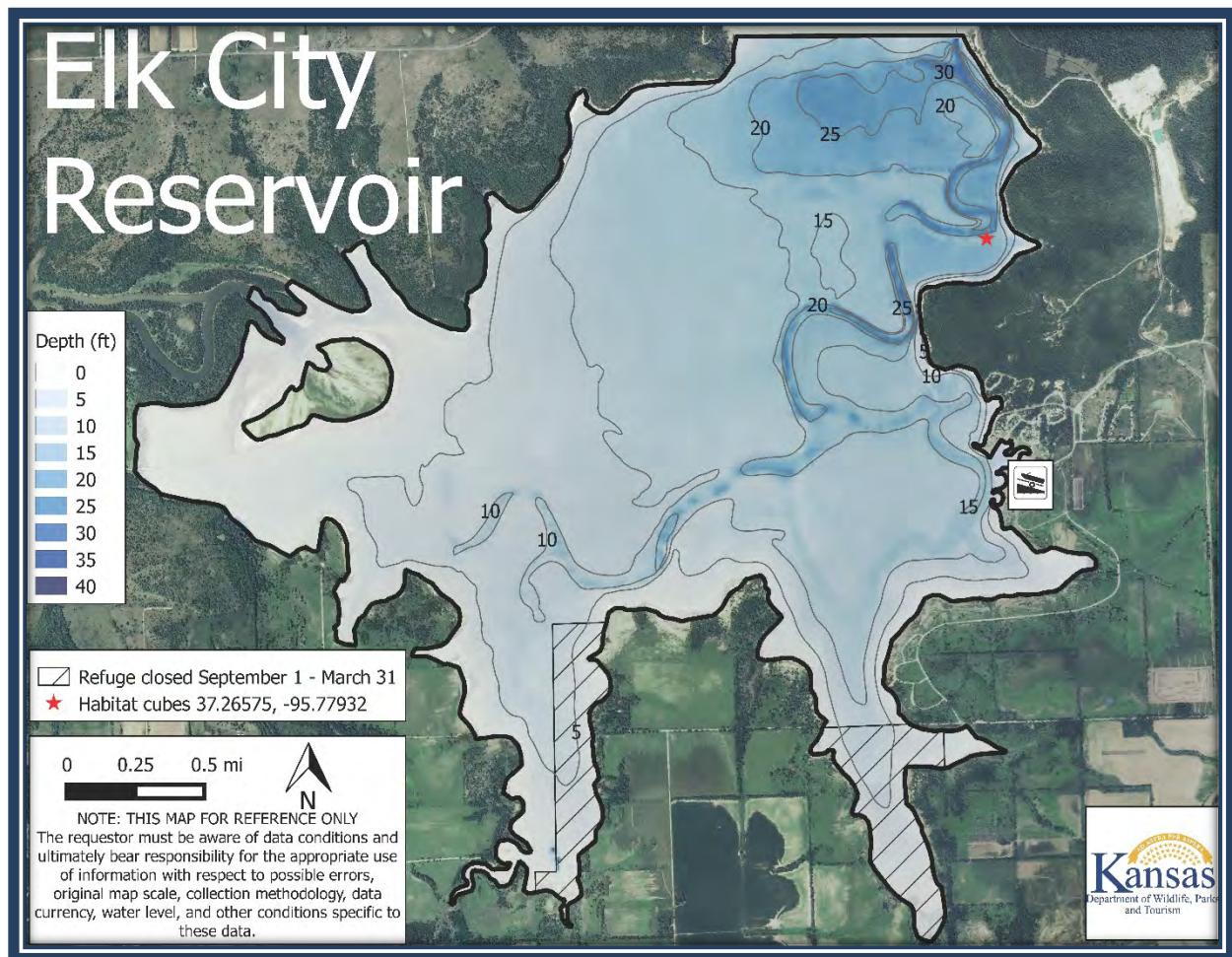
#### Fisheries Resources

In addition to hunting, Elk City Lake also provides abundant fishing opportunities in many varying habitats including steep, rocky shorelines, shallow mudflats, and submerged timber. The reservoir also connects to several creeks that feed into the lake, each varying in depth, width, and structure. Elk City Lake offers more than 50 miles of shoreline and nearly 4,000 acres of open water.

Prominent populations of fish include walleye (*Sander vitreus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomeieu*), crappie (*Pomoxis spp.*), white bass (*Morone chrysops*), Palmetto wiper (white bass x striped bass), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), blue catfish



(*Ictalurus furcatus*), and flathead catfish (*Pylodictis olivaris*). Specific information on fish resources at Elk City Lake can be found on KDWP's website<sup>1</sup>.



**Figure 6 - Bathymetric map of Elk City Lake (Source: KDWP)**

<sup>1</sup> <https://ksoutdoors.com/Fishing/Where-to-Fish-in-Kansas/Fishing-Locations-Public-Waters/Southeast-Region/Elk-City-Reservoir>



**Photo 3 - Deer caught on game camera at Elk City Lake (Source:USACE)**

### Wildlife Resources

The KDWP has a license to approximately 12,240 acres of project land for wildlife management and public hunting. The USACE oversees 1,600 acres of the area for wildlife purposes. Wildlife game species commonly found in the Elk City Lake area include bobwhite quail, cottontail rabbit, mourning dove, fox squirrel, white-tailed deer, turkey, and various species of ducks and geese. The surrounding expanses of grass and wooded hillsides support some of the best quail populations in Kansas. The distribution of deer in the area is excellent. Opportunities for waterfowl hunters are good.

The KDWP urges all sportsmen to respect posted signs and not trespass on private adjoining property.

No hunting is permitted in developed recreational areas on the lake, in the vicinity of the dam and other project structures, or within the designated boundaries of the waterfowl refuge.

Hunting and fishing activities are regulated by Kansas law and federal regulation.





**Photo 4 - Bird of prey at Elk City Lake (Source: KDWP)**

#### 2.2.4 Threatened and Endangered Species

Threatened species are those which are likely to become endangered within the foreseeable future. Endangered species are in danger of extinction throughout all or a significant portion of their range. USFWS also identifies species that are candidates for listing as a result 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. The USFWS Information for Planning and Conservation (IPaC) identified several species listed by the USFWS as Threatened or Endangered that could potential be found at Elk City Lake. (Table 2-5 – See Appendix C for the IPAC report for Elk City Lake).

**Table 2-5 - Federal Threatened and Endangered Species with Potential to Occur at Elk City Lake**

Common Name	Scientific Name	Federal Status	State Status
Neosho Mucket	<i>Lampsilis rafinesqueana</i>	Endangered	Endangered
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	Threatened	Endangered
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Endangered
American Burying Beetle	<i>Nicrophorus americanus</i>	Threatened	Threatened

Source: USFWS

### 2.2.5 Invasive Species

Invasive species are any kind of living organism which, if uncontrolled, causes harm to the environment, economy, or human health. Invasive species generally grow and reproduce quickly and spread aggressively. Non-native, or exotic, species have been introduced, either intentionally or unintentionally, and can out-compete native species for resources or otherwise alter the ecosystem. Native invasive species are those species that spread aggressively due to an alteration in the ecosystem, such as lack of fire or the removal of a predator from the food chain. Table 2-6 lists invasive and exotic species that occur at Elk City Lake identified by USACE.

**Table 2-6 - Invasive Species 2020**

Common Name	Scientific Name	Prevalence
Cowbirds	<i>Molothrus ater</i>	Low
Sericea Lespedeza	<i>Lespedeza cuneate</i>	Moderate/High
Johnson Grass	<i>Sorgham halepense</i>	High
Musk Thistle	<i>Carduus natans</i>	Low/Moderate
Red Sesbania	<i>Sesbania punicea</i>	Low

Source: USACE Invasive Species Profile System OMBIL

### 2.2.6 Visual and Scenic Resources

Elk City Lake offers three attractive park areas with picnicking and camping sites, both with and without electricity. Topography varies from steep slopes to broad rolling crop and pastureland. A prominent feature is the precipitous rock bluff that marks the north margin of the river valley for several miles above the dam site. Native trees and shrubs include ash, birch, elm, hickory, oak, walnut, sycamore, dogwood, hawthorn, redbud, deciduous holly, and sumac. A myriad of wild mammals, birds, reptiles, amphibians, and invertebrates add greatly to the vitality and natural heritage of the area.



**Figure 7 - Elk City Lake (Source: KansasTrailsCouncil.org)**

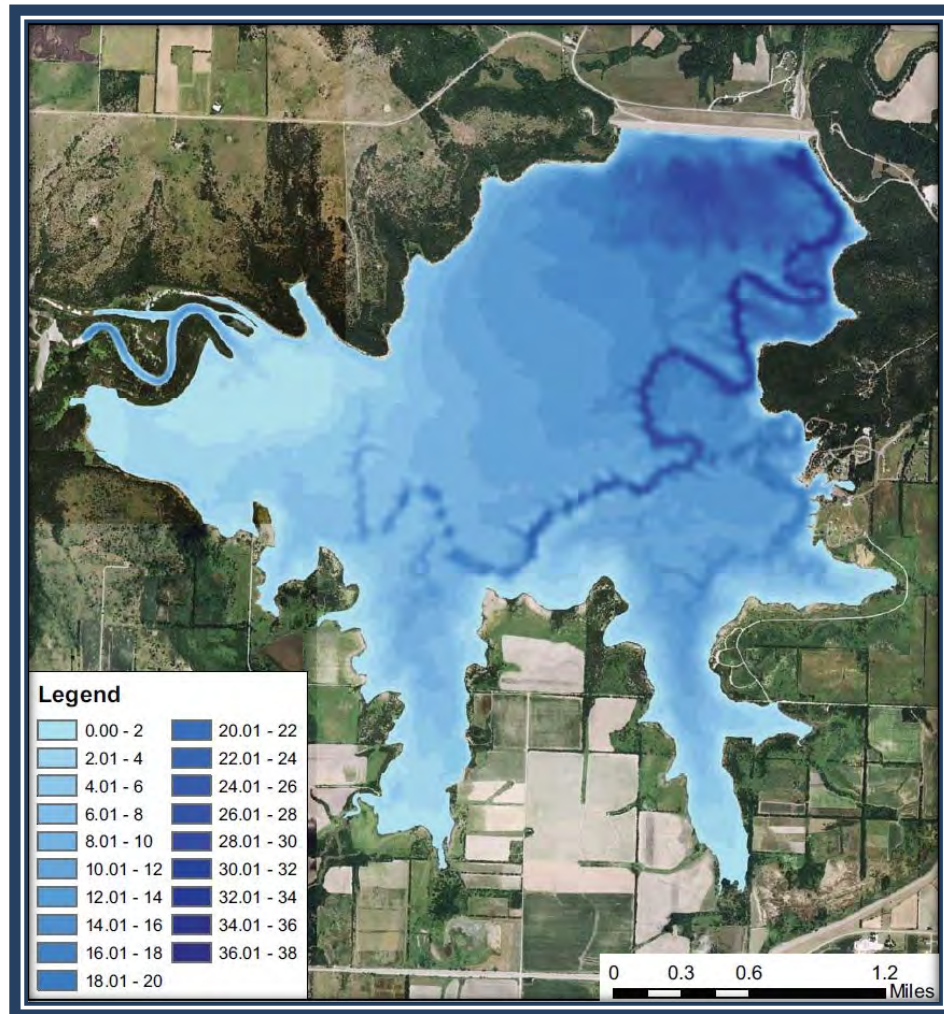
The lake is well known for its seven scenic trails. These trails meander through the colorful oak and hickory forest surrounding the lake and lead the hiker through some of the most interesting rock formations in Kansas. The trails range from a 15-mile scenic trek to a one-mile, all-weather surfaced accessible trail. The trails offer spectacular opportunities for nature enthusiasts to view various wildlife species and enjoy wonderful views. The Elk River Hiking Trail was rated as the best hiking trail in Kansas by "Backpacker" magazine in 2006 and in 2010 was a nominee in the Kansas Sampler Foundation's "8 Wonders of Kansas" geography contest.

#### 2.2.7 Sedimentation and Shoreline Erosion

In May 2010, the Kansas Biological Survey (KBS) performed a bathymetric survey of Elk City Reservoir in Montgomery County, Kansas. The survey was carried out using acoustic echosounding apparatus linked to a global positioning system. The 2010 bathymetric survey by KBS indicated that the area of the conservation pool at 796 ft was 3515 acres with a capacity of 37,422 acre-feet. Comparison of the 2010 capacity to the 1992 Kansas Water Office data suggests that the capacity of the reservoir at the 796 ft. elevation pool has been reduced from 43,504 acre-feet to 37,422 acre feet, or 6082 acre-feet over 18 years (337.8 acre-feet per year), and a loss of 603 acres in area. Fifteen sediment cores were extracted from the lake to determine accumulated sediment thickness at locations distributed across the reservoir. Sediment samples were taken from the top six inches of each core and analyzed for particle size distributions. Bulk density (g/cm<sup>3</sup>) of the sediment was computed for samples from the midpoint of each core.

Bank erosion does occur in parts of this farm region during high flows. This is often aggravated by sudden decreases in flow which cause bank sloughing.

A general discussion of sedimentation can be found in Chapter 6.



**Figure 8 – Water Depth in Feet based on 2003 National Agricultural Imagery Project with water surface elevation of 796' AMSL NAVD29**

### 2.2.8 Water Quality

The State of Kansas has established Water Assurance Districts, authorized by the Kansas Office of Water Resources, to monitor flows and enforce the lawful withdrawal of water by contractual water customers on the Neosho and Verdigris Rivers. The Kansas Water Assurance Plan (KWAP) is a basin-wide approach to meeting the municipal, industrial, and environmental needs of communities associated with those basins outlined in the 1986 MOU between the Assistant Secretary of the Army (Civil Works) and the State of Kansas.



Per the 2020 Kansas Department of Health and Environment Integrated Water Quality Assessment, aquatic life is impaired due to eutrophication (high nutrient loads) that can cause algal blooms and hypoxic (low oxygen) waters. Eutrophication sets off a chain reaction in the ecosystem, starting with an overabundance of algae and plants. The excess algae and plant matter eventually decompose, producing large amounts of carbon dioxide. These nutrients primarily result from surface water runoff from agricultural fields.

The same report considers the high levels of siltation a priority that needs addressed.

### Sustainability

National USACE missions associated with water resource development projects may include flood risk management, water conservation, navigation, recreation, fish and wildlife conservation, 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 most USACE lakes, may be implemented to achieve the fish and wildlife 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, USACE has developed the following statements.

The USACE Sustainability Policy and Strategic Plan states that:

*“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.”*

## 2.3 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 and sacred sites. These property types may be listed on the National Register of Historic Places (NRHP) if they meet the criteria specified by the NRHP, reflecting significance in architecture, history, archaeology, engineering, and culture. Cultural resources that are identified as eligible for listing in the NRHP are referred to as “historic properties,” regardless of category. A Traditional Cultural Property (TCP) is a property that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. Ceremonies, hunting practices, plant-gathering, and social practices which are part of a culture’s traditional lifeways, are also cultural resources.

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

### 2.3.1 Archaeology

There are 140 recorded archaeological sites located wholly or in part on USACE fee lands associated with Elk City Lake. The significance of the sites in the Elk River Valley led to the designation of Elk River Archaeological District, which was listed on the NRHP in 1978 with 69 contributing sites.

Archaeological investigations of the project area were undertaken in anticipation of the impoundment of Elk City Lake. The Kansas State Historical Society, under a cooperative agreement with the National Park Service as part of the National Inter-



Agency Archeological Salvage Program, conducted large surveys, site testing, and excavations beginning in 1961.

Excavations were undertaken at five sites in the summer of 1963 (Frantz, 1964), at four sites in 1964 (Weakly 1965), and at the Infinity site, a National Register listed multicomponent site, during the summers of 1965 and 1966 (Marshall 1972). Two additional sites were identified during dam construction and salvage archaeology was undertaken to collect what data remained. The reservoir was impounded in 1966 and filled by mid-1967. Lands around the reservoir that had not been investigated prior to dam impoundment were surveyed, and by 1978 an additional 17 sites had been recorded (Brogan 1981). The KSHS tested twelve sites in 1978, including four of the newly recorded sites, bringing the total number of sites tested/excavated to 22.

Listed on the NRHP in 1978 with 69 contributing sites, the Elk River Archaeological District includes 14,807 acres, most of which are coterminous with Elk River Lake fee lands. The District extends further west into Elk County, outside of USACE property. There are now more than 135 sites recorded within its boundaries, 105 of which contribute to the Archaeological District. Two sites are individually listed as eligible for the NRHP and contribute to the eligibility of the District. The District was established based upon evidence of successive occupation of the Elk River Valley from the Middle Archaic (~2000 B.C.) through the historic era. The most significant sites document changing lifeways associated with social changes brought on by changing technologies and social structures (Brogan 1981b).

In the larger region there are hundreds of archaeological sites and historic standing structures on record with the Kansas State Historical Society (KSHS). Small surveys have been, and continue to be, conducted in and near Elk City Lake for compliance with Section 106 of the NHPA.

### 2.3.2 Cultural History Sequence

Six broad cultural divisions are applicable to a discussion of the culture history of the region: Paleoindian, Archaic, Woodland, 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. Due to differential rates of change through time in different regions, the State of Kansas has subsumed three of the cultural divisions into the broader Ceramic Period. Due to the use of both systems of cultural divisions in the site records and literature, both systems are incorporated below.

Paleoindian: 13,500 to 9000 BP

Archaic: 9000 to 2000 BP

Woodland (Early Ceramic): AD 1 to 1000

Plains Village (Middle Ceramic): AD 1000 to 1500

Protohistoric (Contact Period; Late Ceramic): AD 1500 to 1825

Historic: AD 1825 to present

## Paleoindian Period

While it is becoming increasingly evident that humans arrived in the Americas as early as 20,000 years ago, the Paleoindian Period is broadly accepted as spanning the end of the Pleistocene into the Early Holocene. The Clovis complex (11,500-11,000) 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 (Blackmar and Hofman 2006). The Dalton Complex is well represented in Eastern Kansas and spans the period from the end of the Paleoindian period and into the Early Archaic (Ballenger 2001; Blackmar and Hofman 2006; Meltzer 2009).

Dynamic landscape evolution throughout the Holocene has resulted in Paleoindian sites in the project area being deeply buried in alluvial stream deposits. Periods of cut and fill of sediments in the river and stream valleys has led to differential preservation of surfaces from this time period, resulting in flushing out of sediments in some locations and time periods, and deposition of large amounts of sediments in other contexts and times (Mandel 2006). Additionally, the arrival of Euro-Americans in the region and subsequent land clearing led to vastly increased volumes of alluvial sedimentation on floodplains, mantling prehistoric surfaces with thick layers of recent alluvial deposits in stream valleys (Weston 1992). In the uplands, wind deposited sediments and tallgrass prairie obscure even shallow sites (Mandel 2006). Where erosion and agriculture are sufficient to reveal very old surfaces, 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 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 (Mandel 2006; Blackmar and Hofman 2006).

## Archaic Period

During the Archaic period, an increase in seasonal variability of resources and increasing populations resulted in changing settlement and subsistence patterns (Hawley and Vehik 2012). 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; Sabo and Early 1990). 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 (Adair and Estep 1991). 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 8,000 BP to 2,000 BP. While the Archaic period is considered pre-ceramic (in that pottery for storage and cooking is not present), a ceramic bead from the Coffey site (in Pottawatomie county north the project area) and small effigy heads from the William Young site (located in Council Grove Lake) are the earliest ceramic figures currently identified in the United States, both from Archaic horizons (Witty 1982; Blackmar and Hofman 2006:64). Fiber tempered ceramics from the Nebo Hill phase in Northeast Kansas represent some of the earliest tempered pottery in the United States (Reid 1983).

The Early Archaic (9000-7000 BP) is best represented near the project area at the Stigenwalt site (14LT351) on Big Hill Creek in Labette County (Thies 1990). The site consisted of two deeply buried large burned rock concentrations, stemmed projectile points, and evidence of a diverse subsistence base that included small mammals such as prairie vole, and plants, such as wild onion.

There are many Middle and Late Archaic sites at Elk City Lake, and within the Elk River Archaeological District, which require additional investigations. It appears likely that sites are present that are transitional from a Late Archaic lifeway to a lifeway represented at Woodland period sites. Much additional research is needed to identify such sites.

#### Woodland (Early Ceramic)

The Woodland Period in Kansas 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. This time is defined in the Eastern Woodlands as Early, Middle, and Late Woodland, all of which comprise the Early Ceramic Period in Kansas (Hoard and Banks 2006). Sites dated to the Early Woodland period are temporary camps with remains of shallow pits and ephemeral houses, and tools which indicate little change in lifeways from the Late Archaic. Like sites from the Late Archaic period, sites dating to the Early Woodland are expected to be deeply buried and rarely encountered (Mandel 2006). In contrast, some Middle and Late Woodland groups from this time constructed more substantial houses, including very large circular to oval grass or thatch covered houses with internal and external pits and hearths (Logan 2006, Marshall 1972, Reynolds 1984, Witty 1999). Extended time spent at habitation sites led to accumulation of large trash deposits. Archaeological assemblages from this period indicate people were living in semi-permanent villages and dispersed communities (Brogan 1981, Rowlison 1980), using settlement strategies such as seasonal mobility, targeted long distance resource procurement by portions of the community or household (such as hunting forays), and intensification of wild and domestic plants to meet their needs. Small game and aquatic resources remained essential in subsistence. Domestication of plants began during this period.

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 (Logan 2006, Marshall 1972, Hawley and Vehik 2012, Witty 1999).

Woodland period sites in Southeast Kansas have been attributed to various named archaeological phases. One of these is the Cuesta phase, defined by Marshall (1972) based upon artifacts and features excavated at the Infinity Site. The phase is defined by house type (large, oval to circular), large low trash mounds, and a distinct artifact inventory (Marshall 1972). There has long been debate as to whether the similarities in technologies and decorative motifs used on pottery are evidence of interaction/communication with, diffusion of knowledge from, or migration by groups from the Kansas City area or the Eastern Woodlands referred to as Hopewell (Adair 2012; Johnson 2001; Logan 2006; O'Brien and Wood 1998). Cuesta phase sites have yielded pottery sherds with the same motifs and other artifacts are sufficiently similar to lead to the determination of a relationship to the Kansas City Hopewell. However, radiocarbon dating has yet to confirm contemporaneity of Cuesta with Kansas City Hopewell. Cuesta phase dates, both conventional and AMS, are significantly later than previously known (Adair 2012), falling within the Late Woodland and Plains Village periods. The Infinity site has components identified as belonging to the Archaic, Middle Woodland, Plains Village, and Historic periods, and exemplifies the need for more precise chronological data. The site is individually listed on the NRHP, and is included in the Elk River Archaeological District.

Named phases in the region attributed to the late Woodland are the Butler phase, which shares many artifact types and ceramic motifs with the Cuesta phase, and the Greenwood phase, which shares house form in addition to artifact types and ceramic motifs with the Cuesta phase. The later radiocarbon dates for Cuesta phase suggest that the differences in named phases are based on minor differences in material culture. This has resulted in a proliferation of named groups, all of whom were adopting and adapting new technologies. There is a need for critical reevaluation of data gathered to date, reexamination of curated collections, and implementation of carefully selected methodology for data collection, including care in selecting samples for radiocarbon dating, going forward (Adair 2012, Logan 2006).

Until the chronology of the area is worked out, it is best to simply approach this time period as one of technological innovation, with ceramics, the bow and arrow, and gradual intensification of horticulture differentiating this time period from more residentially mobile hunting and gathering populations of earlier times.

#### Plains Village (Middle Ceramic)

People during the Plains Village period (A.D. 800 to 1500) grew crops and hunted and gathered wild resources. Artifact assemblages contain gardening tools along with

triangular arrow points for hunting (Hawley and Vehik 2012). Sites from this time are often identified in lowland terraces of waterways where gardening with bone tools was viable (Roper 2002).

The Pomona variant is the Plains Village archaeological culture associated with watersheds in central and eastern Kansas. Witty defined the Pomona variant based upon work conducted at federal reservoirs in eastern Kansas, including Council Grove, John Redmond, Pomona, Elk City, Hillsdale, and Big Hill (Witty 1967, 1978). The Pomona variant has been conceptualized as a phase, a focus, and a variant within which there are four subdivisions (phases). Distinguishing traits include shell-tempered pottery of types attributed by Kansas archaeologists to the Middle Ceramic period, remains of round wattle and daub houses, and a scarcity of cultigen remains such as maize, possibly reflecting less dependence on farming than in other geographic areas during this time (Brown 1985; Thies 1981, 1990; Hawley and Vehik 2012; Witty 1967, 1978). However, the scarcity of identified cultigens is also the result of poor preservation and excavation and processing methods not designed to recover native cultigens, the remains of which are much smaller than maize (Adair 1988, 2006; Roper 2006). Due to the differential rate of people's acceptance of new technologies and changing ways of life, sites attributed to the Pomona variant may overlap temporally with sites attributed to the Woodland period.

The Two Deer site at El Dorado Lake (14BU55) has yielded the earliest evidence for domestication of crops in the region (Adair 1981). Adair and Brown (1981) provide analysis of the artifact classes from their 1978 and 1979 excavations and compare the site to known Woodland and Plains Village sites. Due to similarities and differences identified among the Two Deer site and both Woodland and Plains Village phases identified in the region, it was determined that the site is transitional from Late Plains Woodland to Early Plains Village, and the Bemis Creek phase was coined (Adair and Brown 1981). As discussed in the previous section, much more data are needed to ascertain the processes and timing of the changes in social structure issued in by changes in technology and subsistence.

Knowledge of this period is also limited by variable preservation. Landscape evolution throughout the Holocene resulted in most sites of this period being visible on the surface. Surface sites are exposed by modern landscape modifications much more readily and are therefore more subject to damage by plowing, construction, and looting.

#### The Protohistoric (Contact) Period (Late Ceramic)

The period from A.D. 1500-1825 is referred to as the Protohistoric (or Contact) Period (Late Ceramic). 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. 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). In the Flint Hills region, sites from this time may be attributed to the Great Bend, Kansa, and, toward the late part of the period, the Osage. In Southeastern Kansas, the Osage presence was much more significant.

The Great Bend Aspect is an archaeological complex divided into three major groups in Kansas: the Lower Walnut focus sites of Cowley County, the Little River focus sites of Rice and McPherson counties, and those from the site group in and around the city of Marion. Dated to between 1400 and 1700, the Great Bend aspect is ancestral to the Wichita and Affiliated tribes. 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 sites of the Little River focus represent the villages encountered by a Spanish expedition led by Francisco Vazquez de Coronado in 1541. The expedition was in search of gold they erroneously believed to be in the province of Quivira (Roper et al. 2008; Vehik 2006).

Sites of the Great Bend Aspect are not well known in the project area, but evidence from private collections held by artifact collectors throughout the SE Kansas region indicate a significant Great Bend presence. The identification of Great Bend villages has been severely hampered by modern land use processes and artifact collecting, but one significant site, known as Neodesha Fort, was identified as a Great Bend site with possible remains of a council circle. Located approximately 12 miles NE of the project area, the site was severely impacted by agriculture and an oil tank field. Artifacts associated with the Great Bend are found on Cuesta Phase sites in the vicinity of Big Hill Lake, 18 miles to the East of Elk City Lake (Witty 1999). Artifacts from sites at Elk City Lake may also be associated with the Great Bend, but additional research is needed to confirm this.

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 1719, the Great Bend aspect sites in central Kansas were abandoned, as the occupants migrated southward within the Arkansas River basin. By 1700, French traders were established in the region and had developed trading relationships with Wichita groups in the Arkansas Valley of northern Oklahoma. The Caddoan language speaking Wichita and Affiliated Tribes were historically known as the Wichita Proper, Waco, Taovaya, Tawakoni, and Kichai. In the late 1700s, the Wichita abandoned their homes in northern Oklahoma and traveled south into southeastern Oklahoma and Texas (Vehik 2006).

The French had developed significant relationships with the Osage in the early 1700s. The Osage were then located in present day Missouri, with villages along navigable rivers that were trade routes. The Osage fought alongside the French during the French and Indian/Seven Years War. The Osage received European trade goods and technologies that strengthened their advantage over other tribes. Nearly half of all trade along the Missouri River from 1775-1776 was with the Osage (KSHS 2021b). Ties with the French were further strengthened by intermarriage (KSHS 2021b).

Between 1785 and 1870, a few Osage villages were clustered along the Neosho-Grand River in present day Kansas. When Euro-Americans began to encroach on their territory to a significant degree, the Missouri Osage began moving into Kansas and Oklahoma between 1808 and 1820 (KSHS 2021b). A significant migration occurred between 1820 and 1825, from Vernon County, Missouri, to present day Neosho County, Kansas (KSHS 2021b).

### 2.3.3 Historical Resources in Kansas

What is now the state of Kansas was included in the Louisiana Purchase in 1803, becoming part of what was known as the Louisiana Territory (KSHS 2021c). 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, Kansas was designated Indian Territory and closed to white settlement.

The Historic tribe with lands in southeast Kansas, specifically in the project area, was the Osage. The Osage, who had long included the area in their hunting territory which spanned from southeast Kansas to areas on the Arkansas River northwest of the project area, and began moving their villages into present day Kansas after 1800. As a result of encroachment onto their lands by Euro-American settlers, Osage bands began to move their villages westward. Chief Whitehair moved his band of 400 to form a village on the Neosho River in 1815.

By 1825 the Osage had established villages along the Neosho River in Labette and Neosho Counties (east of Montgomery county). Between 1825 and 1839, the Osage ceded lands in sections in Missouri, Arkansas, Indian Territory, and south of the Kansas River to the United States government, with the exception of a swath of land 50 miles wide and 125 miles long across southeast Kansas for their home (Hawley and Vehik 2012; KSHS 2021j).

The Nebraska-Kansas Act of 1854 delineated Kansas as an organized incorporated territory of the United States in May of 1854. The period between 1854 and 1859 was a time of violence between anti-slavery abolitionists and pro-slavery groups, which led to Kansas Territory being called “Bleeding Kansas” (KSHS 2021b; KSHS 2021d). Osage villages saw armed intrusions during the Bleeding Kansas conflicts. Abolitionists did not recognize the injustices suffered by the Osage (or other tribes) due to the persistent belief in manifest destiny.

On January 29, 1861, the eastern portion of Kansas Territory was admitted to the Union as the state of Kansas. Kansas was an important state for the Union, as transcontinental railroads were planned to cross through the area, and farmland was highly desirable. By the time the Civil War commenced, Kansas had joined the Union and formally rejected slavery, therefore Kansas regiments joined the Union Army. Between 1861 and 1865 both the Confederacy and the Union tried to use the Osage to thwart one another. Some Osage villages were burned and pillaged by Euro-American soldiers (KSHS 2021i).

In 1865, the Osage agreed to sell the eastern portion of their tract of land to the United States. They ceded the northern portion, a strip twenty miles wide, to the United States to be held in trust and sold for their benefit for no less than \$1.25 an acre. The treaty provided that should the Osage agree to leave their Kansas lands and settle on lands provided to them in Indian territory, the diminished reservation should be disposed of in the same manner as Trust lands, with the exception that fifty percent of proceeds from sale of the land would be used by the U.S. to purchase lands they deemed suitable for the Osage in Indian territory (Chapman 1938). White settlement was allowed on the eastern part of what is now Montgomery County.

After the Canville Treaty of 1867 (which ratified the treaty of 1865), in which the Osage ceded their land in Neosho and Labette counties to the United States, Osage villages were established in the project area. Several significant named Osage villages are located in Montgomery county and neighboring counties. Little Bear's village was located near present day Neodesha, twelve miles northeast of the dam, and Whitehair's village was located just south of Neodesha. Big Hill Joe's village was located south of the project area. Chetopa's village and Napawallah's village were located in or near the project area (KSHS 2021j). Black Dog's village was well to the south but was moved several times in response to disease epidemics that swept through the region.

Flood scouring and artifact collecting have removed much of the evidence of the Historic Osage villages in the project area. This makes identification and affiliation of sites challenging. The NRHP listed Infinity site was revealed by flood scouring, and historic artifacts are present in the assemblage from the site. Based upon recovered surface artifacts (gun flints, glass beads, pipe), it is likely that there was a historic Osage component at the site that has largely been removed by the flooding (Brogan 1981b).

Trails were already well established by this time, and new ones were created. The Black Dog Trail (also called the Great Osage Trail) was created by the Black Dog Band of the Osage across the southern portion of Kansas, beginning in the 1820s. The trail ran from the Spring River near Baxter Springs west beyond Arkansas City (a branch of the trail extended south from Arkansas City to Claremore, Oklahoma). It followed several large creek and river drainages, including the Verdigris River. The Trail was used to travel between villages and to hunting grounds.

The Osage Trail (also called Little Osage Trail) was used by the Great Osage and Little Osage to reach their hunting grounds. Located along the Neosho and Verdigris rivers, in the project area the trail stretched from the village of Chief Little Bear just above the confluence of the Fall and Verdigris rivers near Neodesha, up the Fall River in a northwesterly direction, south of the headwaters of the Elk River and to the junction of the Arkansas and Little Arkansas rivers (Weston 1992; Cutler 1883).

Trails usually have reroutes and detours, and multiple paths may diverge between river crossings. The difficulty of travel led to deaths along the trail, and the dead would be buried nearby. Some travelers were buried in cemeteries in towns, but many more were buried along the route. Camps and burials associated with trails are expected in the project area.



The Osage attempted to maintain a boundary at the Verdigris River when white settlers moved to the eastern portion of Montgomery County, which had been ceded in 1867 (KSHS 2021g). Settlers could make a “squatter’s claim” by paying the Osage \$5.00 or \$10.00 for a timber claim. The increased rate of Euro-American settlement overtook the lands west of the Verdigris river, and Montgomery County was organized June 3, 1869. Between 1867 and 1870, the population of Euro-American settlers in Montgomery County grew from scattered settlements to 7,564. Given little choice, the Osage began the move to territory they purchased in what is now Osage County, Oklahoma. The Drum Creek Treaty was signed on September 10, 1870, allowing the purchase of the Osage Diminished Reserve by the United States (Cutler 1883).

Just east of the Elk City project lands, Independence, the county seat, was built on land that was purchased from the Osage in September 1869 by George A. Brown for the price of \$50. Brown originally named the townsite Colfax after the Vice President for Ulysses S. Grant. A group of men from Oswego settled there in September of 1869 in order to establish the townsite as the county seat. Families who had relocated from Indiana spent the winter of 1869 camped along the Verdigris river in covered wagons or sod/hay huts (soddies). This led the Osage to call this area Haytown (Cutler 1883). The post office in Independence was established in 1870, and in 1872 a Government Land Office had located there, and the railroad had arrived. Oil was discovered in 1881 and the town prospered. By 1882 there were eleven churches, three of which were African American, four newspapers, four mills, and two banks (Cutler 1883). The town became a major producer of coal, gas, and oil, as well as rubber, glass, ice, iron, brick, and paper.

Located adjacent to the western and northern extent of Elk City Lake fee lands, and the Elk River Archaeological District, Elk City was founded by brothers Samuel and John Kopple, owners of three trading posts in the city. The post office was established in 1869, and the town was incorporated in 1871. The town thrived, even as they lost the position of terminus of the Atchison, Topeka, and Santa Fe Railroad, which went to Independence. The railroad extended a stub from Independence to Elk City, which kept the town prosperous. The population was 500 in 1883, with one newspaper, one bank, six churches, straw and flour mills, and a brickyard. The discovery of oil and gas in 1902 led to increases in land value.

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

#### 2.3.4 Long-term Cultural Resources Objectives

Completion of a full inventory of cultural resources at Elk City Lake is a long-term objective that is needed for compliance with Section 110 of the NHPA. Ultimately, all currently known sites, as well as those found in future inventories should be evaluated to determine their eligibility for the NRHP. Sites of currently unknown NRHP eligibility and those found in the future to be eligible for the NRHP must be protected from

impacts caused by USACE or those having leases or easements on Elk City Lake fee lands. In order to ensure compliance with the NHPA, ARPA, and NAGPRA cultural resource activities will be coordinated with the State Historic Preservation Officer at the Kansas State Historical Society and federally recognized tribes within whose areas of interest, historical homelands, or ancestral territory the work will occur. ARPA permits are required and issued by the Tulsa District for all archaeological work conducted on USACE fee lands, to ensure qualified professional archaeologists perform the work according to established standards.

## **2.4 DEMOGRAPHIC AND ECONOMIC RESOURCES**

The following information covers the current demographic and economic data for counties near Elk City Lake, Kansas (Zone of Interest). This basic information gives a snapshot of the current population and looks at growth trends for the area.

### **2.4.1 Zone of Interest**

Elk City Lake is located in Montgomery County in south east Kansas. The zone of interest for the socioeconomic analysis of Elk City is defined as Allen, Butler, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson, and Woodson Counties in Kansas, and Craig, Nowata, Osage, Rogers, and Washington Counties in Oklahoma.

### **2.4.2 Population**

The total population for the zone of interest in 2018 was estimated at 447,036, as shown in Table 2-7. Approximately 20% of the zone of interest's total population is within Rogers County, OK, 15% is within Butler County, KS, 12% in Washington County, OK and 11% in Osage County, OK. About 52% of the zone of interest's population is within Kansas and 48% is in Oklahoma. The zone of interest accounts for approximately 15% of the population for Kansas and 11% of Oklahoma.

The zone of interest's population is projected to increase by about 92,000 people by 2070, and annual growth rate of 0.4%. Most of the growth is projected to occur in Rogers County, OK which is projected to grow by 76,000 people in 2070, an annual growth rate of 1.2%, followed by Osage County, OK with a growth of 23,000 persons, an annual growth rate of 0.8%. Butler County, KS is projected to grow by almost 18,000 people, and average annual growth rate of 0.5%. Washington County, OK is projected to grow by 10,000 (0.4% annually), and Crawford County, KS by 6,000 (0.3% annually). Craig and Nowata Counties in OK are expected to grow very slightly over the period, and the remaining counties are expected to decline in population by 2070. Montgomery County, KS, where the lake is located, is projected to have the greatest loss, about 9,000 people, followed by Cherokee County, KS (6,000), Allen County, KS (5,000).

**Table 2-7 - 2000 and 2018 Population Estimates and 2070 Projections**

Geographic Area	2000	2018	2070
Kansas	2,688,418	2,908,776	3,751,900
Oklahoma	3,450,654	3,918,137	5,419,987
Allen County, KS	14,385	12,630	7,810
Butler County, KS	59,482	66,468	84,091
Chautauqua County, KS	4,359	3,367	1,536
Cherokee County, KS	22,605	20,331	12,637
Crawford County, KS	38,242	39,108	44,731
Elk County, KS	3,261	2,562	1,338
Greenwood County, KS	7,673	6,156	2,857
Labette County, KS	22,835	20,367	14,736
Montgomery County, KS	36,252	32,970	24,153
Neosho County, KS	16,997	16,125	13,555
Wilson County, KS	10,332	8,780	5,563
Woodson County, KS	3,788	3,170	1,807
Craig County, OK	14,950	14,493	14,513
Nowata County, OK	10,569	10,383	10,568
Osage County, OK	44,437	47,311	70,082
Rogers County, OK	70,641	90,814	166,354
Washington County, OK	48,996	52,001	62,406
Zone of Interest	429,804	447,036	538,737

2000 Population Estimates: U.S. Bureau of the Census, 2000 Decennial Census

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

2070 Kansas Projections: Center for Economic Development and Business Research, Wichita State University

2070 Oklahoma Projections: Oklahoma Department of Commerce

The distribution of the population by gender is shown in Table 2-8. For the zone of interest, the population is 49.8% male and 50.2% female, as compared to a 49.8% male and 50.2% female distribution for the state of Kansas and 49.6% male and 50.4% for Oklahoma. All of the remaining counties are very similar to near 50%/50% distributions between male and female.

**Table 2-8 - 2018 Population by Gender**

Geographic Area	Male	Female
Kansas	1,449,413	1,459,363
Oklahoma	1,941,576	1,976,561
Allen County, KS	6,281	6,349
Butler County, KS	33,539	32,929
Chautauqua County, KS	1,757	1,610
Cherokee County, KS	9,998	10,333
Crawford County, KS	19,527	19,581
Elk County, KS	1,258	1,304
Greenwood County, KS	3,106	3,050
Labette County, KS	10,070	10,297
Montgomery County, KS	16,410	16,560
Neosho County, KS	7,923	8,202
Wilson County, KS	4,318	4,462
Woodson County, KS	1,583	1,587
Craig County, OK	7,394	7,099
Nowata County, OK	5,125	5,258
Osage County, OK	23,675	23,636
Rogers County, OK	45,246	45,568
Washington County, OK	25,253	26,748
Zone of Interest	222,463	224,573

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

Table 2-9 shows the population by age group expressed as a percent of total population for Kansas, Oklahoma the zone of interest and Montgomery County, Kansas where the lake is located. While the percentages are roughly similar for most of the age groups, it can be seen that there is slightly larger percentage of 45-54 year olds in the zone of interest compared to Kansas, Oklahoma and Montgomery County. The zone of interest also shows larger percentages in the 55 to 74 year age groups, when compared to the two states. Montgomery County shows to have higher percentages of its population in older age groups than the other two geographic areas.

**Table 2-9 - Percent of Population by Age Group, 2018 (U.S. Bureau of the Census, American Community Survey, 5 Year Estimate)**

Geographic Area	Kansas	Oklahoma	Zone of Interest	Montgomery County, KS
Under 5 years	6.7%	6.7%	5.9%	6.4%
5 to 9 years	6.9%	6.8%	6.5%	6.5%
10 to 14 years	6.9%	6.9%	7.0%	7.0%
15 to 19 years	6.9%	6.7%	6.9%	6.0%
20 to 24 years	7.5%	7.2%	6.5%	6.7%
25 to 34 years	13.2%	13.8%	11.6%	11.5%
35 to 44 years	12.0%	12.3%	11.5%	10.6%
45 to 54 years	12.1%	12.1%	12.8%	12.3%
55 to 59 years	6.6%	6.5%	7.1%	6.6%
60 to 64 years	6.1%	5.9%	6.6%	7.1%
65 to 74 years	8.4%	8.7%	9.8%	10.4%
75 to 84 years	4.5%	4.6%	5.5%	6.0%
85 years and over	2.1%	1.7%	2.2%	2.8%

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

The 2018 population by race and Hispanic origin is shown in Table 2-10. In the zone of interest, approximately 79% of the population is White, 7% American Indian and Alaska Native, 6% Two or more races, 5% Hispanic or Latino, 3% Black, with each of the other races making up 1% or less each of the total population. For Kansas, 76% are White, 12% are Hispanic or Latino, 6% Black, 3% Asian, and 3% two or more races, 1% American Indian and Alaska Native, with each of the remaining races making up less than 1% each. Oklahoma has 66% White, 10% Hispanic or Latino, 7% Black, 7%

American Indian and Alaskan Native, 7% Two or more races, 2% Asian, and less than 1% for the remaining groups.

**Table 2-10 - 2018 Population by Race and Hispanic Origin**

Geographic Area	Total	White	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Hispanic or Latino	Some other race	Two or more races
Kansas	2,908,776	2,214,543	163,713	19,504	82,887	1,827	340,616	2,302	83,384
Oklahoma	3,918,137	2,586,110	282,622	280,638	82,318	3,982	407,521	4,790	270,156
Allen County, KS	12,630	11,431	188	35	76	7	438	11	444
Butler County, KS	66,468	59,255	1,481	497	750	31	3,142	10	1,302
Chautauqua County, KS	3,367	2,905	20	208	0	0	36	0	198
Cherokee County, KS	20,331	17,952	125	483	87	72	512	11	1,089
Crawford County, KS	39,108	33,979	842	164	787	0	2,146	0	1,190
Elk County, KS	2,562	2,318	6	46	18	0	111	0	63
Greenwood County, KS	6,156	5,673	19	9	8	0	233	0	214
Labette County, KS	20,367	17,409	852	190	62	0	908	0	946
Montgomery County, KS	32,970	26,324	1,656	1,032	346	41	2,135	0	1,436
Neosho County, KS	16,125	14,579	157	49	65	6	811	15	443
Wilson County, KS	8,780	8,094	49	57	2	0	267	0	311
Woodson County, KS	3,170	2,945	34	16	0	0	30	0	145
Craig County, OK	14,493	9,250	439	3,114	130	15	516	0	1,029
Nowata County, OK	10,383	6,955	257	1,628	30	16	305	9	1,183
Osage County, OK	47,311	30,067	5,322	6,012	183	12	1,668	0	4,047
Rogers County, OK	90,814	65,483	962	11,047	1,235	63	4,169	52	7,803
Washington County, OK	52,001	38,015	1,350	5,587	1,068	15	3,065	28	2,873
Zone of Interest	447,036	352,634	13,759	30,174	4,847	278	20,492	136	24,716

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

### 2.4.3 Education and Employment

Table 2-11 shows the highest educational attainment for the 2018 population 25 years of age and older. In the zone of interest, 33% of the population had earned a high school diploma or equivalent, 25% had some college, but no degree, and 15% had

earned a Bachelor's degree. Approximately 10% had earned an associate degree and 7% had a graduate or professional degree. Only 7% of the population had attended school between the 9th and 12th grades but did not earn a diploma. About 3% of the population had less than a 9th grade education. The area interest educational attainment is representative of the state overall. For Kansas, 26% had earned a high school diploma or equivalent, 23% had some college but no degree, and 21% has a bachelor's degree. About 12% had a graduate degree or higher, and 8% had an associate degree. Only 6% had 9 to 12 years of education but without degree, twice the percentage of the area of interest, and 4% had less than 9 years of education.

**Table 2-11 - 2018 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older**

Geographic 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
Kansas	1,894,675	69,212	106,507	492,819	442,045	161,016	394,462	228,614
Oklahoma	2,574,001	105,753	208,035	806,407	606,833	198,903	428,829	219,241
Allen County, KS	8,594	248	449	2,918	2,292	930	1,096	661
Butler County, KS	43,560	855	2,395	11,557	11,515	4,594	8,410	4,234
Chautauqua County, KS	2,446	110	200	870	632	223	309	102
Cherokee County, KS	13,941	456	1,079	4,674	3,783	1,288	1,693	968
Crawford County, KS	23,359	723	1,399	6,598	5,699	2,060	4,289	2,591
Elk County, KS	1,893	101	149	764	415	180	138	146
Greenwood County, KS	4,466	102	273	1,544	1,337	333	639	238
Labette County, KS	13,852	592	1,071	4,517	3,658	1,552	1,616	846
Montgomery County, KS	22,209	810	1,692	6,455	6,476	2,725	2,801	1,250
Neosho County, KS	10,743	264	646	3,374	3,049	1,193	1,304	913
Wilson County, KS	6,085	230	540	2,140	1,661	636	615	263
Woodson County, KS	2,334	52	223	851	630	264	235	79
Craig County, OK	10,170	412	955	4,074	2,254	966	1,047	462
Nowata County, OK	7,182	219	569	3,263	1,705	655	551	220
Osage County, OK	33,004	1,056	3,015	12,735	7,597	2,789	4,141	1,671
Rogers County, OK	60,856	1,419	3,385	19,984	15,419	5,846	10,515	4,288
Washington County, OK	35,529	725	2,575	12,036	7,304	2,733	6,966	3,190
Zone of Interest	300,223	8,374	20,615	98,354	75,426	28,967	46,365	22,122

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate



Table 2-12 shows the 2018 employment by sector expressed as a percent of total employment for the area of interest and the number of employments by sector for Kansas, Oklahoma, and the area of interest and the constituent counties is presented in Table 2-13. For the area of interest, 25% of the employment is in the educational, health care and social assistance services sector, followed by 15% in manufacturing, and 10% in retail trade. While a significant portion of total employment are in the services sector, this shows manufacturing is an important sector. About 7% are in arts, entertainment, recreation and accommodation services, 7% in professional, scientific and management, and 7% in construction. About 6% are employed in the transportation and warehousing sector the remaining sectors represent 5% or less each of total employment.

**Table 2-12 - Percent Employment by Sector for Area of Interest (2018)**

Geographic Area	Zone of Interest
Agriculture, forestry, fishing and hunting, and mining	4.4%
Construction	6.8%
Manufacturing	15.3%
Wholesale trade	2.5%
Retail trade	10.3%
Transportation and warehousing, and utilities	6.3%
Information	1.5%
Finance and insurance, and real estate and rental and leasing	4.7%
Professional, scientific, and management, and administrative and waste management services	6.7%
Educational services, and health care and social assistance	25.3%
Arts, entertainment, and recreation, and accommodation and food services	7.4%
Other services, except public administration	4.9%
Public administration	4.1%

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

Table 2-13 - Employment by Sector (2018)

Geographic Area	Civilian employed population 16 years and over	Agriculture, forestry, fishing and hunting, and mining	Construction	Manufacturing	Wholesale trade	Retail trade	Transportation and warehousing, and utilities	Information	Finance and insurance, and real estate and rental and leasing	Professional, scientific, and management, and administrative and waste management	Educational services, and health care and social assistance	Arts, entertainment, and recreation, and accommodation and food services	Other services, except public administration	Public administration
Kansas	1,428,660	46,532	90,820	176,981	40,345	153,119	69,792	28,040	88,306	136,580	352,931	116,543	64,254	64,417
Oklahoma	1,761,328	85,058	126,336	169,679	45,451	203,801	91,688	29,882	97,476	148,046	394,752	168,588	92,364	108,207
Allen County, KS	5,887	319	306	1,279	144	623	295	67	425	191	1,609	230	300	99
Butler County, KS	31,098	847	2,416	4,822	1,020	2,804	1,673	322	1,582	2,271	8,446	2,262	1,232	1,401
Chautauqua County, KS	1,403	227	142	97	23	125	79	28	42	49	438	46	32	75
Cherokee County, KS	8,699	268	641	1,626	108	860	666	91	349	471	2,293	561	406	359
Crawford County, KS	18,831	585	1,258	2,496	403	2,004	867	248	650	1,081	6,171	1,681	853	534
Elk County, KS	993	92	84	78	30	46	34	5	46	42	313	100	61	62
Greenwood County, KS	2,866	430	248	307	66	266	111	31	108	90	681	159	187	182
Labette County, KS	9,545	421	414	1,947	142	945	568	85	425	416	3,013	510	409	250
Montgomery County, KS	14,519	412	645	3,279	248	1,704	824	124	477	882	3,834	919	612	559
Neosho County, KS	7,359	411	408	1,231	189	759	396	49	436	441	2,041	275	365	358
Wilson County, KS	4,045	354	286	727	50	380	161	77	187	132	1,129	271	185	106
Woodson County, KS	1,400	231	70	156	58	101	121	54	55	42	335	62	57	58
Craig County, OK	5,708	383	367	362	101	728	461	65	188	300	1,597	526	304	326
Nowata County, OK	4,347	295	318	707	164	389	282	35	167	348	956	302	259	125
Osage County, OK	18,960	1,285	1,398	2,317	406	1,825	1,583	318	855	1,376	3,829	1,456	1,032	1,280
Rogers County, OK	43,485	1,123	3,063	6,318	1,366	4,540	3,741	927	2,550	3,292	9,315	3,373	2,162	1,715
Washington County, OK	22,712	1,165	1,604	3,047	500	2,674	895	409	1,019	2,116	5,048	2,166	1,353	716
Zone of Interest	201,857	8,848	13,668	30,796	5,018	20,773	12,757	2,935	9,561	13,540	51,048	14,899	9,809	8,205
2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate														

The civilian labor force for the area of interest makes up about 14.2% of the civilian labor force for Kansas and 11% for Oklahoma, as shown in Table 2-14. The unemployment rate for the zone of interest was 4.9%, slightly higher than the Kansas overall, which has an unemployment rate of 4.4%, but less than Oklahoma, which has a 5.3% unemployment rate. The constituent counties ranged from 3.1% in Greenwood County, Kansas to 8.6% in Woodson County, Kansas.

**Table 2-14 - Civilian Labor Force, Employment and Unemployment (2018)**

Geographic Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Kansas	1,493,698	1,428,660	65,038	4.4%
Oklahoma	1,860,415	1,761,328	99,087	5.3%
Allen County, KS	6,168	5,887	281	4.6%
Butler County, KS	32,476	31,098	1,378	4.2%
Chautauqua County, KS	1,515	1,403	112	7.4%
Cherokee County, KS	9,126	8,699	427	4.7%
Crawford County, KS	19,723	18,831	892	4.5%
Elk County, KS	1,060	993	67	6.3%
Greenwood County, KS	2,959	2,866	93	3.1%
Labette County, KS	9,940	9,545	395	4.0%
Montgomery County, KS	15,363	14,519	844	5.5%
Neosho County, KS	7,646	7,359	287	3.8%
Wilson County, KS	4,263	4,045	218	5.1%
Woodson County, KS	1,531	1,400	131	8.6%
Craig County, OK	6,058	5,708	350	5.8%
Nowata County, OK	4,693	4,347	346	7.4%
Osage County, OK	20,288	18,960	1,328	6.5%
Rogers County, OK	45,671	43,485	2,186	4.8%
Washington County, OK	23,884	22,712	1,172	4.9%
Zone of Interest	212,364	201,857	10,507	4.9%

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

#### 2.4.4 Households, Income, Poverty

Table 2-15 shows the number and size of households for Kansas, Oklahoma and the zone of interest. The zone of interest has approximately 175,000 households, which makes up about 16% of the number of households of Kansas and 12% of Oklahoma. About 20% of the households are in Rogers County, Oklahoma (34,000), about 14% are in Butler County (25,000), 12% in Washington County, Oklahoma (21,000) and 10% in Osage County, Oklahoma (18,000). The average household size for the area of interest is 2.50 persons, with the constituent counties ranging from 2.14 to 2.60. These are just slightly smaller than Kansas (2.52) and Oklahoma (2.58).

**Table 2-15 - Number of Households and Average Household Size (2018)**

Geographic Area	Total Households	Average Household Size
Kansas	1,124,549	2.52
Oklahoma	1,474,620	2.58
Allen County, KS	5,289	2.31
Butler County, KS	24,473	2.60
Chautauqua County, KS	1,450	2.28
Cherokee County, KS	8,037	2.50
Crawford County, KS	15,053	2.47
Elk County, KS	1,117	2.26
Greenwood County, KS	2,758	2.20
Labette County, KS	8,033	2.47
Montgomery County, KS	13,538	2.37
Neosho County, KS	6,681	2.35
Wilson County, KS	3,795	2.28
Woodson County, KS	1,476	2.14
Craig County, OK	5,433	2.46
Nowata County, OK	4,084	2.50
Osage County, OK	18,165	2.53
Rogers County, OK	34,452	2.60
Washington County, OK	20,667	2.48
Zone of Interest	174,501	2.50

2018 Population Estimates: U.S. Bureau of the Census, American Community Survey, 5 Year Estimate

Median household income and per capita income are shown in Table 2-16. While the median household income for the zone of interest was not available, for the constituent counties, it ranged from \$34,621 in Woodson County, Kansas to \$63,272, in Butler County, Kansas. By comparison, the Kansas' median household income was \$57,422, and Oklahoma was \$51,424. All of the constituent counties were below the states, with the exception of Butler County, Kansas and Rogers County, Oklahoma, which had median household income greater than the state overall.

The per capita income for the zone of interest was approximately \$27k and fell below the Kansas's per capita income of \$31k but about the same as Oklahoma.

**Table 2-16 - Median and Per Capita Income (2018)**

Geographic Area	Median Household Income	Per Capita Income
Kansas	\$57,422	\$30,757
Oklahoma	\$51,424	\$27,432
Allen County, KS	\$42,679	\$23,454
Butler County, KS	\$63,272	\$28,759
Chautauqua County, KS	\$38,690	\$24,496
Cherokee County, KS	\$41,103	\$21,635
Crawford County, KS	\$40,174	\$22,461
Elk County, KS	\$38,494	\$22,437
Greenwood County, KS	\$42,595	\$27,639
Labette County, KS	\$47,668	\$23,524
Montgomery County, KS	\$45,173	\$24,103
Neosho County, KS	\$44,294	\$23,934
Wilson County, KS	\$46,208	\$26,523
Woodson County, KS	\$34,621	\$21,123
Craig County, OK	\$41,701	\$20,704
Nowata County, OK	\$41,895	\$22,147
Osage County, OK	\$47,789	\$24,363
Rogers County, OK	\$62,949	\$30,886
Washington County, OK	\$52,103	\$30,267
Zone of Interest	NA	\$26,524

Percentages of families and persons falling below the poverty level is shown in Table 2-17. The percent of all families for the zone of interest was not available, but for the

constituent counties, it ranged from 7.2% in Butler County, Kansas to 14.3% in Chautauqua County, Kansas.

Approximately 14% of all persons in the zone of interest had incomes below the poverty level, slightly higher than Kansas' percentage of 12% but lower than Oklahoma's 16%. Crawford County (21%) and Woodson County (22%) had significantly higher rates of poverty compared to the zone of interest and the two states, and Rogers County, Oklahoma had the lowest at 9.5%.

**Table 2-17 - Percentage of Families and People Whose Income in the Past 12 Months is Below the Poverty Level (2018)**

Geographic Area	All families	All people
Kansas	8.20%	12.40%
Oklahoma	11.60%	16.00%
Allen County, KS	12.10%	16.50%
Butler County, KS	7.20%	10.50%
Chautauqua County, KS	14.30%	17.00%
Cherokee County, KS	11.00%	13.80%
Crawford County, KS	13.50%	20.90%
Elk County, KS	10.60%	14.60%
Greenwood County, KS	8.40%	12.20%
Labette County, KS	13.40%	17.90%
Montgomery County, KS	13.20%	18.30%
Neosho County, KS	13.00%	17.50%
Wilson County, KS	9.30%	14.40%
Woodson County, KS	13.80%	22.00%
Craig County, OK	13.80%	18.50%
Nowata County, OK	13.00%	16.90%
Osage County, OK	11.60%	16.50%
Rogers County, OK	7.30%	9.50%
Washington County, OK	10.70%	13.90%
Zone of Interest	NA	14.38%





**Figure 9 – Recreation Area at Elk City Lake (Source: USACE)**

## **2.5 RECREATION FACILITIES, ACTIVITIES, NEEDS AND TRENDS**

Recreational facilities at Elk City Lake are comprised of three parks; two are managed by USACE, and one is managed by the KDWP. These attractive park areas offer picnicking and camping sites (with and without electricity), swimming areas, boat launching ramps, water hydrants, sanitary facilities, showers, fireplaces, playgrounds, and group shelters. Visitors should note that entry into any Kansas State Park requires a vehicle entry permit available at the state park office or gatehouses.

Holders of the national passes "Golden Age Passport" or "Golden Access Passport" or the newer America the Beautiful - National Parks and Federal Recreational Lands Pass Program's "Senior Pass" or "Access Pass" receive 50% discounts on camping fees at Corps-managed areas.

### **USACE Day Use Pass**

The Corps of Engineers was given the authority by Congress to collect day use fees as part of deficit reduction legislation in the Omnibus Budget Reconciliation Act of 1993. The funds generated from these fees are used by Congress to help offset operation and maintenance costs of the Corps' recreation program.

- A fee of \$2 per person walk-in/bike-in
- A fee of \$5 per private vehicle
- A fee of \$20 per bus/commercial vehicle

- The number of individuals in the private vehicle/bus/commercial vehicle does not apply.
- There are no day use fees for children under 16.
- Campers do not pay additional day use/facility fees at the same project, on any day for which the camping permit is valid.

### **USACE Annual Day Use Pass**

The Corps Annual Day Use Pass may be purchased for \$40 which permit the vehicle and accompanying passengers to use all boat launching ramps and swimming beaches at all nation-wide Corps-operated recreation areas without further charges.

- Passes must be visibly displayed on the rear-view mirror. Rangers will ticket if it is not visible.
- Replacements are not available.

The Annual Day Use Pass can be obtained at the Corps lake offices and many of the lake recreation areas.

#### **2.5.1 Zone of Interest**

The visitation market area, or zone of interest, is the area from which the majority of visitors to the lake originate. This zone is the area within approximately a 100-mile radius of Elk City Lake, with the majority of visitation from within 70 miles.

#### **2.5.2 Visitation**

For State-managed parks, the following visitation information was retrieved for Elk City Lake from the 2015 Kansas SCORP. As can be seen, the average distance visitors travelled to the Elk City State Park nearby, was 59 miles.

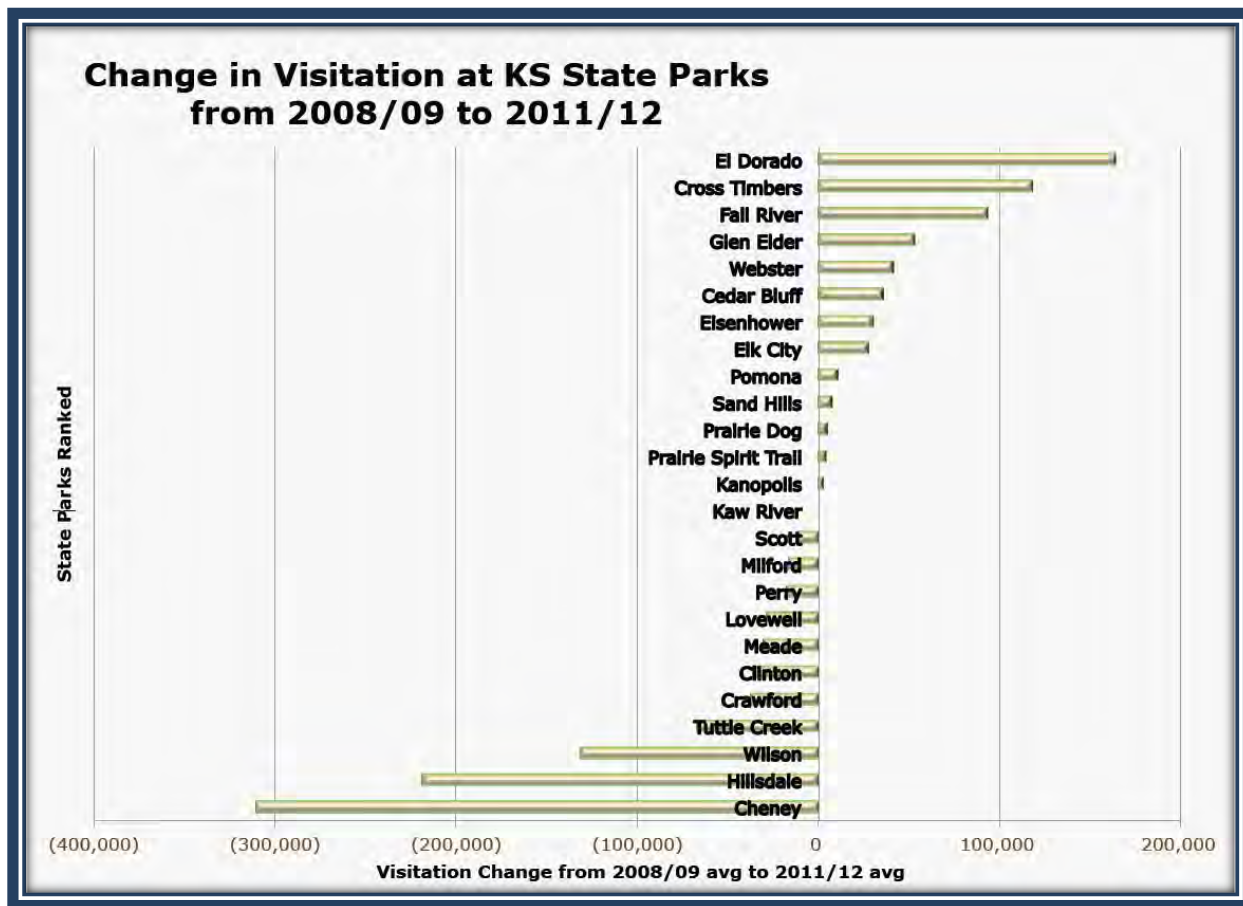
**Table 2-18 – Kansas State Park Reservation Profile**

Park Name	Reservations	Minimum Distance	Maximum Distance	Average Distance
El Dorado State Park	2,237	5.3	326.7	38.9
Elk City State Park	438	5.3	452.7	58.9
Fall River State Park	162	4.8	298.4	81.8

As illustrated in Figure 10, visitation to Elk City Lake's State Park increased modestly between 2008 to 2012 and is expected to continue growing. As discussed in the



following sections, the recreation facilities and opportunities at Elk City Lake support many of the trends in outdoor recreation.



**Figure 10 - Change in Visitation at State Parks Year to Year (Source Kansas SCORP)**

Visits to parks and lakes nearest the Kansas City metro area (Clinton, Hillsdale, Perry) generally declined. Some of the greatest increases occurred in less populated areas (Cross Timbers, Fall River, Glen Elder, Webster, Cedar Bluff, Elk City, Eisenhower, and Pomona). Impacts at Cheney and El Dorado were drought based, and algae blooms were credited with temporarily closing several parks (e.g. Milford), but a full park-by-park explanation is not available. The data do suggest that change in population had less effect than would be anticipated.

Table 2-19 illustrates USACE managed parks at Kansas lakes managed by the Tulsa District. As can be seen, there is variation in visitation trends in many parks, most likely due to weather and related biological factors, such as blue-green algae blooms. For Elk City Lake, visitation has remained steady.

**Table 2-19 - USACE Elk City Lake Annual Visitation (2015-2019)**

Year	Visitation
2019	188,200
2018	1,238,987
2017	103, 588
2016	127,192
2015	110,914

### **2.5.3 Recreation Areas and Facilities**

Elk City Lake is located about 5 miles northwest of Independence, Kansas, and is well known among fishermen and hunters. Elk City Lake is also a great place for boaters, swimmers, skiers, and sightseers to come and enjoy nature.

Elk City Lake offers three attractive park areas with picnicking and camping sites, both with and without electricity. The parks also include swimming areas, boat launching ramps, water hydrants, sanitary facilities, showers, fireplaces, playgrounds, and group shelters.

The lake is also well known for its seven scenic trails. These trails meander through the colorful oak and hickory forest surrounding the lake and lead the hiker through some of the most interesting rock formations in Kansas. The trails range from a 15-mile scenic trek to a one-mile, all-weather surfaced accessible trail. The trails offer spectacular opportunities for nature enthusiasts to view various wildlife species and enjoy wonderful views. The Elk River Hiking Trail was rated as the best hiking trail in Kansas by "Backpacker" magazine in 2006 and in 2010 was a nominee in the Kansas Sampler Foundation's "8 Wonders of Kansas" geography contest.

Recreation areas and facilities are provided by federal and state agencies at Elk City Lake. Table 2-20 lists the various parks with their associated services and managing agencies. Upon completion of Elk City Lake, USACE developed Card Creek, Outlet Area, and Outlet Channel public-use areas at Elk City Lake.

Currently, USACE manages Card Creek, Outlet Area, and Outlet Channel public-use areas at Elk City Lake. Detailed descriptions of public use areas can be found in Chapter 5 of this Plan, where a listing of areas as well as a general summary of the primary facilities and future management is provided. Additionally, Appendix A of this Plan contains park plates and location maps.

**Table 2-20 - Recreational Facilities and Operating Agencies**

FACILITIES		Designated Campsites	Boat Launching	Restrooms	Drinking Water	Group Shelter	Showers	Designated Picnic	Dump Stations	Swimming Beaches	Electrical (30 amp)	Electrical (50 amp)	Nature Trail	Playground
LOCATION														
Project Office														
Card Creek		*	*	*	*	*	*		*		*	*	*	*
Outlet Channel		*		*	*	*	*	*	*		*	*	*	*
Overlook				*				*					*	
Elk City State Park		*	*	*	*	*	*	*	*	*	*	*	*	*
Operating Agency		US Army Corps of Engineers												
Operating Agency		Kansas Wildlife, Parks & Tourism												

### *Fishing and Hunting*

Elk City Lake offers excellent opportunities for hunting and fishing. Principle species of sport fish found in the lake include white crappie, white bass, largemouth bass, blue channel catfish, channel catfish, flathead, and various sunfish. Fishing tournaments are welcome on the lake; for more information or to schedule a fishing tournament call the Project Office. An application should be filled out for each tournament. State regulations also apply at the lake; a complete list of regulations is available at the project office.

The KDWP has a license to approximately 12,240 acres of project area for wildlife management and public hunting. The U.S. Army Corps of Engineers oversees 1,600 acres of the area for wildlife purposes. Almost all areas are open for public hunting except around the dams, parks, and control structures. For a map of the public hunting areas, contact the project office or the KDWP office. Wildlife game species commonly

found in the Elk City Lake area include coyotes, bobwhite quail, cottontail rabbit, mourning dove, fox squirrel, white-tailed deer, turkey, and various species of ducks and geese. The surrounding expanses of grass and wooded hillsides support some of the best quail populations in Kansas. The distribution of deer in the area is excellent. Opportunities for waterfowl hunters are good.

With abundant furbearer populations throughout most of Kansas, fur harvesting opportunities abound. In fact, furbearers are probably one of our most under-utilized natural resources, and the benefits of their harvest are numerous. Species legally taken as furbearing animals in Kansas are badger, bobcat, beaver, gray fox, red fox, swift fox, mink, muskrat, opossum, otter, raccoon, striped skunk, and weasel. For detailed legal information, contact the department's Law Enforcement Division.

Gravel, township, and county dirt roads provide access to the areas. All vehicles are restricted to established roads or parking areas.

The KDWP urges all sportsmen to respect posted signs and not trespass on private adjoining property.

No hunting is permitted in developed recreational areas on the lake, in the vicinity of the dam and other project structures, or within the designated boundaries of the waterfowl refuge.

Hunting and fishing activities are regulated by Kansas law and federal regulation. To ensure a pleasant experience for everyone, courtesy, safety, and good sportsmanship should be practiced at all times.

USACE Tulsa District publishes a Public Hunting Guide listing each USACE lake in the Tulsa District. This guide is updated to address any changes in State wildlife/hunting rules that may affect hunting at USACE lakes, as well as any changes in the management of USACE land at each lake. Hunters are advised to obtain a copy of the guide and to visit with USACE lake staff when planning to hunt.

### *Camping and Picnicking*

Three attractive park areas offer picnicking and camping sites (with and without electricity), swimming areas, boat launching ramps, water hydrants, sanitary facilities, showers, fireplaces, playgrounds, and group shelters.

### *Boating*

Boating on the lake is in accordance with the Kansas boating laws and USACE regulations.

### *Sightseeing*

Topography varies from steep slopes to broad rolling crop and pastureland. A prominent feature is the precipitous rock bluff that marks the north margin of the river valley for several miles above the dam site. Native trees and shrubs include ash, birch, elm, hickory, oak, walnut, sycamore, dogwood, hawthorn, redbud, deciduous holly, and sumac. A myriad of wild mammals, birds, reptiles, amphibians, and invertebrates add greatly to the vitality and natural heritage of the area.

### Bird/Wildlife Viewing

Bird watchers, wildlife enthusiasts, as well as photographers enjoy the different species of non-game birds and animals in Elk City State Park. The huge pileated woodpecker is a common bird among the mature trees in the park along the Elk River. A variety of wildlife are found in the park since it has different habitat types. Examples include waterfowl, upland and small game, deer, and turkey.

### Swimming

Swimming is available at Elk City State Park.

### Trails

Elk City Lake is well known for its scenic trails: The Eagle Rock Mountain Bike Trail, Table Mound Hiking Trail, Post Oak Self-Guided Nature Trail, Green Thumb Nature Trail, Elk River Hiking Trail, and Osage Lowlands Trail, which is a multi-purpose, all-weather trail. These trails meander through the colorful oak and hickory forest surrounding the lake and lead the hiker through some of the most interesting rock formations in Kansas while providing spectacular views of the lake and Elk River. Many people who have hiked the trails claim them to be the best trail system in Kansas. The Post Oak, Table Mound, and the Elk River Trails have been designated National Recreation Trails under the U.S. Department of the Interior's National Trail System. For more information on the various scenic trails, please see the following:

- **Eagle Rock Mountain Bike Trail** - This 4-mile trail. This trail was designed with the beginner mountain biker in mind but also for the experienced mountain biker to excel on. On its path, which passes by large sycamore and oak trees, the trail has roller coaster dips, straight and winding climbs, downhills, and log jumps with ride-around provided in most places for the less skilled riders. The trail begins along the Elk River just north of the reservoir outlet. The wooded portion of the trail soon gives way to a trek through ice age boulders that cover the hillside. Another segment of the trail winds through tall native grasses. Like all the trails at Elk City Lake, the scenery seen along Eagle Rock trail is phenomenal.
- **Table Mound Hiking Trail** – This is a 2.75-mile trail. This linear trail has a trailhead at the Scenic Overlook near the dam and at Timber Road Campground, northwest of the State Park office. Due to the trail's length, it is able to give witness to the hiker many different and picturesque scenes. If chosen to begin the trail at the Scenic Overlook, the trail runs north .2 mile atop edge of Table Mound along the edge of a 20-foot bluff. After dropping through a crack in a rock and going down to the foot of the bluff, it turns sharply south. For about the next .5 mile, the trail passes along vertical rock walls, boulder fields and cave-like formations. The trail then drops down through a ravine and crosses the county road. For the next 1.9 miles, the trail winds through forested hills and crosses three small creeks. The final segment is .15 mile and is along an old roadway. This trail is blazed with blue paint markings and is considered a moderately strenuous hike. This trail has been designated as a National Recreation trail under the U.S Department of the Interior's National Trail System.

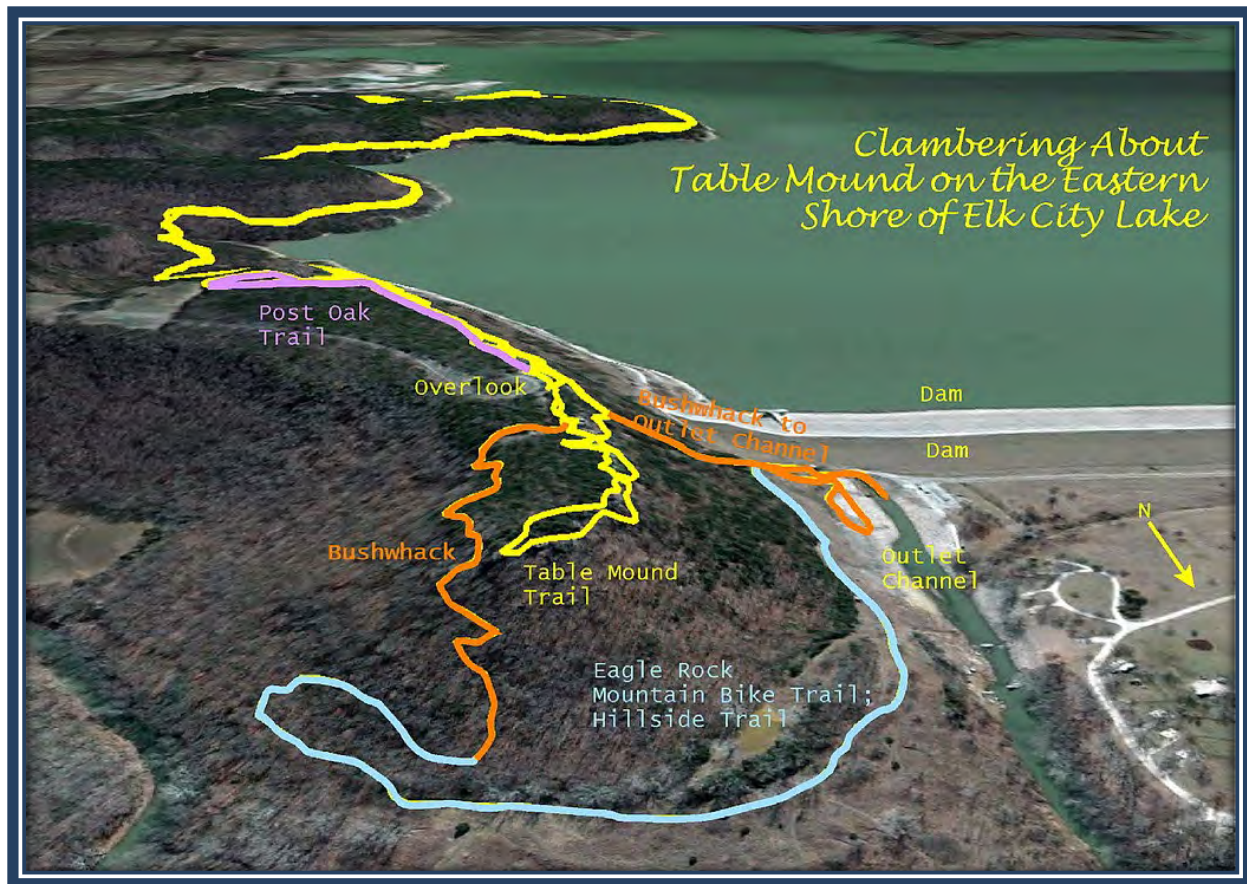
- **Post Oak Self-Guided Nature Trail** – This is a 1-mile trail. This 2/3-mile trail located on the top of table mound is a relatively easy hike. The trailhead is located at the scenic overlook near the dam. The old-growth forest setting that this trail winds through is indicative of the Cross Timbers region. A wide variety of tree species can be found here with many specimens being well over 200 years in age. A self-guiding brochure has been developed to coincide with this trail to be used as an interpretive aide for the user. This trail has been designated as a National Recreation Trail under the U.S Department of the Interior's National Trail System.
- **Green Thumb Nature Trail** - This is a 1 mile trail. This interpretive nature trail is a loop design with its trailhead located in the Timber Road Campground. Features of the trail include two wooden pedestrian footpaths, which are about 33-40 feet in length and interpretive signing informing hikers of the plants and animals native to this area. The trail is described as a moderately strenuous hike that is somewhat uphill. At the top of the hill, the surrounding trees frame a spectacular view of Elk City Lake.
- **Elk City State Park Biking and Hiking Trails** – This consist of 12 miles of trail. Located in the Cross Timbers region consisting mainly of ancient post and blackjack oaks, Elk City State Park boasts some of the best hiking trails in southeast Kansas. Currently, the state park operates Four foot trails totaling 8 miles and one mountain bike trail which is approximately 4 miles in length. Two other trails, the Elk River hiking trail and the Timber Ridge hiking trail are also located at Elk City Lake but are not located on state park property.
- **Elk River Hiking Trail** - The Elk River Hiking Trail is located on the northwest side of Elk City Lake. The trail is a 15 mile point-to-point trail which can be accessed from two main trailheads. The Northeastern trailhead is located below the west end of the dam across from the Fish & Wildlife Office. The Southwestern trailhead can be reached from Highway 160 south of Elk City. There are also several gravel roads intersecting the trail which can be accessed from County Roads north of the lake. The Elk River Hiking Trail offers panoramic views from the tops of the many limestone bluffs on the northwestern shores of Elk City Lake. The trail crosses several small streams and ravines and winds through narrow canyons and under rock overhangs. The trail has blue trail blazes and mile markers.





Figure 11 - Elk River Trail Map (Source: MapCarta.com)

- **Osage Lowlands Trail Multi-Purpose, All Weather Trail** - This is a 3.29 mile trail. This is a paved trail through the southern area of the Elk City State Park. It has views of the wildlife area, the south side of the lake and is available for walking or bike riding.



**Figure 12 - Other trails at or near Elk City Lake (Source: MapCarta.com)**

In addition to the hiking trails, Elk City Lake features the Elk City Wildlife Area which has many different habitat types and is managed primarily for waterfowl, upland and small game, deer, and turkey. Camping is permitted at the state park and Corps of Engineers campgrounds. Toilets are available at these areas also. Anglers primarily fish for catfish, flathead, and crappie, and pursue white bass in the river in the spring. Hiking trails are available in the state park and on the Corps of Engineers properties. No hunting is allowed in the state park or in the waterfowl refuge area and in the safety zone adjacent the state park, hunting is restricted to archery and shotgun with pellets only. The waterfowl refuge is closed to all activities from September 1 to March 31 and angler access is allowed in the refuge from April 1 to August 31. Check current hunting regulations summary for additional hunting requirements.

#### **2.5.4 Commercial Concession Leases**

Concessionaires provide valuable services to the public at USACE lakes across the United States. USACE makes efforts to attract concessionaires that can establish suitable, well-maintained businesses that will offer desirable water-related services to the general public. Presently, at Elk City Lake demand for such facilities is non-existent.

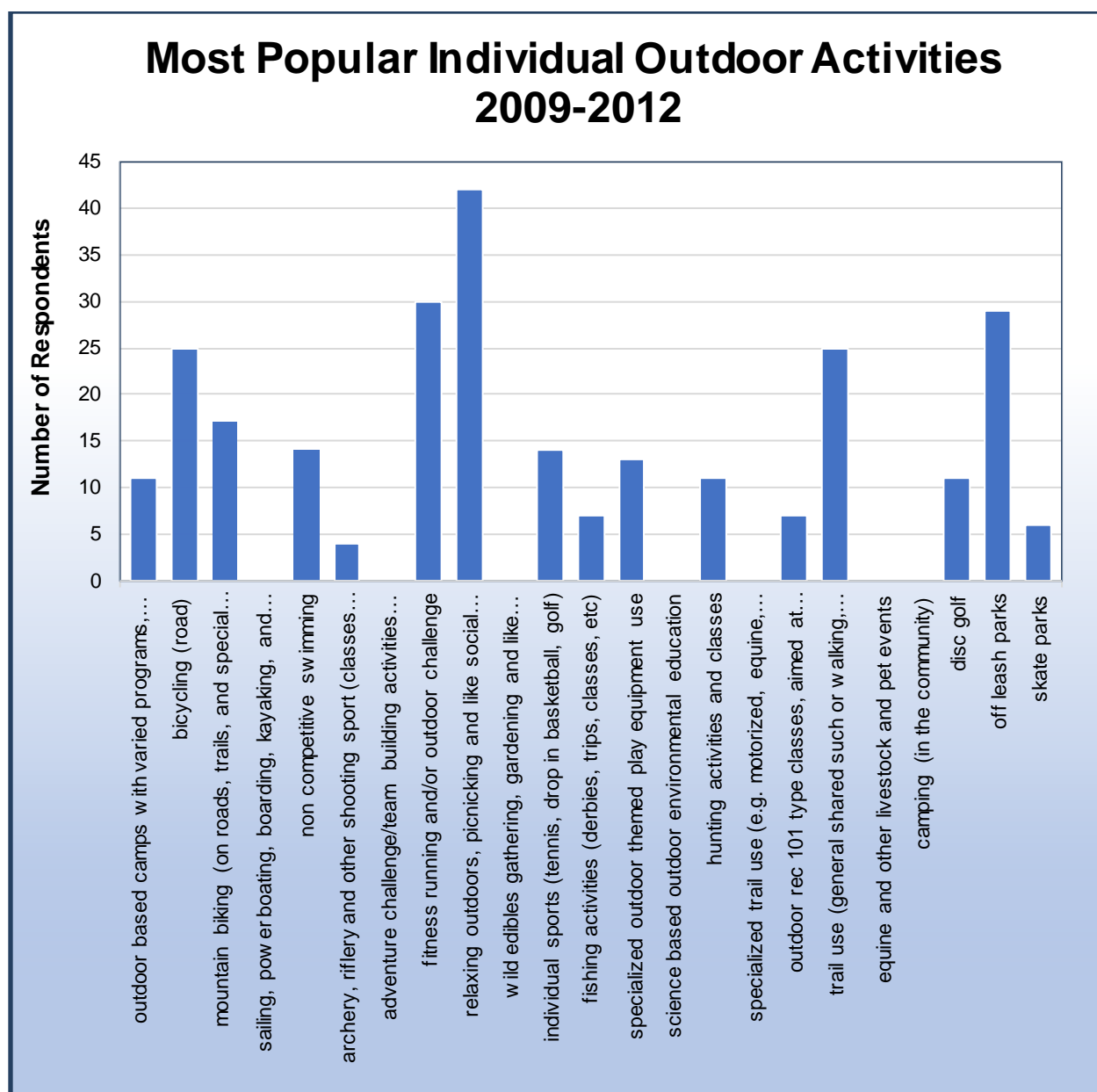
USACE will continue to provide outdoor recreation opportunities either directly or through leases with other agencies.

#### 2.5.5 Recreation Analysis – Trends

To help provide Kansas communities statewide with informational resources for recreational needs and trends across the state, KDWP published the 2015 Kansas Statewide Comprehensive Outdoor Recreation Plan (SCORP). The SCORP serves to address emerging issues in Kansas outdoor recreation and set goals for the next five years. According to the 2015 Kansas SCORP the following are activities showing significant participation increases:

- Wildlife based recreation show encouraging gains. Fishing and several forms of hunting saw new participants.
- Boating/Water Based Recreation (when grouped) all fared well. This includes paddleboards, kayaking, boardsailing, windsurfing, sailing, and canoeing, as well as power boating.
- Health and fitness enhancing Activities dominated the list of activities attracting new participants. A subgroup (trail running – adventure racing – triathlons, etc.) leads specific activities. This participation is supported by input from agency professionals who rank it high in popularity. Recent “Warrior Dash” type activities in the Kansas City, Kansas metropolitan area drew as many as 30,000 young adults (ages 18-35).

Figure 13 illustrates the survey results from the 2015 Kansas SCORP of the most popular individual outdoor recreational activities. As seen, the most popular activities are relaxing outdoors, picnicking and other social activities, all activities by Elk City Lake.



**Figure 13 - Most Popular Individual Outdoor Activities 2009-2012 – KS Public Supplier’s Survey  
(Source: State of Kansas SCORP)**

#### 2.5.6 Recreation Analysis – Needs

The activities addressed above are supported by USACE at Elk City Lake. Wildlife based recreation accounts for a substantial amount of Elk City Lake’s outdoor recreation demand, both by adjacent residents and by visitors. After a period of decline, more recent statistics show generally favorable growth in various sectors of this user group according to the SCORP. Boating in Kansas, like hunting and fishing, has been noticeably impacted by drought since 2011. The 2012 year was particularly severe, with

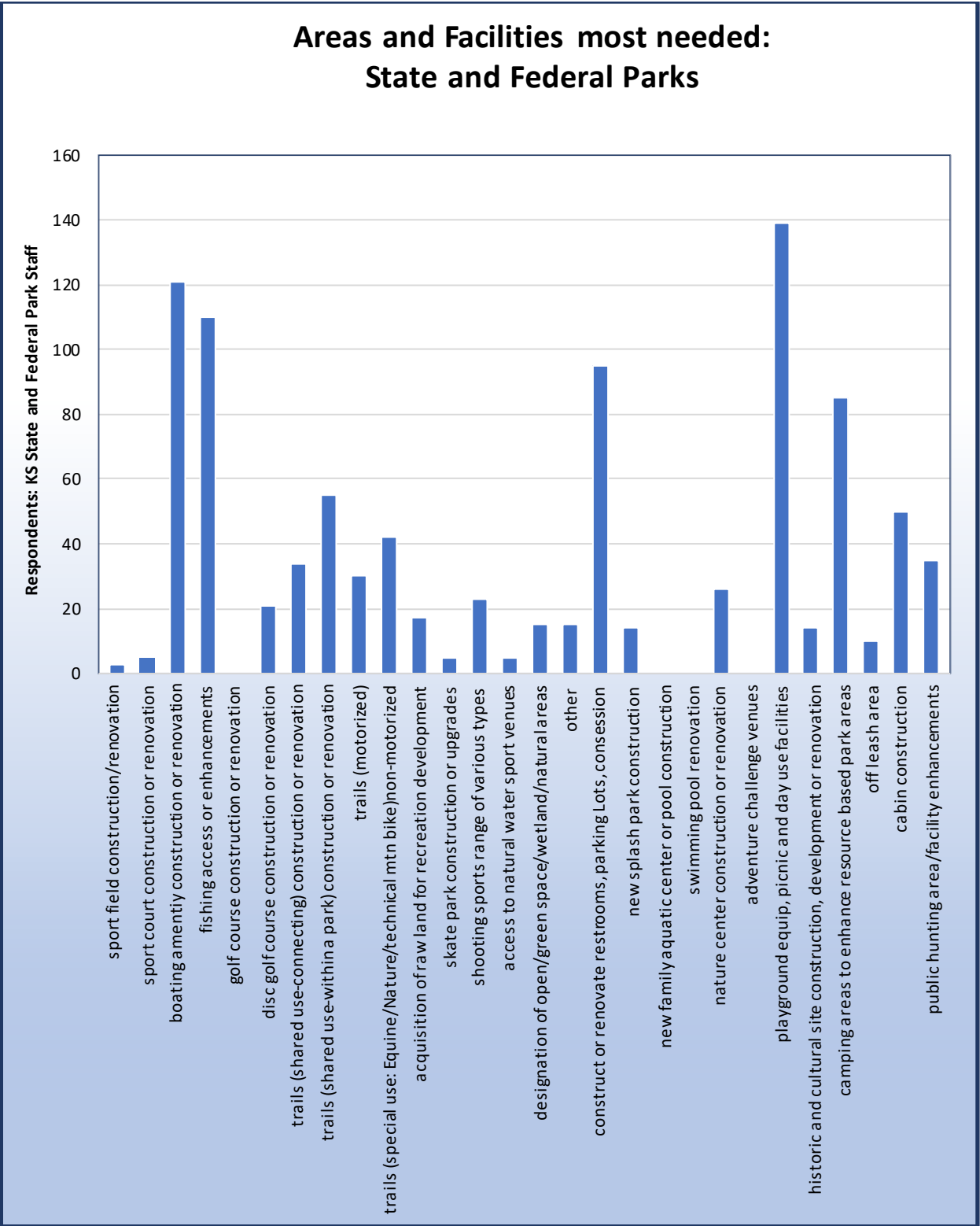


several water bodies completely inaccessible. However, 2013 brought some relief in the eastern half of the state.

Water based recreation is a crucial aspect of outdoor recreation in Kansas, making up a substantial core of the visitors to USACE and State managed parks. Recreational boating activities in Kansas were expected to increase following 2015 precipitation within the region. Fitness and health enhancing outdoor experiences are popular in a variety of formats. Those of an individual nature are increasing while traditional team sports (football, baseball, and soccer) are in decline. Triathlons and road racing both ranked in the top 5 outdoor activities attracting new participants. Support for this type of activity was also provided by agency professionals, who in a 2013 Supplier's Survey ranked fitness and trail running as the fastest growing outdoor pursuits. Figure 15 illustrates the areas and facilities identified as most needed in state and federal parks in Kansas.



**Figure 14 – Catamaran and Sailboat at Elk City Lake (Source: USACE)**



**Figure 15 – Area and Facilities most needed: State and Federal Parks (Source: SCORP)**



### 2.5.7 Summary Discussion – Needs and Trends

Given the outdoor recreation trends information shown in Figure 13 and Figure 15 above, it is evident that future recreation development at Elk City Lake should focus on providing increased trail opportunities (of all kinds), more facilities for family and group gatherings, and more wildlife and nature-related viewing opportunities. 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. The large expanses of natural habitat on public land are held in high regard by the citizens throughout the zone of interest for Elk City Lake. This Plan responds to these needs through revised land classifications, new management objectives and conceptual management plans for each land classification.

### 2.5.8 Recreation Carrying Capacity

The plan formulated herein proposes to provide a variety of activities and to encourage optimal, safe use of present public use areas without causing irreparable harm to natural resources. The carrying capacity of the land is determined primarily by the distinct characteristics of the site including but not limited to soil type, steepness of topography and available moisture. Recreational carrying capacity of the lake's water surface is based primarily on available space and numbers of users. These characteristics, both natural and manmade, are development constraints that often determine the type and number of facilities that should be provided.

No recreation carrying capacity studies have been conducted at Elk City Lake. Presently, USACE manages recreation areas using historic visitation data combined with best professional judgment to address recreation areas, including the water surface, considered to be overcrowded, overused, underused, or well balanced. Compared to other USACE lakes, Elk City Lake experiences low to moderate visitation. This trend is expected to continue based on regional population projections. However, USACE will continue to work with KDWP to identify possible causes and effects of overcrowding and overuse and apply appropriate best management practices including site management, regulating visitor behavior, and modifying visitor behavior as needed.

## **2.6 REAL ESTATE**

The total project area at Elk City Lake encompasses 18,475 acres of land acquired in fee simple title by USACE. Above the area acquired in fee simple title, 989 acres were encumbered with a perpetual flowage easement. These are the official acres and may differ from those in other parts of this plan due to better measurement technology, erosion, and sedimentation.

Purchase of flowage easement by the Government constitutes payment for the right to flood and for the damage and expense to the landowner resulting from project operation. Construction of buildings or facilities for human habitation, or alteration of the

existing terrain to the extent that storage of flood water is reduced, will not be permitted on flowage easement lands. Construction of most structures and improvements on flowage easement lands will require formal written authorization from USACE.

Prospective buyers of property adjacent to Elk City Lake are strongly encouraged to determine the location of the flowage easement line on any property they are considering purchasing. Flowage easements may or may not be located on deeds or plats provided by the seller(s).

Individuals and companies interested in leases to provide services to the public on public lands should be aware that there are specific restrictions and procedures they must follow. In many cases, individuals or companies will be encouraged to pursue a sublease with an existing lessee. In general, new leases that provide recreational amenities and services require market studies and competitive bidding before an award can be made. Questions regarding this topic should be directed to the USACE lake office at 19065 Cherryvale Pkwy, Cherryvale, KS 67335.

#### 2.6.1 Encroachments and Trespass

Individuals or entities without specific, written permission from the District Engineer are prohibited from conducting business on Government property under the Code of Federal Regulations, Title 36 CFR, 327.18. Government property is monitored by Elk City Lake 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 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, USACE 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 Tulsa District Real Estate Division and/or Office of Counsel. 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.

At Elk City Lake, the most common encroachments 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. Placement of private property, including livestock, on public land without written authorization is prohibited.

## 2.6.2 Outgrants

The term “outgrant” is a broad term used by USACE to describe a variety of real estate instruments wherein an interest in real property has been conveyed by USACE to another party. Outgrants at Elk City Lake include leases, licenses, easements, consents, permits, and others. Outgrants do not include the Shoreline Use Permits that authorize private structures and activities owned or conducted by adjacent landowners such as boat docks and vegetation modification. At present, there are approximately 28 recorded outgrants in effect on USACE lands and 989 acres of flowage easement at Elk City Lake. These outgrants include the following:

- 15 Easements
- 1 Fish/Wildlife license
- 1 Recreational/Park Lease
- 1 Fish/wildlife Lease
- 1 Hay Harvesting Lease
- 10 Consents

## 2.7 PERTINENT PUBLIC LAWS

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

- Public Law 59-209, Antiquities Act of 1906. - 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.
- Public Law 74-292, Historic Sites Act of 1935. - 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".
- Public Law 75-761, Flood Control Act of 1938. - 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 Elk City Lake.

- Title 16 U.S. Code §§ 668-668a-d, 54 Stat. 250, Bald Eagle Protection Act of 1940, as amended. 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.
- Public Law 78-534, Flood Control Act of 1944. - 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. 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.
- Public Law 79-525, River and Harbor Act of 1946. - This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- PL 79-526, Flood Control Act of 1946 (24 July 1946), amends PL78-534 to include authority to grant leases to non -profit organizations at recreational facilities in reservoir areas at reduced or nominal fees.
- Public Law 83-780, Flood Control Act of 1954. - 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.
- Public Law 85-624, Fish and Wildlife Coordination Act 1958. - 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.
- Public Law 86-523, Reservoir Salvage Act of 1960, as amended. This Act provides for (1) the preservation of historical and archeological data that might otherwise be lost or destroyed as the result of flooding or any alteration of the terrain caused as a result of any Federal reservoir construction projects; (2) coordination with the Secretary of the Interior whenever activities may cause loss of scientific, prehistoric, or archeological data; and (3) expenditure of funds for

recovery, protection, and data preservation. This Act was amended by Public Law 93-291.

- Public Law 86-717, Forest Cover Conservation Act, 6 Sept. 1960. - This act provides for the protection of forest cover and other vegetative cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.
- Public Law 87-88, Federal Water Pollution Control Act Amendments of 1961, as amended. Section 2(b)(1) of this Act gives USACE responsibility for Water Quality management of USACE reservoirs. This law was amended by the Federal Water Pollution Control Act Amendment of 1972, Public Law 92-500.
- Public Law 87-874, Rivers and Harbors Act of 1962. - This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Public Law 88-578, Land and Water Conservation Fund Act of 1965. - This act established a fund from which Congress can make –appropriations for outdoor recreation. Section 2(2) 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 89-72, Federal Water Project Recreation Act of 1965. - 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 USACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- Public Law 89-90, Water Resources Planning Act (1965). - 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.
- Public Law 89-272, Solid Waste Disposal Act, as amended by PL 94-580, dated October 21, 1976. - 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 national 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.
- Public Law 89-665, Historic Preservation Act of 1966. - 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.

- Public Law 90-483, River and Harbor and Flood Control Act of 1968, 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.
- Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). - 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.
- Public Law 91-611, River and Harbor and Flood Control Act of 1970. - 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.
- Public Law 92-347, Golden Eagle Passbook and Special Recreation User Fees. - This act revises Public Law 88-578, the Public Land and Water Conservation 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 USACE from collecting entrance fees to projects.
- Public Law 92-500, Federal Water Pollution Control Act Amendments of 1972. - The Federal Water Pollution Control Act of 1948 (PL 845, 80th Congress), as amended in 1956, 1961, 1965 and 1970 (PL 91- 224), 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."
- Public Law 92-516, Federal Environmental Pesticide Control Act of 1972. - 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, Collection of Fees for Use of Certain Outdoor Recreation Facilities. - This act amends Section 4 of the Land and Water Conservation 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.

- Public Law 93-205, Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended. 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. This Act was amended by Public Law 96-159.
- Public Law 93-251, Water Resources Development Act of 1974. - 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 plant installations.
- Public Law 93-291, Archeological Conservation Act of 1974. - 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.
- Public Law 93-303, Recreation Use Fees. - This act amends Section 4 of the Land and Water Conservation 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.
- Public Law 93-523, Safe Drinking Water Act. - 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, Amendment of the Land and Water Conservation Fund Act of 1965. - Expands the role of the Advisory Council. Title 2 - Section 102a amends Section 106 of the 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.
- Public Law 95-217, Clean Water Act of 1977, as amended. This Act amends the Federal Water Pollution Control Act of 1970 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.

- Public Law 95-341, American Indian Religious Freedom Act of 1978. 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.
- Public Law 95-632, Endangered Species Act Amendments of 1978. This law amends the Endangered Species Act Amendments 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.
- Public Law 96-95, Archeological Resources Protection Act of 1979. This Act protects archeological resources and sites that are on public and tribal lands, and 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.
- Public Law 98-63, Supplemental Appropriations Act of 1983. 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 USACE, except policymaking or law or regulatory enforcement.
- Public Law 99-662, The Water Resources Development Act (WRDA) 1986. - Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure. Establishes new requirements for cost sharing.
- PL101-233, North American Wetland Conservation Act (13 Dec 1989), 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.
- PL101-336, Americans with Disabilities Act of 1990 (ADA), 26 July 1990, as amended by the ADA Amendments Act of 2008 (PL110-325), prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires reasonable accommodations for persons with disabilities.
- PL101-601, Native American Graves Protection and Repatriation Act (16 Nov 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.
- PL 102-580, Water Resources Development Act (WRDA) of 1992 (31 Oct 1992) authorizes 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.

- PL 103-66 Omnibus Reconciliation Act-Day use fees (10 Aug 1993), authorizes USACE to collect fees for the use of developed recreational sites and facilities, including campsites, swimming beaches and boat ramps.
- PL104-303, WRDA 1996. 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.
- PL104-333, Omnibus Parks and Public Lands Management Act of 1996, (12 Nov 1996), 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.
- PL106-147, Neo-tropical Migratory Bird Conservation Act (20 July 2000), promotes the conservation of habitat for neo-tropical migratory birds.
- The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, 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, purchase or barter, 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."

## 3 RESOURCE GOALS AND OBJECTIVES

### 3.1 INTRODUCTION

This chapter sets forth goals and objectives necessary to achieve the USACE vision for the future of Elk City Lake. The terms “goals” and “objectives” are often defined as synonymous, but in the context of this Plan, goals express the overall desired end state of the cumulative land and recreation management programs at Elk City Lake. Resource objectives specify task-oriented actions necessary to achieve the master plan goals.

### 3.2 RESOURCE GOALS

The following goals are the priorities for consideration when determining management objectives and development activities. Implementation of these goals is based upon time, manpower, and budget. The objectives provided in this chapter are established to provide high levels of stewardship to USACE managed lands and resources while still providing a high level of public service. These goals will be pursued through the use of a variety of mechanisms such as: assistance from volunteer efforts, hired labor, contract labor, permit conditions, remediation, and special lease conditions. It is the intention of Elk City Lake staff to provide a realistic approach to the management of all resources. The following statements, based on *EP 1130-2-550*, Chapter 3, express the goals for the Elk City 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 project 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 project natural resources.
- GOAL D.** Recognize the unique qualities, characteristics, and potentials of the project.
- 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; 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.

### **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, Elk City Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, USACE Environmental Operating Principles (EOPs), and applicable national performance measures. The objectives also incorporate findings and recommendations included in the 2016 Strategic Wildlife Action Plan (WAP) and the 2015 Kansas Statewide Comprehensive Outdoor Recreation Plan (SCORP). The objectives 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.

The objectives in this Master Plan are intended to provide project benefits, meet public needs, and foster environmental sustainability for Elk City Lake to the greatest extent possible. Implementation of the objectives will require close coordination between KDWP and USACE and are dependent available funds. Tables 3-1 through 3-5 list the objectives for Elk City Lake.

**Table 3-1 - Recreational Management Objectives**

Recreational Management Objectives	Goals				
	A	B	C	D	E
Provide enough campsites in popular areas and renovate existing facilities to provide a quality recreation experience for visitors while protecting natural resources for use by others.	*		*		
Provide opportunities for day use activities, especially picnicking.	*		*		
In coordination with KDWP, optimize opportunities for hunting game wildlife species on all USACE lands where such activities are appropriate and in accordance with natural resource management objectives. Maintain the Elk City Lake Public Hunting Area Map and Guide to accurately reflect the status of hunting opportunities and special restrictions for all USACE lands.	*		*	*	*
Monitor boating traffic and evaluate the need to conduct a comprehensive recreation boating use study to ensure visitor safety and enjoyment.	*		*		
Provide new recreation facilities in accordance with public demand.	*		*		
Work with partners to expand existing and develop new trails.	*		*		*
Consider pool fluctuations in design and placement of recreation facilities such as campsites, boat ramps, courtesy docks and restrooms, as well as tree planting and general landscaping.	*	*	*	*	
Ensure consistency with USACE Natural Resource Management Strategic Plan.					*
Monitor the 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 in light of USACE policy and operational aspects of Elk City 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 priority habitats identified for the Chautauqua Hills Ecological Focus Areas described by KDWP in the State Wildlife Action Plan (WAP).	*	*		*	*
Consider partnering with the Ancient Cross Timbers Consortium, as Montgomery County is in the target area.		*		*	*
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 in Need of Conservation by implementing ecosystem management principles. Key among these principles is the use of native species adapted to the Elk City Lake ecological regions in restoration and mitigation plans.	*	*		*	*
Actively manage principal game wildlife species by establishing means of taking within specified public hunting areas in accordance with the regulatory processes of KDWP.	*	*	*		*
Manage high density and low-density recreation lands in ways that enhance benefits to wildlife while meeting recreation needs.					*
Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats.		*			*
Minimize activities that disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Ensure that adverse impacts resulting from land use actions, including outgrants, are appropriately mitigated to restore the value of the land to the nation.		*		*	*



Implement prescribed fire as a management tool to promote the vigor and health of Cross Timbers forests, woodlands, and prairie.	*	*			*
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 communities. Emphasize actions that promote butterfly and /or pollinator habitat, migratory bird habitat, and habitat for birds listed by USFWS as Birds of Conservation Concern.	*	*		*	*

**Table 3-3 - Visitor Information, Education, and Outreach Objectives**

Visitor Information, Education and Outreach Objectives	Goals				
	A	B	C	D	E
Provide opportunities 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, water safety, recreation, cultural resources, ecology, invasive species and USACE missions.	*	*	*	*	*
Work closely with interest groups.	*			*	*
Promote USACE Water Safety message.	*		*	*	*

Educate adjacent landowners on shoreline management policies and permit processes in order to reduce encroachment actions.	*	*	*	*	*
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**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 1130-2-550 and applicable chapters in ER 405-1-12.	*				*
Manage project lands and recreational programs per USACE Climate Preparedness and Resilience guidance.					*

**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 the Cultural Resources Management Plan.	*	*		*	*
Increase public awareness and education of regional and local Tribal history.		*		*	*

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.

## **4 LAND ALLOCATION, LAND CLASSIFICATION, WATER SURFACE, AND PROJECT EASEMENT LANDS**

### **4.1 LAND ALLOCATION**

All project 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. There are four possible categories of allocation identified in USACE regulations for acquisition: Operations, Recreation, Fish and Wildlife, and Mitigation. At Elk City 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 water supply, water quality, recreation, 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**

Previous versions of the Elk City Lake Master Plan included land classification criteria that were similar, but not identical to the current criteria. These prior land classifications were based more on projected need than on actual experience, which resulted in some areas being classified for a type of use that has not or is not likely to occur. Additionally, in the 33 years since the 1988 Supplement Number 2 (an update to the original 1977 Master Plan) was published, USACE land management policy, wildlife habitat values, surrounding land use, and regional recreation trends have changed significantly giving rise to the need for revised land classifications. Refer to Table 8-1 in Chapter 8 for a summary of land classification changes from the prior classifications to the current classifications.

#### **4.2.3 Current Land Classifications**

USACE regulations require the project lands and water surface to be classified in accordance with the primary use for which project lands are managed. There are six primary categories and four subcategories of classification identified in USACE regulations including:

- Project Operations

- High Density Recreation
- Mitigation
- Environmentally Sensitive Areas
- Multiple Resource Management Lands
  - Low Density Recreation
  - Vegetation Management
  - Wildlife Management
  - Future/Inactive Recreation Areas
- Water Surface

The land and water surface classifications for Elk City Lake were established after considering public comments, input from key stakeholders including elected officials, city and county governments, and lessees operating on USACE land. Additionally, wildlife habitat values and concerns, as well as outdoor recreation trends analysis provided in the SCORP were used in decision making. Also included in the analysis were historical public use and land management patterns that have developed since publication of the 1977 Master Plan and 1988 Supplement. 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, project office, and maintenance yards, all of which must be maintained to carry out the authorized purpose of flood control. In addition to the operational activities taking place on these lands, limited recreational use may be allowed for activities such as public access to the fishing pier. Regardless of any limited recreation use allowed on these lands, the primary classification of Project Operations will take precedent over other uses. There are 625 acres of Project Operations land specifically managed for this purpose.

#### 4.2.5 High Density Recreation (HDR)

These are lands developed for intensive recreational activities for the visiting public 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 Elk City Lake there are 650 acres classified as High Density Recreation land. Refer to Chapter 2, Table 2-20 for a listing of the current High Density Recreation Areas and who operates them at Elk City Lake. Each of the High Density Recreation areas is described briefly in Chapter 5 of this Plan.

#### 4.2.6 Mitigation

This classification is used only for lands allocated for mitigation for the purpose of offsetting losses associated with the development of the project. No Mitigation lands are allocated for Elk City Lake; therefore, no lands are classified as Mitigation lands.

#### 4.2.7 Environmentally Sensitive Areas

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. At Elk City Lake several distinct areas have been classified as Environmentally Sensitive Areas (ESA), primarily for the protection of sensitive habitats or cultural resources. There are 764 acres classified as ESA at Elk City Lake. Each of these areas are discussed in Chapter 5 of this Plan and illustrated on the maps in Appendix A.

#### 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 12,595 acres of land under this classification at Elk City Lake. The following paragraphs list each of the sub-classifications, and the number of acres and primary uses of each.

- Low Density Recreation. These are lands that may support passive public recreational use (e.g., fishing, hunting, wildlife viewing, natural surface trails, hiking, etc). There are 1,174 acres under this classification at Elk City Lake.
- Wildlife Management. This land classification applies to those 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 11,421 acres of land included in this classification at Elk City Lake.
- Vegetative Management. 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 of land included in this classification at Elk City Lake.
- Future or Inactive Recreation. These are lands with site characteristics compatible with High Density Recreation development. These are areas where High Density Recreation development was anticipated in prior land classifications, but the development either never took place or was minimal. 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 of land included in this classification at Elk City 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 USACE or lessees with navigational or informational buoys or signs, or are denoted on public maps and brochures. The four sub-categories of water surface classification include:

- Restricted. These areas are restricted to the extent that public access is not allowed for reasons of public safety, and for project operations and security purposes. The areas include water surface in front of the intake gate control tower and the two designated swimming beaches. Approximately two acres of water surface are classified as Restricted at Elk City Lake. These areas are depicted on the land classification maps in Appendix A.



- Designated No-Wake. There are eight boat ramps where approximately six acres of water surface are classified as Designated No-Wake for reasons of public safety and protection of property and shorelines. The water surface acreage in this classification can vary significantly depending on lake elevation. No-wake areas are typically denoted by buoys in appropriate areas.
- Fish and Wildlife Sanctuary. These areas are managed with annual or seasonal boating access restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. As part of the Waterfowl Refuge under the management of KDWP, there are 234 acres of Fish and Wildlife Sanctuary acres at Elk City Lake.
- Open Recreation. This classification encompasses the majority of the lake water surface and is open to general recreation with boats being the primary means of transport. 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. Approximately 3,621 acres of water surface at Elk City Lake are classified as Open Recreation.

A summary of land classifications at Elk City Lake is provided in Table 4-1. Acreages were calculated using historical and GIS data. A map representing these areas can be found in Appendix A.

**Table 4-1 - Acreage by Land Use Classification**

Classification	Acres
<b>Project Operations</b>	625
<b>High Density Recreation</b>	650
<b>Environmentally Sensitive Areas</b>	764
<b>Multiple Resource Managed Lands: Low Density Recreation</b>	1,174
<b>Multiple Resource Managed Lands: Wildlife Management</b>	11,421
<b>Multiple Resource Managed Lands: Vegetative Management</b>	-
<b>Future/Inactive Recreation</b>	-

Classification	Acres
<b>Water Surface: Restricted</b>	2
<b>Water Surface: Designated No-wake</b>	6
<b>Water Surface: Fish and Wildlife Sanctuary</b>	234
<b>Water Surface: Open Recreation</b>	3,621

\* **Note:** These acreage figures were measured using GIS technology and may vary slightly from official land acquisition records.

#### 4.3 PROJECT EASEMENT LANDS

These are 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 Elk City Lake, only flowage easements exist. 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 12 separate easements, totaling 989 acres of flowage easement lands, at Elk City Lake.

## **5 RESOURCE PLAN**

### **5.1 RESOURCE PLAN OVERVIEW**

This chapter describes in broad terms how each land classification within the Master Plan will be managed. All management goals described in Section 3.2 apply to each of the land classification, but the primary goal(s) for each classification is listed below for emphasis. Refer to section 3.3 for a listing of resource objectives applicable to each management goal. Refer to Appendix A for maps showing the various land classifications.

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. The land classifications and applicable management goals for each classification for Elk City Lake include the following:

- Project Operations Goal A
- High Density Recreation Goal C
- Environmentally Sensitive Areas Goal B, D, E
- Multiple Resource Management Lands for:
  - Low Density Recreation Goal C
  - Wildlife Management Goal B, E

A more descriptive and detailed plan for managing project lands can be found in the Elk City Lake OMP. The OMP is an annually-updated, task and budget oriented plan identifying tasks necessary to implement the Resource Plan and achieve the goals and objectives of the Master Plan.

### **5.2 PROJECT OPERATIONS**

Project Operations is land associated with the dam, spillway, levees, lake office, maintenance facilities, and other areas solely for the operation of the project. There are 625 acres of lands under this classification, which are managed by the USACE. The management plan for this area is to continue providing physical security necessary to ensure sustained operations of the dam and related facilities including restricting public access in hazardous locations near the dam and spillway.

### **5.3 HIGH DENSITY RECREATION**

Elk City Lake has 650 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 Elk City Lake include 190 acres in three park areas that are managed by USACE, and Elk City State Park with a total of 325 acres managed by KDWP under a lease agreement with USACE. The KDWP is responsible for the operation and maintenance of their leased areas, and although USACE does not provide direct maintenance within any of the leased locations, it may occasionally lend support where appropriate. The USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all leased and USACE-operated HDR areas. USACE works with partners to ensure that recreation areas are managed and operated in accordance with the objectives prescribed in Chapter 3.

The following is a description of the parks operated by USACE and by KDWP on USACE lands at Elk City Lake, some of which are highly developed, while others have only basic facilities and limited development. Classifications for the various parks at Elk City 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 USACE Managed Parks

USACE is the largest federal provider of outdoor recreation, managing 12 million acres of lands and waters across the county. 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 in light of today's fiscal realities and be responsive to the changing needs of the American people. The following parks are under USACE direct management.

#### 5.3.1.1 Day Use Parks

Memorial Overlook – Memorial Overlook is a scenic viewing area that is located high above the east side of the Dam. Encompassing 5 acres of land, Memorial Overlook offers panoramic views of Elk City Lake and Dam. Operated by USACE, the park serves as a day use area with picnic tables and hiking trail access to the Post Oak Nature Trail and the Table Mound Hiking Trail.



**Photo 5 – View of Elk City Lake from Memorial Overlook (Source: USACE)**

#### 5.3.1.2 Class A Parks

USACE does not operate any Class A Parks at Elk City Lake. See Elk City Lake State Park for description of KDWP operated Class A Park.

#### 5.3.1.3 Class C Parks

Outlet Channel – The Outlet Channel area encompasses 150 acres and is located below the dam and along the west side of the outlet channel. The park is operated by the USACE and serves as a combination of day use and camping recreation. The day use recreation offers fishing, a group picnic shelter, basketball court, volleyball court, and playground. Trailheads for both the Elk River Hiking Trail and Eagle Rock Mountain Bike Trail can be accessed from the park. The campground offers 15 campsites, including 7 campsites with electric, water and sewer hookups, and 8 primitive campsites. A vault toilet but no showers are available.





**Photo 6 – View of outlet channel (Source: USACE)**

### **5.3.2 Elk City State Park Lease**

Dense oak and hickory woodlands meet rolling meadows of big bluestem and Indian grass at this striking park located on the east shore of Elk City Lake. Elk City State Park offers a quiet, family-oriented get-away. The compact park allows easy, quick access to features including boat ramps, a swim beach, camping, rental cabin, playgrounds, and hiking trails. The lake area offers picturesque views ranging from open prairie to wooded hills and limestone bluffs.

The area is well-known for its diverse trail systems. Wildlife watchers can see a variety of Kansas wildlife, including the large pileated woodpecker which is common in the mature trees along the Elk River.

Elk City State Park campgrounds are organized into four areas to include Comfort Cove, Prairie Meadow, Sunset Point, and Timber Road. A separate day use area is available for visitors to enjoy.



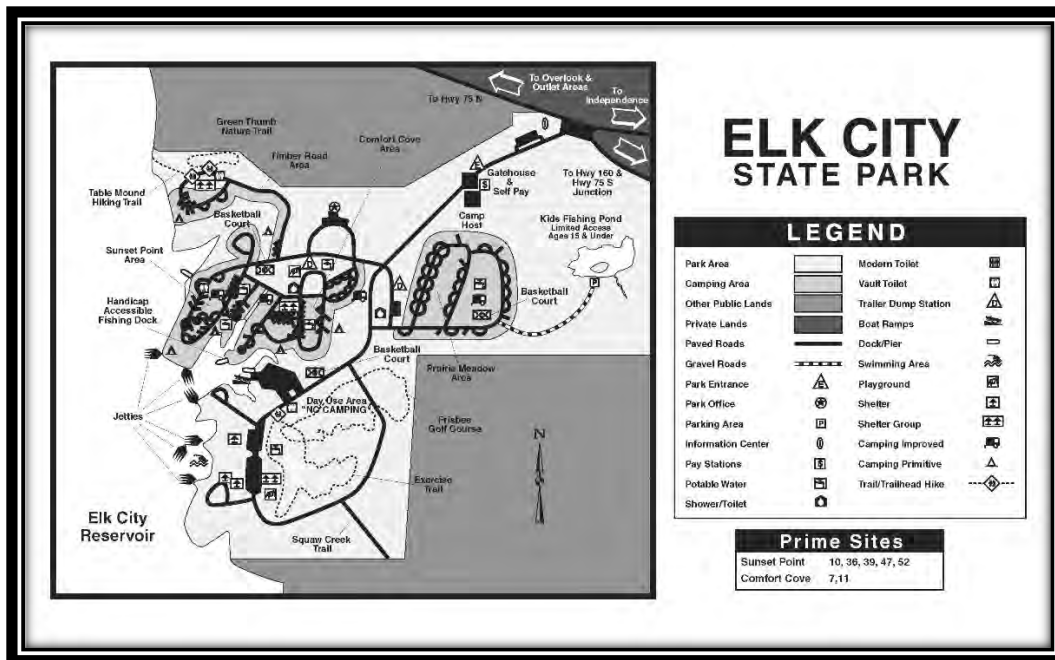


Figure 16 - Map of Elk City State Park (Source: KDWP)

- *Comfort Cove* campground contains 52 total campsites, 11 sites with water, electric and sewer hookups, 33 sites with water and electric hookups, and 8 primitive sites. Other amenities at the campground includes an ADA fishing dock, amphitheater, playground, RV dump station, and shower house.
- *Prairie Meadow* campground contains 30 total campsites all with water and electric hookups. Amenities at the campground includes a basketball court, kids fishing pond, RV dump station, shower house, and volleyball court.
- *Sunset Point* campground contains 55 total campsites, 22 sites with water and electric hookups, and 33 primitive sites. Vault toilets are available in this area of the park.
- *Timber Road* campground contains 13 primitive campsites. Access to both the Table Mound Hiking Trail and Green Thumb Nature Trail in this area. A wildlife feeder and vault toilets are available in this area of the park.
- *Osage Lowland Day Use Area* requires a permit to access the area which is separate from the campgrounds. Access to the Post Oak Nature Trail and Osage Lowlands Trail is in this day use area. Amenities in the day use area includes basketball court, swimming beach, boat ramp, courtesy dock, ½-mile exercise trail, group shelter, vault toilets, playground, and a sand volleyball court.

### 5.3.3 Trails

There are several trails on USACE lands, some of which are managed by partner agencies. Located in the Cross Timbers region consisting mainly of ancient post and blackjack oaks, Elk City State Park boasts some of the best hiking trails in southeast

Kansas. Currently, the Elk City State Park operates four foot trails totaling 8 miles and one mountain bike trail which is approximately 4 miles in length. Two other trails, the Elk River hiking trail and the Timber Ridge hiking trail are also located at Elk City Lake and are managed by USACE.



Figure 17 - Elk City Lake hiking trails map (Source: USACE)

- *Green Thumb Nature Trail* is a 1 mile loop interpretive nature trail managed by KDWP; its trailhead is in the Timber Road Campground. Features of the trail include two wooden pedestrian footpaths and interpretive signage informing hikers of the plants and animals native to this area. Being a somewhat uphill hike, the trail is described as a moderately strenuous. Upon arriving at the top of the hill, the surrounding trees frame a spectacular view of Elk City Lake.
- *Table Mound Hiking Trail* is a 2.75 mile linear trail managed by KDWP; access is from its two trailheads located at either the Scenic Overlook near the dam or at Timber Road campground. Hikers will be witness to many different and picturesque scenes along the trail. The trail is blazed with blue paint markings and is considered a moderately strenuous hike. The trail has been designated as a National Recreation trail under the U.S Department of the Interior National Trail System.

- *Post Oak Self-Guiding Nature Trail* is a 2/3-mile trail managed by KDWP; the trailhead is located at the Scenic Overlook near the dam. The trail is located on the top of table mound and is considered a relatively easy hike. The old-growth forest setting that this trail winds through is indicative of the Cross Timbers region. A wide variety of tree species can be found here with many specimens being well over 200 years in age. A self-guiding brochure has been developed to coincide with this trail to be used as an interpretive aide for the user. The trail has been designated as a National Recreation Trail under the U.S Department of the Interior National Trail System.
- *Eagle Rock Mountain Bike Trail* is a 4 mile mountain bike trail managed by KDWP; the trailhead is located near the Timber Road campground below the dam. The trail was designed with the beginner mountain biker in mind but also for the experienced mountain biker to excel on. On its path, which passes by large sycamore and oak trees, the trail has roller coaster dips, straight and winding climbs, down hills, and log jumps with ride-around provided in most places for the less skilled riders. The wooded portion of the trail soon gives way to a trek through ice age boulders that cover the hillside. Another segment of the trail winds through tall native grasses.
- *Osage Lowlands Trail* is 2.5 mile paved hike and bike trail managed by KDWP; the trailhead is in the Osage Lowlands day use area. It has views of the wildlife area, the south side of the lake and is available for walking or bike riding.
- *Elk River Hiking Trail* is a 15 mile point-to-point hiking trail managed by USACE; the trail is located along the northwestern shore of the lake with the eastern trailhead located west of the dam near at the intersection of County Rd 5000 and County Rd 3300, and the western trailhead located off US Highway 160 just north of the Elk River. The trail offers scenic views from the tops of the many limestone bluffs, but it also crosses several small streams and ravines and winds through narrow canyons and under rock overhangs. The trail is rated as strenuous. The trail has been designated as a National Recreation trail under the U.S Department of the Interior National Trail System.
- *Timber Ridge Hiking Trail* is a 2.4 mile loop trail managed by USACE; the trailhead is in Card Creek park. The trail is both a hike and mountain bike trail which is rated for all skill levels. The trail is accessible year-round.

## 5.4 ENVIRONMENTALLY SENSITIVE AREAS

Environmentally Sensitive Areas (ESA) 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 or applicable state statutes. These areas must be managed to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit,

such as prairie restoration and management. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area. There are 764 acres at Elk City Lake under this classification. These acres are managed in cooperation with the State of Kansas for the protection of unique habitat, protected wildlife, or cultural resources. Management actions that may be implemented include planting suitable native vegetation, no tillage of the ground surface will be permitted, and the use of prescribed burns to maintain desired vegetative cover.

At Elk City Lake, eight areas totaling approximately 764 acres were classified as ESA. Each of these areas are numbered on the land classification maps in Appendix A. Table 5-1 provides a listing, including habitat type, acreage, WHAP scores and a determining factor description. WHAP scores can be as high as 1.00; in general, scores above 0.60 are considered good habitat, and scores above 0.80 are considered excellent habitat. More information about the WHAP are available in the WHAP Report in Appendix C.

**Table 5-1 ESA Areas at Elk City Lake**

ESA Area Number	WHAP Scores Per Sample Point Number and Associated Habitat Type				
	Point No.	Score	Habitat Type	Approx. Acres	Determining Factor
ESA 1	N/A	N/A	N/A	28	Aesthetic and other value
ESA 2	18	.66	Riparian/ Bottomland Hardwood Forest	28	Combination of bottomland hardwood forest and aesthetic and other value
ESA 3	20	.80	Riparian/ Bottomland Hardwood Forest	55	Combination of bottomland hardwood forest and aesthetic and other value
ESA 4	N/A	N/A	N/A	36	Aesthetic and other value
ESA 5	N/A	N/A	N/A	403	Aesthetic and other value
ESA 6	11	.66	Riparian/ Bottomland Hardwood Forest	57	Combination of bottomland hardwood forest and aesthetic and other value
ESA 7	N/A	N/A	N/A	141	Aesthetic and other value
ESA 8	N/A	N/A	N/A	17	Aesthetic and other value

## 5.5 MULTIPLE RESOURCE MANAGEMENT LANDS

Multiple Resource Management Lands (MRML) are organized into four sub-classifications. These sub-classifications are: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. The following is a description of each sub-classification's resource objectives, acreages, and description of use.



**Photo 7 – Hunters at Elk City Lake (Source: USACE)**

### 5.5.1 MRML - Low Density Recreation

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 in close proximity to 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. There are 1,174 acres of MRML – Low Density Recreation at Elk City Lake.



### 5.5.2 MRML - Wildlife Management

There are 11,421 acres of MRML – Wildlife Management at Elk City Lake. The management of these lands is provided by KDWP. These include lands reaching upstream from the dam along the Elk River, Salt Creek and Card Creek that flow into the lake. 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 practices by USACE 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. KDWP employs many of these same management practices on the Elk City Wildlife Area but may also implement enhancement practices such as agricultural leases that may benefit waterfowl and planting sunflower fields to attract doves for hunters. Additional best management practices may include the following:

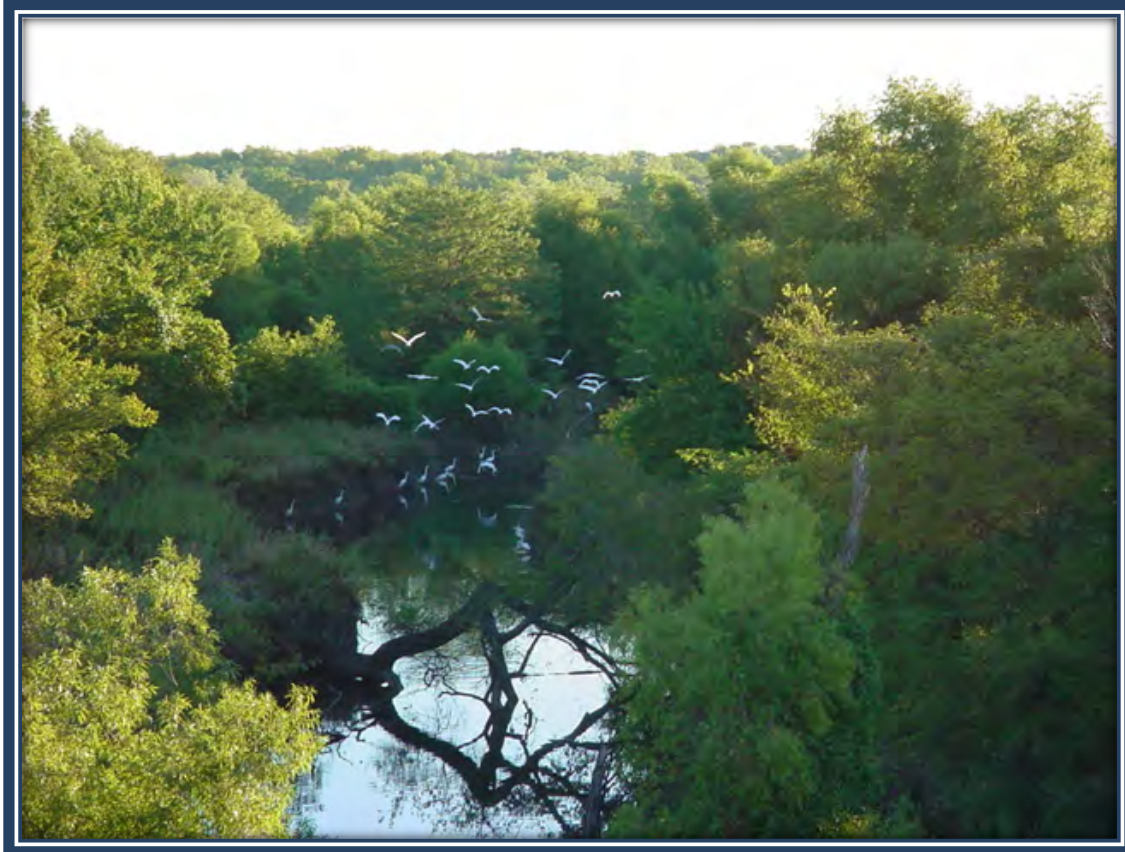
- Use of erosion control blankets that do not pose entrapment hazards to wildlife
- Minimize nighttime lighting and only use down-shielded lighting to prevent disorientation of night-migrating birds
- Follow USFWS guidelines for building glass to prevent bird collisions
- Preserve and restore wildlife habitat in high density recreation areas
- Ensure that mowing practices provide standing tallgrass over winter to provide essential cover for wintering birds
- Report sightings of state-listed species and presence of rare vegetative communities

There are federally-listed threatened or endangered species that could and do utilize habitat within the Elk City Lake area. Therefore, any work conducted on this project will be in accordance with the Endangered Species Act and will be appropriately coordinated with the USFWS. The species of focus within this area of consideration are animals listed as a threatened or endangered species under the Endangered Species Act. These species will continue to receive attention to ensure they are managed in accordance with their habitat needs.

USACE also manages non-game wildlife, with some non-game programs, such as songbird nest box construction and installation of bat boxes, performed on an intermittent basis. The plan is to continue these initiatives to provide some form of management for non-game species. Conservation and protection of habitat that is typical of the Chautauqua Hills Ecological Focus Areas, especially highly unique or diverse areas will be given high priority. Priority will also 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 Need, and 4) Meet the needs of resident species not included in the above priorities.



**Photo 8 - Wildlife management area (Source: USACE)**

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 USACE and approved through state regulatory processes. Natural surface pedestrian trails are appropriate for most Wildlife Management areas.

### **5.5.3 MRML-Vegetative Management**

These are lands designated for stewardship of forest, prairie, and other native vegetative cover. Passive recreation activities, such as hiking on natural surface trails, wildlife photography, and hunting may be allowed in these areas. There are 0 acres of Vegetative Management at Elk City Lake.

#### 5.5.4 Future or Inactive Recreation Areas

These areas either have site characteristics compatible with potential future development or are currently closed recreation areas. These areas will be managed for multiple resources until opportunities to develop or reopen them arise. There are 0 acres of Future or Inactive Recreation at Elk City Lake.

### 5.6 **WATER SURFACE**

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 classified using the following classifications:

- Restricted
- Designated No-Wake
- Fish and Wildlife Sanctuary
- Open Recreation

At conservation pool level of 796.0 NGVD there are 3,863 (measured using GIS dataset) acres of surface water. Buoys are managed by USACE with close coordination with the KDWP. These buoys help mark hazards, swim beaches, boats keep-out and no-wake areas. The following water surface classifications are designated at Elk City Lake.

#### 5.6.1 Restricted

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations and safety and security purposes. The total acreage of Restricted water surface is approximately 2 acres. The Restricted water surface at Elk City Lake includes areas near the dam and the swim beach. Future management calls for proper placement and upkeep of buoys as well as describing the restricted water surface areas on maps available to the public.

#### 5.6.2 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. There are three boat ramp areas at Elk City Lake where no-wake restrictions are in place for public safety and protection of property. Designated No-Wake areas at Elk City Lake include approximately 6 acres. Future management of these areas rests with USACE and KDWP. Specific measures to be taken include proper placement and maintenance of buoys, placement of signs near boat ramps, and describing designated no-wake areas on maps available to the public.

### 5.6.3 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. As a part of the Waterfowl Refuge managed by KDWP, there are 234 acres of Fish and Wildlife Sanctuary water surface at Elk City Lake.

### 5.6.4 Open Recreation

Open Recreation includes all water surface areas available for year round or seasonal water-based recreational use. Approximately 3,621 acres of Elk City 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 Kansas. USACE always encourages all boaters and swimmers to wear their lifejackets and to learn to swim well.

## **5.7 RECREATIONAL SEAPLANE OPERATIONS**

Recreation seaplane landings and takeoffs may occur on water surface areas where this activity is not prohibited. A map depicting areas where seaplane landings and takeoffs are prohibited can be found in the map section of this Plan. 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, Part 327.4. Appendix E contains the seaplane map for Elk City Lake.

## **6 SPECIAL TOPICS/ISSUES/CONSIDERATIONS**

### **6.1 SEDIMENTATION**

By design, reservoirs constructed for flood control purposes drain into extensive land areas and are therefore characterized by large watersheds. As a result, reservoirs may be subject to input and accumulation of large quantities of sediments transported from their watersheds, particularly when drainage areas are characterized by erodible soils and land uses which expose soils to erosion and transport during significant rainfall events. Such land uses may include agricultural practices such as row crop farming and other practices resulting in soil disturbance. Large federal reservoirs are designed to accommodate high sediment inputs over time, though sediment accumulation eventually decreases the capacity of these lakes for water storage. Typically, sedimentation is event-driven with most sediment loading occurring during major inflow events. The rate of storage loss varies by lake and sediment accumulation over time is typically monitored by periodic sedimentation surveys.

The conservation pool (the upper limit of which is sometimes referred to as “normal” pool level) contains all the water stored for project purposes such as Water Quality, Water Supply, fish and wildlife, and recreation. Over time, accumulation of sediment in the conservation pool decreases the capacity for water storage and, in extreme cases, may severely impact authorized project purposes. Watershed protection strategies which decrease soil erosion at the source are generally viewed as the most effective means of reducing reservoir sedimentation. Owing to prohibitively high costs and environmental effects, large-scale dredging of federal reservoirs is currently rarely employed as a means of restoring lost capacity. Details of sedimentation for Elk City Lake can be found in Chapter 2.

### **6.2 WATERSHED RESTORATION AND PROTECTION STRATEGY**

The WRAPS is a framework that allows for increased stakeholder involvement in issues that impact their watershed. Administered by the KDHE under the authority of the 1998 Clean Water Action Plan, this program helps communities identify protection needs and opportunities, create goals and action items to accomplish those goals, and funding to the stakeholders to implement the action items.

Each WRAPS group has a nine-element plan that guides their activities. The Elk City Lake WRAPS Nine Element plan is written to address impairments relating to nutrients and sedimentation. Best management practices will be put in place specifically to address impacts from croplands.

Specifically, impairments addressed in the Upper Walnut/Elk City Lake WRAPS are the impacts of bacteria, nutrients, and sediment by targeting rangeland, livestock, cropland and streambank areas. Best management practices for reducing nutrients and sedimentation within cropland including contour farming, grassed waterways, buffers, and streambank stabilization. The steps within the WRAPS program involve building

awareness and education, engaging local leadership, monitoring and evaluation of watershed conditions, and assessment, planning, and implementation of the WRAPS process at the local level.

### **6.3 POOL ELEVATION**

Elk City Lake possesses two active zones or “pools” defined by elevation and established at the time the reservoir was designed by the USACE and authorized by Congress. The flood control pool at Elk City Lake is normally kept empty but is periodically used to catch and control upstream flows, which, without the dam, could cause downstream flooding. Flood control storage at Elk City Lake exists between elevations 796 and 825 feet (ft.) NGVD. Storage in the flood control pool is only used to minimize downstream flooding during periods of rainfall and the objective of operating the lake is to evacuate this pool as quickly as possible while minimizing downstream flood impacts. The bottom elevation of the flood control pool (796 ft.) defines the transition point between flood control and conservation pools at Elk City Lake.

The conservation pool stores water to support authorized project purposes. The conservation pool for Elk City Lake exists between elevations 764 and 796 ft. NGVD. Accordingly, the top of the Elk City Lake conservation pool (sometimes referred to as “normal” pool elevation) is 796 ft. NGVD as authorized by Congress. Based on the most recent sediment survey (2010), Elk City Lake contains approximately 37422 acre-feet (a unit of volume equal to one acre of surface area and a depth of 1 foot) of storage at the top of the conservation pool. While the lake level at any given time may vary depending upon withdrawals, reservoir releases, drought, or rainfall, which replenishes water in the conservation pool or fills portions of the flood control pool, the objective of operating the lake is to maintain a lake level as close to the top of the conservation pool as possible.

Changing the elevation of the top of the conservation pool of a federal reservoir from that authorized by Congress is not a simple, inexpensive, or trivial matter. This action requires redistribution or “reallocation” of storage between authorized pools, typically increasing the elevation of the conservation pool by reallocating from flood storage for some clearly identified and defined need – often an increase in storage for Water Supply. This requires detailed study of the impacts to authorized project purposes as well as associated environmental impacts. Depending upon the nature of the request, detailed studies and any mitigation required to change conservation pool elevations may require considerable cost sharing by non-federal entities requesting the changes. Finally, depending on the extent and nature of reallocation of storage, final approval of such changes may require Congressional authorization.

There are currently no identified needs or requests for reallocation of storage or changes to authorized pool elevations at Elk City Lake. Accordingly, there are no current plans to study or implement changes to authorized pool levels or operations from those currently in place.

## **6.4 LAKE LEVEL MANAGEMENT PLANS**

During the fall and winter months, fluctuations of normal lake levels at Elk City Lake are implemented annually in efforts to improve wildlife/waterfowl habitat. Dependent upon summer conditions and water levels, by targeting up to a 1 to 2 foot rise in elevation during the November through January time period, as requested by KDWP, the goal is to improve and/or support wildlife.

An increase in the water level during the stated time period could drastically improve the habitat and food availability for waterfowl. Having an improved quality of habitat will benefit all waterfowl species as a whole. It will enable ducks and geese to increase their body condition and store energy, as fat, that they will use during their migration. At the same time, the hunting opportunities will be greatly increased around the entire perimeter of the reservoir.

## **6.5 MOTORIZED VEHICLES**

The operation of motorized vehicles on roadways within USACE managed property at Elk City Lake is governed by applicable Federal, state, and local laws and regulated by authorized enforcement officials (36 CFR 327.2 and 327.26). All vehicles/operators are required to be tagged/title/licensed through a department of motor vehicle (DMV). The off-road operations of any motorized vehicle is not authorized.

## **7 PUBLIC AND AGENCY COORDINATION**

### **7.1 PUBLIC AND AGENCY COORDINATION**

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 Elk City 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 environmental assessment process. Public involvement is especially important at Elk City Lake to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs in a region. The following milestones provide a brief look at the overall process of revising the Elk City Lake Master Plan.

The USACE began planning to revise the Elk City Lake Master Plan in the Fall of 2019. The objectives for a master plan revision were to (1) update land classifications to reflect changes in USACE land management policies since 1977 and (2) update 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 INPUT AND PUBLIC MEETINGS**

In the interest of public health and well-being due to the Covid-19 pandemic, the public input process was changed from a face-to-face public meeting to a virtual presentation detailing the specifics of the master plan revision. The presentation and public input process remained open for 45 days. The public comment period began May 11, 2020 and ran through June 26, 2020.

The presentation included a description and definition of a master plan, descriptions of the new land use classification options, and instructions for commenting on the master plan. Presentation topics included:

- Public involvement process
- Project overview
- Overview of the National Environmental Policy Act (NEPA) process
- Master Plan and current land classifications
- Instructions for submitting comments

For Elk City Lake, USACE received 17 comments from 2 individuals. While issues raised are important, most of the comments received do not pertain to land use issues of the master plan. Issues addressed in the comments included cultural resources, recreational facility needs, invasive species, and harmful algal blooms. All the public



comments received were noted and will be addressed as future funds and development are considered.

Elk City Lake is a federally-owned and managed public property, and it is USACE's goal to be a good neighbor, as well as stewards for public interest. As such, USACE is bound to the equal enforcement of policies and fees for this publicly held national asset. Table 7-1 provides a summary list of the comments received during the initial scoping comment period for the Master Plan, followed by the USACE response.

**Table 7-1 - Public Comments from May 11, 2020 through June 26, 2020**

Comment	Response
<b>COMMENTS FROM OSAGE NATION</b>	
<p>The Osage Nation Historic Preservation Office (ONHPO) has received notification of and associated documentation for the proposed revision of the Master Plans for the USACE Council Grove Lake in Morris County, Kansas; Elk City Lake in Montgomery County, Kansas; Marion Lake in Marion County, Kansas; and El Dorado Lake in Butler County, Kansas. These lakes are located within the Osage Nation's Ancestral Territory and in some cases are located in regions that are very sensitive to the Osage.</p> <p>Management of Federal lands must be conducted in accordance with Sections 106 and 110 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act, and the American Indian Religious Freedom Act. Consultation with the Osage Nation is a critical component in the USACE's compliance with these laws. The Master Plans for USACE Projects, including the four presently under review, must specifically state that the USACE will comply with these laws. The ONHPO understands that compliance with Section 106 of the NHPA will be conducted on an individual basis.</p>	<p>Tulsa District will consult with the Osage Nation and other Tribal Nations, as appropriate, to identify to the furthest extent possible historic properties and historic sites and features of significance to these Nations. Similarly, Tulsa District will ensure compliance with Section 106 of the National Historic Preservation Act of 1966 for all actions approved for or conducted on government property in the future.</p>

Comment	Response
<p>Due to the significance to the Osage Nation of the areas occupied by these projects, the Osage Nation requests a teleconference meeting with USACE, Tulsa District Natural Resources and Recreation Branch and the Southwest Planning Division to discuss the Osage Nation's concerns with the projects in general and the development of the Master Plans. The ONHPO appreciates the opportunity to participate at this stage and looks forward to working with the USACE throughout the process and requests an approximate timeline for each phase.</p> <p>Please let me know if you have any questions. Thank you for consulting with the Osage Nation on this matter.</p>	
<b>COMMENTS FROM KDWP</b>	
<p>Outdoor Recreation Trends - Trends that have been significant for Kansas and much of the nation include:</p> <ul style="list-style-type: none"> <li>• Increased demand for trails for hikers, bikes, horseback riders and some motorized use.</li> <li>• Increased modern rental cabin development and availability within state parks.</li> <li>• Increased use of non-motorized small watercraft, kayaks, and paddle boards.</li> <li>• Camping and especially utility camping has much higher use numbers than predicted in the original master plan and we see that on the increase for the future.</li> <li>• Seasonal camping in less popular camp sites modeled after the USACE Kansas City District program is in demand.</li> </ul>	<p>The Elk City Lake master plan revision will align with state and national recreation trends. USACE monitors and tracks the Kansas SCORP to be responsive to public needs with regards to recreational facilities and opportunities.</p>

Comment	Response
<p>Potential Resource Management Objective include:</p> <ul style="list-style-type: none"> <li>• Shoreline erosion control in high use recreational developed area specially to protect existing roads and facilities.</li> <li>• Upgrade or replace existing facilities as needed and funds allow.</li> <li>• Maintain warm season grassland communities in non-developed areas.</li> <li>• Keep plan flexible enough to keep current or modern recreational needs and trends as they develop.</li> <li>• Continue to provide quality outdoor recreational opportunities and facilities to the public.</li> <li>• Maintain forb communities from invasive plant species to increase pollinator potential.</li> <li>• As a reservoir with frequent high-water events each event brings additional seed sources from the watershed of invasive species and state listed noxious weeds that must be controlled. Continue to use approved mechanical, chemical and prescribed burning techniques to control these species.</li> </ul>	<p>See Chapter 3 of the Master Plan for details regarding the revised Resource Goals and Objectives. The revised Resource Objectives are organized into 5 categories including recreational management, natural resources management, visitor information, education and outreach, general management, and cultural resources management. Resource objective are all associated to specific resource goals.</p>
<p>Recreational Facility Needs:</p> <ul style="list-style-type: none"> <li>• Additional modern rental cabins</li> <li>• Additional trails</li> <li>• Kayak launching facilities</li> <li>• Archery target facility</li> <li>• Fish cleaning station</li> <li>• Harden some existing campsites</li> <li>• Replace existing original open-air shower facilities with structures better</li> </ul>	<p>Noted. Current and revised HDR zoning in the State Park allows for most all these activities to take place. Trial development can occur outside of HDR areas to include LDR areas.</p> <p>For USACE facilities, restroom replacement is included as an unfunded line item in the annual budget.</p> <p>Seasonal designation of campsites under current USACE Policy and</p>

Comment	Response
<p>suited to meet today's visitor's desires for showers in individual rooms and not one large open-air facility.</p> <ul style="list-style-type: none"> <li>Seasonal designated campsites for a percentage of lesser used sites modeled after the USACE Kansas City District program</li> </ul>	<p>Regulation does not allow this to occur within the Tulsa District.</p>
<p>Special Topics:</p> <ul style="list-style-type: none"> <li>Maintain plant communities from invasive woody species through mechanical, chemical, and prescribed burning methods.</li> <li>The frequency of high-water events and the low lying portions of the state parks means a constant replenishing seed source of invasive plants and state listed noxious weeds that must be controlled. Continue invasive plant and state listed noxious weed control efforts.</li> <li>Harmful algal blooms (HAB) has not been a problem for Elk City yet but continue to monitor and manage watershed and lake levels to prevent HAB's whenever possible.</li> </ul>	<p>USACE will continue with existing herbicide application and prescribed burning practices.</p> <p>USACE will continue with existing noxious weed programs.</p> <p>Noted comment regarding the potential occurrence of HABs.</p>

### 7.3 PUBLIC AND AGENCY REVIEW OF MASTER PLAN, EA, AND FONSI

The final Master Plan was developed after obtaining public and agency comment through a virtual (online) process beginning August 23, 2021 and ending September 23, 2021. The virtual public involvement process was necessary due to the public meeting constraints resulting from the COVID-19 pandemic. A video presentation explaining the virtual process and high points of the draft Master Plan were posted on the USACE Tulsa District website. No comments were received from the agencies, stakeholders, and individuals involved in the revision process within the comment period.

## 8 SUMMARY OF RECOMMENDATIONS

### 8.1 SUMMARY OVERVIEW

The preparation of this Master Plan for Elk City Lake followed the recent USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated 30 January 2013. Three major requirements set forth in the new guidance include the preparation of contemporary Resource Objectives, Classification of project lands using the newly 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, and consideration of regional recreation and natural resource management priorities identified by other federal, state, and municipal authorities. 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 Elk City Lake. Factors considered in the Plan development were identified through public involvement and review of regional and statewide planning documents including the SCORP.

### 8.2 LAND RECLASSIFICATION PROPOSAL

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to new land classification standards that reflect how lands are being managed now and in the foreseeable future. The new land classification standards will also comply with current USACE guidance. Public comment was solicited to assist in making these land reclassification decisions. Chapter 7 of this Plan describes the public involvement process and provides a summary of public comments received. After analyzing public comment, examining recreational trends, and considering regional natural resource management priorities, USACE team members reclassified the Federal lands associated with Elk City Lake as described in Table 8-1.

**Table 8-1 - Change in Land and Water Surface Classification**

Prior Land Classifications (1988)	Acres	New Land Classifications (2021)	Acres	Net Difference
Project Operations	2,946	Project Operations (PO)	625	(2,231)
Recreation – Intensive Use	1,452	High Density Recreation (HDR)	650	(802)
		Environmentally Sensitive Areas (ESA)	764	764

Recreation – Low Density	948	Multiple Resource Management – Low Density Recreation (LDR)	1,174	226
Wildlife Management	9,288	Multiple Resource Management – Wildlife Management (WM)	11,421	2,133
		Multiple Resource Management – Vegetation Management (VM)	0	0
		Future/Inactive Recreation Areas	0	0
<b>TOTAL</b>	<b>14,634</b>	<b>TOTAL</b>	<b>14,634</b>	<b>0</b>
<b>Prior Water Surface Classifications (1977)</b>	<b>Acres</b>	<b>New Water Surface Classifications (2021)</b>	<b>Acres</b>	<b>Net Difference</b>
Water Surface	<b>3,550</b>	Open Recreation	3,621	71
		Designated No-Wake	6	6
		Fish and Wildlife Sanctuary	234	234
		Restricted	2	2
<b>TOTAL</b>	<b>3,550</b>	<b>TOTAL</b>	<b>3,863</b>	<b>313</b>
<b>TOTAL FEE</b>	<b>18,184</b>	<b>TOTAL FEE</b>	<b>18,497</b>	<b>313</b>

\* **Note:** The new and total acreage figures were measured using GIS technology and may vary slightly from official land acquisition records.

Table 8-2 lists the descriptions and justifications for the reclassification of USACE lands at Elk City Lake. Some variation in total acreages occurred due to better measuring technology and changes in landforms.

**Table 8-2 - Changes and Justifications for New Land Classifications <sup>(1)</sup>**

Land Classification	Description of Changes <sup>(2)</sup>	Justification
<b>Project Operations</b>	The net decrease in Project Operations lands from 2,946 to 625 acres was due to the following:	Overall, the decrease in PO acres is due to appropriately reflecting the current use of these reclassified acres.

	<ul style="list-style-type: none"> <li>• 41 acres from HDR reclassified to PO.</li> <li>• 367 acres from PO reclassified to ESA.</li> <li>• 1,995 acres from PO reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	
<b>High Density Recreation</b>	<p>The net decrease in High Density Recreation lands from 1,452 to 650 acres was due to the following:</p> <ul style="list-style-type: none"> <li>• 73 acres from HDR reclassified to ESA.</li> <li>• 678 acres from HDR reclassified to LDR.</li> <li>• 41 acres from HDR reclassified to PO.</li> <li>• 10 acres from HDR reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>USACE previously managed a park area which was closed due to frequent flooding and this land was moved from HDR to LDR. Additionally, areas near the outlet channel were also changed from HDR to LDR due to frequent flooding and lack of funding to maintain the area for public use.</p>
<b>Environmentally Sensitive Areas</b>	<p>The classification of 764 acres as Environmentally Sensitive Areas resulted from the following:</p> <ul style="list-style-type: none"> <li>• 73 acres from HDR reclassified to ESA.</li> <li>• 36 acres from LDR reclassified to ESA.</li> <li>• 367 acres from PO reclassified to ESA.</li> <li>• 271 acres from WM reclassified to ESA.</li> <li>• 17 acres not previously classified in the original Master Plan were classified as ESA.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Reclassification of 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 764 acres to ESA will have no effect on current or projected public use.</p>
<b>MRML – Low Density Recreation</b>	<p>The net increase in MRML-Low Density Recreation lands from 948 to 1,174 acres was due to the following:</p> <ul style="list-style-type: none"> <li>• 678 acres from HDR reclassified to LDR.</li> </ul>	<p>Many of the acres reclassified to LDR were the area adjacent to the Elk City State Park. The area contains marsh areas where wildlife management is the</p>



	<ul style="list-style-type: none"> <li>• 36 acres from LDR reclassified to ESA.</li> <li>• 417 acres from LDR reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>priority activity. Additionally, an area previously known as South Squaw State Park, was reclassified from HDR to LDR due to the park being closed several years ago due to frequent flooding. The reclassification of these acres from HDR to LDR recognizes the current and protected use of the land.</p>
<b>MRML – Wildlife Management</b>	<p>The net increase in MRML-Wildlife Management from 9,288 to 11,421 was due to the following:</p> <ul style="list-style-type: none"> <li>• 10 acres from HDR reclassified to WM.</li> <li>• 417 acres from LDR reclassified to WM.</li> <li>• 1,995 acres PO reclassified to WM.</li> <li>• 271 acres WM reclassified to ESA.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Several areas surrounding the lake were originally classified other than Wildlife Management however are currently managed for natural resources/wildlife habitat. These areas were reclassified to better align with their utilization to Wildlife Mgmt.</p>
<b>MRML – Vegetation Management</b>	<p>There are no MRML-VM lands at Elk City Lake.</p>	
<b>Future/Inactive Recreation Areas</b>	<p>There are no Future/Inactive Recreation Areas at Elk City Lake.</p>	

<sup>(1)</sup> 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.

<sup>(2)</sup> Acreages are based on GIS measurements and may vary from Net Difference totals detailed in Table 8-2.

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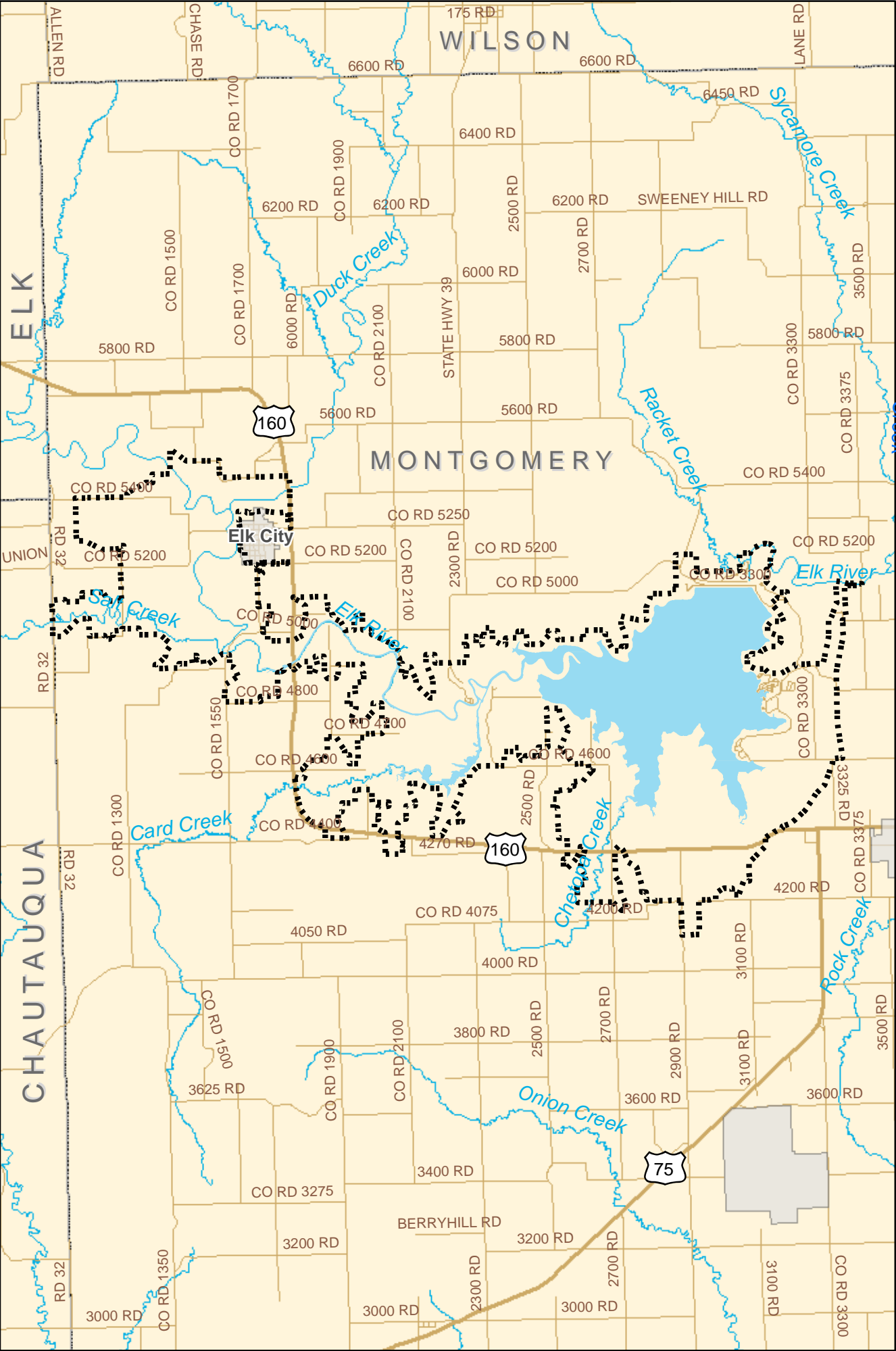


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## **APPENDIX A - LAND CLASSIFICATION, MANAGING AGENCIES, AND RECREATION MAPS**



INDEX TO MASTER PLAN MAPS

GENERAL

MAP NO.	TITLE
ECL20MP-OI-00	PROJECT LOCATION & INDEX TO MAPS
ECL20MP-OM-01	LAND MANAGING ENTITIES
ECL20MP-OW-01	WATER SURFACE CLASSIFICATIONS AND MARINAS
ECL20MP-OP-01	SEA PLANE GUIDE

LAND CLASSIFICATION

MAP NO.	TITLE
ECL20MP-LC-01	MASTER PLAN REVISION LAND CLASSIFICATION CHANGES
ECL20MP-OC-00	LAND AND WATER CLASSIFICATIONS (00)
ECL20MP-OC-01	LAND AND WATER CLASSIFICATIONS (01)
ECL20MP-OC-02	LAND AND WATER CLASSIFICATIONS (02)
ECL20MP-OC-03	LAND AND WATER CLASSIFICATIONS (03)
ECL20MP-OC-04	LAND AND WATER CLASSIFICATIONS (04)
ECL20MP-OC-05	LAND AND WATER CLASSIFICATIONS (05)

RECREATIONAL AREAS


MAP NO.	TITLE
ECL20MP-OR-0A	MANAGED RECREATIONAL AREAS
ECL20MP-OR-0B	PARK PLATE INDEX
ECL20MP-OR-01	OUTLET CHANNEL & OVERLOOK
ECL20MP-OR-02	ELK CITY STATE PARK
ECL20MP-OR-03	OSAGE LOWLAND DAY USE AREA
ECL20MP-OR-04	CARD CREEK

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.



 WATER SURFACE

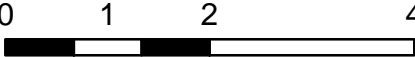

 FEE BOUNDARY



U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT

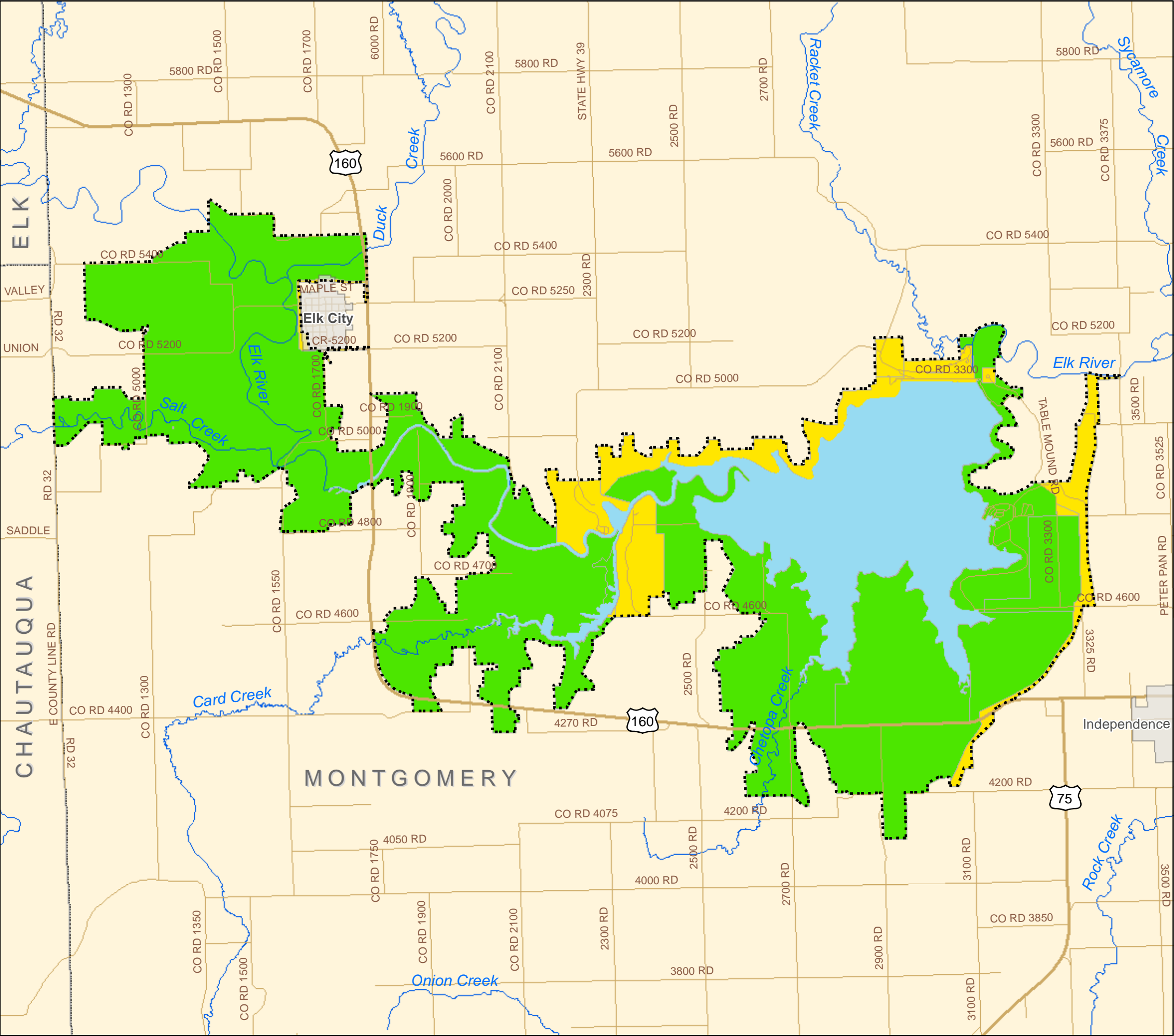
ELK CITY LAKE MASTER PLAN





PROJECT LOCATION AND MAP INDEX



DATE: OCTOBER 2021

MAP NO. ECL20MP-OI-00



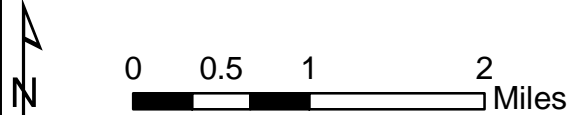
-  KANSAS DEPARTMENT OF WILDLIFE AND PARKS (KDWP)
-  U.S. ARMY CORPS OF ENGINEERS
-  WATER SURFACE
-  FEE BOUNDARY



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

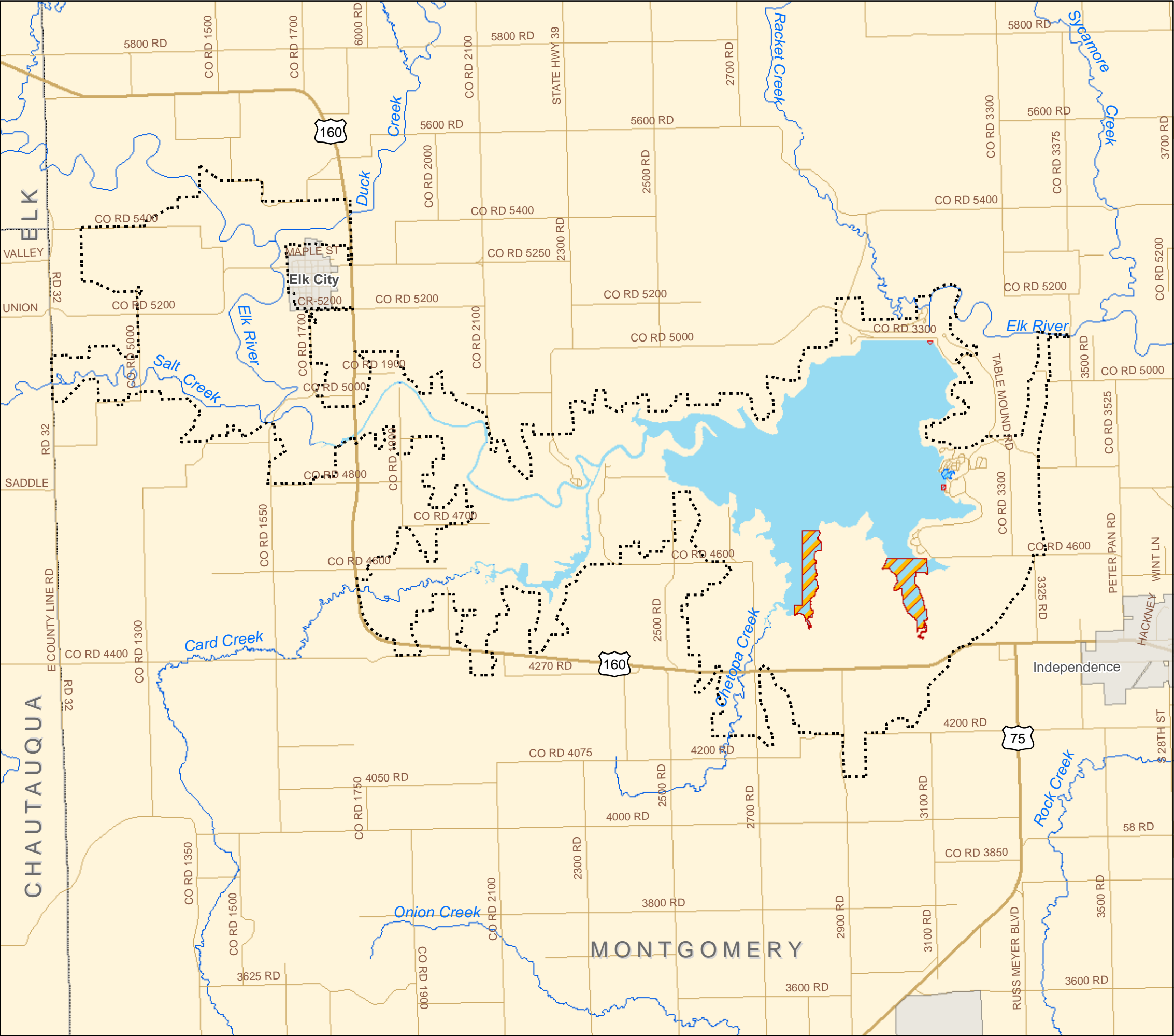
ELK CITY LAKE ELK RIVER, KANSAS






**ELK CITY LAKE MASTER PLAN  
LAND MANAGING ENTITIES**



DATE: OCTOBER 2021	MAP NO. ECL20MP-OM-01
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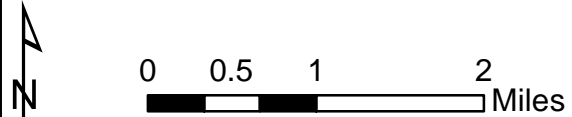
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-  WATER SURFACE: DESIGNATED NO WAKE AREAS
-  WATER SURFACE: RESTRICTED
-  WATER SURFACE: OPEN RECREATION
-  FEE BOUNDARY



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

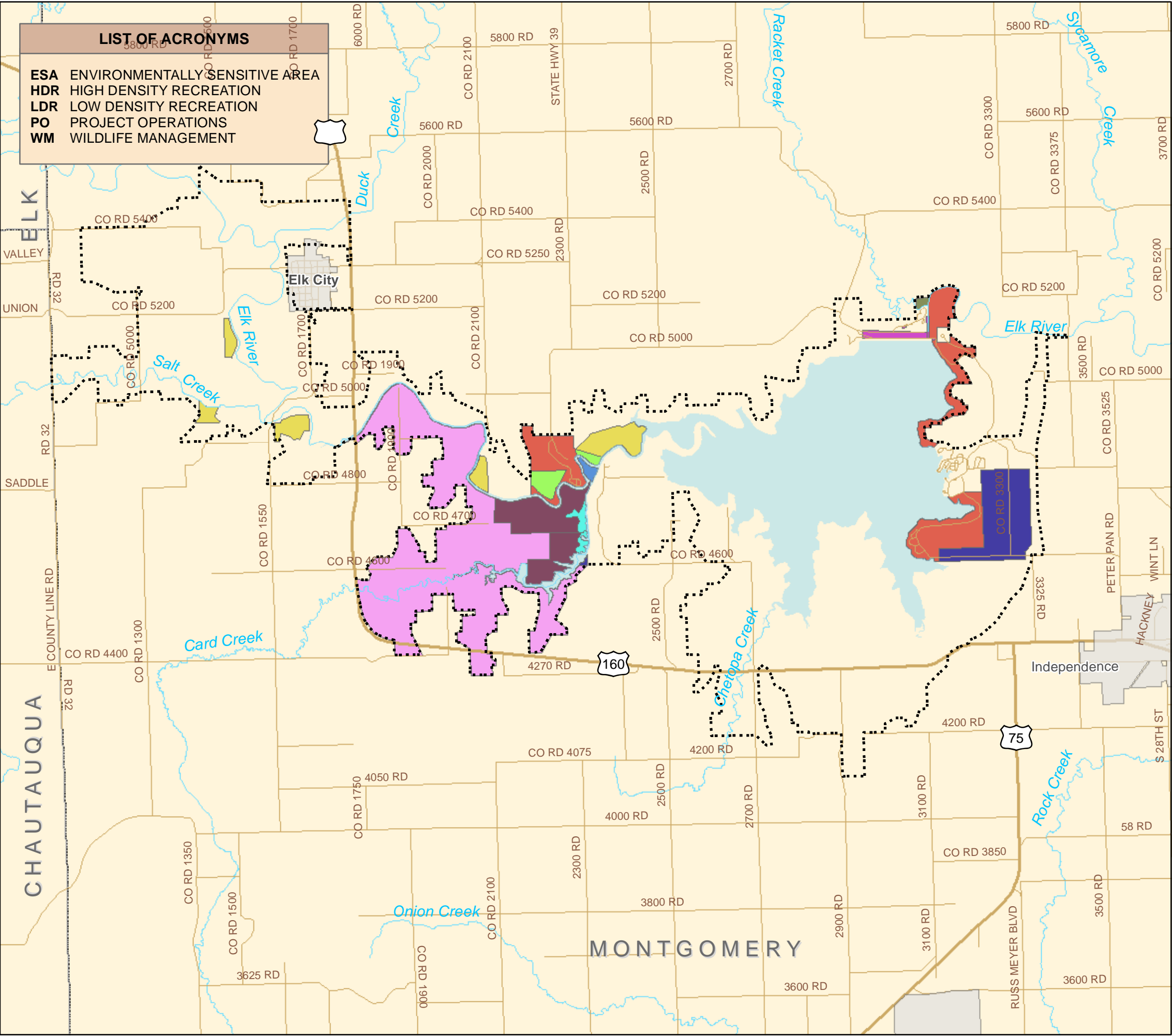
ELK CITY LAKE ELK RIVER, KANSAS

**ELK CITY LAKE MASTER PLAN  
WATER SURFACE CLASSIFICATIONS  
AND MARINAS**



DATE: OCTOBER 2021	MAP NO. ECL20MP-OW-01
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LIST OF ACRONYMS

ESA

ENVIRONMENTALLY SENSITIVE AREA

HDR

HIGH DENSITY RECREATION

LDR

LOW DENSITY RECREATION

PO

PROJECT OPERATIONS

WM

WILDLIFE MANAGEMENT




LAND CLASSIFICATION CHANGES  
FROM 1977 MASTER PLAN TO 2021

- FROM "NULL" TO ESA
- FROM HDR TO ESA
- FROM HDR TO LDR
- FROM HDR TO PO
- FROM HDR TO WM
- FROM LDR TO ESA
- FROM LDR TO WM
- FROM PO TO ESA
- FROM PO TO WM
- FROM WM TO ESA

USACE BASE MAP LAYERS

- WATER SURFACE
- FEE BOUNDARY



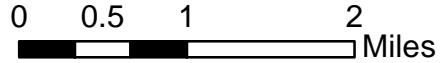

U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT

ELK CITY LAKE

ELK RIVER, KANSAS

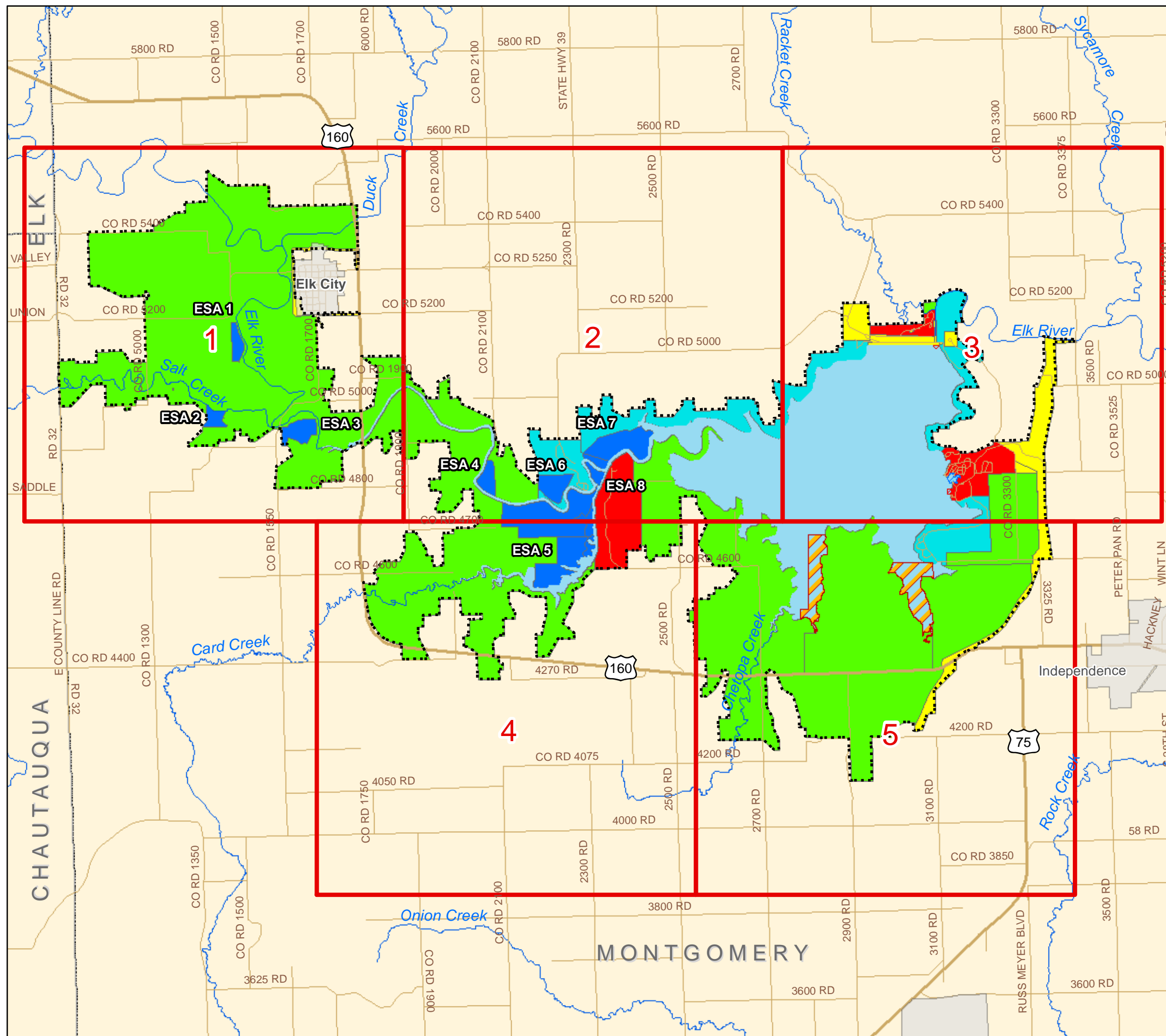
ELK CITY LAKE MASTER PLAN

MASTER PLAN REVISION LAND  
CLASSIFICATION CHANGES




DATE:  
OCTOBER 2021

MAP NO.  
ECL20MP-LC-01



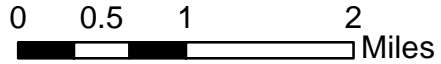

- INDEX GRID
- PROJECT OPERATIONS
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTALLY SENSITIVE AREA
- WILDLIFE MANAGEMENT
- WATER SURFACE: FISH & WILDLIFE SANCTUARY
- WATER SURFACE: DESIGNATED NO WAKE AREAS
- WATER SURFACE: RESTRICTED
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY

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

ELK CITY LAKEELK RIVER, KANSAS

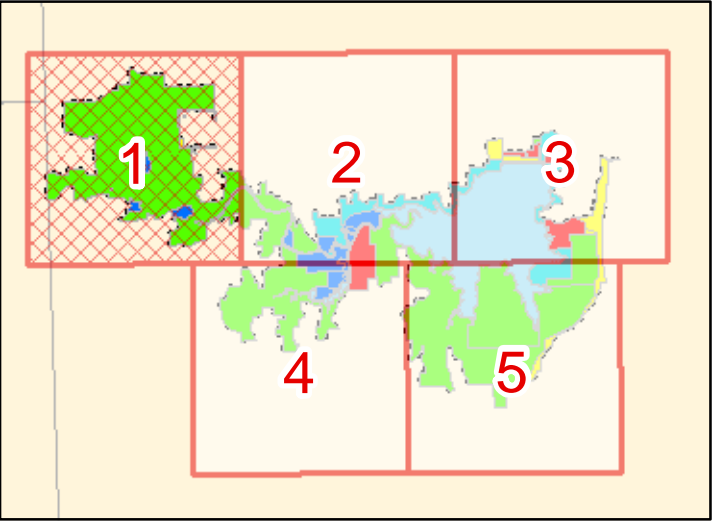
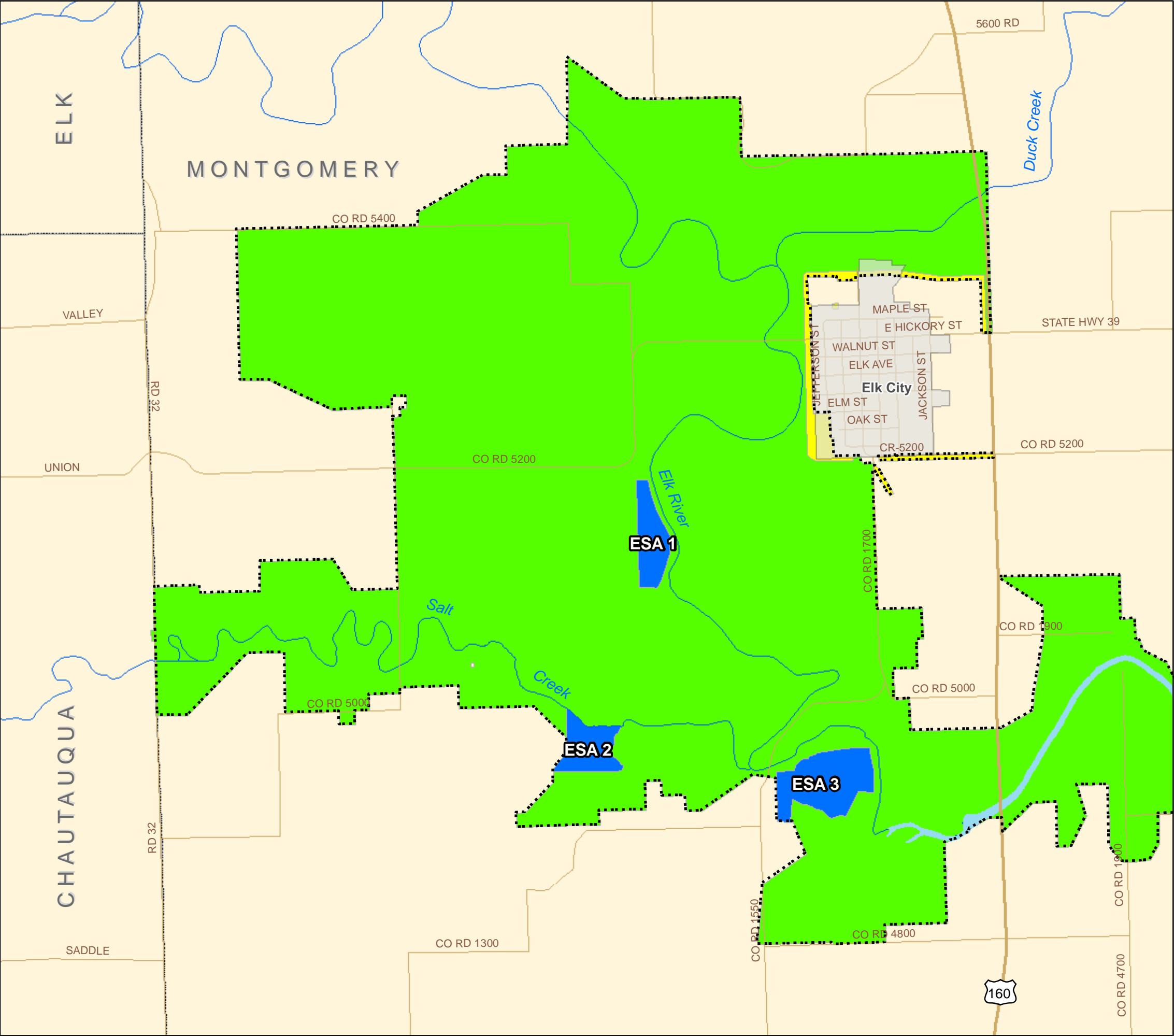
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**LAND AND WATER CLASSIFICATIONS  
(INDEX SHEET 00)**



DATE:  
OCTOBER 2021

MAP NO.  
ECL20MP-OC-00



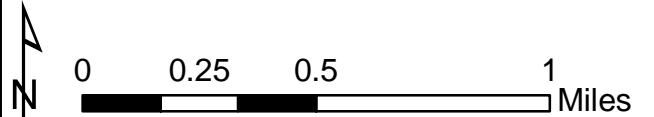
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- ENVIRONMENTALLY SENSITIVE AREA
- WILDLIFE MANAGEMENT
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY



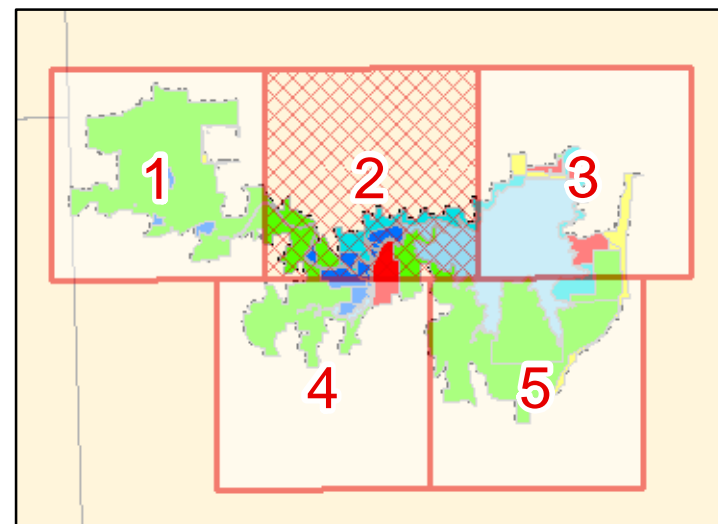
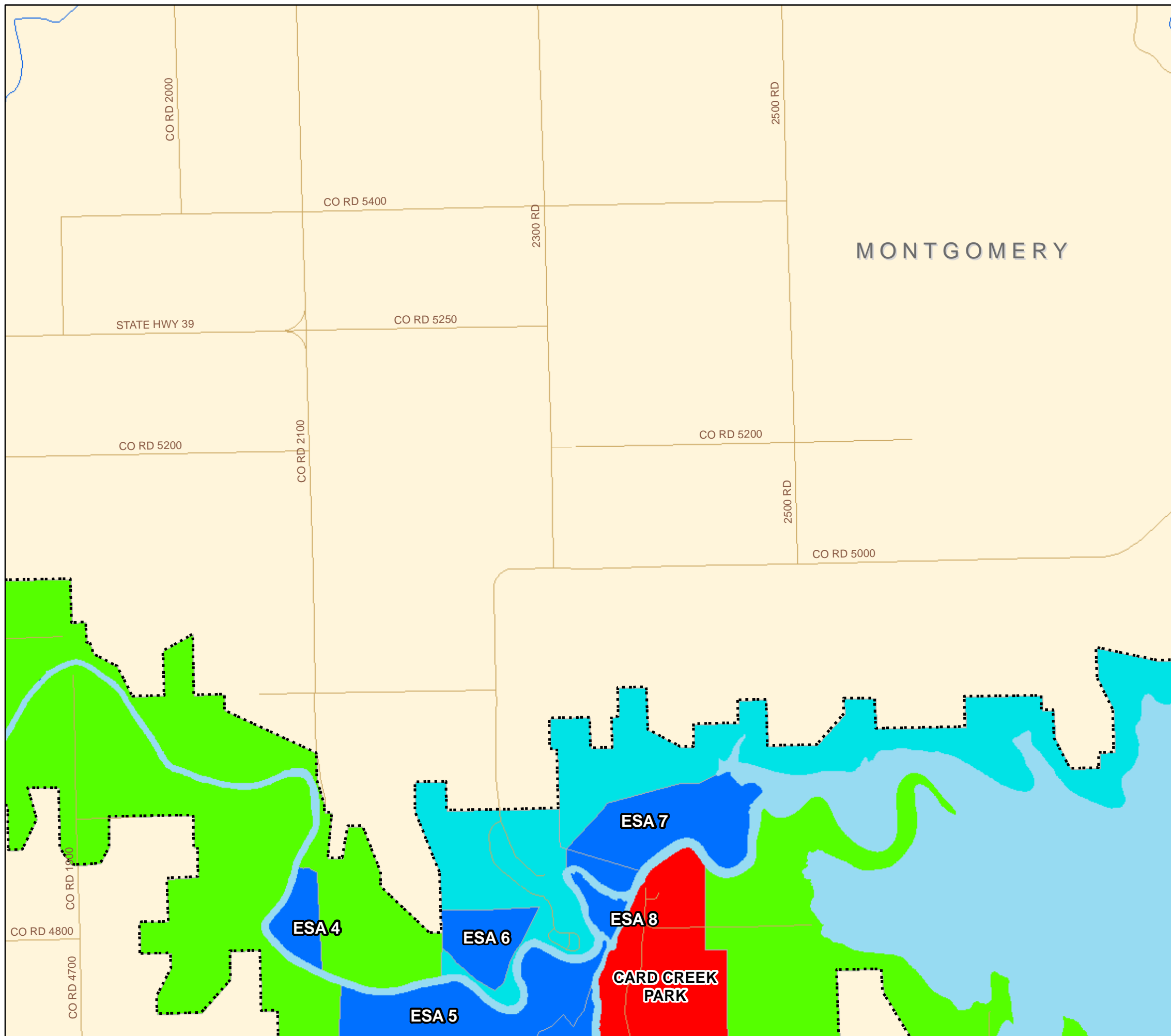
**U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT**

ELK CITY LAKE ELK RIVER, KANSAS

**ELK CITY LAKE MASTER PLAN  
LAND AND WATER CLASSIFICATIONS  
(INDEX SHEET 01)**



DATE: OCTOBER 2021	MAP NO. ECL20MP-OC-01
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- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTALLY SENSITIVE AREA
- WILDLIFE MANAGEMENT
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY

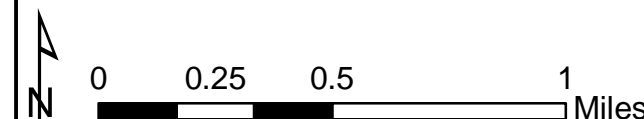


**U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT**

ELK CITY LAKE ELK RIVER, KANSAS

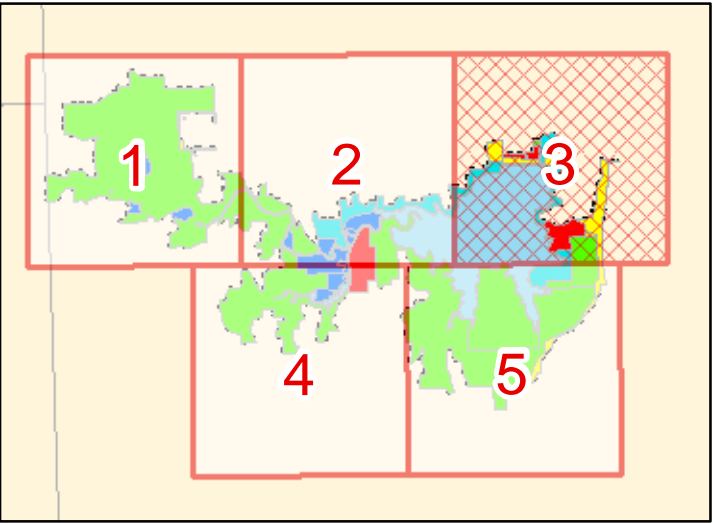
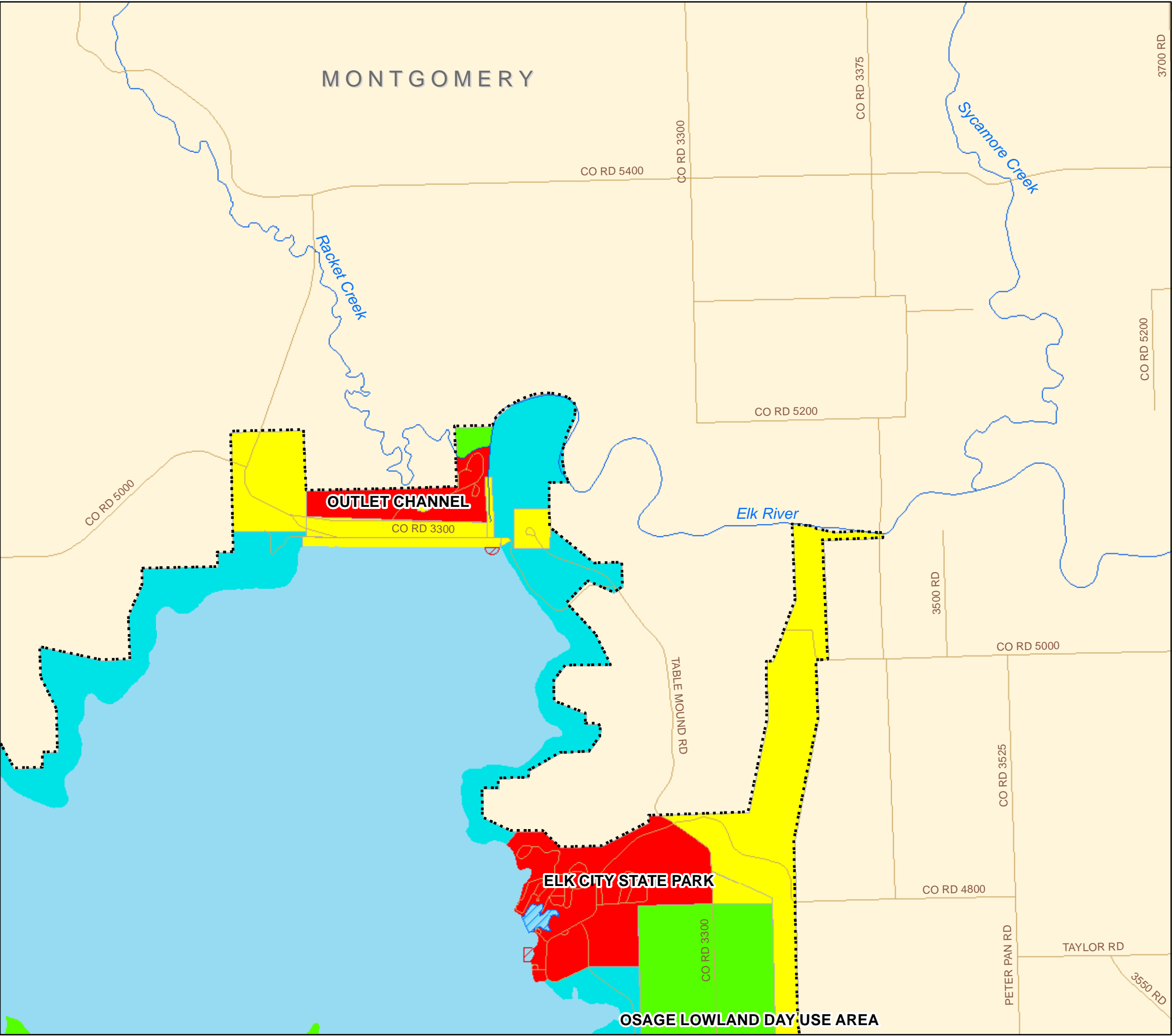
## ELK CITY LAKE MASTER PLAN

LAND AND WATER CLASSIFICATIONS  
(INDEX SHEET 02)



DATE: OCTOBER 2021	MAP NO. ECL20MP-OC-02
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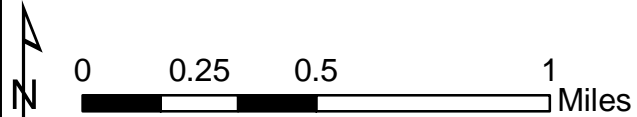
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- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- WILDLIFE MANAGEMENT
- WATER SURFACE: DESIGNATED NO WAKE AREAS
- WATER SURFACE: RESTRICTED
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY



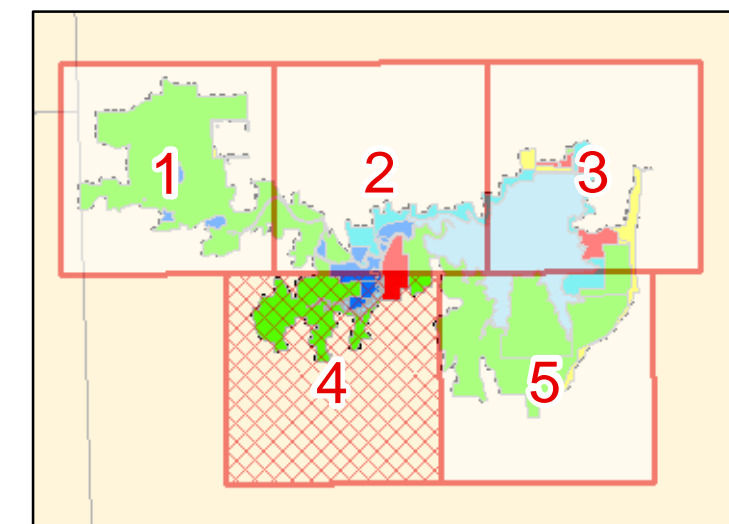
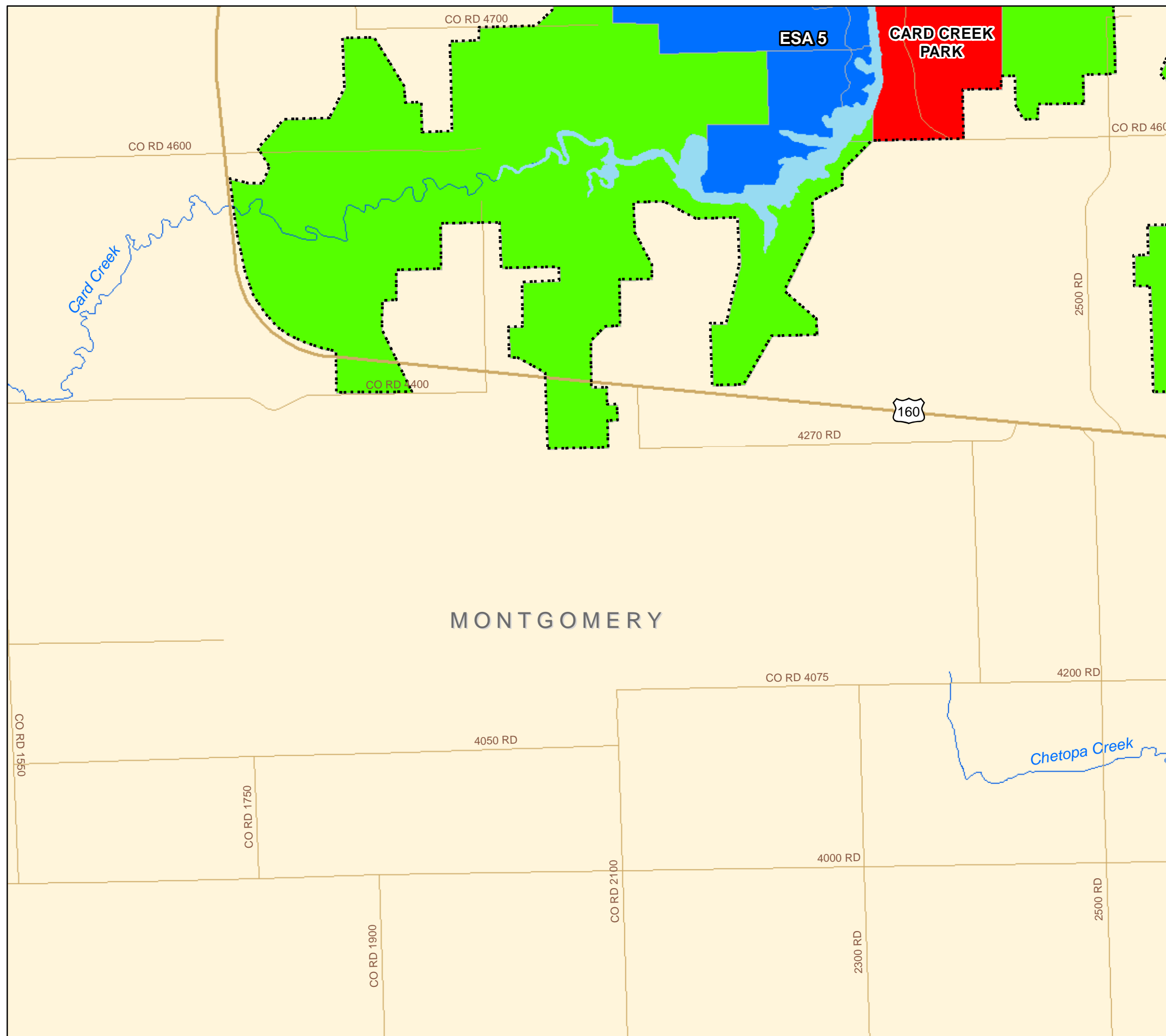
**U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT**

ELK CITY LAKE ELK RIVER, KANSAS

**ELK CITY LAKE MASTER PLAN  
LAND AND WATER CLASSIFICATIONS  
(INDEX SHEET 03)**



DATE: OCTOBER 2021	MAP NO. ECL20MP-OC-03
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- HIGH DENSITY RECREATION
- ENVIRONMENTALLY SENSITIVE AREA
- WILDLIFE MANAGEMENT
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY



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

ELK CITY LAKE ELK RIVER, KANSAS

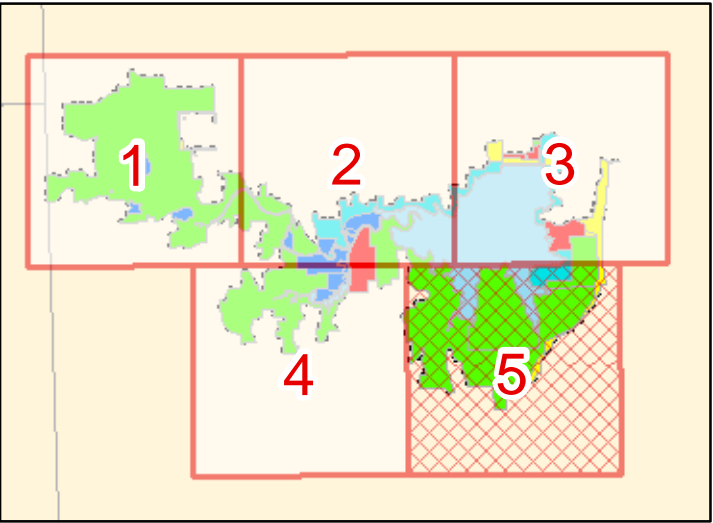
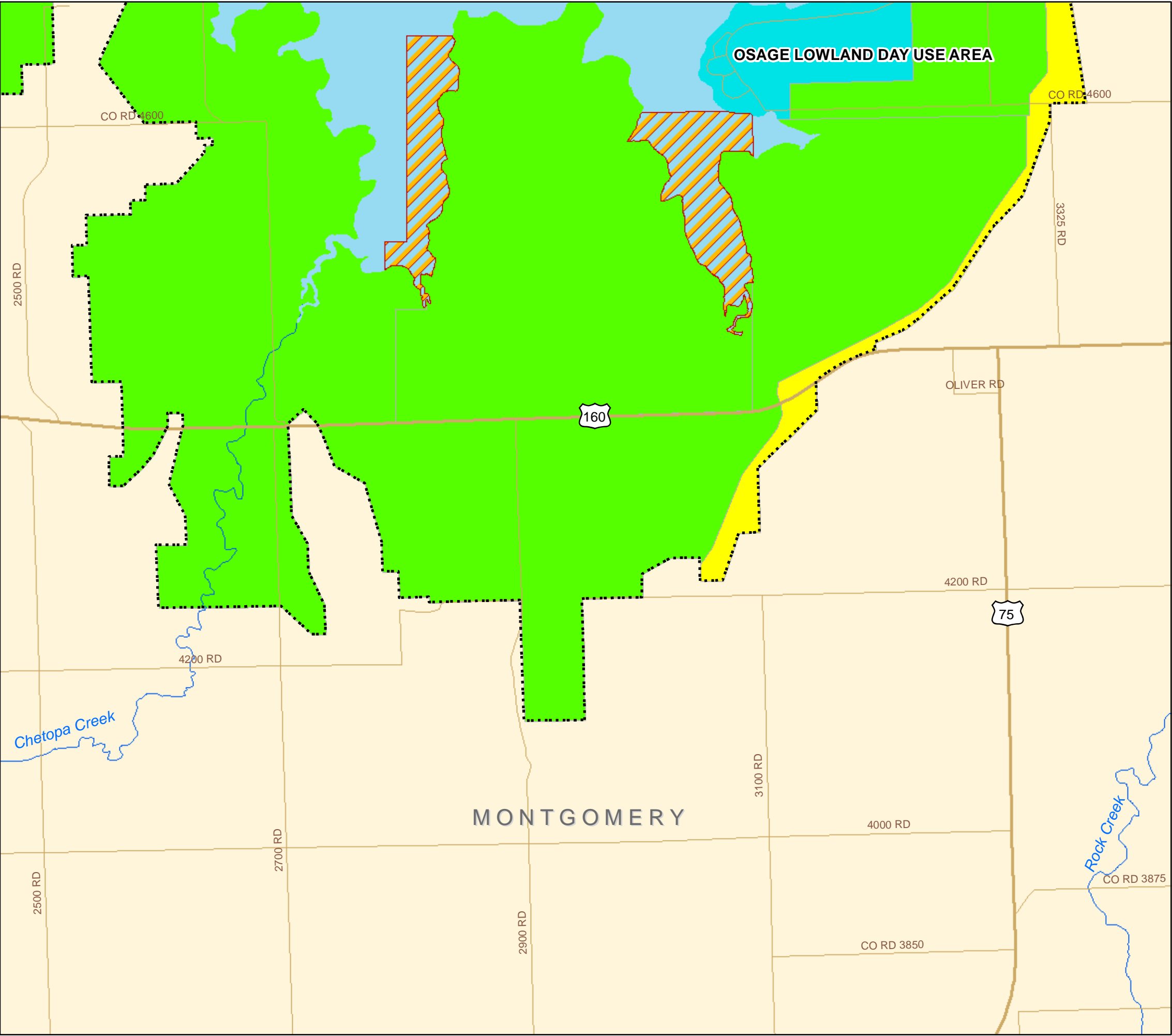
## ELK CITY LAKE MASTER PLAN

### LAND AND WATER CLASSIFICATIONS (INDEX SHEET 04)



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DATE:	MAP NO.
OCTOBER 2021	ECL20MP-OC-04



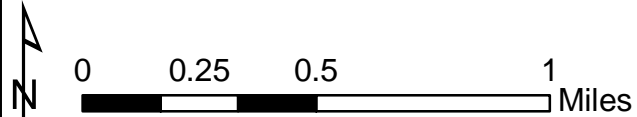
- PROJECT OPERATIONS
- LOW DENSITY RECREATION
- WILDLIFE MANAGEMENT
- WATER SURFACE: FISH & WILDLIFE SANCTUARY
- WATER SURFACE: OPEN RECREATION
- FEE BOUNDARY



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

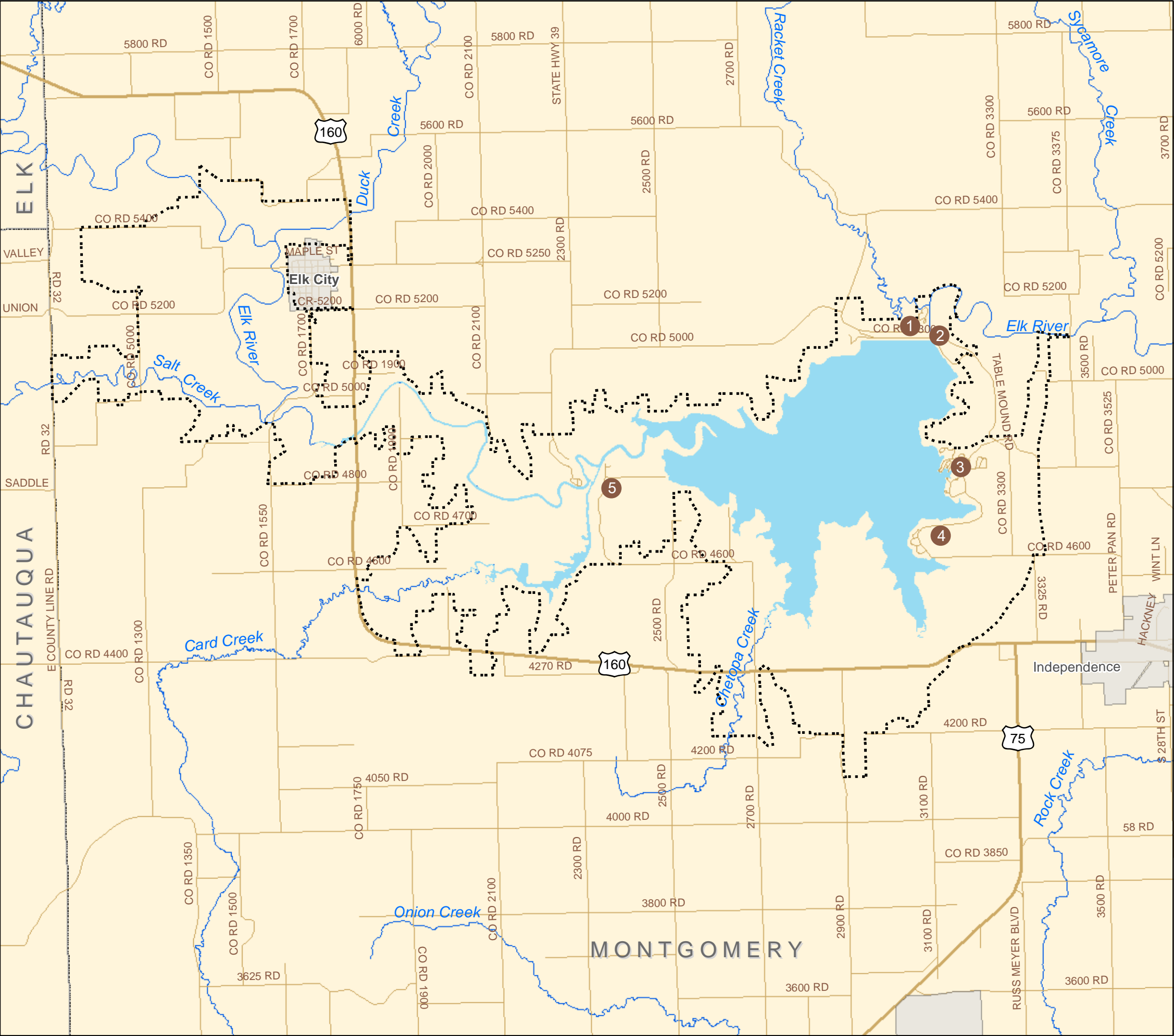
ELK CITY LAKE ELK RIVER, KANSAS

**ELK CITY LAKE MASTER PLAN  
LAND AND WATER CLASSIFICATIONS  
(INDEX SHEET 05)**




DATE:	MAP NO.
OCTOBER 2021	ECL20MP-OC-05





- MANAGED RECREATIONAL AREAS**
- 1 OUTLET CHANNEL
  - 2 OVERLOOK
  - 3 ELK CITY STATE PARK
  - 4 OSAGE LOWLAND DAY USE AREA
  - 5 CARD CREEK PARK



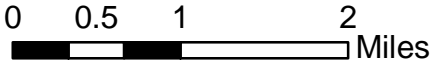
**U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT**

ELK CITY LAKE

ELK RIVER, KANSAS

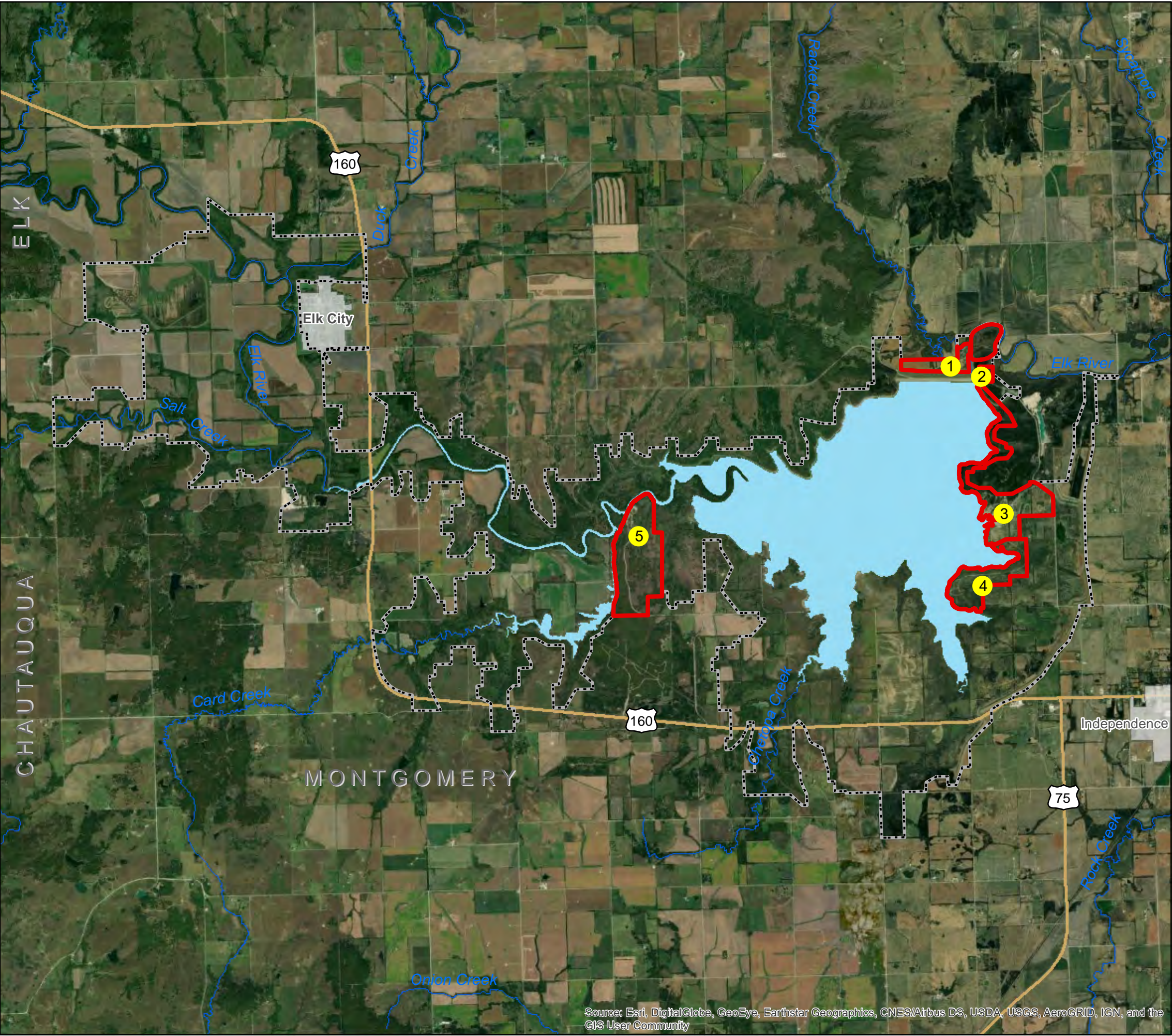
**ELK CITY LAKE MASTER PLAN**

**MANAGED RECREATIONAL AREAS**





DATE:	MAP NO.
OCTOBER 2021	ECL20MP-OR-0A





RECREATION AREAS		
ID #	NAME	SHEET #
1	OUTLET CHANNEL	ECL20MP-OR-01
2	OVERLOOK	ECL20MP-OR-01
3	ELK CITY STATE PARK	ECL20MP-OR-02
4	OSAGE LOWLAND DAY USE AREA	ECL20MP-OR-03
5	CARD CREEK	ECL20MP-OR-04

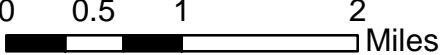



**U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT**

ELK CITY LAKEELK RIVER, KANSAS

ELK CITY LAKE MASTER PLAN

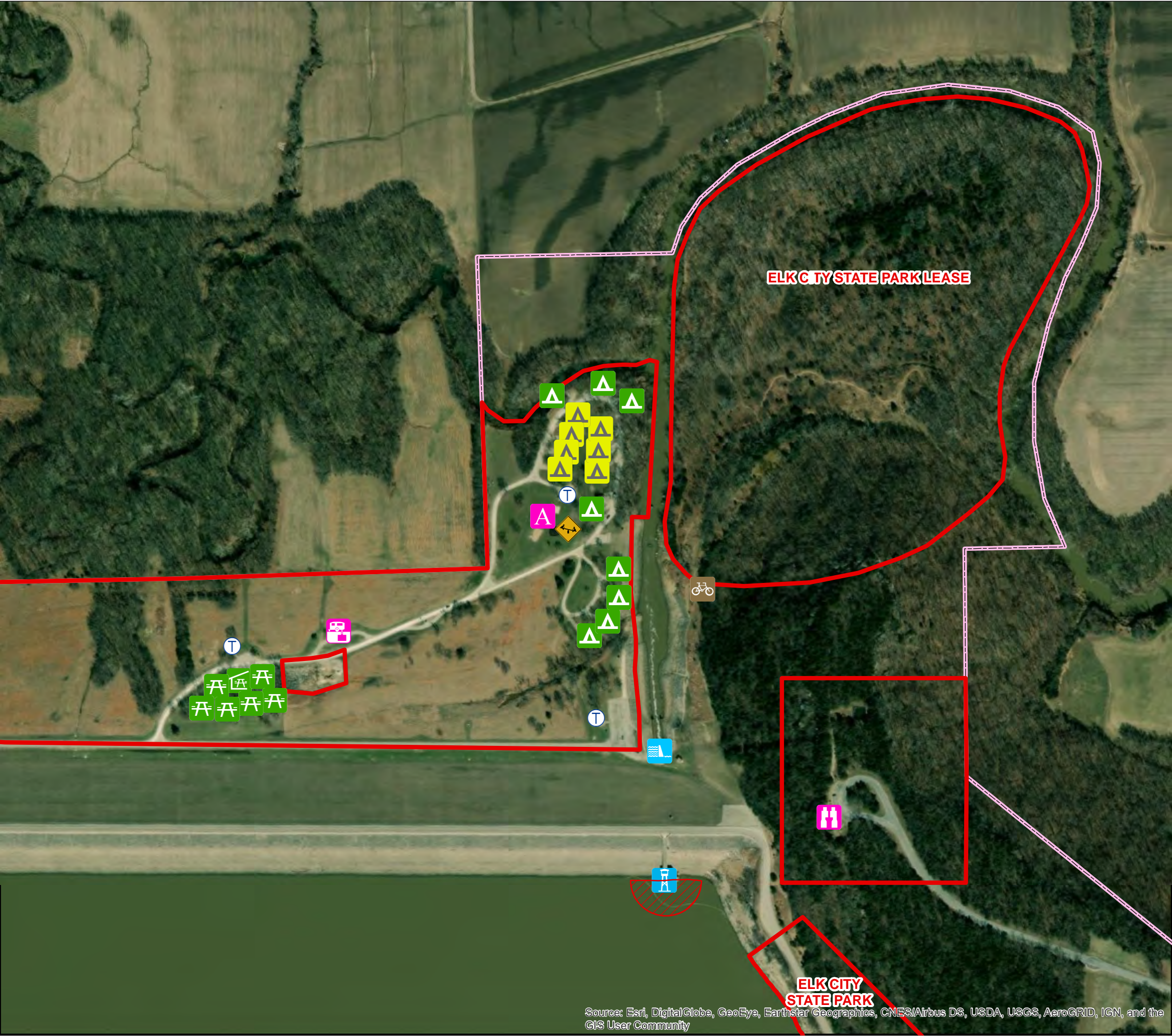
PARK PLATE INDEX



DATE: **OCTOBER 2021**

MAP NO. **ECL20MP-OR-0B**





ITEM	EXISTING
BOAT RAMP	
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	15
ELECTRICAL HOOK-UP	7
GROUP PICNIC SHELTER	
PICNIC SITES	6
COMFORT STATION	
VAULT TOILET	3
RESTROOMS	
SHOWERS	
DUMP STATION	1

- ATHLETIC COURT
- PICNIC SITE
- BIKE TRAIL
- SPILLWAY
- CAMPSITE
- VAULT TOILET
- CAMPSITE, IMPROVED
- GROUP SHELTER
- INTAKE STRUCTURE
- OBSERVATION SITE
- SANITARY DUMP STATION
- PARK LIMITS
- WATER SURFACE: RESTRICTED
- FEE BOUNDARY

U.S. ARMY CORPS OF ENGINEERS  
TULSA DISTRICT

ELK CITY LAKEELK RIVER, KANSAS

ELK CITY LAKE MASTER PLAN

RECREATIONAL AREAS  
(OUTLET CHANNEL & OVERLOOK)

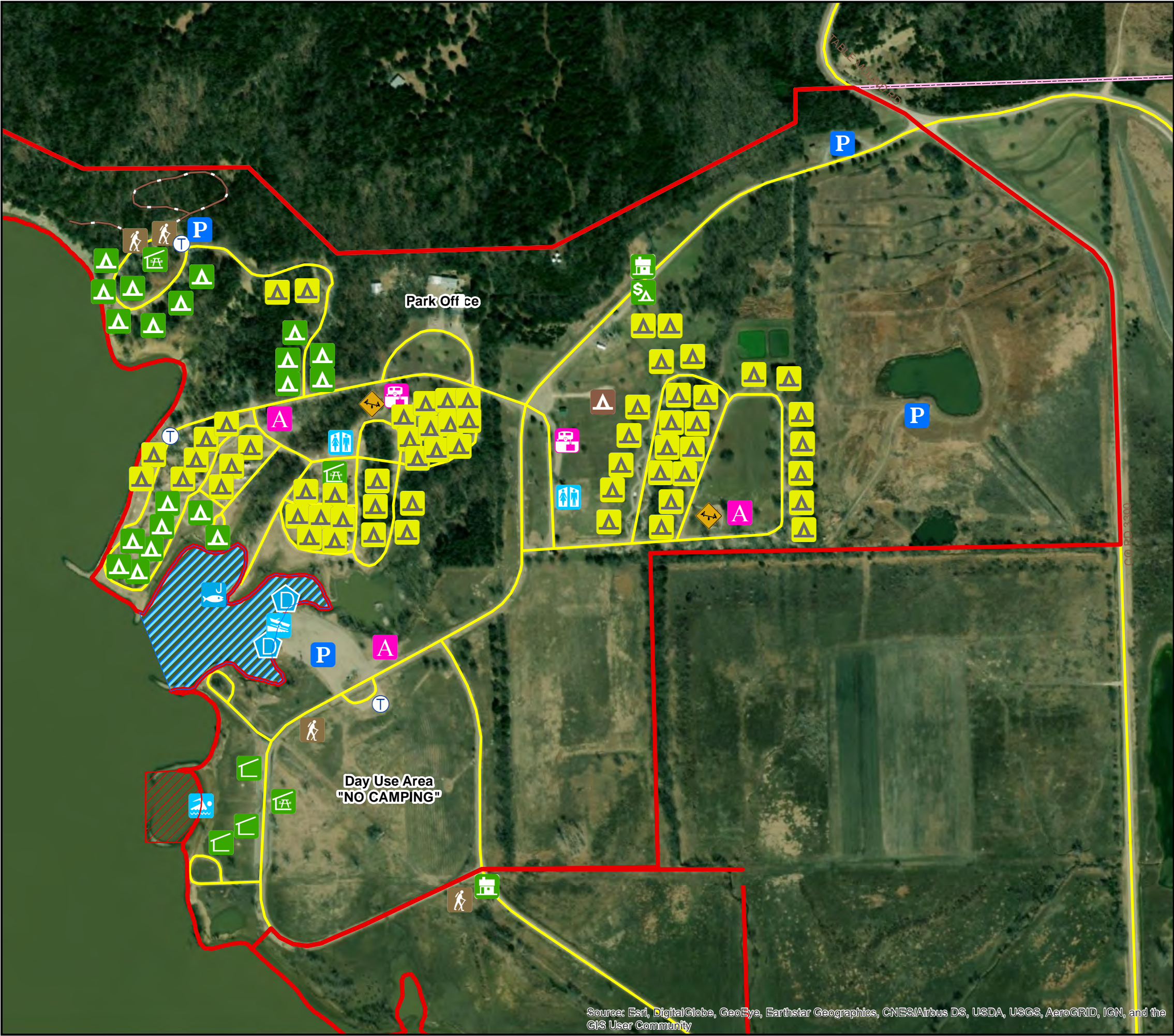
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DATE: OCTOBER 2021

MAP NO. ECL20MP-OR-01

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	152
ELECTRICAL HOOK-UP	85
GROUP PICNIC SHELTER	3
PICNIC SITES	
COMFORT STATION	
VAULT TOILET	3
RESTROOMS	
RESTROOM W/ SHOWERS	2
DUMP STATION	2

- PARKING AREA
- PLAYGROUND
- BOAT RAMP
- SANITARY DUMP STATION
- SHELTER
- SWIM BEACH
- TRAILHEAD
- VAULT TOILET
- HIKING/NATURE TRAIL
- PARK LIMITS
- WATER SURFACE: DESIGNATED NO WAKE
- WATER SURFACE: RESTRICTED
- FEE BOUNDARY
- ATHLETIC COURT
- RESTROOM WITH SHOWERS
- CAMPSITE, PRIMITIVE
- CAMPSITE, IMPROVED
- CABIN
- COURTESY DOCK
- ENTRANCE GATE
- GROUP PICNIC SHELTER
- HONORARY FEE STATION
- FISHING DOCK

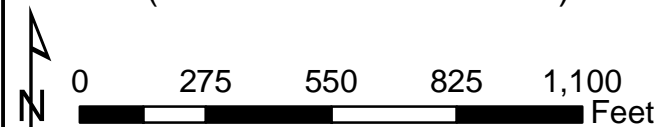


U.S. ARMY CORPS  
OF ENGINEERS  
TULSA DISTRICT

ELK CITY LAKE ELK RIVER, KANSAS

ELK CITY LAKE MASTER PLAN

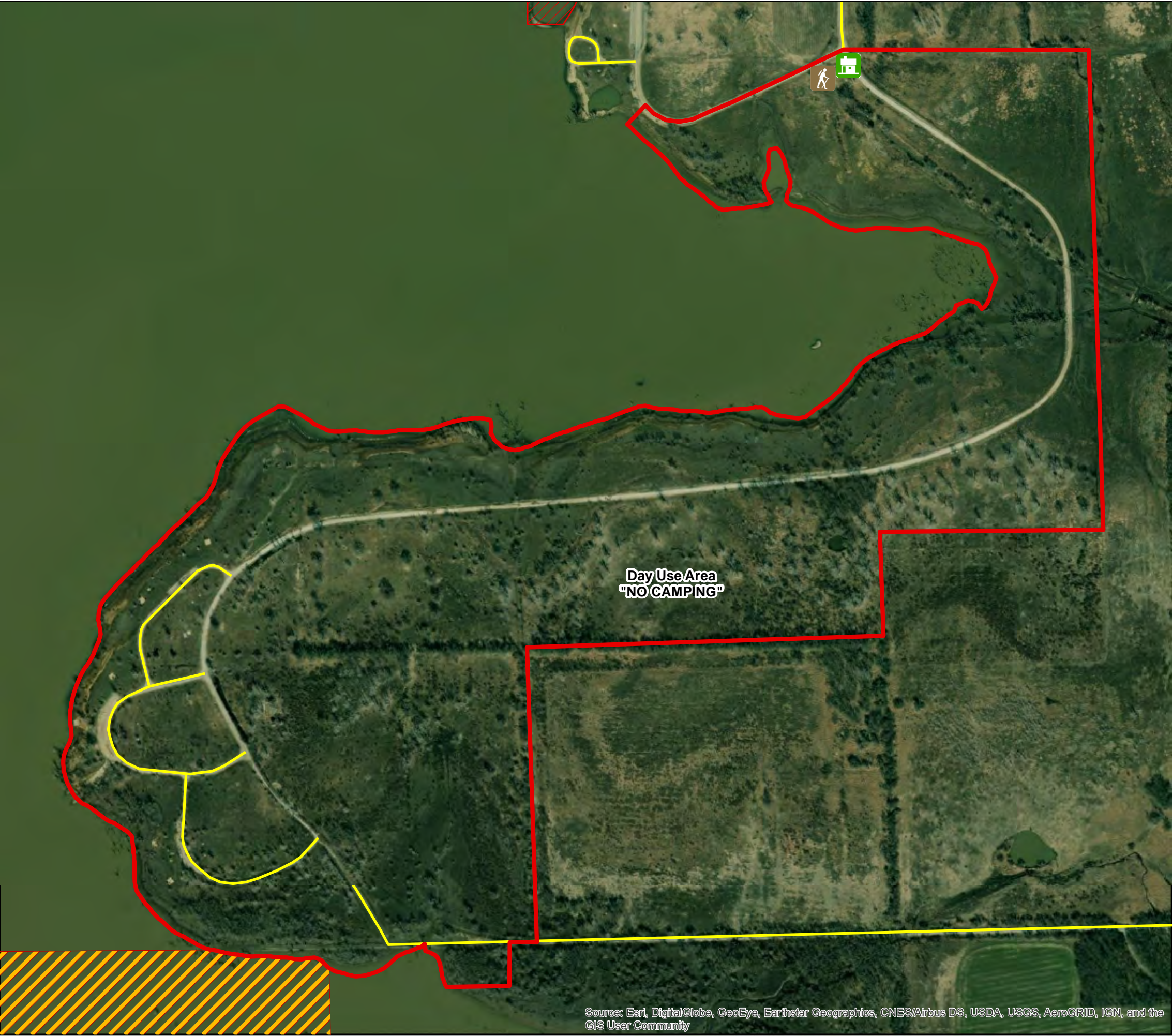
RECREATIONAL AREAS  
(ELK CITY STATE PARK)









DATE:	MAP NO.
OCTOBER 2021	ECL20MP-OR-02


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	
CAMPSITES	
ELECTRICAL HOOK-UP	
GROUP PICNIC SHELTER	
PICNIC SITES	
COMFORT STATION	
VAULT TOILET	
RESTROOMS	
SHOWERS	
DUMP STATION	

-  ENTRANCE GATE
-  TRAILHEAD
-  PARK LIMITS
-  WATER SURFACE: FISH & WILDLIFE SANCTUARY
-  WATER SURFACE: RESTRICTED
-  FEE BOUNDARY




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

ELK CITY LAKE

ELK RIVER, KANSAS

ELK CITY LAKE MASTER PLAN

RECREATIONAL AREAS  
(OSAGE LOWLAND DAY USE AREA)

N

02505007501,000

Feet

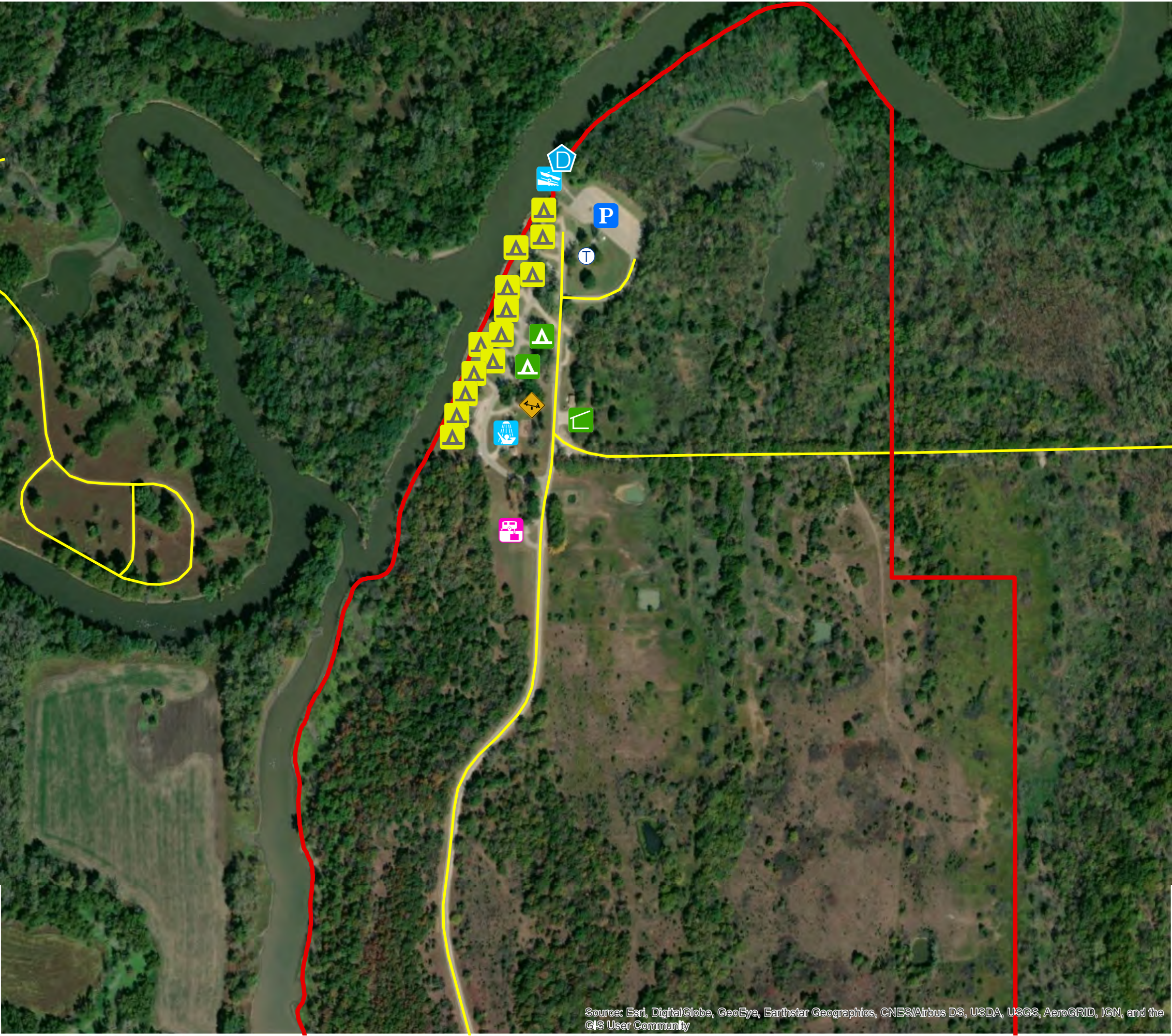
DATE:

OCTOBER 2021













MAP NO.


ECL20MP-OR-03





ITEM	EXISTING
BOAT RAMP	1
COURTESY DOCK	
GROUP CAMPSITES	
CAMPSITES	20
ELECTRICAL HOOK-UP	13
GROUP PICNIC SHELTER	
PICNIC SITES	
COMFORT STATION	
VAULT TOILET	1
RESTROOMS	
SHOWERS	1
DUMP STATION	1

-  BOAT RAMP
-  CAMPSITE
-  CAMPSITE, IMPROVED
-  COURTESY DOCK
-  CXT SHOWERHOUSE
-  PARKING AREA
-  PLAYGROUND
-  SANITARY DUMP STATION
-  SHELTER
-  VAULT TOILET
-  PARK LIMITS
-  FEE BOUNDARY




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

ELK CITY LAKEELK RIVER, KANSAS

## ELK CITY LAKE MASTER PLAN

### RECREATIONAL AREAS (CARD CREEK PARK)



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Feet

DATE:  
OCTOBER 2021

MAP NO.  
ECL20MP-OR-04

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



## **APPENDIX B - NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DOCUMENTATION**



# **Environmental Assessment for the Elk City Lake 2021 Master Plan**

Verdigris River Basin  
Montgomery County, Kansas



November 2021



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## ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) evaluates the potential environmental and socioeconomic impacts of the Master Plan of Elk City Lake. 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 should it be implemented.
- 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.

*APPENDICES*      A      NEPA Coordination and Scoping

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**ENVIRONMENTAL ASSESSMENT**  
**ELK CITY LAKE MASTER PLAN 2021 REVISION**  
**MONTGOMERY COUNTY, KANSAS**

**SECTION 1: INTRODUCTION**

The United States Army Corps of Engineers (USACE) is proposing to adopt and implement the 2021 Elk City Lake Master Plan as a revision of the 1988 Supplement Number 2 (Land Use) Master Plan hereafter called the 1988 Master Plan. The 2021 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 Elk City Lake project. 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 land associated with Elk City Lake for the benefit of present and future generations.

Adoption and implementation of the 2021 Master Plan (Proposed Action) would create potential impacts on the natural and human environments, and as such, this Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, (Public Law 91-190), and 33 Code of Federal Regulations (CFR) Part 230.

**1.1 PROJECT LOCATION AND SETTING**

Elk City Lake is in southeastern Kansas approximately 5 miles northwest of the town of Independence Kansas. The dam is located at mile 8.7 on the Elk River, a tributary of the Verdigris River. The lake area extends throughout portions of Montgomery County. The lake is formed by the Elk City Dam, which was constructed and designated in 1962 for the purpose of flood risk management, water conservation, water supply, water quality, recreation, and wildlife.

Table 3 in the 2021 Master Plan outlines information regarding existing reservoir storage capacity at Elk City. Detailed descriptions are incorporated herein by reference (USACE, 2021).

Feature	Elevation (feet)	Area (acres)	Capacity (acre-feet)	Equivalent Runoff (inches) <sup>(1)</sup>
Top of Dam	849.0	29,628	768,327	22.73
Maximum Pool	842.84	24,690	577,074	17.1
Top of Flood Control Pool & Spillway Crest	825.0	13,286	261,840	7.75

Flood Control Storage	796.0 - 825.0	-	224,418	6.63
Top of Conservation Pool	796.0 <sup>(2)</sup>	3,515	37,422	1.11
Conservation Storage	764.0 - 796.0	-	37,393 <sup>(3)</sup>	1.10
Top of Inactive Pool	764.0	19.09	28.97	0.00
(1) From a 634-square-mile drainage area above the dam. (2) Seasonal pool plans are usually proposed on an annual basis by the State of Kansas. (3) Includes 32,126 acre-feet (86%) for Water Supply (10 mgd yield) and 5,266 acre-feet (14%) for Water Quality control (7.4 mgd yield).				

## 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 Elk City Lake are in compliance with applicable environmental laws and regulations and to maintain quality lands for future public use. The 2021 Master Plan is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years.

The need for the Proposed Action is to bring the 1988 Master Plan up to date and to reflect ecological, socio-political, and socio-demographic changes that are currently impacting Elk City Lake, as well as those changes anticipated to occur through 2046. In particular, changes in outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy, have all indicated the need to revise the plan. Additionally, increasing fragmentation of wildlife habitat, national policies related to climate change, growing demand for recreational access, and protection of natural resources are all factors affecting Elk City Lake. In response to these continually evolving trends, the USACE determined that a full revision of the 1988 plan would be required.

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 the U.S. Fish and Wildlife Service [USFWS]) to operate and maintain public lands
- Evolving public concerns

As part of the master planning process, the project delivery team evaluated public comments and current land uses, determined any necessary changes to land classifications, and formulated proposed alternatives. As a result of public coordination

and a virtual public involvement process, alternatives were developed, and this EA was initiated.

### **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 2021 Master Plan. The alternative considerations were formulated with special attention given to revised land classifications, new resource management objectives, and a conceptual resource plan for each land classification category. In accordance with the National Environmental Policy Act of 1969, as amended, and implementing regulations in 40 Code of Federal Regulations (CFR) Parts 1500 – 1508, including guidelines in 33 CFR Part 230.

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## SECTION 2: PROPOSED ACTION AND ALTERNATIVES

The project need is to revise the 1988 Master Plan so that it is compliant with current USACE regulations and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends. As part of this process, which includes public outreach and comment, two alternatives were developed for evaluation including a No Action Alternative. The alternatives were developed using land classifications that indicate the primary use for which project lands would be managed. USACE regulations specify five possible categories of land classification: Project Operations (PO), High Density Recreation (HDR), Mitigation, Environmentally Sensitive Areas (ESA), and Multiple Resource Managed Lands (MRML). The MRML classification is divided into four subcategories: Low Density Recreation (MRML-LDR), Wildlife Management (MRML-WM), Vegetative Management (MRML-VM), and Future/Inactive Recreation (MRML-IFR) Areas.

The USACE guidance recommends the establishment of resource goals and objectives for purposes of development, conservation, and management of natural, cultural, and man-made resources at a project. Goals describe the desired end state of overall management efforts, whereas resource objectives are specific task-oriented actions necessary to achieve the overall 2021 Master Plan goals. Goals and objectives are guidelines for obtaining maximum public benefits while minimizing adverse impacts on the environment and are developed in accordance with 1) authorized project purposes, 2) applicable laws and regulations, 3) resource capabilities and suitability's, 4) regional needs, 5) other governmental plans and programs, and 6) expressed public desires. The five project-wide management goals established for Elk City Lake that were used in determining the Proposed Action, as well as the nationwide USACE Environmental Operating Principles, are discussed in detail "Chapter 3: Resource Goals and Objectives of the 2021 Master Plan", and are incorporated herein by reference (USACE, 2021).

The goals for Elk City Lake Master Plan include the following:

- Goal A: Provide the best management practices (BMPs) to respond to regional needs, resource capabilities and capacities, and expressed public interests consistent with authorized project purposes.
- Goal B: Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.
- Goal C: Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining project natural resources.
- Goal D: Recognize the unique qualities, characteristics, and potentials of the project.
- Goal E: Provide consistency and compatibility with natural 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 3.3 of the 2021 Master Plan.

## **2.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE**

The No Action Alternative serves as a basis for comparison to the anticipated effects of the other action alternatives, and its inclusion in this EA is required by NEPA and CEQ regulations (40 CFR § 1502.14(d)). Under the No Action Alternative, the USACE would not approve the adoption or implementation of the 2021 Master Plan. Instead the USACE would continue to manage Elk City Lake's natural resources as set forth in the 1988 Master Plan. The 1988 Master Plan would continue to provide the only source of comprehensive management guidelines and philosophy. However, the 1988 Master Plan is out of date and does not reflect the current ecological, socio-political, or socio-demographic conditions of Elk City Lake. The No Action Alternative, while it does not meet the purpose of, or need for, the Proposed Action, serves as a benchmark of existing conditions against which federal actions can be evaluated, and as such, the No Action Alternative is included in this EA, as prescribed by CEQ regulations.

## **2.2 ALTERNATIVE 2: PROPOSED ACTION**

Under the Proposed Action, the 2021 Master Plan would be reviewed, coordinated with the public, revised to comply with USACE regulations and guidance,

and revised to reflect changes in the land management and land uses that have occurred over time or are desired in the near future. The keys to this alternative would be the revision of land classifications to USACE standards and the preparation of the resource objectives that would reflect current and projected needs and would be compatible with regional goals while sustaining Elk City Lake's natural resources and providing recreational experiences for the next 25 years.

The proposed land classification categories are defined as follows:

- Project Operations (PO): Lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas used solely for the operation of Elk City Lake.
- High Density Recreation (HDR): 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 (ESA): 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 (MRML-LDR): Lands with minimal development or infrastructure that support passive recreational use (primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
  - MRML Wildlife Management (MRML-WM): Lands designated for stewardship of fish and wildlife resources.
  - Future/Inactive Recreation (MRML-IFR): Lands that are set aside for future High Density Recreation development and use.
  - Vegetative Management (MRML-VM): Lands designated for stewardship of forest, prairie, and other native Vegetative cover.
- Water Surface: Allows for surface water zones.
  - Restricted: Water areas restricted for Elk City Lake operations, safety, and security.
  - Designated No-Wake: Water areas to protect environmentally sensitive shoreline areas, 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.
  - Fish and Wildlife Sanctuary: Water areas that have either annual or seasonal restrictions to protect fish and wildlife within a designated area.

Table 2.2.1 shows the proposed classifications and acres contained in each classification, Table 2.2.2 shows the water surface classifications, and Table 2.2.3 provides the justification for the proposed reclassification.

**Table 2.2.1 Proposed Elk City Lake Land Classifications**

Prior Land Classifications (from 1988)	Acres	New Land Classifications (2021)	Acres	Net Difference
Project Operations	2,946	Project Operations (PO)	625	(2,231)
Recreation – Intensive Use	1,452	High Density Recreation (HDR)	650	(802)
		Environmentally Sensitive Areas (ESA)	764	764
Recreation – Low Density	948	Multiple Resource Management – Low Density Recreation (LDR)	1,174	226
Wildlife Management	9,288	Multiple Resource Management – Wildlife Management (WM)	11,421	2,133
		Multiple Resource Management – Vegetation Management (VM)	0	0
		Future/Inactive Recreation Areas	0	0
<b>TOTAL</b>	<b>14,634</b>	<b>TOTAL</b>	<b>14,634</b>	<b>0</b>

\* Land classification acreages were derived using geographic information system technology and do not reflect the official land acquisition records.

\* Source: USACE 2021

**Table 2.2.2 Proposed Elk City Lake Water Surface Classifications**

Prior Water Surface Classifications (from 1977)	Acres	New Water Surface Classifications (2021)	Acres	Net Difference
Water Surface	<b>3,550</b>	Open Recreation	3,621	71
		Designated No-Wake	6	6
		Fish and Wildlife Sanctuary	234	234
		Restricted	2	2
<b>TOTAL</b>	<b>3,550</b>	<b>TOTAL</b>	<b>3,863</b>	<b>313</b>
<b>TOTAL FEE</b>	<b>18,184</b>	<b>TOTAL FEE</b>	<b>18,497</b>	<b>313</b>

Source: USACE 2021

**Table 2.2.3 Justification for the Proposed Reclassification**

Land Classification	Description of Changes <sup>(2)</sup>	Justification
<b>Project Operations</b>	<p>The net decrease in Project Operations lands from 2,946 to 625 acres was due to the following:</p> <ul style="list-style-type: none"> <li>• 41 acres from HDR reclassified to PO.</li> <li>• 367 acres from PO reclassified to ESA.</li> <li>• 1,995 acres from PO reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Overall, the decrease in PO acres is due to appropriately reflecting the current use of these reclassified acres.</p>
<b>High Density Recreation</b>	<p>The net decrease in High Density Recreation lands from 1,452 to 650 acres was due to the following:</p> <ul style="list-style-type: none"> <li>• 73 acres from HDR reclassified to ESA.</li> <li>• 678 acres from HDR reclassified to LDR.</li> <li>• 41 acres from HDR reclassified to PO.</li> <li>• 10 acres from HDR reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>USACE previously managed a park area which was closed due to frequent flooding and this land was moved from HDR to LDR. Additionally, areas near the outlet channel were also changed from HDR to LDR due to frequent flooding and lack of funding to maintain the area for public use.</p>
<b>Environmentally Sensitive Areas</b>	<p>The classification of 764 acres as Environmentally Sensitive Areas resulted from the following:</p> <ul style="list-style-type: none"> <li>• 73 acres from HDR reclassified to ESA.</li> <li>• 36 acres from LDR reclassified to ESA.</li> <li>• 367 acres from PO reclassified to ESA.</li> <li>• 271 acres from WM reclassified to ESA.</li> <li>• 17 acres not previously classified in the original Master Plan were classified as ESA.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Reclassification of 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 764 acres to ESA will have no effect on current or projected public use.</p>

<b>MRML – Low Density Recreation</b>	<p>The net increase in MRML-Low Density Recreation lands from 948 to 1,174 acres was due to the following:</p> <ul style="list-style-type: none"> <li>• 678 acres from HDR reclassified to LDR.</li> <li>• 36 acres from LDR reclassified to ESA.</li> <li>• 417 acres from LDR reclassified to WM.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Many of the acres reclassified to LDR were the area adjacent to the Elk City State Park. The area contains marsh areas where wildlife management is the priority activity. Additionally, an area previously known as South Squaw State Park, was reclassified from HDR to LDR due to the park being closed several years ago due to frequent flooding. The reclassification of these acres from HDR to LDR recognizes the current and protected use of the land.</p>
<b>MRML – Wildlife Management</b>	<p>The net increase in MRML-Wildlife Management from 9,288 to 11,421 was due to the following:</p> <ul style="list-style-type: none"> <li>• 10 acres from HDR reclassified to WM.</li> <li>• 417 acres from LDR reclassified to WM.</li> <li>• 1,995 acres PO reclassified to WM.</li> <li>• 271 acres WM reclassified to ESA.</li> </ul> <p><i>* Any remaining acres not accounted for in above totals are attributed to changes in measuring technology.</i></p>	<p>Several areas surrounding the lake were originally classified other than Wildlife Management however are currently managed for natural resources/wildlife habitat. These areas were reclassified to better align with their utilization to Wildlife Mgmt.</p>
<b>MRML – Vegetation Management</b>	There are no MRML-VM lands at Elk City Lake.	
<b>Future/Inactive Recreation Areas</b>	There are no Future/Inactive Recreation Areas at Elk City Lake.	

<sup>(1)</sup>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.

<sup>(2)</sup> Acreages are based on GIS measurements and may vary from Net Difference totals detailed in Table 28 of the Master Plan.

## 2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Other alternatives to the Proposed Action were initially considered as part of the scoping process for this EA. However, none met the purpose of, and need for, the Proposed Action or the current USACE regulations and guidance. Furthermore, no

other alternatives addressed public concerns. Therefore, no other alternatives are being carried forward for analysis in this EA.

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### **SECTION 3: AFFECTED ENVIRONMENT AND CONSEQUENCES**

This section of the EA describes the natural and human environments that exist at the project and the potential impacts of the No Action Alternative (Alternative 1) and Proposed Action (Alternative 2), outlined in Section 2.0 of this document. Only those issues that have the potential to be affected by these alternatives are described, per CEQ guidance (40 CFR § 1501.7 [3]). Some topics are limited in scope due to the lack of direct effect from the Proposed Action on the resource, or because that particular resource is not located within the project area. For example, no body of water in the Elk City Lake watershed is designated as a Federal Wild or Scenic River, so this resource will not be discussed.

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 § 1508.8 [a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8 [b]). As discussed in this section, the alternatives may create temporary (less than one year), short-term (up to three years), long-term (three to ten years), or permanent effects, following implementation of the master plan revision.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource 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 would 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**

Elk City Dam was constructed for the purpose flood risk management, water supply, water quality, wildlife, and recreation. Congressional authority for the construction of the Elk City Dam began with authorization by the Flood Control (FCA) dated 18 August 1941 (Public Law 77-228). It added the Verdigris River in Kansas by modifying the RHA of 28 June 1938 to include reservoirs in the Verdigris River Basin, in accordance with the recommendations of the Chief of Engineer's In-House Document Number 440, dated 5 July 1939.

The USACE lands presently associated with Elk City Lake are listed in the 1988 Master Plan as follows:

- 2,946 acres of Project Operations
- 1,452 acres of Recreation Intensive Use
- 948 acres of Recreation Low-Density Use
- 9,288 acres of Wildlife Management

The USACE operates and manages numerous areas designated as High-Density Recreation (HDR) including Card Creek, Outlet Channel, Overlook and Squaw Creek. Section 5.3 of the 2021 Master Plan further describes recreation areas at Elk City Lake.

#### **3.1.1 Alternative 1: No Action Alternative**

The No Action Alternative for Elk City Lake is defined as the USACE taking no action, which means the operation and maintenance of USACE lands at Elk City Lake would continue as outlined in the existing 1988 Master Plan. No new resource analysis, resources management objectives, or land-use classifications would occur. Although this alternative does not result in a Master Plan that meets current regulations and guidance, there would be no significant negative long-term impacts on land uses on Elk City Lake lands.

#### **3.1.2 Alternative 2: Proposed Action**

The objectives for revising the Elk City Lake 2021 Master Plan were to describe current and foreseeable land uses, taking into account expressed public opinion and USACE policies that have evolved to meet day-to-day operational needs.

The USACE intends to continue to operate the campgrounds, day use areas, and access points, by maintaining and improving existing facilities with no plans for expansion. Emphasis will be placed on improvements such as upgrading aging water and electrical infrastructure, improving energy efficiency and sustainability of facilities, and repairing or replacing outdated restrooms.

The changes required for the Proposed Action were developed to help fulfill regional goals associated with good stewardship of land and water resources that would allow for continued use and development of project lands. Therefore, implementation of

the Proposed Action would not result in significant negative long-term adverse impacts on land uses on project lands. For example, 764 acres would be reclassified as ESA compared to the No Action Alternative which contains 0 acres (see Table 2.2.1). The ESA reclassifications would afford protection to and potentially benefit wildlife, wildlife habitats, sensitive species habitat, and cultural resources. The protection and appropriate management of these areas aligns with Resource Goals B, C, D, and E as described in Section 3.2 of the revised Master Plan, as well as numerous natural resource objectives listed in Table 22 of the revised Master Plan. The reduction of HDR by 786 acres occur in areas of parks with little to no recreational development. No decrease in recreational opportunities are expected as low impact activities, such as hiking and wildlife viewing, can still occur on other land classes like ESA and WM. Maintaining the HDR and MRML-LDR areas allows for continued outdoor recreation opportunities at Elk City Lake. New resource goals A, C, and E and several recreational objectives are supported by these reclassifications as described in Section 3.3 and Table 22 of the revised Master Plan. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. ESA classification would allow for appropriate active management and protection for these sites.

No changes in land use are expected with 2021 Master Plan as recreation and project maintenance areas and operation areas will largely remain the same. As such, no short or long-term, adverse impacts are expected to occur as a result of the 2021 Master Plan.

### **3.2 WATER RESOURCES**

#### **Surface Water**

Elk City Lake is located on the Elk River. Its watershed drains approximately 634 square miles above the dam and is in Montgomery County in southeastern Kansas. Fluctuation within the conservation pool depends upon the rate of withdrawals for water supply by the water district, as well as inflows and evaporation.

#### **Water Quality**

The Kansas Department of Health and Environment 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. The 2020 Kansas Integrated Water Quality Assessment, published pursuant to the Clean Water Act Sections 305(b) and 303(d), evaluates the quality of surface waters in Kansas and identifies those that do not meet uses and criteria defined in the Kansas Surface Water Quality Standards. Impaired waters are then identified, along with impairment descriptions, on the 303(d) list.

The Integrated Water Quality Assessment has identified siltation and eutrophication at station LM025001 in Elk City Lake, resulting in the lake being listed as a medium priority among the impaired Water Bodies in Kansas. The lake is shallow and due to this has high levels of inorganic turbidity and sediment in the water column. High

levels of phosphorus and sediment entering the lake are a known issue. Due to impairment issues, Elk City Lake is a medium priority in the Water Restoration and Protection Strategy Program.

For more information regarding water quality at Elk City Lake, please refer to Section 2.2.8 of the 2021 Master Plan.

### Wetlands

Waters of the United States are defined within the Clean Water Act (CWA), and jurisdiction is addressed by the USACE and United States Environmental Protection Agency (USEPA). 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). Wetlands are defined under Section 404 as those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

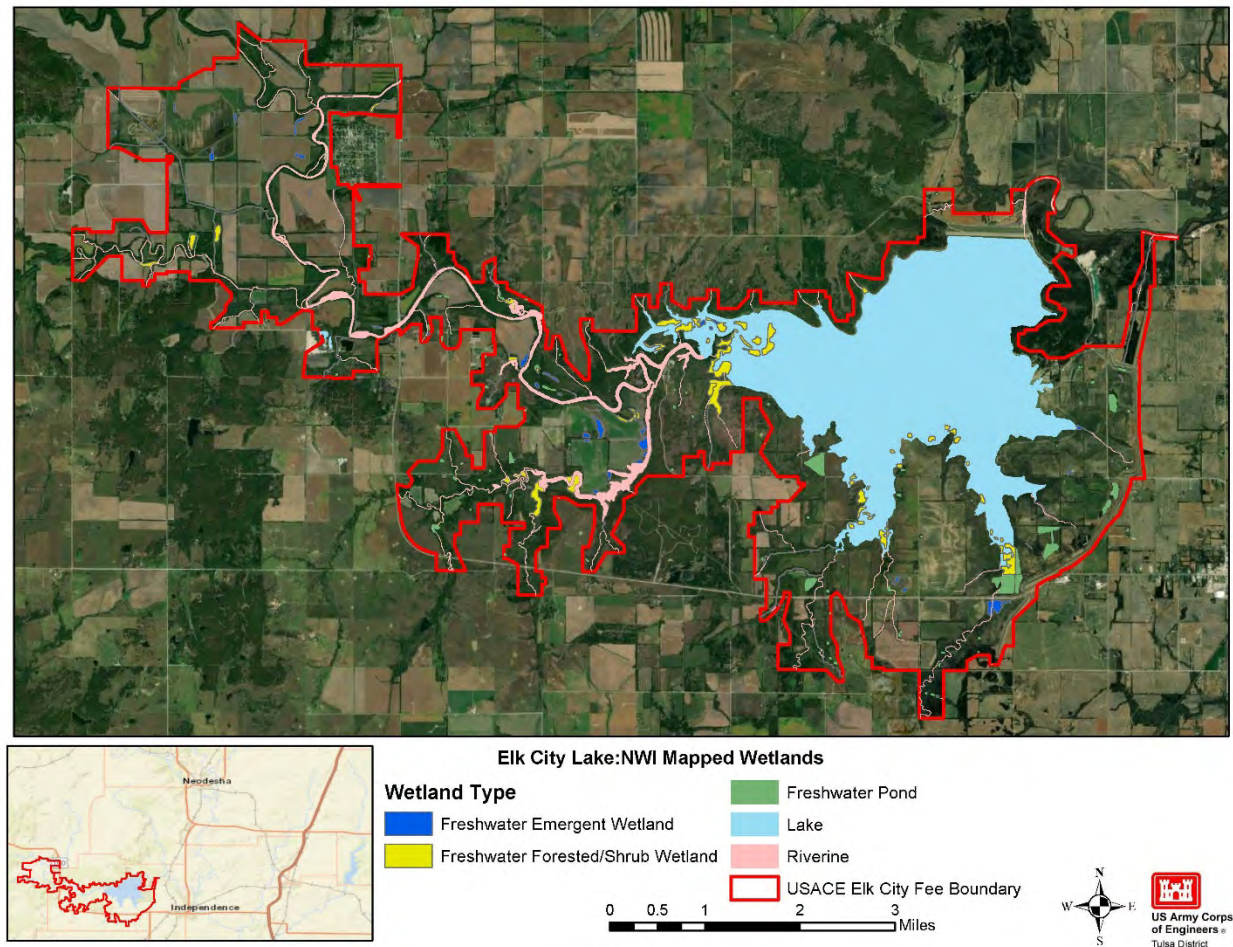
As a result of the topography of the region for Elk City Lake, wetlands generally occur near the rivers and within areas with low topographic relief. Table 3.2.1 lists the acreages of various types of wetlands present at Elk City Lake. Wetland classifications presented are derived from the USFWS Trust Resource List generated using the Information, Planning, and Conservation System decision support system (USFWS, 2020D).

**Table 3.2.1 Wetland Resources**

<b>Wetland Types</b>	<b>Total Acres</b>
Emergent Wetland	7.367
Forested Wetland	20.342
Pond	9.775
Lake	3,910.583
Riverine	42.596

Note: Acreages from the USFWS website do not match exactly with the USACE digitized acreages.

**Figure 3.2.2. Map of Wetlands within USACE Elk City Lake Federal Fee-Owned Property.**



### 3.2.1 Alternative 1: No Action Alternative

There would be no negative significant permanent impacts on water resources as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

### 3.2.2 Alternative 2: Proposed Action

The reclassifications included in the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources. Land reclassifications and new resource objectives proposed as part of the Proposed Action would have a potential for minor long-term beneficial impacts on water quality. For example, 764 acres would be reclassified as ESA compared to the No Action Alternative which allocates 0 acres to strictly ESA (see Table 2.2.1). This directly supports resource goals B, D, and E and several natural resource management objectives including minimizing activities that disturb the aesthetic value and protect

natural habitat, all of which are further described in Chapter 3 of the revised Master Plan. The net reduction of HDR lands from 1,452 acres to 650 acres will limit future intensive development, thus reducing the potential for erosion and sedimentation. Natural vegetation communities act as buffers to trap runoff, thus potentially reducing sedimentation. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative.

### **3.3 CLIMATE**

Elk City Lake lies in a moderately humid region of the southwest United States where the temperature is generally mild. Summer temperatures are generally hot during the day and cool at night, while winter temperatures are generally mild to cold, including frequent freezing temperatures. Sub-zero temperatures are in short duration and not uncommon during the winter. While the mean annual temperature is about 57.7 degrees Fahrenheit (°F), the maximum recorded temperature was 113 °F in 1954, and the minimum recorded temperature was -21 °F in 1982. The growing season between killing frosts is normally from April to late-October. For more detailed information see Section 2.1.2 of the 2021 Master Plan.

#### **3.3.1 Alternative 1: No Action Alternative**

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions. There would be no impacts on climate as a result of implementing the No Action Alternative.

#### **3.3.2 Alternative 2: Proposed Action**

Revision of the Elk City Lake Master Plan would have no impact on the climate of the study area. There would be no impacts on climate as a result of implementing the Proposed Action Alternative.

### **3.4 CLIMATE CHANGE AND GREENHOUSE GASS (GHG)**

CEQ drafted guidelines for determining meaningful GHG decision-making analyses. The CEQ guidance states that if a project would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide (CO<sub>2</sub>)-equivalent (CO<sub>2</sub>e) GHG emissions per year, the project should be considered in a qualitative and quantitative manner in NEPA reporting (CEQ, 2015). CEQ proposes this as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ, 2015).

EPA records show that there are six GHG contributors within Montgomery County, Kansas. The general operations and recreation facilities associated with Elk City Lake does not approach the proposed reportable limits. Within the Operational Management Plan (OMP) for Elk City Lake, USACE does prescribe land management actions that will protect natural resources and reduce GHG emissions. In addition, USACE will continue monitoring programs at Elk City Lake as required to meet applicable laws and policies.

The USACE has prepared an Adaptation Plan in response to the Federal Executive Orders on climate change and the CAP. The Adaptation Plan includes the following USACE policy statement:

*It is the policy of USACE to integrate climate change preparedness and resilience planning and actions in all activities for the purpose of enhancing the resilience of our built and natural water-resource infrastructure and the effectiveness of our military support mission, and to reduce the potential vulnerabilities of that infrastructure and those missions to the effects of climate change and variability.*

The USACE manages 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 USACE policy.

#### **3.4.1 Alternative 1: No Action Alternative**

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions. There would be no impacts on climate change or contributions to GHG emissions and climate change as a result of implementing the No Action Alternative.

#### **3.4.2 Alternative 2: Proposed Action**

Under the Proposed Action, current Elk City Lake project management plans and monitoring programs would not be changed. There would be no impacts on climate change or contributions to GHG emissions as a result of implementing the 2021 Master Plan. In the event that GHG emission issues become significant enough to impact the current operations at Elk City Lake, the 2021 Master Plan and all associated documents would be reviewed and revised as necessary.

### **3.5 AIR QUALITY**

The overall air quality condition for Elk City Lake is generally of good quality. The region is currently in attainment for all air quality standards. In conducting routine operations and maintenance activities at Elk City Lake, the USACE will comply with all Federal, state, and local laws governing air quality and will implement best management practices to protect air quality.

#### **3.5.1 Alternative 1: No Action Alternative**

There would be no impacts on air quality as a result of implementing the No Action Alternative since there would be no change to the existing 1988 Master Plan.

#### **3.5.2 Alternative 2: Proposed Action**

Existing operation and management of Elk City Lake is compliant with the Clean Air Act and would not change with implementation of the 2021 Master Plan. Land reclassifications and new resource objectives proposed as part of the Proposed Action



would have a potential for negligible long-term beneficial impacts on air quality. The new resources goals, primarily B and C, along with several recreational and natural resource management objectives regarding sustainability and the conservation of natural areas are supported by the proposed land classifications and are further described in Chapter 3 of the revised Master Plan. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. Because the proposed action does not entail greenhouse gas emissions and the project area does not fall within a State Implementation Plan area for air quality standards, a General Conformity analysis in accordance with the Clean Air Act is not required.

### **3.6 TOPOGRAPHY, GEOLOGY, AND SOILS**

#### Topography and Geology

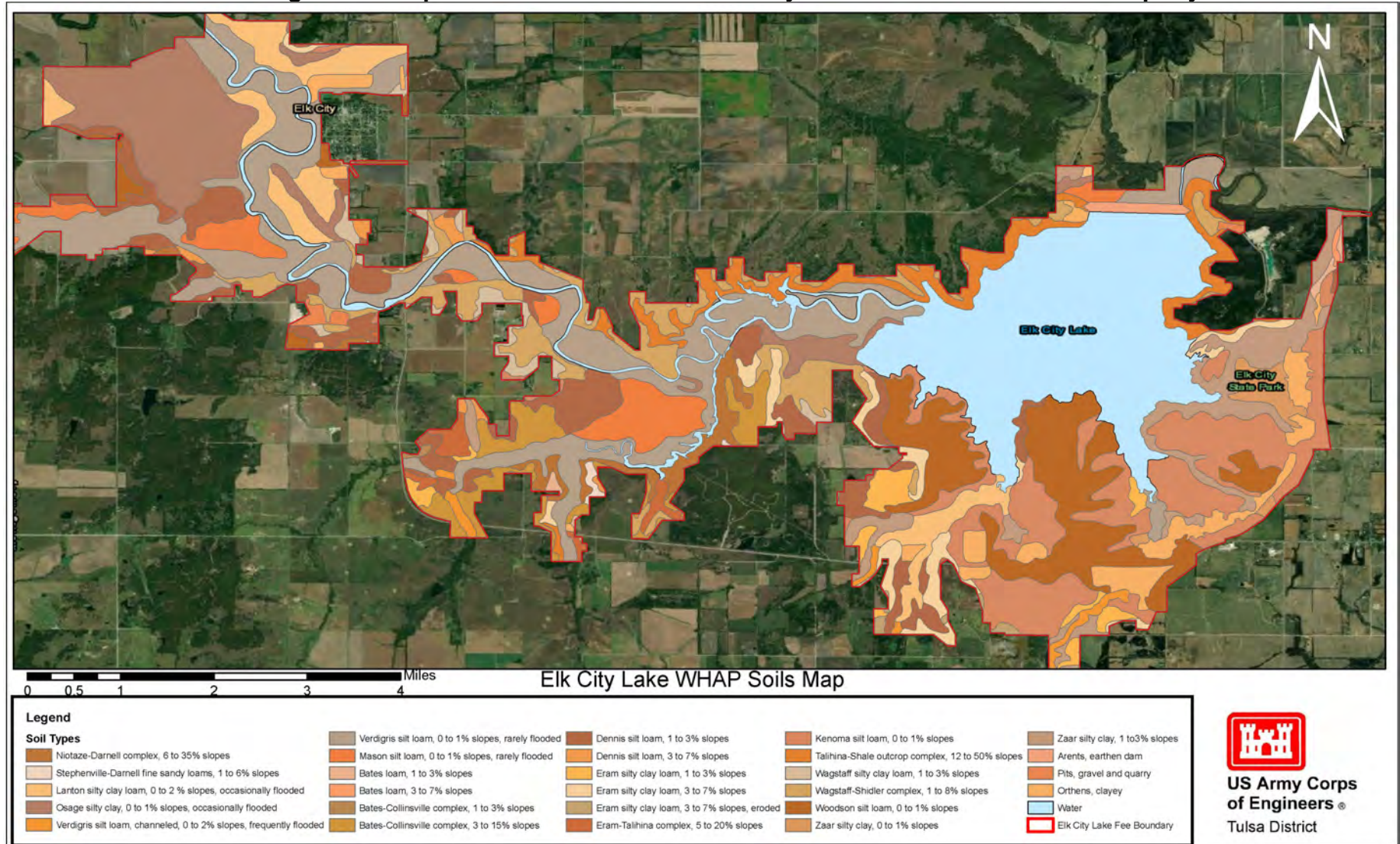
Elk City Lake is located in the "Chautauqua Hills" region of the Verdigris River Basin. Topography in the area varies from steep wooded slopes to broad rolling open crop and pastureland. Land in the vicinity of the lake to the north of Elk River is very flat and is primarily devoted to agricultural and livestock production. Prominent features of the landscape are the precipitous rock bluff and the tableland that mark the north margin of the river valley for several miles above the dam site. In this area, the banks along Elk City Lake are from 30' to 40' in height, generally stable, and thickly covered with trees and brush. To the east, the terrain is rather steep in some areas and rugged with rocks jutting out along the hillside. Along the flat areas of the lake shore, a fluctuation in the vertical pool elevation results in a large horizontal fluctuation.

Elk City Lake is located in the Cherokee Plains subdivision of the Prairie Plains physiographic province. The bedrock strata are shale and limestone of Pennsylvanian age. Geologic formations on the project lands are some of the area's most important scenic resources. The rock bluff along the northwest and east shore of the lake is limestone and contains fossils and strata of interest to the student of geology. The area is also of interest to the explorer-hiker because of its many formations and crevices.

#### Soils

The Elk City Lake area has Wagstaff Shidler complex soils in the highest density. For a visual representation of where these soils can be found please see the below Figure 3.6 and for a more detailed discussion see Section 2.1.5 in the 2021 Master Plan.

Figure 3.6 Map of Soils within USACE Elk City Lake Federal Fee-Owned Property.



### **3.6.1 Alternative 1: No Action Alternative**

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, sedimentation, or shoreline erosion as a result of implementing the No Action Alternative.

### **3.6.2 Alternative 2: Proposed Action**

Topography, geology, and soils were considered during the refining process of land reclassifications for the 2021 Master Plan. Total acreage for HDR was reduced from 1,425 acres to 650 acres. This net reduction is based on the realization that the amount of acreage originally planned for intensive recreation use per the 1988 Master Plan significantly exceeded the amount necessary to meet public needs and therefore were not being fully utilized. Areas currently developed as park would continue to operate as parks and no change would occur. However, some of the lands designated as Recreation – Intensive Use would be reclassified to various other land use classifications to better reflect historic use patterns and current land management efforts. As such, no additional intensive use facilities would be constructed outside of existing intensive use areas, limiting future impacts to soils and Prime Farmlands.

Land reclassifications, such as increased acreages to ESA and WM, and new resource objectives proposed as part of the Proposed Action would have a potential long-term beneficial impact on soil conservation and Prime Farmlands at Elk City Lake. The reduction of Recreation Areas will limit future intensive development, thus reducing the potential impacts of soil erosion and development of Prime Farmland. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. As described in Chapter 3 of the revised Master Plan, resource goals B, C, D, and E and several natural resource management objectives, particularly those that address unauthorized uses of public land, evaluation of lands for active soil erosion, and taking action to prevent sediment deposition in the lake, are supported by the proposed resource management objectives. The 6 acres of designated no-wake water surface and 234 acres of designated Fish and Wildlife Sanctuary will also help minimize wave-induced soil erosion near recreation features. Therefore, under the Proposed Action, there would be no long-term, major adverse impacts on topography, geology, soils or Prime Farmland as a result of implementing the 2021 Master Plan.

## **3.7 NATURAL RESOURCES**

Operational civil works projects administered by USACE are required, with few exceptions, to prepare an inventory of natural resources. The basic inventory required is referred to within USACE regulations (ER and EP 1130-2-540) as a Level One Inventory. This inventory includes the following: vegetation in accordance with the National Vegetation Classification System through the sub-class level; assessment of the potential presence of special status species including but not limited to federal and state listed endangered and threatened species, migratory species, and birds of conservation concern listed by the USFWS; land (soils) capability classes in accordance with Natural Resources Conservation Service (NRCS) soil surveys; and wetlands in

accordance with the USFWS Classification of Wetlands and Deepwater Habitats of the United States, which are previously discussed in Section 3.2.

In the fall of 2020, USACE biologist, rangers, and lake managers conducted a wildlife habitat assessment of USACE lands at Elk City Lake to inform potential revision of land classifications. Methodology used, habitat quality, and vegetation species encountered at Elk City Lake is described in Appendix B of this EA.

Habitat assessments were conducted using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure ([WHAP] TPWD 1995). WHAP survey point locations were preselected based on aerial imagery from existing Geographical Information Systems (GIS) data. Following survey point selection teams collected information on the habitat quality, species composition, and utilization by wildlife to help give managers and staff a better understanding of the property and inform the Master Plan revision.

WHAP data collected was used to identify unique and/or high-quality habitats for targeted conservation through the designation of appropriate land classes such as ESA, MRLM-WM, or MRLM-VM. These land classes allow for the continued conservation and management of natural, high quality habitat.

#### Fisheries and Wildlife Resources

Elk City Lake provides habitat for an abundance of fish and wildlife species. The lake provides a quality fishery, as well as quality wildlife habitat on public land associated with the project. Prominent populations of fish include walleye (*Sander vitreus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), crappie (*Pomoxis* spp.), white bass (*Morone chrysops*), Palmetto wiper (white bass x striped bass), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), and flathead catfish (*Pylodictis olivaris*). Please refer to Section 2.2.3 of the 2021 Master Plan for more detailed information.

#### Terrestrial Wildlife Resources

The Kansas Department of Wildlife and Parks (KDWP) has a license to approximately 12,240 acres of project area for wildlife management and public hunting. The USACE oversees 1,600 acres of the area for wildlife purposes. Wildlife game species commonly found in the Elk City Lake area include bobwhite quail, cottontail rabbit, mourning dove, fox squirrel, white-tailed deer, turkey, and various species of ducks and geese. The surrounding expanses of grass and wooded hillsides support some of the best quail populations in Kansas. The distribution of deer in the area is excellent. Opportunities for waterfowl hunters are good. For more information please refer to Section 2.2.4 of the 2021 Master Plan.

### **3.7.1 Alternative 1: No Action Alternative**

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

### **3.7.2 Alternative 2: Proposed Action**

The proposed net increase of ESA by 764 acres and MMRL-WM by 2,133 acres would cause major long-term beneficial impacts to natural resources within these areas. Through the WHAP survey and analysis some of these areas were identified as having high quality wildlife habitat leading to classification of the areas as ESA. The net increase in MRML-WM lands resulted primarily from reclassification of former Recreation-Intensive Use lands that will not be needed for high density recreation uses or development for the foreseeable future. The ESA classification provides the highest form of protection for natural resources. These proposed changes would then protect natural resources from various types of adverse impacts such as habitat fragmentation.

The reclassifications, resource management objectives, and resource plan required for the Proposed Action would promote land management and land uses that are compatible with the goals of good stewardship of natural resources. The Proposed Action would allow project lands to continue supporting the KDWP and USFWS missions associated with wildlife conservation and implementation of operational practices that would protect and enhance wildlife and fishery populations and habitat. In addition, the Proposed Action would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186.

### **3.8 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 as a result 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.

The USFWS's Information for Planning and Consultation (IPaC) database (2020D) lists the threatened and endangered species and trust resources that may occur within the Elk City Lake Federal Fee Boundary (see USFWS Species List and the IPaC Report in Appendix C of the 2021 Master Plan). Based on the IPaC report, there are four federally listed species found on USACE fee-owned lands and waters at Elk City Lake. A list of these species is presented in Table 2.3. No Critical Habitat has been designated within or near Elk City Lake.

**Table 2.3. Federally Listed Threatened & Endangered Species with Potential to Occur at Elk City Lake**

Common Name	Scientific Name	Federal Status	State Status
<b>Neosho Mucket</b>	<i>Lampsilis rafinesqueana</i>	Endangered	Endangered
<b>Rabbitsfoot</b>	<i>Quadrula cylindrica cylindrica</i>	Threatened	Endangered
<b>Northern Long-eared Bat</b>	<i>Myotis septentrionalis</i>	Threatened	Endangered
<b>American Burying Beetle</b>	<i>Nicrophorus americanus</i>	Threatened	Threatened

USFWS lists the northern long-eared bat threatened wherever it is found (USFWS, 2020B). It was federally listed in 2015 following studies that revealed a decline in populations from the spread of white nose syndrome. USFWS service lists Montgomery County as a location where northern long-eared bats occur (USFWS, 2020B). Most 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. Few large patches of forest occur in the study and no known caves exist in the area. With limited habitat, they are not expected to occur in the study area.

USFWS lists the Neosho mucket endangered wherever it is found (USFWS, 2020B). It was federally listed in 2012 following studies that revealed that it is highly restricted in their ranges and the threats occur throughout their ranges. USFWS service lists Montgomery County as a location where Neosho mucket occur (USFWS, 2020B). It is a compressed mussel that can get up to 9.5 cm in length. Preferred habitat consists of moderate to swift currents in riffles and runs with gravel as a substrate and clear water. Because of the waters within the USACE fee owned boundary are not clear and the overall rarity of the species, they are not expected to occur in the study area.

USFWS lists the rabbitsfoot threatened wherever it is found (USFWS, 2020B). It was federally listed in 2012 following studies that revealed that it is highly restricted in their ranges and the threats occur throughout their ranges. USFWS service lists Montgomery County as a location where rabbitsfoot occur (USFWS, 2020B). It is an elongate mussel that can get up to 12 cm in length. Preferred habitat consists of slow currents in small and large rivers with gravel as a substrate and clear water. Because of the waters within the USACE fee owned boundary are not clear and the overall rarity of the species, they are not expected to occur in the study area.

The American burying beetle is a member of the family Silphidae (carrion, or burying beetles) that is listed threatened wherever it is found. It is the largest species of Nicrophorus in North America. 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 by USFWS (2020A) 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 (NatureServe 2020). Habitat for the species does exist within Montgomery County but because of the overall rarity, the species is not expected to occur within the study area.

### **3.8.1 Alternative 1: No Action Alternative**

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions; therefore, no major, long-term adverse impacts on threatened and endangered species would be anticipated as a result of implementing the No Action Alternative.

### **3.8.2 Alternative 2: Proposed Action**

Under the Proposed Action, the USACE would continue cooperative management plans with the USFWS and KDWP to preserve, enhance, and protect wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications proposed in the 2021 Master Plan include 764 acres as ESA, and 2,133 additional acres MRML-WM.

The ESA reclassification recognizes those areas having the highest ecological value and ensures they are given the highest order of protection among possible land classifications. The high degree of protection for ESA means that any threatened or endangered species will benefit from higher quality habitats and less disturbances. Under the proposed reclassification, areas of remanent tall grass prairie would be considered for classification as ESAs.

MRML-WM areas are managed to maintain and improve habitat for fish and wildlife resources. Even though they are not afforded as much protection as areas classed as ESA, they still provide valuable habitats for threatened, endangered, or unique habitats.

The reclassification of these lands was supported by recommendations from the USFWS. The reclassification will have no effect on current or projected public use.



Habitat in ESA classified lands can provide valuable resting, stopover, and/or foraging grounds for threatened and endangered species.

Based on the above information describing habitat benefits for state and federal listed species, it is the USACE determination that implementation of the 2021 Master Plan will have No Effect on any federally threatened or endangered species. Any future activities that could potentially result in impacts on federally listed species will be coordinated with USFWS, consistent with requirements found in Section 7 of the Endangered Species Act.

### **3.9 INVASIVE SPECIES**

Invasive species are any kind of living organism which, if uncontrolled, causes harm to the environment, economy, or human health. Invasive species generally grow and reproduce quickly and spread aggressively. Non-native, or exotic, species have been introduced, either intentionally or unintentionally, and can out-compete native species for resources or otherwise alter the ecosystem. Native invasive species are those species that spread aggressively due to an alteration in the ecosystem, such as lack of fire or the removal of a predator from the food chain.

Both USACE and KDWP monitor and enforce aquatic nuisance species regulations in an effort to prevent the expansion/colonization of invasive species at Elk City Lake. Section 2.2.5 of the 2021 Master Plan further describes invasive species at Elk City Lake.

#### **3.9.1 Alternative 1: No Action Alternative**

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

#### **3.9.2 Alternative 2: Proposed Action**

The land reclassifications, resource objectives, and resource plan required to revise the Elk City Lake Master Plan are compatible with the lake's invasive species management practices. The addition of 764 acres classified as ESA may provide long-term benefits as these areas may receive additional invasive species management. The objectives developed under the proposed action as explained in detail in Chapter 3 of the revised Master Plan will result in minor, long-term beneficial impacts by reducing and preventing the spread of invasive species. In summary, these objectives are: monitoring for invasive species presence; addressing unauthorized uses of public lands which may spread invasive species; and evaluating erosion control as eroding lands provide colonization opportunities for invasive plant species. All of these would include a public outreach and education emphasis.

### **3.10 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES**

#### Cultural History Sequence

Six broad cultural divisions are applicable to a discussion of the culture history of the region: Paleoindian, Archaic, Woodland, 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. Due to differential rates of change through time in different regions, the State of Kansas has subsumed three of the cultural divisions into the broader Ceramic Period. Due to the use of both systems of cultural divisions in the site records and literature, both systems are incorporated below.

Paleoindian: 13,500 to 9000 BP

Archaic: 9000 to 2000 BP

Woodland (Early Ceramic): AD 1 to 1000

Plains Village (Middle Ceramic): AD 1000 to 1500

Protohistoric (Contact Period; Late Ceramic): AD 1500 to 1825

Historic: AD 1825 to present. For more detailed information about the archeological history in each of these time periods please see Section 2.3 of the Revised Master Plan.

#### Cultural Resources Management at Elk City Lake

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 and sacred sites.

Completion of a full inventory of cultural resources at Elk City Lake is a long-term objective that is needed for compliance with Section 110 of the NHPA (National Historic Preservation Act). Ultimately, all currently known sites, as well as those found in future inventories should be evaluated to determine their eligibility for the NRHP. Sites of currently unknown NRHP eligibility and those found in the future to be eligible for the NRHP must be protected from impacts caused by USACE or those having leases or easements on Elk City Lake fee lands. In order to ensure compliance with the NHPA, Archeological Resource Protection Act, and National American Graves Protection and Repatriation Act cultural resource activities will be coordinated with the State Historic Preservation Officer at the Kansas State Historical Society and federally recognized tribes within whose areas of interest, historical homelands, or ancestral territory the work will occur. ARPA permits are required and issued by the Tulsa District for all archaeological work conducted on USACE fee lands, to ensure qualified professional archaeologists perform the work according to established standards. The cultural, historical, and archaeological resources are described in detail in Section 2.3 of the 2021 Master Plan and are incorporated herein by reference (USACE 2021).

Numerous cultural resources laws 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. Stewardship of cultural resources on USACE Civil Works water resources projects is an important part of the overall Federal responsibility.

### **3.10.1 Alternative 1: No Action Alternative**

There would be no major adverse impacts on cultural resources as a result of implementing the No Action Alternative, as there would be no changes to the existing 1988 Master Plan. However, maintaining existing land classifications would not recognize the presence or importance of cultural resources, which could lead to long-term negative moderate or major impacts as a result of implementing the No Action Alternative.

### **3.10.2 Alternative 2: Proposed Action**

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications. Based on previous surveys at Elk City Lake, the required reclassifications, resource management objectives, and resource plan would not change current cultural resource management plans or alter areas where these resources exist. The Proposed Action would potentially result in long-term and moderate beneficial impacts with the reclassification of additional 764 acres to ESA as those lands afford more protection against development and ground disturbing activities. Therefore, no significant adverse impacts on cultural, historical, and archaeological resources would occur as a result of implementing revisions to Elk City Lake Master Plan. Any future ground-disturbing activities would take into account Section 106 of the NHPA and other applicable cultural resource statutes to insure that cultural resources are protected. Also, several cultural resources management objectives were developed to promote the protection of Elk City Lake cultural resources and are described in Chapter 3 of the revised Master Plan.

## **3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

The zone of interest for this socioeconomic analysis includes as Allen, Butler, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson, and Woodson Counties in Kansas, and Craig, Nowata, Osage, Rogers, and Washington Counties in Oklahoma. This Central Kansas-county region, where the most impacts would be expected, has been utilized as the basis in summarizing the population characteristics of Elk City Lake. The population, education level, employment rates, income, and household characteristics of the area are discussed in detail in Section 2.4 of the 2021 Master Plan (USACE, 2021).

### Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by President Clinton on February 11, 1994. It was intended to ensure that proposed federal actions do not have disproportionately high and adverse human health and environmental effects on minority and low-income populations and to ensure greater public participation by

minority and low-income populations. It required each agency to develop an agency-wide environmental justice strategy. A Presidential Transmittal Memorandum issued with the EO states that “each federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. Section 4321, et seq.”

EO 12898 does not provide guidelines as to how to determine concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the Proposed Actions. The U.S. Census American Community Survey provides the most recent estimates available for race, ethnicity, and poverty. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or Other (Section 2.4.2 of the 2021 Master Plan). Poverty status is used to define low-income. Poverty is defined as the number of people with income below poverty level, which was \$24,588 for a family of four in 2017 with two children under 18 (US Census Bureau, 2021). A potential disproportionate impact may occur when the minority in the study area exceeds 50 percent or when the percent minority and/or low-income in the study area are meaningfully greater than those in the region.

#### Protection of Children

EO 13045 requires each federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas. Please refer to Figure 16 in Section 2.4.2 of the 2021 Master Plan for a graphical representation for the percentage of total population that are children in the study area.

#### **3.11.1 Alternative 1: No Action Alternative**

Under the No Action Alternative, there would be no changes to the existing Master Plan, with the USACE continuing to Elk City Lake natural resources as set forth in the 1988 Master Plan. There would be no major adverse long-term impacts on socioeconomic resources. Beneficial socioeconomic impacts existing as a result of the implementation of the 1988 Master Plan would continue, as visitors would continue to come to the lake from surrounding areas. In addition to camping in USACE-operated campgrounds, 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 disproportionately high or adverse impacts on minority or low-income populations or children with the implementation of the No Action Alternative.

### **3.11.2 Alternative 2: Proposed Action**

Elk City Lake is beneficial to the local economy through indirect job creation and local spending by visitors and offers a variety of recreation opportunities and uses innovative maintenance and planning programs to minimize usage fees. The 650 acres of HDR and 1,174 acres of MRML-LDR will continue to provide recreation opportunities. The 764 acres of ESA land will also allow minimally invasive recreation activities such as wildlife viewing and hiking.

Since recreational opportunities remain abundant, and the revised Master Plan recognizes and reinforces projected recreational trends there would be negligible, long-term beneficial impacts on area economic stability and environmental justice populations resulting from the revision of the 1988 Master Plan.

## **3.12 RECREATION**

The majority of visitors to Elk City Lake come from within a 100-mile radius of the reservoir. These visitors are a diverse group of people with a wide variety of interests. Examples of visitors include campers who utilize the federally and state operated campgrounds around the reservoir; adjacent residents; hunters and anglers who utilize public hunting areas and participate in recreational fishing as well as tournaments; and day users who picnic, hike, bird watch, bicycle, and ride horses. Recreational facilities, activities, and needs are discussed in detail in Section 2.5 of the 2021 Master Plan.

### **3.12.1 Alternative 1: No Action Alternative**

Under the No Action Alternative, there would be no major adverse long-term impacts on recreational resources, as there would be no changes to the existing Master Plan.

### **3.12.2 Alternative 2: Proposed Action**

The primary objective for revising the Elk City Lake 1988 Master Plan is to capture current land use and management that has evolved to meet day-to-day operational needs. Under the Proposed Action, the required revisions to Elk City Lake Master Plan would be compatible with current recreation management plans and recognizes regional and national outdoor recreation trends. The reclassification changes required for the Proposed Action were developed to enhance regional goals associated with good stewardship of land and water resources that would allow for continued recreational use and development of project lands. The 650 acres of HDR and 1,174 acres of MRML-LDR will continue to provide recreation opportunities. The 764 acres of ESA land will also allow minimally invasive recreation activities such as wildlife viewing and hiking. Since recreational opportunities remain abundant, and the revised Master Plan recognizes and reinforces projected recreational trends there would be negligible, long-term beneficial impacts on recreation resulting from the revision of the Master Plan from the Proposed Action.

### **3.13 AESTHETIC RESOURCES**

Elk City Lake sits in the narrow portion of the Chautauqua Hills Region, one of the last vestiges of Tall Grass Prairie in North America. Lying in close proximity to several major metropolitan areas, Elk City lake proper and surrounding federal lands offers public, open space value and scenic vistas without having to travel far from home. The relatively flat shoreline provides visitors with an unobstructed view of mixed native grasslands, riparian hardwood forests, and croplands managed for wildlife.

Elk City Lake is well known for providing excellent fishing, but is also popular for the many hunting, hiking, camping, and wildlife viewing opportunities available.

#### **3.13.1 Alternative 1: No Action Alternative**

There would be no major adverse impacts on visual resources as a result of implementing the No Action Alternative, as there would be no changes to the existing 1981 Master Plan.

#### **3.13.2 Alternative 2: Proposed Action**

Elk City Lake currently plays a pivotal role in availability of parks and open space in Montgomery County. Even though the amount of acreage available for HDR reduces from 1,452 acres to 650 acres with implementation of the 2021 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1988 at Elk City Lake. The conversion of these lands would have no effect on current or projected public use or visual aesthetics.

Furthermore, the addition in the acreage of land classified as ESAs to 764 acres and the net increase of MRML-WM by 2,133 acres would protect lands that are aesthetically pleasing at Elk City Lake and limit future development. Natural Resources Management Objectives for the lake will continue to minimize activities which will disturb the scenic beauty and aesthetics of the lake.

Therefore, the Proposed Action would result in minor, long-term beneficial impacts to the aesthetic resources of Elk City Lake.

### **3.14 HAZARDOUS MATERIALS AND SOLID WASTE**

This section describes existing condition with the Project area with regard to potential environmental contamination and the sources of releases to the environment. Contaminants could enter the lake environment via air or water pathways. The highways and roads, railroads, and oil and gas pipelines in the vicinity could also provide sources of contaminants to the project area.

#### **3.14.1 Alternative 1: No Action Alternative**

There would be no major adverse long-term impacts on hazardous, toxic, radioactive, or solid wastes as a result of implementing the No Action Alternative, as there would be no changes to the existing Master Plan.

### **3.14.2 Alternative 2: Proposed Action**

The land reclassifications required to revise the Master Plan would be compatible with Elk City Lake hazardous and toxic waste and solid waste management practices. Therefore, no major, adverse, long-term impacts due to hazardous, toxic, radioactive, or solid wastes would occur as a result of implementing the 2021 Master Plan.

### **3.15 HEALTH AND SAFETY**

As mentioned earlier in this document, Elk City Lake authorized purposes include flood risk management, water supply, water quality, recreation, and wildlife. Compatible uses incorporated in project operation management plans include programs that establish recreation management practices to protect the public, such as water safety education, safe boating and swimming regulations, safe hunting regulations, and speed limit and pedestrian signs for park roads. The staff of Elk City Lake are in place to enforce these policies, rules, and regulations during normal park hours.

#### **3.15.1 Alternative 1: No Action Alternative**

Under the No Action Alternative, the 1988 Master Plan would not be revised. No major, adverse, long-term impacts on human health or safety would be anticipated.

#### **3.15.2 Alternative 2: Proposed Action**

Under the Proposed Action, the required revisions to the Elk City Lake 1988 Master Plan would be compatible with project safety management plans. The project would continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Elk City Lake area would continue to be enforced to ensure public safety. Therefore, there would be no major, adverse, long-term impacts on public health and safety as a result of implementing the Proposed Action.

### **3.16 SUMMARY OF CONSEQUENCES AND BENEFITS**

Table 3.16 provides a tabular summary of the consequences and benefits for the No Action and Proposed Action alternatives for each of the 15 assessed resource categories.



Table 3.16. Summary of Consequences and Benefits

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Land Use	No effect on private lands. Minor to moderate benefit from placing emphasis 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 the state, and public comment.	Land classification changes and new resource objectives fully recognize passive use recreation trends and regional environmental values.
Water Resources Including Groundwater, Wetlands, and Water Quality	Minor change with benefits 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	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. Leadership in Energy and Environmental Design (LEED) standards for green design, construction, and operation activities will be employed to the extent practicable.
Climate Change and Greenhouse Gases	Same as for Climate.	Same as for Climate.	Same as for Climate.	Same as for Climate.
Air Quality	Negligible change to help reduce air emissions.	No effect.	Promotes activities and goals that will help to reduce emissions.	Reduces HDR acres, which in turn reduces the motor vehicle exhaust that is produced. New resource objectives also help to reduce emissions.

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Topography, Geology and Soils	Beneficial change to place emphasis on good stewardship of land and water resources.	Fails to specifically recognize known and potential soil erosion problems.	Encourages good stewardship that would reduce existing and potential erosion.	Specific resource objectives call for stopping erosion from overuse and land disturbing activities.
Natural Resources	Major 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 764 acres of ESA and a net increase in lands emphasizing wildlife management.
Threatened & Endangered Species	Moderate benefits from land reclassification for recognizing both federal and state-listed species.	Fails to recognize current federal and state-listed species.	Fully recognizes federal and state-listed species.	The master plan sets forth the most recent listing of federal and state-listed species and addresses on-going commitments associated with USFWS conservation goals.
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, Historical and Archaeological Resources	Minor change to recognize current status of cultural resource.	Included cursory information about cultural resources that is inadequate for future management and protection.	Recognizes the presence of cultural resources and places emphasis on protection and management.	Reclassification of lands 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	Negligible 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 Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
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.	Specific management objectives to minimize activities that disturb the scenic beauty and aesthetics of the lake.
Hazardous Materials and Solid Waste	No change.	No effect.	No effect.	No added benefit.
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 2 acres of water surface as restricted and 6 acres of designated no-wake for public safety purposes.

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## **SECTION 4: CUMULATIVE IMPACTS**

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is 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.

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.” This cumulative impacts analysis summarizes expected environmental impacts from the combined impacts of past, current, and reasonably foreseeable future activities affecting any part of the human or natural environments impacted by the Proposed Action.

### **4.1 Past Impacts within the Zone of Interest.**

Elk City Lake was authorized by the Flood Control Act (FCA) dated 18 August 1941 (Public Law 77-228, 77th Congress, 1st Session). It added the Verdigris River in Kansas by modifying the FCA of 28 June 1938 to include reservoirs in the Verdigris River Basin, in accordance with the recommendations of the Chief of Engineer’s in House Document Number 440, dated 5 July 1939, 76th Congress, 1st Session.

### **4.2 Current and Reasonably Foreseeable Projects Within and Near the Zone of Interest**

Future management of the Lands at Elk City Lake 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.

Regional and county mobility plans call for general roadway improvements of some existing roadways within the surrounding vicinity of USACE lands. No local road expansion or construction projects planned or anticipated to take place within the zone of interest during the planning horizon of the 2021 Master Plan.

The Resource Plan in Chapter 5 of the 2021 Master Plan does not list any specific actions that may occur in the future.

### **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 Elk City Lake and cumulative adverse impacts on resources would 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 is inconsistent with adopted land use plans or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Under the No Action Alternative, land use would not change. Although the Proposed Action would result in the reclassification of project lands, the reclassifications were developed to enhance regional goals associated with good stewardship of land and water resources that would allow for continued use and development of project lands. Therefore, cumulative impacts on land use within the area surrounding Elk City Lake, when combined with past and proposed actions in the region, are anticipated to be minimal.

#### **4.3.2 Water Resources**

Elk City Lake was developed for flood risk management, water supply, water quality, wildlife, and recreation. A major impact would occur if any action is 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. The reclassifications required for the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources.

Other activities surrounding Elk City Lake, such as the addition of future utility lines, which would require boring beneath streams in most cases to avoid impacts, have been identified as having the potential to contribute directly to the cumulative impacts on water quality; however, water quality monitoring will continue to be used to assess any changes in these conditions. The cumulative impacts on water quality from the Proposed Action at Elk City Lake are anticipated to be negligible when combined with past and proposed actions in the area.

#### **4.3.3 Climate**

The implementation of the revised land use classifications in the 2021 Master Plan, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on the climate.

#### **4.3.4 Climate Change and GHG**

Under the Proposed Action, current Elk City Lake project management plans and monitoring programs would not be changed. In the event that GHG emission issues become significant enough to impact the current operations at Elk City Lake, the 2021 Master Plan and all associated documents would be reviewed and revised as necessary. Therefore, implementation of the 2021 Master Plan, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on climate change and GHG emissions.

#### **4.3.5 Air Quality**

For the area surrounding Elk City Lake, activities that could add to air emissions are likely few and minor in nature. Vehicle traffic along park and area roadways and routine daily activities in nearby communities contribute to current and future emission sources. Minor improvements to the communities in the Elk City Lake area, such as construction of new business buildings, could also contribute to minor future emissions. Implementation of the 2021 Master Plan will not contribute to major cumulative impacts in the region.

#### **4.3.6 Topography, Geology, and Soils**

A major impact would occur if the action exacerbates or promotes long-term erosion, if the soils are inappropriate for the proposed construction and would 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 adverse impacts on topography, geology, and soils within the area surrounding Elk City Lake, when combined with past and proposed actions in the region, are anticipated to be negligible on the long-term basis.

Land use around Elk City Lake has not changed in the past several years. The cumulative impacts on Prime Farmland from the Proposed Action at Elk City Lake are anticipated to be negligible when combined with past and proposed actions in the area.

#### **4.3.7 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 and expansion of 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 would



threaten the viability of natural resources. Therefore, there would be long-term beneficial impacts to natural resources resulting from the revision of the 2021 Elk City Lake Master Plan, when combined with past and proposed actions in the area.

#### **4.3.8 Threatened and Endangered Species**

The Proposed Action and No Action Alternative would not adversely impact threatened, endangered and special status species within the area, as they will be coordinated with the appropriate resource agencies. Should federally listed species change in the future (e.g., delisting of a species or listing of new species), associated requirements will be reflected in revised land management practices in coordination with the USFWS. The USACE would continue cooperative management plans with the USFWS and the state to preserve, enhance, and protect critical wildlife habitat resources.

The land reclassifications explained in detail in Section 3.8.3 will allow for further protection of state listed threatened, endangered, and unique species. The reclassifications will also allow future land management practices that would maintain and enhance habitats for these species that could occur in the area. Therefore, there would be minor long-term beneficial impacts on threatened and endangered species resulting from the revision of the Elk City Lake 1988 Master Plan when combined with past and proposed actions in the area.

#### **4.3.9 Invasive Species**

Invasive species control has and will continue to be conducted on various areas across the project lands. Implementing Best Management Practices (BMP) will help reduce the introduction and distribution of invasive species, ensuring that proposed actions in the region will not contribute to the overall cumulative impacts related to invasive species. The land reclassifications required to revise the 1988 Master Plan are compatible with Elk City Lake invasive species management practices. Therefore, there would be minor long-term beneficial impacts on reducing and preventing invasive species within the area surrounding Elk City Lake.

#### **4.3.10 Cultural, Historical, and Archaeological Resources**

The Proposed Action would not affect cultural resources or historic properties. Therefore, this action, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on cultural resources or historic properties.

#### **4.3.11 Socioeconomics and Environmental Justice**

The Proposed Action would not result in the displacement of persons (minority, low-income, children, or otherwise) or decrease numbers of people recreating at Elk City Lake as a result of implementing the revised land classifications. The creation of jobs and increase of visitor spending, results in a positive impact to the local economy. Therefore, the effects of the Proposed Action on environmental justice and the

protection of children, when combined with other ongoing and proposed projects in the Elk City Lake area, are anticipated to have negligible long-term beneficial impacts.

#### **4.3.12 Recreation**

Elk City Lake is beneficial to the local visitors and offers a variety of free recreation opportunities. Some of the popular recreation activities at Elk City Lake are, on a national basis, either static or declining in participation. For example, developed camping activity, power boating, hunting, and fishing have experienced small to moderate declines in recent years. In contrast to these declines, significant increases in hiking, walking, sightseeing, wildlife viewing and canoeing/kayaking have occurred in recent years. Even though the amount of acreage available for HDR would decrease with implementation of the 2021 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1988 at Elk City Lake. The lands that remain in the HDR classification include undeveloped acreage that could be used for future outdoor recreation development, and all MRML lands are available for passive recreation uses characteristic of MRML-LDR lands. The conversion of these lands would have no adverse effect on current or projected public use. Therefore, the effects of the Proposed Action, when combined with other existing and proposed projects in the region, would result in negligible long-term beneficial impacts on the area recreation.

#### **4.3.13 Aesthetic Resources**

Elk City Lake proper and surrounding federal lands offer public, open space values and scenic vistas that are unique in the region. Natural Resources Management Objectives for the lake will continue to minimize activities which disturb the scenic beauty and aesthetics of the lake. Therefore, the Proposed Action would result in minor long-term beneficial impacts to the aesthetic resources of Elk City Lake.

#### **4.3.14 Hazardous Materials and Solid Waste**

No hazardous material or solid waste concerns would be expected with implementation of the 2021 Master Plan; therefore, when combined with other ongoing and proposed projects in Elk City Lake, there would be no major long-term adverse impacts on hazardous materials and solid waste.

#### **4.3.15 Health and Safety**

No health or safety risks would be created by the Proposed Action. The effects of implementing the 2021 Master Plan, when combined with other ongoing and proposed projects in the Elk City Lake area, would result in no major long-term adverse impacts on health and safety for the area.

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## **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 2021 Master Plan 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 2021 Master Plan revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. Information provided by USFWS and the state on fish and wildlife resources has been utilized in the development of the 2021 Master Plan.

### Endangered Species Act of 1973, as amended

Current lists of threatened and endangered species were compiled for the revision of the 2021 Master Plan. There would be no adverse long-term impacts on threatened or endangered species resulting from the revision of the 2021 Master Plan. However, major long-term beneficial impacts, such as habitat protection, could occur as a result of the revision of the 2021 Master Plan.

### Executive Order 13186 (Migratory Bird Habitat Protection)

Sections 3a and 3e of EO 13186 directs 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 2021 Master Plan 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 2021 Master Plan revision.

### Migratory Bird Treaty Act

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 would be coordinated to avoid impacts on migratory and nesting birds.

### Clean Water Act (CWA) of 1977

The Proposed Action is in compliance with all state and federal CWA regulations and requirements and water quality is regularly monitored by the USACE. A state water

quality certification pursuant to Section 401 of the CWA is not required for the 2021 Master Plan revision. However, any future utilities would be required to comply with all Clean Water Act requirements. There will be no change in management of the reservoir that would 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 Kansas 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 surveys prior to any earthmoving or other potentially impacting activities.

#### Clean Air Act of 1977

The US EPA 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 2021 Master Plan 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. Prime Farmland is present within and adjacent to Elk City Lake. The 2021 Master Plan would not impact Prime Farmland present on Elk City Lake.

#### Executive Order 11990, Protection of Wetlands

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 2021 Master Plan complies with EO 11990.

#### Executive Order 11988, Floodplain Management

This EO directs federal agencies to evaluate the potential impacts of proposed actions in floodplains. The operation and management of the existing project complies with EO 11988.

#### 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 would not impact Prime Farmland present on Elk City 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 revision of the 2021 Master Plan 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 would 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 renew. The impacts of reclassification of land would not be considered an irreversible commitment because subsequent Master Plan 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 revisions to the Elk City Lake 2021 Master Plan.



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## **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 2021 Master Plan revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. The USACE began its public involvement process with a public information presentation posted to the website to provide an avenue for public and agency stakeholders to ask questions and provide comments. This was done in response to the COVID-19 Pandemic and social distancing guidelines. The public information presentation was available starting on May 11, 2020 and the comment period remained open until June 26, 2020. This presentation introduced the public to the 1988 Master Plan and began the public comment period. A second public information presentation was posted to the website on 23 August 2021. This information presentation introduced the public to the Draft Master Plan and EA and begin the 30-day public review period of the Draft Master Plan and EA. The USACE, Tulsa District, placed advertisements on the USACE webpage, social media, and print publications prior to these meetings. The EA was coordinated with agencies having legislative and administrative responsibilities for environmental protection. Please refer to Section 7 of the 2021 Master Plan for a summary of comments received during the public comment period.

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## **SECTION 8: REFERENCES**

- Environmental Protection Agency (EPA). 2020. Outdoor Air Quality Index Report: 2017, Marshall, TX. <https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report>
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## **SECTION 9: ACRONYMS/ABBREVIATIONS**

%	Percent
°	Degrees
ARPA	Archaeological Resources Protection Act
BMP	Best Management Practice
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	CO <sub>2</sub> -equivalent
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EP	Engineer Pamphlet
ER	Engineer Regulation
ESA	Environmentally Sensitive Area
F	Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
HDR	High Density Recreation
IFR	Inactive/Future Recreation
IPaC	Information, Planning, and Consultation System
KDWP	Kansas Department of Wildlife and Parks
LEED	Leadership in Energy & Environmental Design
MRML-IFR	Future/Inactive Recreation
MRML	Multiple Resource Management Lands
MRML-LDR	Low Density Recreation
MRML-WM	Wildlife Management
MRML-VM	Vegetative Management
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O <sub>3</sub>	Ozone
OEQ	Office of Environmental Quality
PO	Project Operations
ROD	Record of Decision

RPEC	Regional Planning and Environmental Center
SINC	Site of Interest for Nature Conservation
SGCN	Species of Greatest Conservation Need
SO <sub>2</sub>	Sulfur Dioxide
TPWD	Texas Parks and Wildlife Department
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WHAP	Wildlife Habitat Appraisal Protocol
WM	Wildlife Management
VM	Vegetative Management



## **SECTION 10: LIST OF PREPARERS**

David Hilburn – Biologist, Regional Planning and Environmental Center, 6 years of USACE experience

Shelby Scego – Biologist, Regional Planning and Environmental Center, 3 years of USACE experience.

**APPENDIX C – FEDERAL AND STATE THREATENED AND ENDANGERED  
SPECIES LISTS**

TRUST RESOURCES REPORT – USFWS

STATE OF KANSAS - MONTGOMERY COUNTY THREATENED AND ENDANGERED  
SPECIES LIST

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Project information

### NAME

Elk City

### LOCATION

Chautauqua and Montgomery counties, Kansas



### DESCRIPTION

Some(The Elk City Master Plan (Montgomery County, Kansas) 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 Elk City Lake for the next 25 years.)

## Local office

Kansas Ecological Services Field Office

☎ (785) 539-3474

📠 (785) 539-8567

2609 Anderson Avenue  
Manhattan, KS 66502-2801

NOT FOR CONSULTATION

# Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [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.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
------	--------

Northern Long-eared Bat    Myotis septentrionalis    Threatened

Wherever found

No critical habitat has been designated for this species.

<http://ecos.fws.gov/ecp/species/9045>

## Clams

NAME	STATUS
<div>Neosho Mucket    Lampsilis ra    nesqueana</div> <div>Wherever found</div> <div>There is    <b>nal</b> critical habitat for this species. The location of the critical habitat is not available.</div> <div><a href="http://ecos.fws.gov/ecp/species/3788">http://ecos.fws.gov/ecp/species/3788</a></div>	Endangered
<div>Rabbitsfoot    Quadrula cylindrica cylindrica</div> <div>Wherever found</div> <div>There is    <b>nal</b> critical habitat for this species. The location of the critical habitat is not available.</div> <div><a href="http://ecos.fws.gov/ecp/species/5165">http://ecos.fws.gov/ecp/species/5165</a></div>	Threatened

## Insects

NAME	STATUS
<div>American Burying Beetle    Nicrophorus americanus</div> <div>No critical habitat has been designated for this species.</div> <div><a href="http://ecos.fws.gov/ecp/species/66">http://ecos.fws.gov/ecp/species/66</a></div>	Threatened

## Critical habitats

Potential e    cts to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

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 on 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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

**Bald Eagle** *Haliaeetus leucocephalus*

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.

<http://ecos.fws.gov/ecp/species/1626>

Breeds Oct 15 to Aug 31

### Henslow's Sparrow *Ammodramus henslowii*

Breeds May 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<http://ecos.fws.gov/ecp/species/3941>

### Lesser Yellowlegs *Tringa avipes*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<http://ecos.fws.gov/ecp/species/9679>

### Red-headed Woodpecker *Melanerpes erythrocephalus*

Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

## 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.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### 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.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Red-headed  
Woodpecker  
BCC Rangewide  
(CON) (This is a Bird  
of Conservation  
Concern (BCC)  
throughout its  
range in the  
continental USA  
and Alaska.)



**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 migratory birds potentially occurring 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 onshore 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 [AKN Phenology 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 to 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, migrating or present year-round in my project 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 refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). 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.

# Facilities

## National Wildlife Refuge lands

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 AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

## Wetlands in the National Wetlands Inventory

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.

This location overlaps the following wetlands:

### FRESHWATER EMERGENT WETLAND

[PEM1A](#)  
[PEM1C](#)  
[PEM1Ah](#)  
[PEM1Cx](#)  
[PEM1Ch](#)  
[PEM1Ax](#)  
[PEM1Fh](#)

### FRESHWATER FORESTED/SHRUB WETLAND

[PFOAh](#)  
[PFOA](#)  
[PSSAh](#)  
[PFOAd](#)  
[PFOCh](#)



[PFOAx](#)

[PSSA](#)

## FRESHWATER POND

[PABFh](#)

[PABF](#)

[PABFx](#)

[PUSC](#)

[PUSCh](#)

## LAKE

[L1UBHh](#)

[L1UBHx](#)

## RIVERINE

[R2UBG](#)

[R2UBF](#)

[R4SBC](#)

[R2UBFx](#)

[R5UBH](#)

[R4SBA](#)

[R4SBCx](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercled worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the

geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Kansas Ecological Services Field Office  
2609 Anderson Avenue  
Manhattan, KS 66502-2801  
Phone: (785) 539-3474 Fax: (785) 539-8567



In Reply Refer To:

October 27, 2021

Consultation Code: 06E21000-2021-SLI-0130

Event Code: 06E21000-2022-E-00196

Project Name: Elk City

Subject: Updated 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 ECOS-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 ECOS-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/endangered/esa-library/pdf/esa\\_section7\\_handbook.pdf](https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf)

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*)(<https://www.fws.gov/birds/management/managed-species/eagle-management.php>), and wind projects affecting these species may require development of an eagle conservation plan (<https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>). Additionally, wind energy projects should follow the wind energy guidelines (<https://www.fws.gov/ecological-services/energy-development/wind.html>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance.php>

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 Tracking Number 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:

**Kansas Ecological Services Field Office**

2609 Anderson Avenue

Manhattan, KS 66502-2801

(785) 539-3474

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## Project Summary

Consultation Code: 06E21000-2021-SLI-0130

Event Code: Some(06E21000-2022-E-00196)

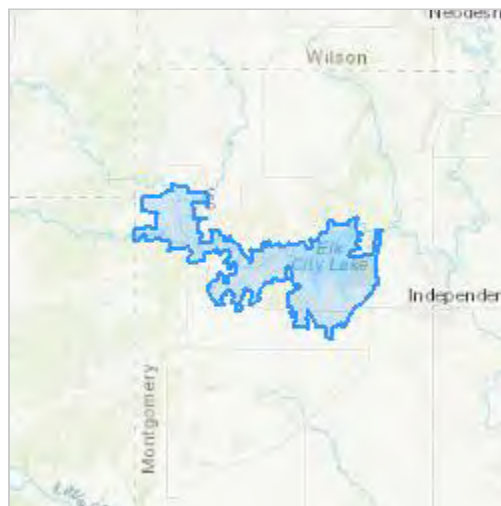
Project Name: Elk City

Project Type:

Project Description: The Elk City Master Plan (Montgomery County, Kansas) 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 Elk City Lake for the next 25 years.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.256555174568426,-95.8119506855846,14z>



Counties: Chautauqua and Montgomery counties, Kansas

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## Endangered Species Act Species

There is a total of 5 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 Fisheries<sup>1</sup>, 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: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Clams

NAME	STATUS
Neosho Mucket <i>Lampsilis rafinesqueana</i> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/3788">https://ecos.fws.gov/ecp/species/3788</a>	Endangered
Rabbitsfoot <i>Quadrula cylindrica cylindrica</i> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/5165">https://ecos.fws.gov/ecp/species/5165</a>	Threatened

## 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: <a href="https://ecos.fws.gov/ecp/species/66">https://ecos.fws.gov/ecp/species/66</a>	Threatened
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Candidate

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# 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.

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## Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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
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. <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Breeds Oct 15 to Aug 31
Henslow's Sparrow <i>Ammodramus henslowii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/3941">https://ecos.fws.gov/ecp/species/3941</a>	Breeds May 1 to Aug 31

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NAME	BREEDING SEASON
<b>Lesser Yellowlegs <i>Tringa flavipes</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
<b>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

## 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.

### Survey Effort (|)

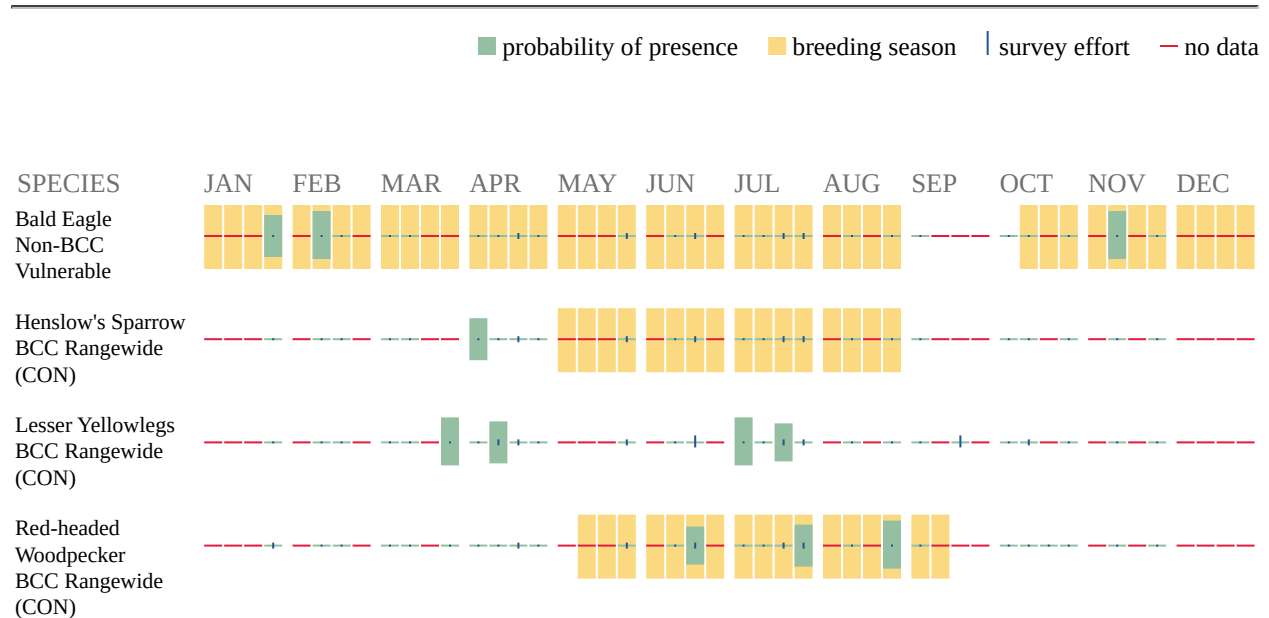
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

### No Data (—)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.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 migratory birds potentially occurring 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 [AKN Phenology 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, migrating or present year-round in my project 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 refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). 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?**

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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

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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.

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# 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.

## LAKE

- [L1UBHh](#)
- [L1UBHx](#)

## FRESHWATER POND

- [PABF](#)
- [PABFh](#)
- [PABFx](#)
- [PUSC](#)
- [PUSCh](#)

## FRESHWATER EMERGENT WETLAND

- [PEM1A](#)
- [PEM1Ah](#)
- [PEM1Ax](#)
- [PEM1C](#)
- [PEM1Ch](#)
- [PEM1Cx](#)
- [PEM1Fh](#)

## FRESHWATER FORESTED/SHRUB WETLAND

- [PFOA](#)
  - [PFOAd](#)
  - [PFOAh](#)
  - [PFOAx](#)
  - [PFOCh](#)
  - [PSSA](#)
  - [PSSAh](#)
-

RIVERINE

- [R2UBF](#)
  - [R2UBFx](#)
  - [R2UBG](#)
  - [R4SBA](#)
  - [R4SBC](#)
  - [R4SBCx](#)
  - [R5UBH](#)
-

## APPENDIX D – WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) REPORT

WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP)  
SUMMARY REPORT ELK CITY LAKE MASTER PLAN  
MONTGOMERY COUNTY, KANSAS

JANUARY 2021



**US Army Corps  
of Engineers®**

Tulsa District

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## INTRODUCTION

Habitat assessments were conducted at Elk City Lake on September 2<sup>nd</sup> – 3<sup>rd</sup>, 2020 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 39 WHAP points were surveyed, all within U.S. Army Corps of Engineers (USACE) fee boundary (Figure1).

The purpose of this report is to describe wildlife habitat quality within the USACE Elk City Lake fee-owned property in Montgomery County, Kansas. 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 Elk City Lake Master Plan revision process.

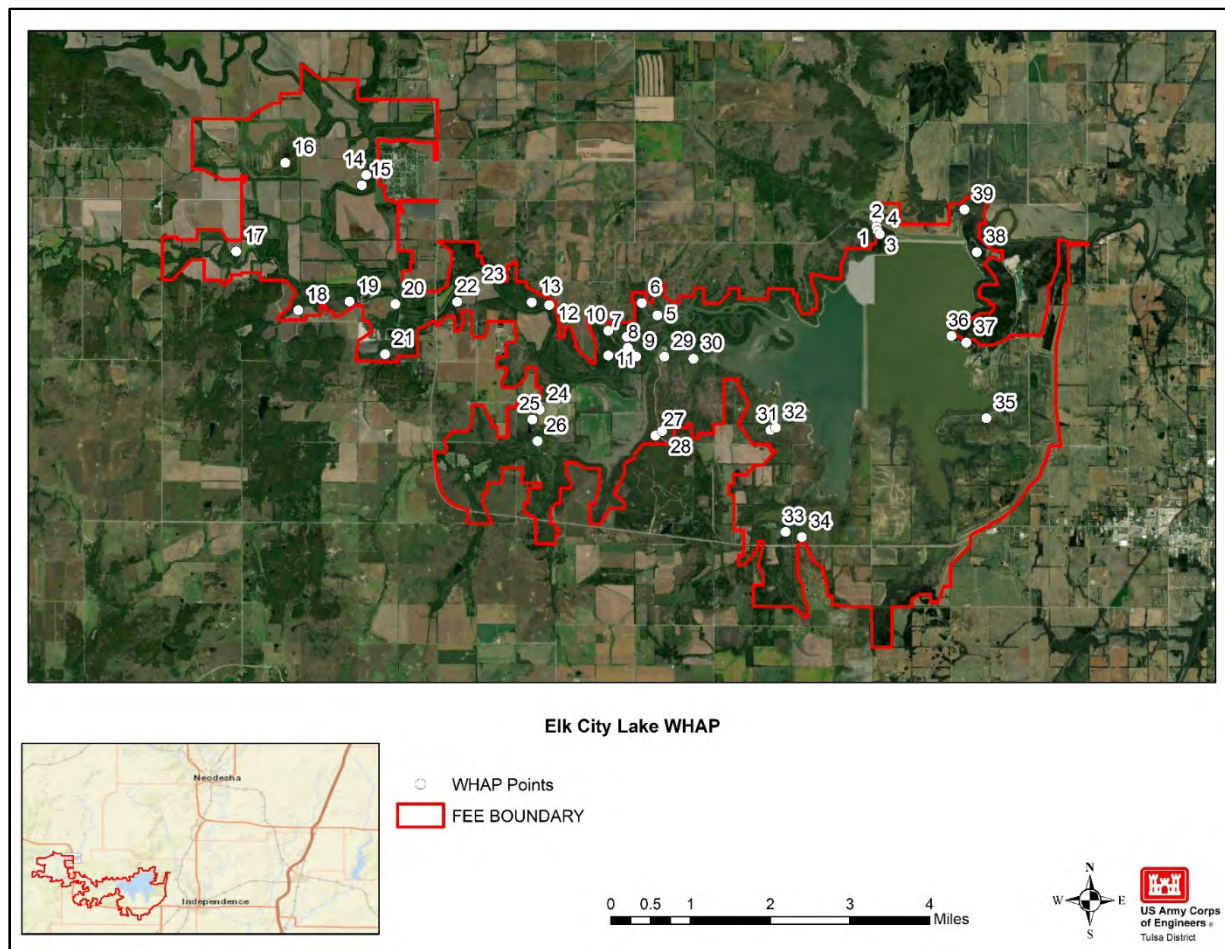


Figure 1: Distribution of WHAP Points – Elk City Lake, Kansas

## STUDY AREA

Located in the Verdigris River Basin of the Middle Verdigris Watershed, Elk City Lake is located on the Elk River, at river mile 8.7 in Montgomery County, Kansas (Figure 2). This portion of the basin is characterized by rough and broken terrain, with elevations rising up to 1,500 feet. The valley side slopes are relatively steep, with most of the valley in cultivation or pasture land. Wooded areas are prevalent along the channel and in the river bottom in the lower reaches of the stream. The drainage area above the lake is approximately 634 square miles.

USACE fee-owned property at Elk City Lake encompasses approximately 18,497 acres, including 14,634 acres of land that sits above the conservation pool elevation of 796.0' mean sea level.

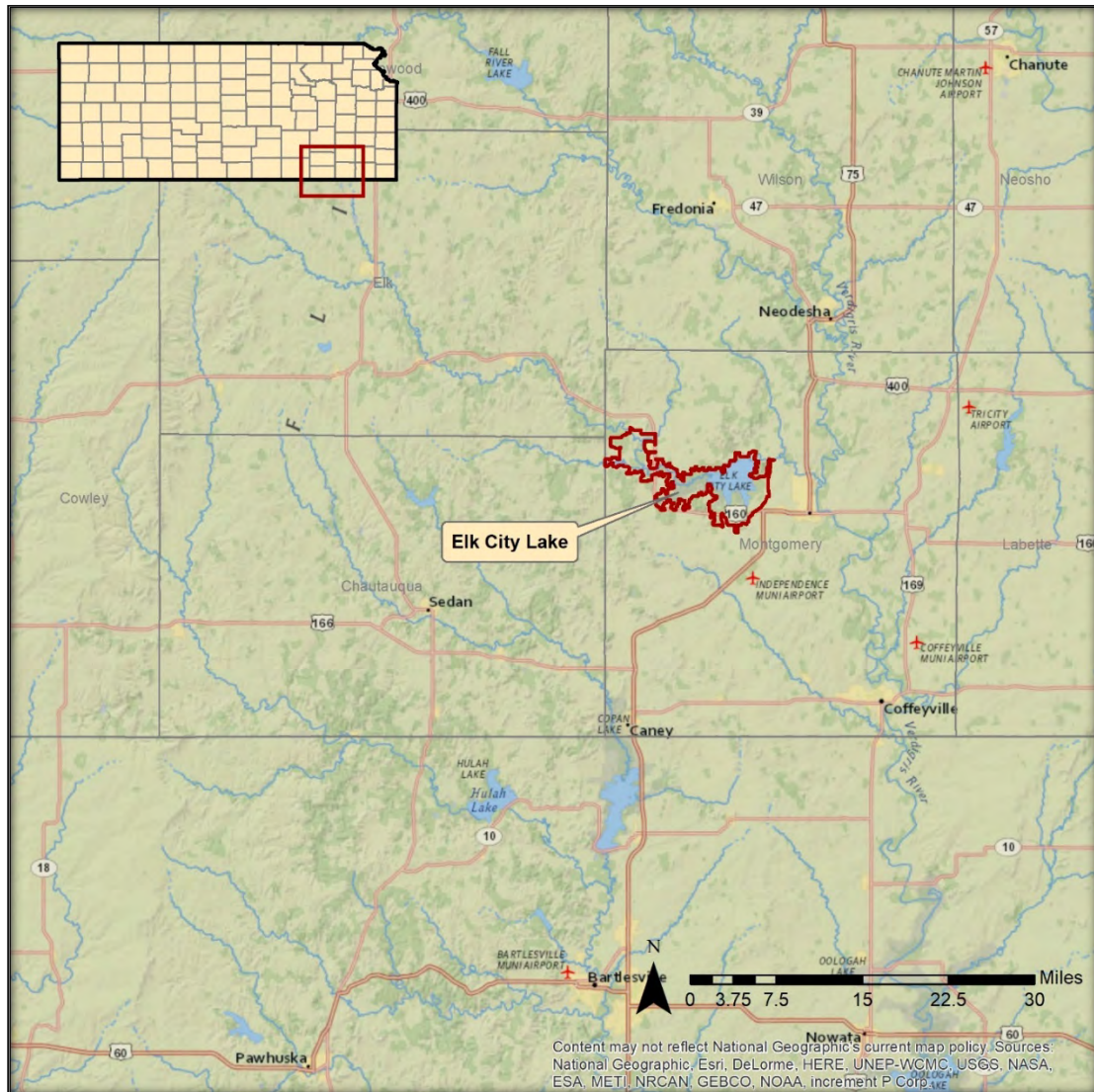


Figure 2: Elk City Lake Vicinity Map

## METHODOLOGY

An interagency team of biologists, foresters, and USACE park rangers conducted a habitat evaluation of selected areas at Elk City Lake. TPWD's WHAP protocol was used to analyze and describe existing habitats.

The WHAP requires evaluating representative sites of each cover type present within an area of interest. A search area of 0.1 acre (circle with radius of 37.2 feet) was used at each site to compile a list of herbaceous and woody species and complete the Biological Components Field Evaluation Form (TPWD 1995).

Field data collected on the form include 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

Each component has a preestablished range of possible values depending on habitat (cover) types. Points were assigned for all components at each site based observed site conditions. A habitat quality score, where values range from 0.0 (low quality) to 1.0 (high quality), was calculated for each site by totaling all values and multiplying by 0.01. Habitat quality was then determined for all sites within the same habitat type. Photographs were taken at each site (cardinal directions) and are included as Attachment B.

The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for 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 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.



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 the loss of bottomland hardwoods and other aquatic habitats. The range of component values were established based on this priority, with hydric soils and/or vegetation having higher values than drier habitat types. As such, scores for these habitats are usually higher, depending on how the values are allotted for each WHAP habitat component. Conversely, upland forest and grassland habitat values are lower, thus those 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. Consider the Site Potential component with a maximum score of 0.25 points; it 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: at least periodically support predominately hydrophytic vegetation, is 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 during the growing season of 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 layer).

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.

These two components alone regularly exclude grassland habitat from receiving 0.26 points on the WHAP scale. In order to identify the maximum score each habitat type can receive, USACE environmental staff scored each criterion given ideal conditions for riparian/bottomland hardwood forest (BHF), upland forest (includes all non-riparian/BHF forests), grassland, swamp, and marsh habitats. The maximum values scores, shown in Table 1, were then used to normalize scores for habitats that are prevented from reaching the maximum WHAP score 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	7 B	
Riparian/B HF	25	20	20	15	5	5	5	5	1.00
	12	20	20	15	5	5	5	5	0.87
Grassland	12	12	20	0	4	1	5	5	0.59
									0.65
Marsh	25	20	20	20	NA	5	10	NA	1.00

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

Elk City Lake lies at the north eastern end of the Cross Timbers ecoregion (Level IV) and extends into the Osage Cuestas ecoregion (Level IV). The Cross Timbers area extends through eastern Oklahoma into northern Texas. In Kansas, this region is known as the Chautauqua Hills and has a diversity of habitat that includes upland woodlands on sandstone outcrops dominated by post oak (*Quercus stellata*) and blackjack oak (*Quercus marilandica*), surrounded by terraces of prairie and gently rolling terrain gradually sloping to the water's edge.

The Osage Cuestas ecoregion derives its name from the prevalence in the region of gentle hills which are suddenly cutoff by east facing ridges on one side. Land between these ridges are characterized by gently rolling plains. The western portion of the region is characterized by tall grass prairies which turns into mixture of oak/hickory forests and tallgrass prairie, with floodplain forests around the various bodies of water. It is a region that occupies eastern portion of Kansas that is further characterized by the alternating layers of sandstone, limestone, and shale.

Woodlands are concentrated around lakes, rivers, and streams, and dominated by oaks (*Quercus spp.*) and hickories [(*Carya spp.*) Rohweder et al. 2001]. The dominant grass species in this ecoregion are big bluestem (*Andropogon gerardi*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*). Wildflowers like violets (*Viola spp.*), coneflowers (*Echinacea spp.*), evening primroses (*Oenothera spp.*), lobelias (*Lobelia spp.*), beardtongues (*Penstemon spp.*), and sunflowers (*Heliantheae spp.*) can be found throughout the region.

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
Croplands	1
Riparian/BHF	19
Upland Forest	10
Grassland	7
Marsh	2
Total Points Surveyed	39

## RESULTS AND DISCUSSION

The total habitat score for each point surveyed is a representation of multiple habitat characteristics 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 of this report.

Riparian/Bottomland Hardwood Forests [BHF (19 sites)] and upland forest (10 sites) were the most abundant habitat types surveyed. Riparian/BHF scores ranged from 0.47 to 0.87 while upland forest scores ranged from 0.51 to 0.70. The lower scores, especially for drier upland habitats, may be partly due to long-term flooding that has occurred at Elk City Lake in recent years, thus leading to reduced plant diversity. Flooding at lower elevations in the flood pool during the growing season (spring thru fall) would result in the mortality of the typically upland species of herbaceous plant growth. This likely affected survey metrics within these inundated areas. Frequent high-water levels are 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.

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Riparian/BHF	0.67	0.87	0.47
Upland Forest	0.63	0.70	0.51
Grassland	0.75	0.98	0.66
Cropland	0.06	0.06	0.06
Marsh	0.59	0.61	0.56

**Table 3 Average, Minimum, and Maximum Scores per Habitat Type**



Figure 3 – 6 show the range of total scores for all points surveyed (N=39). Overall, grassland and riparian/BLF habitats exhibited the highest average total score (0.75 and - 0.67). However, when comparing upland forest habitat to riparian/BHF average total scores (0.63 and 0.67), there is a difference of only 0.04. With such a close margin between these two habitat types, they are essentially equal in value, which is evidence of how the normalizing of scores helps the sites to be evaluated on an equal basis.

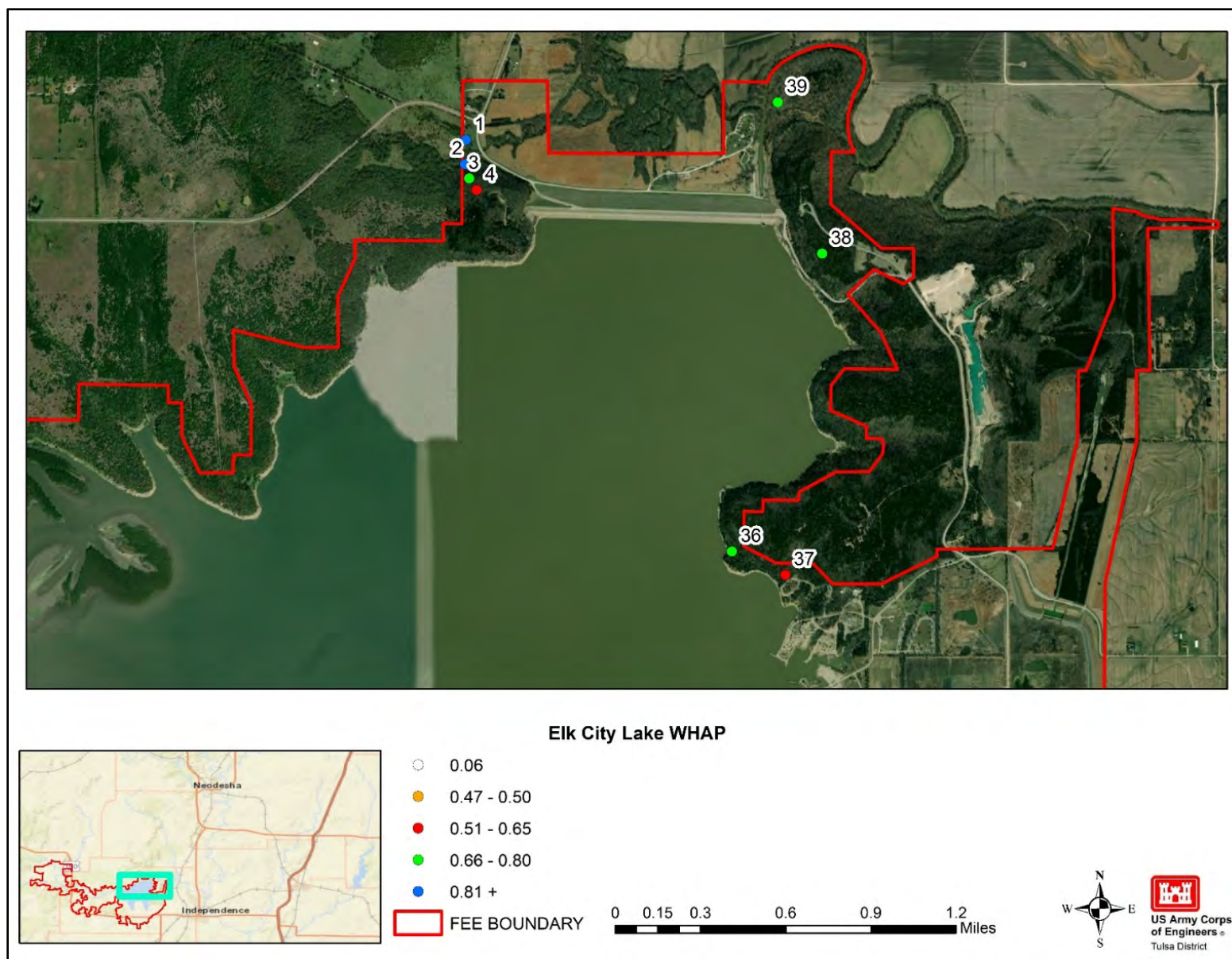
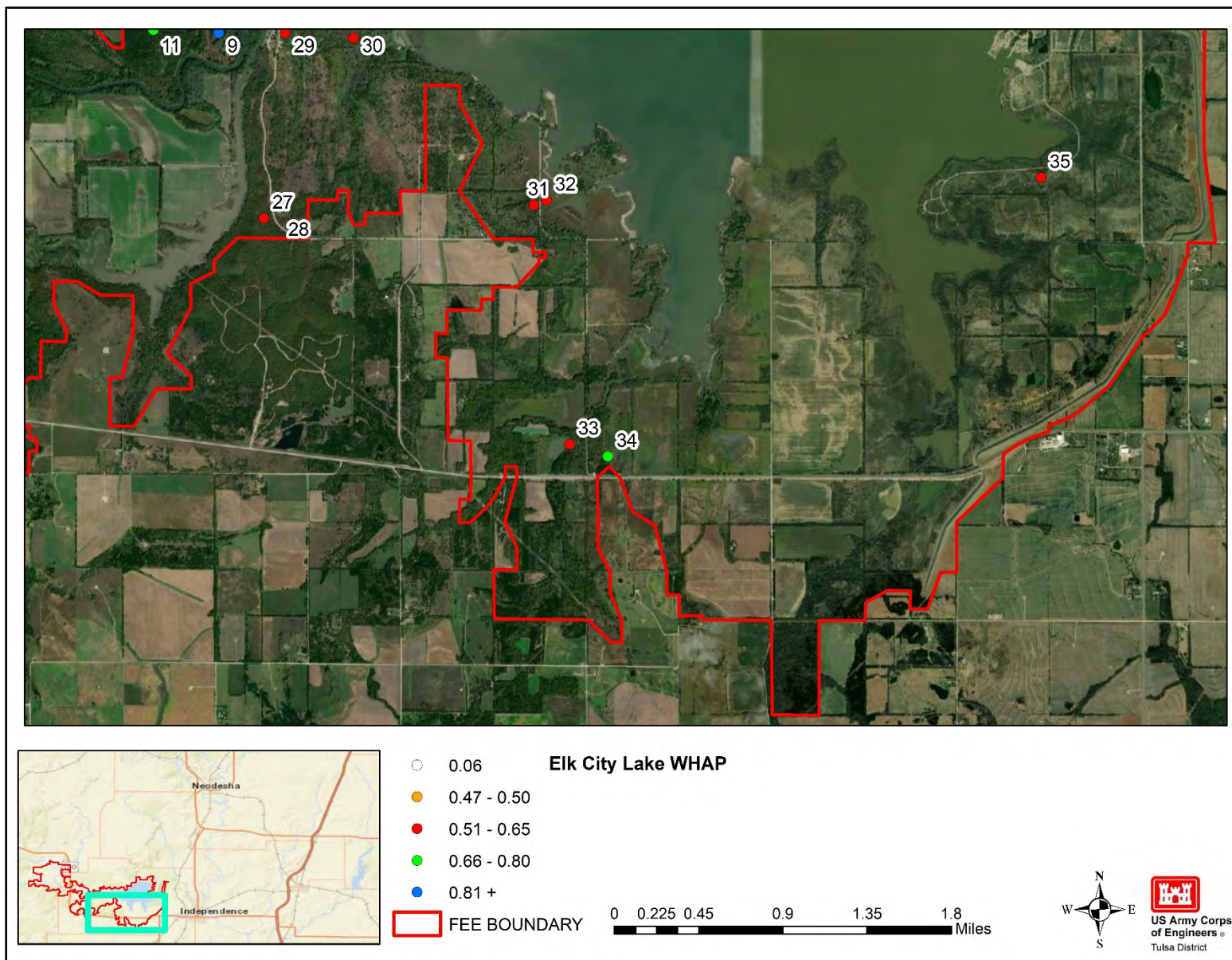
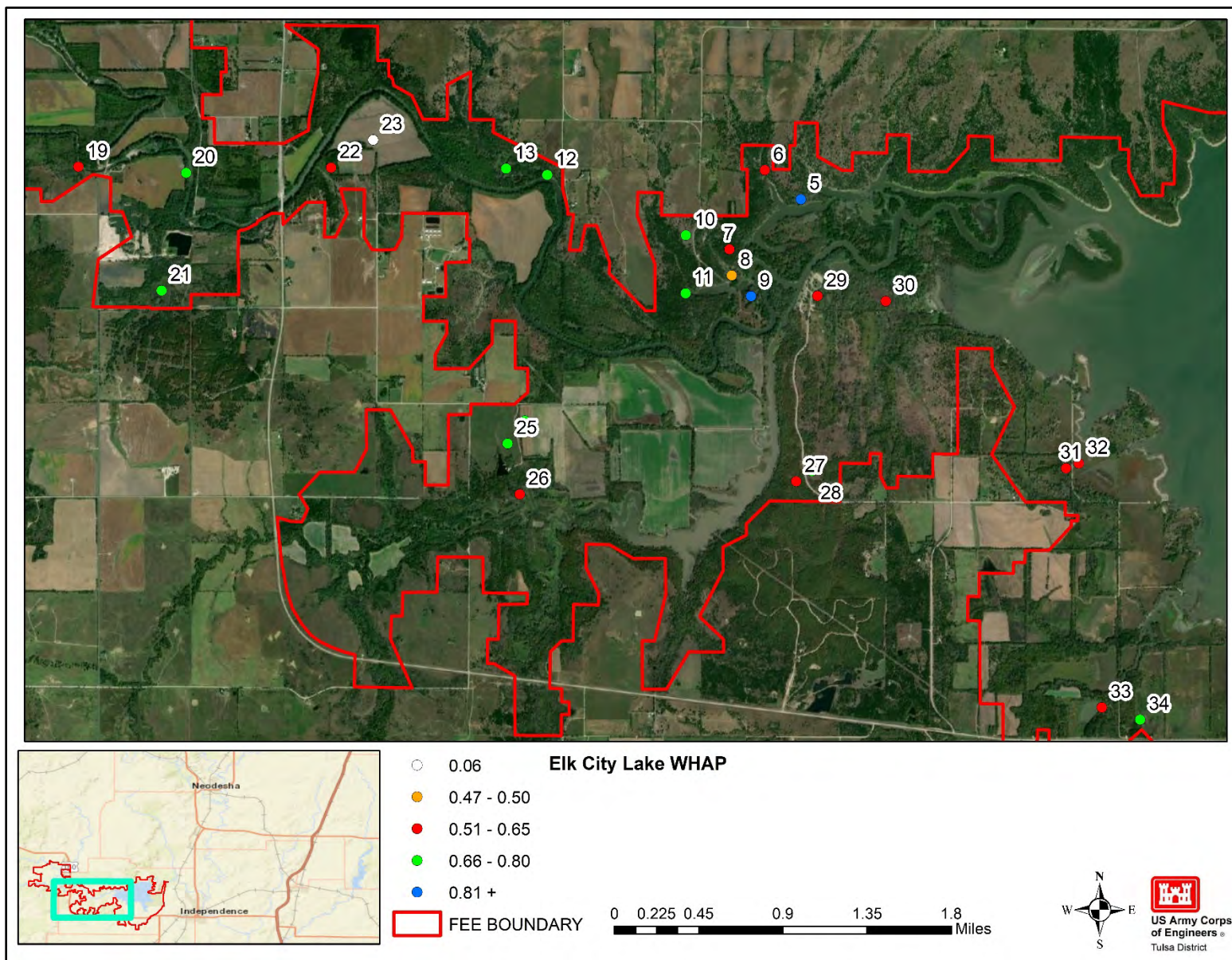


Figure 3: Total Score Range for All Points Surveyed on the Eastern Boundary of Elk City Lake



**Figure 4: Total Score Range for All Points Surveyed within the Center of Elk City Lake**





**Figure 5: Total Score Range for All Points Surveyed within the West Central Portion of Elk City Lake**



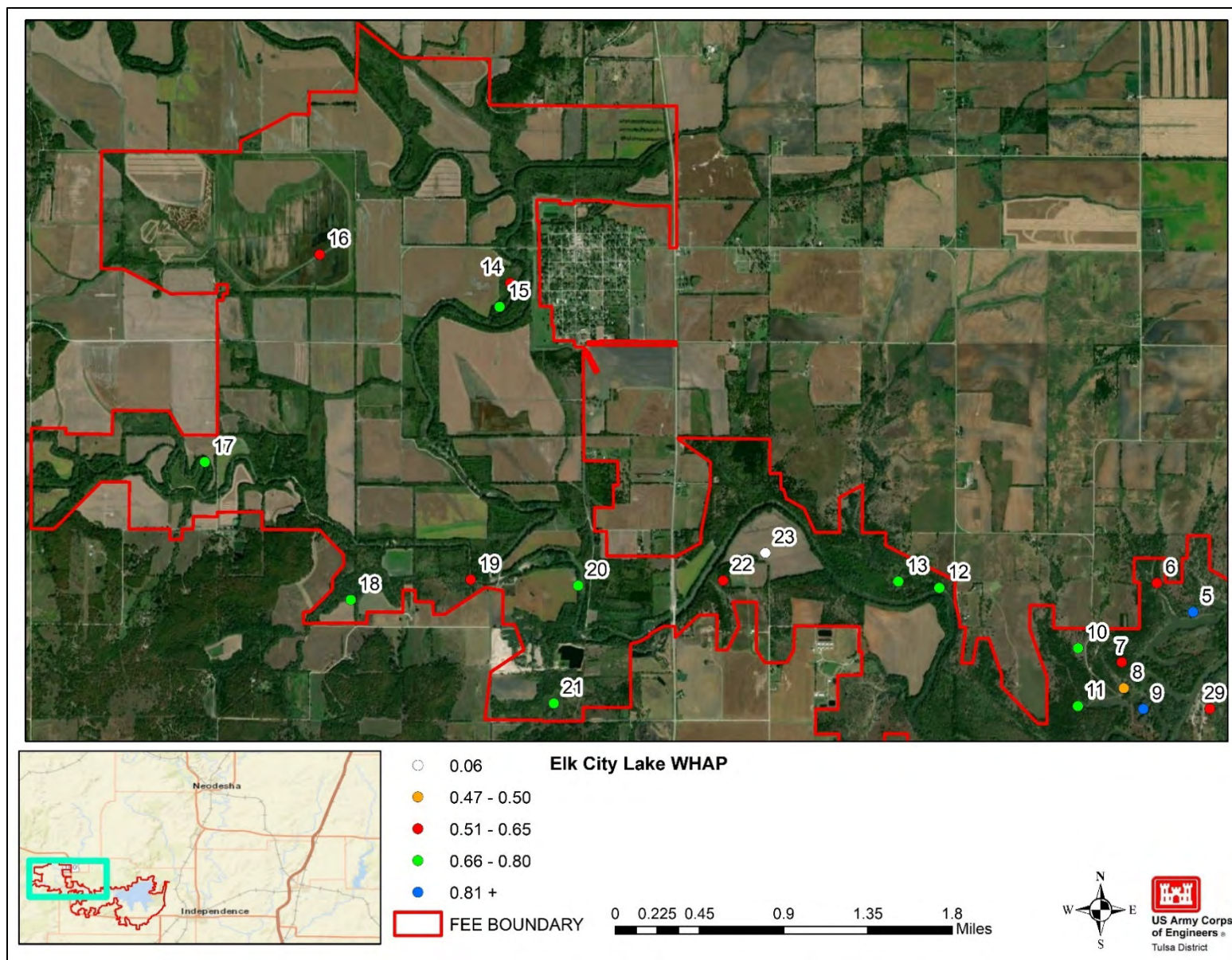
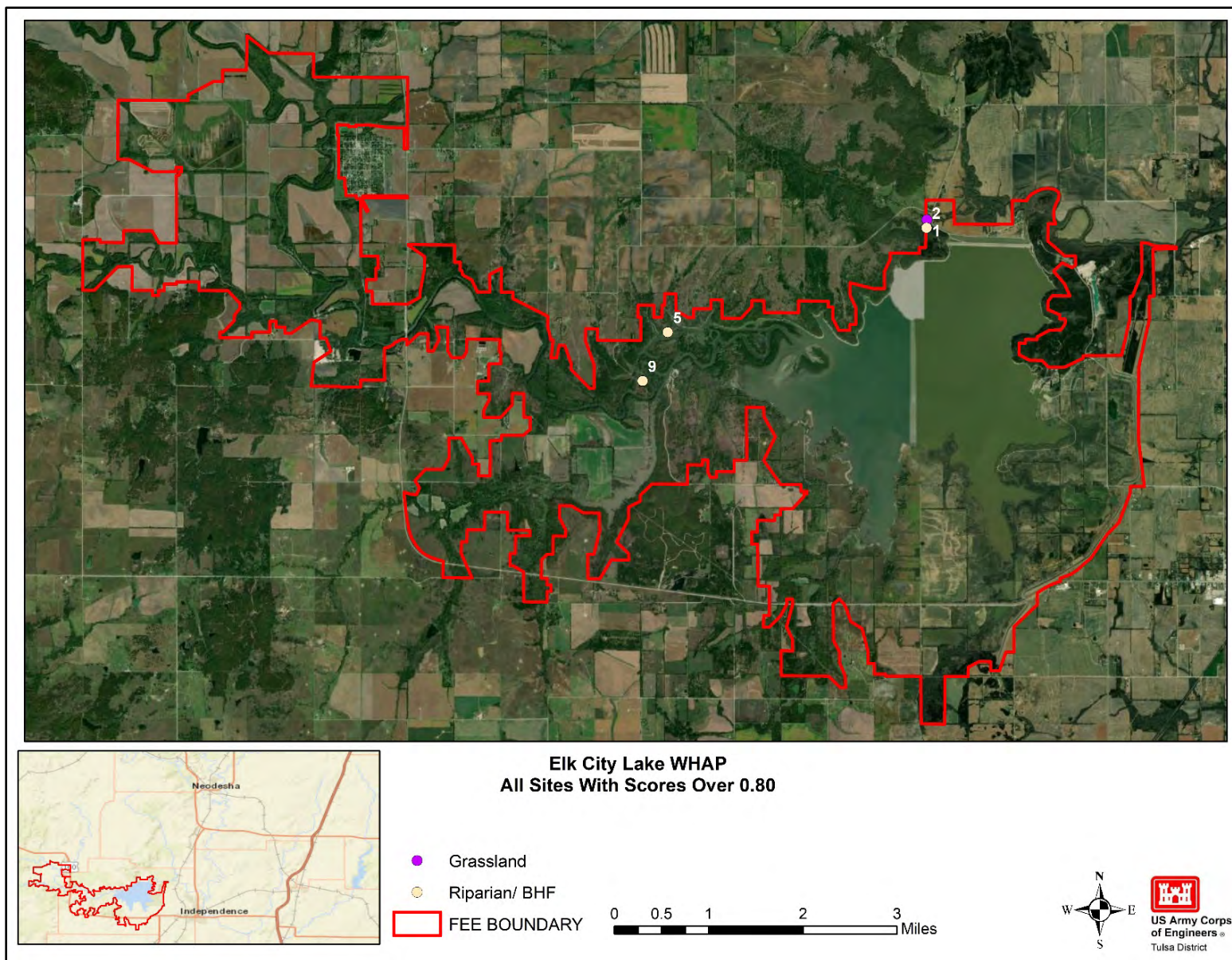


Figure 6: Total Score Range for All Points Surveyed on the Western Boundary of Elk City Lake





**Figure 7: All Sites with Total Scores over 0.80**

Four sites received a score of 0.80 or above, indicating higher quality habitat in comparison to other sites sampled. Three of the four sites were riparian/BHF sites. Site 1, a grassland site, received a higher score than what it may have otherwise because of the presence of hydric soils, which gives it a higher site potential than what is typical for a grassland. However, if the area was not mowed and left grow naturally it would convert to riparian/ BHF habitat.

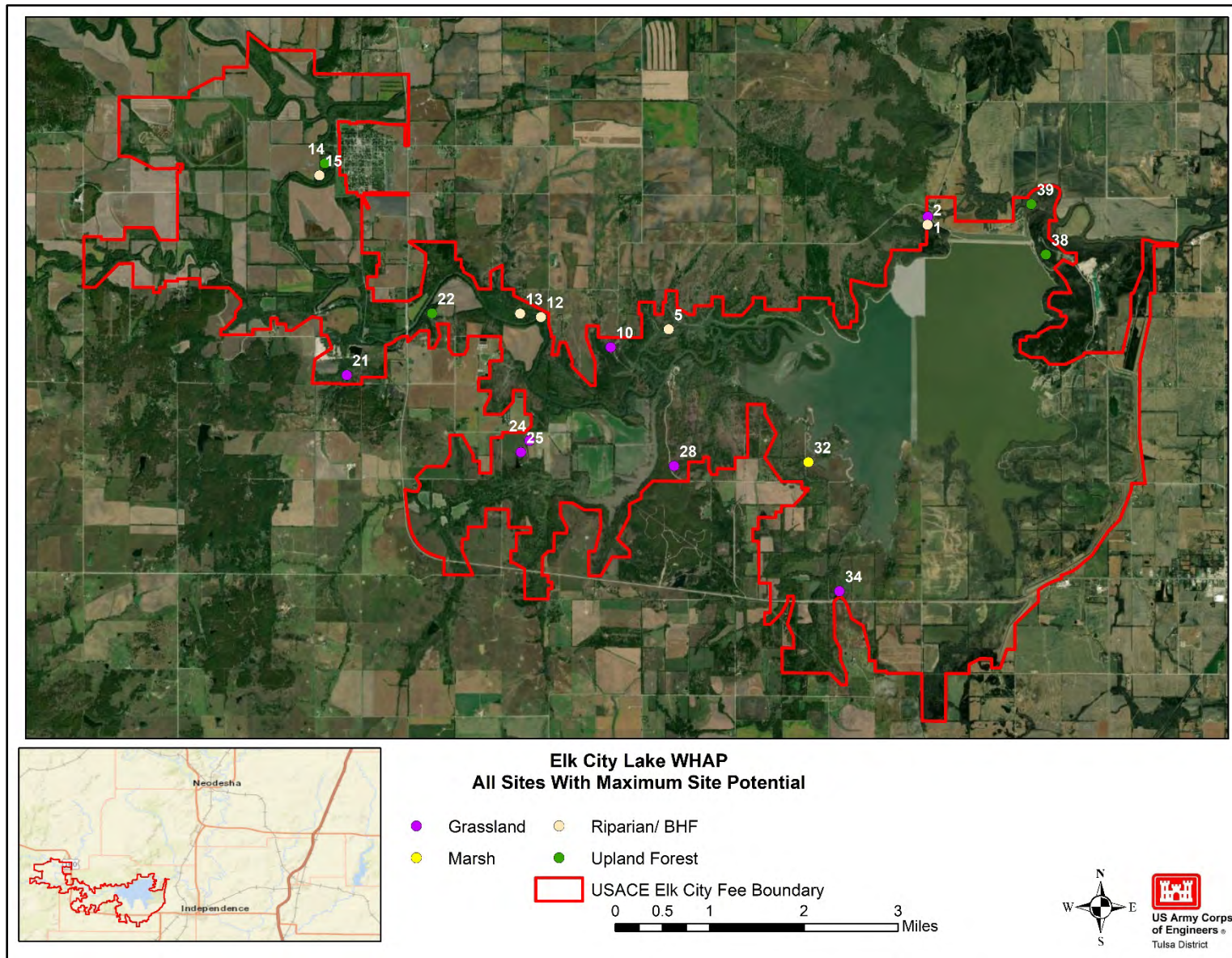
Beyond vegetative diversity, the three major metrics within the WHAP scoring criteria that allocate points are site potential, successional stage, and uniqueness and relative abundance. Table 4 shows these metrics' average score per habitat type.

**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	19.63	13.95	11.05
Upland Forest	9.60	10.80	11.50
Grassland	13.14	6.14	8.57
Cropland	1	1	0
Marsh	22.50	5	10.00

The site potential criterion allocates more points based on soil substrate characteristics and hydrologic connectivity that can support hydrophytic habitats, such as marshes, swamps, and bottomland hardwood forests. These sites are often considered to be higher quality and more diverse habitat. Since site potential focuses on soil characteristics, lowland sites with recent vegetation damage (e.g. fire, flood, insect damage, etc.) may receive higher scores than surrounding upland sites. Areas scoring high in site potential but low in other metrics can be targeted for management efforts, as vegetation community response should be favorable, thus increasing habitat value. WHAP sites with maximum site potential are shown in Figure 8.





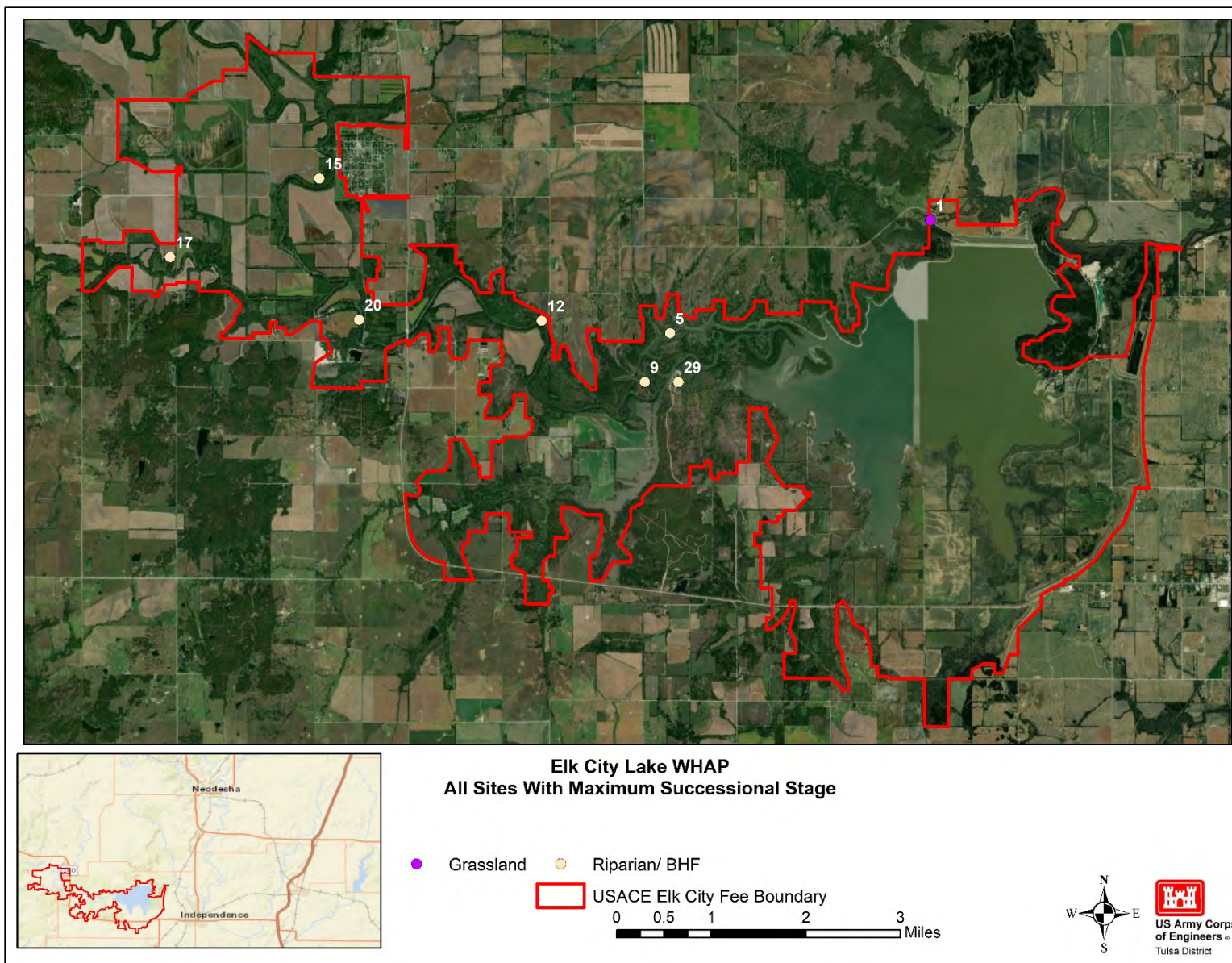
**Figure 8: All Sites with Maximum Site Potential Scores**

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. The successional stage of different habitat types is expected to increase as they age, except in areas that may not have the soil types to support hydrophytic vegetation or are flooded frequently enough to limit upland forest or grassland growth and development. WHAP sites with maximum successional stage are shown in Figure 9.

Uniqueness and relative abundance take into consideration the rarity of a habitat or vegetative community and its abundance in the region. Current and past agricultural practices have significantly influenced the region's remaining habitat composition. Few large, contiguous patches of habitat remain around Elk City Lake, thus those remaining tracts representing historic vegetation are important to conserve and protect.

In addition to receiving a maximum score for successional stage, WHAP site #9 was the only site receiving maximum scores for uniqueness and relative abundance.





**Figure 9: All Sites with Maximum Successional Stage Scores**

## **RECOMMENDATIONS**

Even with unplanned disturbances, there are several areas with valuable wildlife habitat remaining on USACE fee-owned property at Elk City Lake. Habitat management efforts by the USACE and the Kansas Department of Wildlife, Parks, and Tourism has proven effective in maintaining quality wildlife habitat around the lake.

When comparing overall high WHAP scores (Figures 3, 4, 5, and 6) to Maximum Site Potential scores (Figure 8), no one area of the lake was identified, but rather several individual points in various habitat types scattered around the lake (points 1, 2, 5, and 9). These sites are close to or have reached their 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 0.66 – 0.80, 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. There was not any part of the lake nor WHAP sites that 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 Elk City Lake Master Plan revision will consider WHAP scores when making land classification decisions.

## REFERENCES

- Rohweder, M.R. December 2015. Kansas Wildlife Action Plan. Ecological Services Section, Kansas Department of Wildlife, Parks and Tourism in cooperation with the Kansas Biological Survey. 176 pp.
- Texas Parks and Wildlife Department (TPWD). 1995. Wildlife Habitat Appraisal Procedure (WHAP). Last revised January 12, 1995. Retrieved from [https://tpwd.texas.gov/publications/pwdpubs/media/pwd\\_rp\\_w7000\\_0145.pdf](https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_w7000_0145.pdf)

**ATTACHMENT A: Elk City WHAP Results Summary**



Point Number	Habitat Type	Final Score	Berry Drupe	Legume/Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
1	Grassland	0.98	poison ivy, hack berry	NA	NA	walnut, pecan	maple	NA	NA	NA	sedge, violet clover,	NA
2	Riparian/ BH	0.84	Virginia creeper, poison ivy, wild grape, red bud, autumn olive, green briar	NA	red oak, bur oak	Hickory	box elder, ash, elm	juniper	American sycamore	plantain, black w	cocklebur, inland sea oats, Johnson grass, aster sp., knot weed, sneeze weed, beggars lice, golden rod	NA
3	Upland Forest	0.69	Virginia creeper, poison ivy, mustang grape, red bud, coral berry	NA	chinkapin oak, pin oak, red oak, post oak	hickory	elm, ash	NA	NA	bass wood	beggars lice, anemonie	NA
4	Upland Forest	0.59	coral berry, wild grape, red bud, hack berry, poison ivy	NA	chinkapin oak, red oak,	NA	NA	juniper	NA	NA	Virginia rye, skunk brush, inland sea oats, rosette grass, carex sp.,	NA
5	Riparian/ BHF	0.87	hackberry, balloon vine, riverbank wild grape,	NA	shumard oak, burr oak,	NA	green ash, American elm, red maple	NA	American sycamore	cotton wood, black willow	white morning glory, Pennsylvania smart weed, dotted smartweed, cocklebur, pokeweed, stinging nettle, common ragweed, bitter weed,	NA
6	Upland Forest	0.63	coral berry, riverbank wildgrape, hawthorn, red bud,	NA	chinkapin oak, northern red oak,	black walnut, hickory,	NA	eastern red cedar	NA	pricklypear	switchgrass, side oats gramma, poverty rush, big bluestem, wild rye, nimblewell, prairie broom weed, terragon, prairie tea, pasture heliotrope, coral vine, slender lespedeza, rose mock vervain	NA
7	Upland Forest	0.51	hackberry, coral berry,	NA	chinkapin o	black walnut,	green ash, American elm,	eastern red cedar	NA	NA	purple top tridens, eastern woodland sedge, sericia lespedeza, panic velvet grass, whorled milkweed,	NA
8	Riparian/ BH	0.47	balloon vine,	NA	NA	pecan	NA	NA	NA	NA	swamp weed, martweed, vinewe	NA
9	Riparian/ BH	0.83	mukberrym cudzoo, one seed cucumber, balloon vine	NA	NA	NA	elm	NA	NA	wilow, cottonwood,	sump weed, smart weed, knotweed, bindweed, cocklebur, moonseed,	NA
10	Grassland	0.69	black berry, coral berry, persimmon, sumac	NA	NA	NA	elm,	juniper	NA	NA	foxtail, switchgrass, sericia lespedeza, Canadian rye, wavy leaf thistle, golden rod, big bluestem, indian grass, narrow leaf mountain mint, japanese honey suckle, side oats grama, skunk brush, annual ragweed,	NA

Point Number	Habitat Type	Final Score	Berry/Drupe	Legume/Pod	Acorn	Nut/Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
11	Riparian/ BH	0.66	Mexican ground cherry, button bush, hackberry, balloon vine	honey locust	NA	pecan	elm	NA	NA	NA	heliotrope, blue day flower, smart weed, knotweed, swampweed, bindweed, cocklebur,	NA
12	Riparian/ BH	0.78	buttonbush, hackberry, balloon vine,	NA	NA	NA	red maple, green ash,	NA	NA	black willow,	cocklebur, devils beggar tick, climbing day flower, prickly sida, white morning glory, bitterweed, dotted smartweed, false daisy, stinging nettle, horsetail,	NA
13	Riparian/ BH	0.66	balloon vine, porcelain berry,	NA	NA	NA	green ash	NA	NA	osage orange	dotted smartweed, Pennsylvania smartweed, cocklebur, common 3-seeded mercury, mulberry weed, eyebane, common dayflower, perennial ryegrass, palmer's anarynth, annual marsh elder,	NA
14	Upland Forest	0.64	river bank grape, poison ivy, prairie blackberry, Virginia creeper, coral berry	NA	red oak	NA	box elder, green ash, American elm	eastern red cedar	NA	NA	white grass, ground cherry, winter creeper, Virginia wild rye, golden rod, prairie flower, carolina wild petunia	NA
15	Riparian/ BHF	0.80	hack berry, paw paw, white mulberry, poison ivy, Virginia creeper, green briar	NA	NA	bitternut hickory	American elm, silver maple, box elder,	NA	NA	cotton wood	cardinal flower, branched foldwing, jumpseed, horseweed, Virginia wildrye, winter creeper, common moonseed, field thistle	NA
16	Marsh	0.61	Poison ivy, Virginia creeper, riverbank wild grape, green briar	NA	NA	NA	NA	NA	NA	NA	American jumpseed, spangle grass, Virginia wild rye, late boneset, blue mist flower, blue violet, branched foldwing, common moonseed, eastern woodland sedge, American beakgrain, wingstem,	NA
17	Riparian/ BHF	0.79	hackberry, red mulberry, coral berry	NA	red oak, burr oak,	black walnut, bitternut hickory, swamp chestnut, American bladdernut	American elm, box elder,	NA	American sycamore	NA	NA	NA
18	Riparian/ BHF	0.66	redbud, hackberry, paw paw, red mulberry, roughleafed dogwood, coral berry, greenbriar, Virginia creeper, poison ivy, riverbank wild grape	NA	NA	black walnut	American elm, green ash,	NA	NA	NA	common moonseed, spangle grass, American jumpseed, Virginia wild rice, eastern woodland sedge, common day flower, pannicled tick clover, wingstem, white avens, white grass	NA
19	Riparian/ BHF	0.52	hack berry, coral berry, Muscadine, riverbank wild grape, may pop, green briar, poke berry, poison ivy, mulberry, coral berry, hackberry, Virginia creeper	NA	NA	black walnut,	velvet ash, American elm,	eastern red cedar	NA	osage orange,	lespedeza, common ragweed, common nipplewort, spangle grass, Pennsylvania sedge, eastern woodland sedge, prairie tea, horse weed, switch grass, golden rod, spanish needles, toothed spurge, marsh bristle grass, crab grass, panic grass, branched noseburn, dallis grass, croton, yellow wood sorrel, mulberry weed, ground cherry,	NA
20	Riparian/ BHF	0.80		NA	chinkapin oak, shumard oak, black oak,	bitternut hickory	American elm, green ash, box elder, red maple,	NA	NA	osage orange	giant ragweed, eastern woodland sedge, Johnson grass, wild rye, panic grass, giant foxtail	NA

Point Number	Habitat Type	Final Score	Berry/Drupe	Legume/Pod	Acorn	Nut/Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
											longspike tridens, late boneset, annual ragweed, lespedeza, switchgrass, yellow indian grass, goldenrod, broom sedge, bluestem, prairie broomweed, panic grass, thistle, carolina horse nettle, marsh bristle grass, bearded beggars tick, Johnson grass, dallis grass, horse weed, big bluestem, torrey's rush, frost aster,	
21	Grassland	0.75	coral berry, common blackberry, maypop	partridge pea	NA	NA	NA	NA	NA	NA		NA
22	Upland Forest	0.52	hackberry, persimmon, poison ivy, coral berry,	partridge pea,	pin oak,	NA	green ash, American elm,	eastern red cedar	NA	NA	Johnson grass, siricium lespedeza, Pennsylvania sedge, late boneset, panic grass, yellow wood sorrel, cocklebur.	NA
23	Cropland	0.06	NA	soybeans	NA	NA	NA	NA	NA	NA	NA	soybean field
24	Grassland	0.66	NA	NA	NA	NA	winged elm	NA	NA	NA	late boneset, Johnson grass, field thistle, morning glory, goldenrod, prairie cone flower, tie vine, creeping woodsorrel, cocklebur, big bluestem, prickly sida, horseweed, frost aster, carolina horse nettle, japanese clover, panic grass,	NA
25	Grassland	0.66	common blackberry	NA	NA	NA	NA	NA	NA	NA	common ragweed, big bluestem, American bluehearts, goldenrod, slender lespedeza, panic grass, panicled tick clover, whorled milkweed, rattlesnake master, grassleaved goldenrod, broomsedge bluestem, switchgrass, narrowleaved sunflower, foxglove beardtongue, horseweed, creeping woodsorrel, showy ticktrefoil, late boneset, lesser knapweed,	NA
26	Riparian/ BHF	0.62	muscadine grape, button bush	honey locust	NA	bitternut hickory	American elm	NA	NA	osage orange	tie vine, dotted smart weed, pennsylvannia smart weed, balloon vine, lead plant, prickly sida, green foxtail, morning glory, cocklebur, toothed spurge, nodding spurge, climbing dayflower	NA
27	Riparian/ BHF	0.57	hackberry, Virginia creeper, green briar, mustang grape, coral berry	NA	blackjack oak, post oak, red oak, burr oak,	shagbark hickory,	ash	juniper,	NA	osage orange	carex, bedstraw, 3-seeded mercury, American germander, sericium lespedeza, slender goldentop, American germander, tall blazing star, switch grass, slender bush clover, bluestem, deer tongue, indian blanket,	NA
28	Grassland	0.75	sumac, rough leafed dogwood, persimmon, coral berry	partridge pea	NA	NA	American elm, ash,	eastern red cedar	NA	NA	carex, American germander, sorrel, canada rye, beggars tick, bind weed, moonseed, milkweed, knotweed, pink smart weed	NA
29	Riparian/ BHF	0.62	mulberry, hackberry, poison ivy, persimmon, mustang grape, rubus spp., muscadine grape, green briar	honey locust	burr oak,	pecan	ash, elm, silver maple	NA	NA	NA	stinging nettle, knotweed, pink smart weed, climbing day flower, beggars tick, false daisy, nutsedge, bindweed, pig weed, pennywort	NA
30	Riparian/ BHF	0.57	American beauty berry	NA	NA	NA	silver maple, green ash	NA	NA	cotton wood, narrow leaf willow		NA





Point Number	Habitat Type	Final Score	Berry Drupe	Legume/Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
31	Riparian/ BH	0.57	paw paw, balloon vine,	NA	NA	NA	silver maple, American elm	NA	NA	cottonwood	American germander, sumpweed, knotweed, carex, bindweed, smartweed, beggars tick, spurge	Lots of fallen timber, thick leaf layer,
32	Marsh	0.56	button bush,	NA	NA	NA	NA	NA	NA	NA	pink smartweed, sumpweed, barnyard grass, American germander, bindweed, cocklebur, sida sp., spurge	NA
33	Riparian/ BH	0.60	button bush, balloon vine	partridge pea	NA	pecan	NA	NA	NA	willow	Johnson grass, barnyard grass, sump weed, cocklebur, knot weed, smart weed	NA
34	Grassland	0.73	Persimmon	NA	NA	NA	NA	NA	NA	NA	switch grass, beggars tick, boneset, bull thistle, sump weed, American germander, panicum, hawkstail, passion flower,	NA
35	Riparian/ BH	0.57	vine weed, balloon vine	honey locust	NA	NA	Ash	NA	NA	cotton wood, willow	sump weed, knot weed, carex, shrub weed	NA
36	Upland Forest	0.67	Poison ivy, Coral berry, Virginia creeper, wild grape, redbud, green briar	NA	Chinkapin oak, Bur oak, Post oak	Hickory	American elm	Juniper	NA	Skunk brush	Bedstraw, carex	NA
37	Upland Forest	0.64	red bud, poison ivy	NA	post oak, red oak	Hickory	NA	Juniper	NA	NA	golden rod, illinois bundle flower, clover	NA
38	Upland Forest	0.70	coral berry, wild grape, Virginia creeper, poison ivy, hack berry, red bud	milk pea	red oak, post oak, chinkapin oak	shag bark hickory	ash	Juniper	NA	osage orange	carex, bedstraw,	NA
39	Upland Forest	0.68	wild grape, green briar, poison ivy	NA	NA	NA	box elder, ash, elm	NA	American sycamore	cotton wood	carex, inland sea oats, sedge	NA

**ATTACHMENT B: Elk City Lake Whap Point Photographs**

Elk City Lake #: 1	
Facing North	Facing East
	
Facing West	
	



Elk City Lake #: 2	
Facing North	Facing East
	
Facing West	Facing South
	

Elk City Lake #: 3	
Facing North	Facing East
	
Facing West	Facing South
	



Elk City Lake #: 4	
Facing North	Facing East
	
Facing West	Facing South
	





Elk City Lake #: 6

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 7

Facing North



Facing East





Facing West



Facing South





Elk City Lake #: 8	
Facing North	Facing East
	
Facing West	Facing South
	

Elk City Lake #: 9	
	Facing East
	
Facing West	Facing South
	



Elk City Lake #: 10

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 11

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 12

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 13

Facing North



Facing East






Facing West



Facing South





Elk City Lake #: 14	
	Facing East
	
Facing West	Facing South
	

Elk City Lake #: 15

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 16

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 17

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 18

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 19

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 20

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 21

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 22

Facing East



Facing West



Facing South





Elk City Lake #: 23

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 24

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 25

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 26

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 27

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 28

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 29

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 30

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 31

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 32

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 33

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 34

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 35

Facing North



Facing East



Facing West



Facing South



Elk City Lake #: 36

Facing North



Facing East



Facing West



Elk City Lake #: 37

Facing North



Facing East



Facing West



Facing South





Elk City Lake #: 38

Facing North



Facing East



Facing West



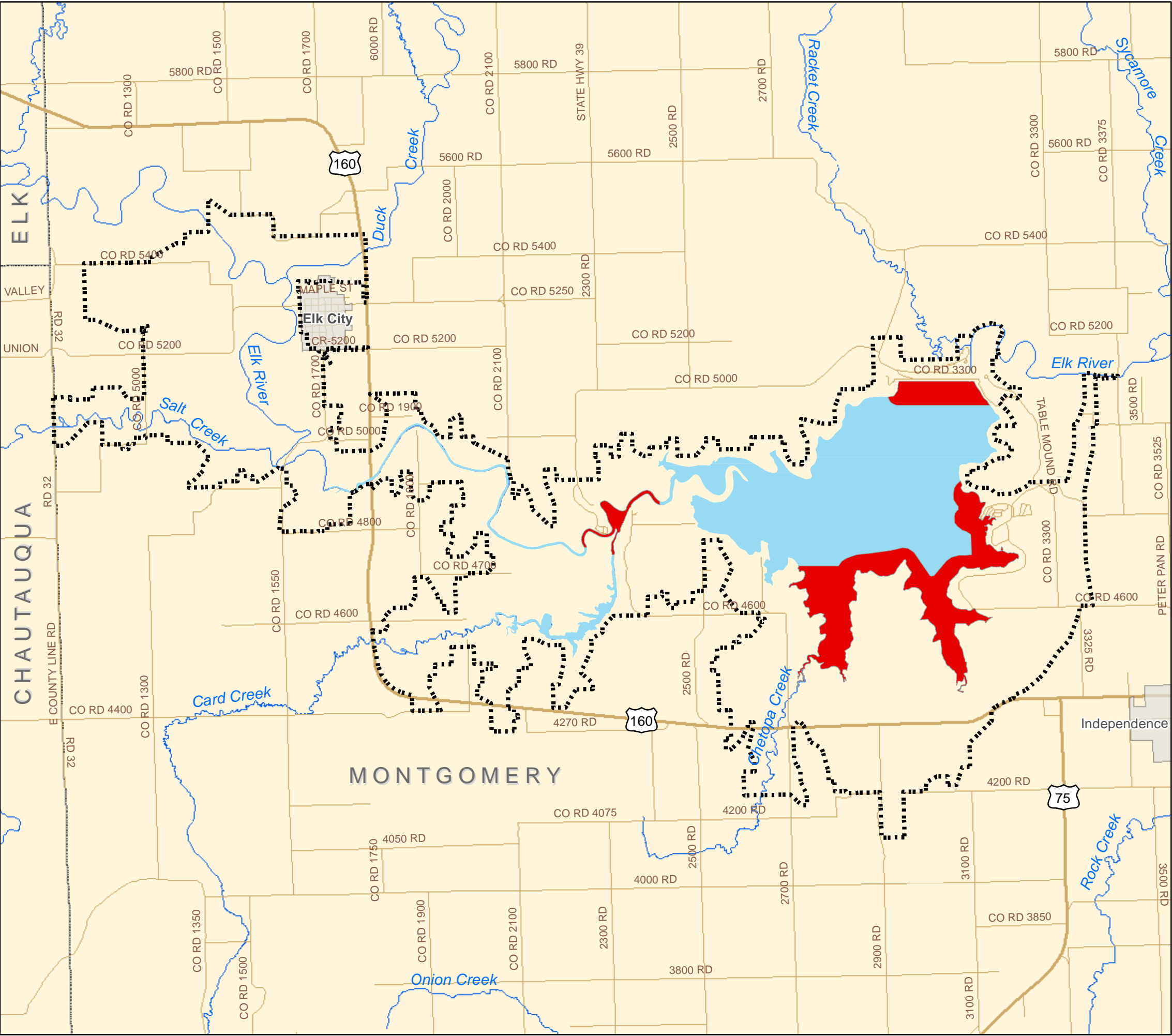
Facing South






Elk City Lake #: 39	
Facing North	
	
Facing West	Facing South
	



## APPENDIX E – SEA PLANE MAP



-  RESTRICTED
-  WATER SURFACE
-  FEE BOUNDARY

**TAKE OFF AND LANDING PROHIBITED  
WITHIN 1400' OF DAM STRUCTURE,  
WITHIN 500' OF BRIDGES AND  
RECREATION AREAS, AND IN  
WATERFOWL REFUGE.**

**OPERATIONS OF A SEA PLANE AT CORPS  
PROJECTS IS AT THE RISK OF THE  
PLANE'S OWNER, OPERATOR,  
AND / OR PASSENGERS**



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

ELK CITY LAKE ELK RIVER, KANSAS

**ELK CITY LAKE MASTER PLAN  
SEA PLANE GUIDE**



DATE:  
OCTOBER 2021

MAP NO.  
ECL20MP-OP-01

## APPENDIX F – ACRONYMS

ADA	Americans with Disabilities Act
ARPA	Archaeological Resources Protection Act of 1979
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
DC	District Commander
DM	Design Memorandum
DQC	District Quality Control
EA	Environmental Assessment
EC	Engineer Circular
EFA	Ecological Focus Area
EM	Engineering Manual
EO	Executive Order
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Area
FONSI	Finding of No Significant Impact
FT	Feet
GIS	Geographical Information Systems
HDR	High Density Recreation
HQ	USACE Headquarters
IPaC	USFWS Information for Planning and Conservation

KDHE	Kansas Department of Health and Environment
KDWP	Kansas Department of Wildlife and Parks
KS	Kansas
KSHS	Kansas State Historical Society
LDR	Low Density Recreation
MGD	Million Gallons per Day
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act, 1970
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NVCS	National Vegetation Classification System
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OMBIL	Operations and Maintenance Business Information Link
OMP	Operations Management Plan for a specific lake Project
OPM	Operations Project Manager
PDT	Project Delivery Team
PM	Project Management or Project Manager
PMBP	Project Management Business Processes

PMP	Project Management Plan
PO	Project Operations
SCORP	State Comprehensive Outdoor Recreation Plan
SHPO	State Historical Preservation Office
SINC	Species in Need of Conservation
SMP	Shoreline Management Plan
WAP	Strategic Wildlife Action Plan
TP	Total Phosphorous
TSS	Total Suspended Solids
Ug/L	Micrograms per Liter
US	United States
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
USFWS	U. S. Fish and Wildlife Service
VMA	Vegetative Management Area
WMA	Wildlife Management Area
WRAPS	Water Restoration and Protection Strategy
WRDA	Water Resources Development Act