FORT GIBSON DAM and RESERVOIR MASTER PLAN

GRAND (NEOSHO) RIVER, OKLAHOMA

DRAFT

US Army Corps of Engineers
Tulsa District

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FORT GIBSON LAKE MASTER PLAN
Table of Contents

Title **Page**

Title **Page**

Title **Page**

List of Tables

CHAPTER 1 – INTRODUCTION

1.1 Project Authorization

Fort Gibson Dam and Reservoir (referred to as Fort Gibson Lake) was authorized by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session). The departmental authority for administration of land and water areas related to Fort Gibson Lake is contained in Section 4 of the Flood Control Act approved 22 December 1944 (58 Stat. 889), and by Section 4 of the Flood Control Act of 1946 (60 Stat. 642), as further amended by Section 209 of the Flood Control Act of 1954 which was approved 3 September 1954. Fort Gibson Lake was incorporated in the Arkansas River multipurpose plan by the River and Harbor Act of 24 July 1946; Project document HD 107, 76th Congress, 1st Session; and the Water Resources Development Act of 1986 (Public Law 99-662). The authority relative to the preparation of the Master Plan (MP) is contained in ER 1130-2-550.

1.2 Project Purpose

Fort Gibson Lake is a unit of the Arkansas River multipurpose plan for flood risk management and hydroelectric power. The project is operated for optimum flood risk management benefits on the Grand (Neosho) River from the dam site to the confluence with the Arkansas River.

1.3 Purpose and Scope of Master Plan

The purpose of the Master Plan is to propose public use development and conservation land use recommendations necessary to develop and conserve existing project lands to realize the optimal potential of the project. This MP incorporates conservation, enhancement, development, operation, management, and public interest use of all project lands, waters, forests, and other resources throughout the life of the project, and includes plans showing the most desirable and feasible locations and types to meet these goals. Emphasis has been placed on a balanced approach to public access, camping, shoreline use, water based recreation, and conservation. Adequate facilities and land-based requirements are proposed to insure all desired recreational opportunities are achieved and assure compliance with applicable environmental regulations, laws and policies. This plan also proposes proper utilization of natural resources and recreational facilities in regards to available funding while at the same time preserving the biological, scenic, scientific, and wildlife resources, plus protecting and enhancing the primary project purposes and benefits. The MP is presented with recreational enhancement funded by the Government limited to existing public use areas rather than acquisition and development of new ones.

1.4 Description of Project and Watershed

Fort Gibson Lake Dam is located on the Grand (Neosho) River (river mile 7.7) in Cherokee and Wagoner Counties, Oklahoma. The project damsite is approximately five miles north of the town of Fort Gibson, Oklahoma, and about 12 miles northeast of Muskogee, Oklahoma. The reservoir extends upstream northeast through Wagoner, Cherokee, and Mayes counties; the lake forms the lower 26 miles of the boundary line between the western slope of the Ozark uplift and the Cherokee Plains which compose the flat divide between the Verdigris and Grand (Neosho) rivers. Construction began in 1942, was suspended during World War II, and resumed in May 1946. Closure of the embankment was completed in June 1949; the project became fully operational when the last of the four generators started producing commercial power in September 1953. The dam includes two concrete, gravity, non-overflow sections. One section is 285 feet long, extending from the spillway to the earth embankment at the right abutment. The other section is 460 feet long, extending from the intake structure to the earth embankment at the left abutment. The dam also includes two earth embankment sections, one of which extends about 374 feet from the natural ground at the right abutment to the right bank, concrete, non-overflow section. The other embankment is 63 feet long, extending from the left abutment to the left bank, concrete, non-overflow section. The powerhouse intake structure is located adjacent to the spillway on the left and is 318 feet long. The total length of the structures, including the spillway, is 2,990 feet, and the maximum height above the streambed is 110 feet. Oklahoma State Highway 251A extends across the top of the structures. There are eight rolled earth-filled dikes that the Corps maintains on the west side of the reservoir, which have a total length of 21,678 feet.

At the top of the power pool (elevation 554.0 feet msl), the lake has approximately 225 miles of shoreline, of which 142 miles is classified as protected and 57 miles is designated for public recreation in the lake's Shoreline Management Plan (SMP). The remaining lakeshore includes 23 miles allocated for limited development and 3 miles classified as prohibited access. Topography of the area includes undulating to rolling valley land, wooded ravines, and hilly slopes; on the west, the land surface is flat to undulating with streams entrenched in broad flood plains.

1.5 Prior Design Memoranda

The following is a list of Design Memoranda previously submitted:

Memo #	Title	Date Submitted	Date
1	Master Recreation Plan	Aug 46	Jan 47
2	Design Memorandum 1B (C1), Public Use and Access Facilities	Jun 61	Jun 61

Memo #	Title	Date Submitted	Date
3	Design Memorandum No. 1C, Master Plan	Jan 62	Jan 62
4	Design Memorandum No. 1C, Master Plan (Updated)	Oct 78	Dec 78

1.6 Pertinent Project Information

The following table provides pertinent information regarding existing water storage/levels.

Table 1.1 Pertinent Fort Gibson Lake elevations and water levels.

Feature	Elevation (feet msl)	Area (acres)	Capacity (acre-feet)	Equivalent Runoff* (inches)
Top of Dam	593.0	-	-	-
Maximum Pool	582.0	-	-	-
Top of Spillway Gates & Flood Control Pool	582.0	51,000	1,284,400	1.93
Flood Control Storage	554.0 – 582.0	-	919,200	1.38
Top of Power Pool	554.0	19,900	365,200	0.55
Bottom of Power Pool	551.0	16,950	311,300	0.50
Spillway Crest	547.0	14,500	248,400	0.37

*From drainage area above the dam site (12,494 square miles)

CHAPTER 2 – PROJECT SETTING AND FACTORS INFLUENCING MANAGMENET AND DEVELOPMENT

2.1 Description of Reservoir

Fort Gibson Lake was authorized by the Flood Control Act, approved 18 August 1941. Authorized Project Purposes include flood control and hydroelectric power. Construction was completed in 1953 at an approximate cost of $42,525,000. The Fort Gibson Lake powerhouse contains four 11,250-kilowatt hydroelectric generators and produces commercial electric power which is valued at approximately $4.6 million a year. Currently there are five Class A Campgrounds, three Class B Campgrounds, and nine day use parks operated by the U.S. Army Corps of Engineers (USACE) with numerous other facilities operated by State, private entities and local governments that have approximately 1.5 to 2 million visitors annually.

Fort Gibson Lake has 1,284,400 acre-feet of storage that is utilized for flood control and generation of hydroelectric power. Of that storage, 365,200 acre-feet is located within the conservation and inactive pools. The lake area at elevation 582.0 feet above sea level (ft msl), which is the top of the flood control pool, consists of 51,000 total acres; the top of the power pool elevation is 554.0 ft msl, comprising 19,900 acres. A total of 75,169 acres were acquired in fee for the operation of the lake, along with an additional easement of 1,101 acres which was acquired for flowage easement purposes and 320 acres for operational easement purposes. In general, when the lake covers 19,900 acres (elevation 554.0 ft msl) it encompasses approximately 225 miles of shoreline. The maximum discharge that can occur through the outlet works without downstream flooding is about 100,000 cfs.

2.2 Hydrology and Groundwater

Fort Gibson Dam is located on the Grand (Neosho) River; the principle tributaries are Rock Creek, Allen Creek, Cottonwood River, Big Creek, Deer Creek, Owl Creek, Flat Rock Creek, Lightning Creek, Cherry Creek, Labette Creek, Spring River, Elk (Cowskin) River, Big Cabin Creek, Spavinaw Creek, Pryor Creek, Chouteau Creek, Spring Creek, and Fourteen Mile Creek, all of which enter the main stem above Fort Gibson Dam. The total drainage area of Fort Gibson Lake is 12,494 square miles.

Groundwater naturally discharges to springs, streams, and rivers. The Grand (Neosho) River and the Spring River receive substantial base flows from the Boone Aquifer. Some ground water also discharges downward through the underlying Chattanooga Shale into the Roubidoux aquifer, the major bedrock aquifer within the Fort Gibson Lake region. The Boone groundwater basin is a minor basin and is part of a large groundwater system that includes parts of northeastern Oklahoma, northern Arkansas, southeastern Kansas, and southern Missouri. The Boone aquifer is comprised of Mississippian limestone and chert. Formation thickness ranges

from zero to greater than 400 feet. Recharge to the Boone aquifer is almost entirely from infiltration of precipitation in areas were the Boone Formation crops out. Bedding plane openings, fractures, and joints are the principal avenues for water recharge.

2.3 Topography, Geology, and Soils

2.3.1 Topography

The Grand (Neosho) River, in the Fort Gibson Reservoir and Dam areas, forms the boundary line between the Cherokee Plains to the east and the Springfield Plateau is the lower part of the dissected ancient westerly sloping plain, which forms the western slope of the Ozark dome. The Grand (Neosho) River watershed to the east reaches isolated elevations in excess of a thousand feet, rising approximately 500 feet above the valley bottom. The flat divide between the Grand (Neosho) River and the Verdigris River to the west has isolated maximum elevations of 800 feet and minimum elevations in low saddles of 573 feet. The Grand River valley flood plain averages 510 feet in elevation.

2.3.2 Geology

The area is mostly underlain by Pennsylvanian-age sandstone and shale; and minor amounts of Pennsylvanian- and Mississippian-age limestone occur. The Lower Boston Mountains is a part of the Ozark Plateau; within the Lower Boston Mountains, slopes are mantled by Quaternary colluvium, and valleys are veneered with Quaternary alluvium. The mountaintops are often capped by resistant sandstone and the sideslopes are often underlain by interbedded sandstone and shale. Rock outcrops are common.

The Dissected Springfield Plateau-Elk River Hills includes mantles of Quaternary cherty clay solution residuum, colluvium, and alluvium, and uplands are underlain by Mississippian-age limestone and interbedded chert. The deepest valleys expose early Mississippian- or Devonian-age shale, dolomite, and limestone.

2.3.3 Soils

The Fort Gibson Project area includes broad areas of three Oklahoma counties and a diversity of soil types associated with mountains, rocky outcrops, Karst features, hills and hill slopes, valleys, flood plains, and prairies. The Fort Gibson Lake project area is comprised of eight general soil associations. They include Steprock-Nella-Mountainburg-Linker-Enders (25.5% of total project area), Verdigris-Taloka-Dennis-Bates (19.8% of project area), Dennis-Coweta-Collinsville-Bates (17.3% of project area), Eldorado-Dennis-Craig (4.6% of project area), Verdigris-Osage-Lanton (3.9% of project area), Taloka-Parsons-Dennis (1.6% of project area), Summit-Catoosa (1.0% of project area), and Rueter-Moko-Clarksville (0.5% of project area). Approximately 25.8% of the total project area is water with lake elevation at the top of the power pool. A condensed list of ecological sites within the Fort Gibson Lake project area that

includes the bulk of specific soil types includes Heavy Bottomland, Loamy Bottomland, Claypan Prairie, Eroded Claypan Prairie, Loamy Prairie, Eroded Loamy Prairie, Shallow Prairie, Sandy Savannah, Shallow Savannah, Smooth Chert Savannah, Savannah Breaks, and Very Shallow.

A more detailed description of each of the above ecological sites and associated soils are described in the Natural Resource Conservatoin Service (NRCS) soil surveys for Wagoner, Cherokee, and Mayes counties available online at http://www.nrcs.usda.gov and can be found in the Draft Environmental Assessment for this Master Plan (Appendix D).

2.4 Climate

The climatic characteristics of the Fort Gibson Lake region include moderate winters and relatively long summers, with mean air temperatures of 37°F in January to 81°F in July. The average length of the growing season (April to September) in this region of Oklahoma is 210 to 220 days. The Fort Gibson Lake watershed has a drainage basin of approximately 12,494 square miles with an average annual rainfall of 40 to 49 inches, with greater than 60% occurring during the growing season.

2.5 Sedimentation and Shoreline Erosion

The lake inflow naturally carries a minimal amount of sediment due the soils in the upstream region of the lake; however, this process has not contributed significantly to volume loss in the reservoir. Shoreline erosion is another contributing factor to sedimentation for the lake. The Fort Gibson Lake project does have limited areas of shoreline erosion, and therefore subsequent sedimentation; currently, the areas of notable shoreline erosion are in southwest quadrant of the lake.

2.6 Resource Analysis

2.6.1 Fish and Wildlife Resources

Fort Gibson Lake provides habitat for an abundance of various wildlife and fisheries located both in the lake proper and in the tail-water area. USACE licenses over 21,800 acres of land to the Oklahoma Department of Wildlife Conservation (ODWC) for the purposes of wildlife management, of which 17,300 acres are managed for public hunting and 4,500 acres are used for a waterfowl refuge. The ODWC submits a five year management plan to USACE for review and approval on an annual basis. In addition to the areas leased to the ODWC, several units managed by USACE also provide excellent game and non-game habitat. USACE managed units total approximately 27,446 acres. These areas are also popular with both hunters and individuals wishing to observe wildlife in their natural habitat. Cooperative efforts with ODWC include a yearly fish habitat enhancement program for the lake and provision of a handicap hunter access area, which is currently managed by ODWC.

Whitetail deer is the only big game species in the Fort Gibson Lake area. Other game species include turkey, bobwhite quail, mourning dove, fox squirrel, gray squirrel, cottontail rabbit, swamp rabbit, raccoon, and various waterfowl species. Common wildlife species in the area include the gray fox, red fox, muskrat, opossum, beaver, common striped skunk, bobcat, weasel, and coyote. The lake and the tail-water provide fishing opportunities for the boater and bank angler. Common species found in the lake include spotted bass, largemouth bass, white bass, white crappie, channel catfish, flathead catfish, blue catfish, walleye, sauger, striped bass, and several species of sunfish. Other species include paddlefish, carp, drum, longnose gar, spotted gar, threadfin shad, and Mississippi silver side minnows. Common species found in the tail-waters include white bass, crappie, channel catfish, flathead catfish, blue catfish, striper, and paddlefish. A more detailed list of wildlife and fish species can be found in the Operational Management Plan (OMP) for Fort Gibson Lake.

2.6.2 Vegetative Resources

The vegetative resources of the Fort Gibson Lake project were classified using information derived from the National Vegetation Classification System. For a detailed species list of vegetative types, refer the OMP for Fort Gibson Lake.

Table 2.1 Vegetative resources of the Fort Gibson Lake Project.

Division	Order	Class	Sub-Class	Acreage*
VEGETATED	Herb Dominated	Herbaceous Vegetation	Annual graminoid or forb vegetation	11,021
VEGETATED	Tree Dominated	Closed Tree Canopy	Deciduous closed tree canopy	23,533
VEGETATED	Tree Dominated	Closed Tree Canopy	Mixed evergreen-deciduous closed tree canopy	1,232
VEGETATED	Tree Dominated	Open Tree Canopy	Evergreen open tree canopy	3,276
NON-VEGETATED	NON-VEGETATED	Non-Vegetated	Non-Vegetated	33,296**

*Based on the most recent information from USACE's Operations and Maintenance Business Line Information Link (OMBIL).

**Includes approximately 19,963 acres of water surface (including streams and ponds).

2.6.3 Threatened and Endangered Species

Table 2.2 lists the federally listed endangered species thought to occur on Fort Gibson Lake (USFWS Consultation Code: OK02EKOK00-2015-E-00850).

Table 2.2 Threatened and endangered species at the Fort Gibson Lake Project.

Species	FED / State List	Inventoried Occurrence	Biological Opinion Issued	Final Recovery Requirements	Recovery Actions Designated
American burying beetle (*Nicrophorus americanus*)	FED	Potential	Y	N	N
Interior least tern (*Sterna antillarum*)	FED	Potential	Y	N	N
Piping Plover (*Charadrius melodus*)	FED	Potential	Y	N	N
Red Knot (*Calidris canutus rufa*)	FED	Potential	N	N	N
Sprague's Pipit (*Anthus spragueii*)	FED	Potential	N	N	N
Whooping Crane (*Grus Americana*)	FED	Uncommon	Y	N	N
Neosho Mucket (*Lampsilis rafinesqueana*)	FED/ State	Potential	N	N	N
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	FED	Potential	N	N	N
Arkansas Darter (*Etheostoma cragini*)	FED	Potential	N	N	N
Ozark Cavefish (*Amblyopsis rosae*)	FED	Potential	N	N	N
Gray bat (*Myotis grisescens*)	FED	Potential	Y	N	N
Northern long-eared bat (*Myotis septentrionalis*)	FED	Potential	Y	N	N
Ozark big-eared bat (*Corynorhinus towsendii ingens*)	FED	Potential	Y	N	N

2.6.4 Invasive Species

Table 2.3 lists the important invasive species that occur on Fort Gibson Lake.

Table 2.3 Invasive species reported to occur at the Fort Gibson Lake Project.

Species	Type of Occurrence	Acreage Impacted*
Zebra mussel (*Dreseinna polymorpha*)	Significant/Major (Aquatic)	19,900
European starling (*Sturnus vulgaris*)	Minor	10,000
Wild boar (*Sus scrofa*)	Moderate	5,000
Eastern Redcedar (*Juniperus virginiana*)	Moderate	20,000
Sericea lespedeza (*Lespedeza cuneata*)	Moderate	20,000
Chinese privet (*Ligustrum sinense*)	Minor	1,000
Japanese honeysuckle (*Lonicera japonica*)	Minor	2,000
Musk/nodding thistle (*Carduus nutans*)	Minor	500
Johnsongrass (*Sorghum halepense*)	Moderate	20,000
Tree of Heaven (*Ailanthus altissima)*	Minor	20
False grape (*Ampelopsis cordata*)	Minor	50
Burr Cucumber (*Sicyos angulatus*)	Minor	50
Hemp Sesbania (*Sesbania exaltata*)	Minor	200

* Based on the most recent information from OMBIL.

2.6.5 Ecological Setting

Fort Gibson Lake lies within three ecoregions. They are the *Lower Boston Mountains, the Dissected Springfield Plateau-Elk River Hills of the Ozark Highlands, and the Osage Cuestas of the Central Irregular Plains.* The following paragraphs are brief descriptions of the characteristics within these ecoregions.

The southern half of the east side of Fort Gibson Lake lies within the Lower Boston Mountains ecoregion. The Lower Boston Mountains are characterized by rounded high hills and benches. The streams in this ecoregion typically have little or no flow during the summer months; however, enduring pools that are fed by interstitial flow may occur. Stream substrates are mostly rocky, and consist of gravel, cobbles, and boulders. Within larger pools, areas with organic material or mud substrates occur. The vegetation in this ecoregions is characterized by mostly oak–hickory forest. Upland areas consist of forests and woodlands containing blackjack oak, post oak and black hickory. Broader floodplains areas consist of bottomland hardwood forests. On north-facing slopes and in ravines, sugar maple, white oak, chinquapin oak, bitternut

hickory, and mockernut hickory occur. On narrow floodplains, forests contain birch, sycamore, cottonwood, elms, and willow.

The northern half of the east side of Fort Gibson Lake lies within the Dissected Springfield Plateau-Elk River Hills of the Ozark Highlands. The Dissected Springfield Plateau-Elk River Hills are characterized by moderately to highly dissected, hilly part of the Springfield Plateau physiographic region. The narrow ridgetops are separated by steep V-shaped valleys. Karst features, including dry valleys, are common in the ecoregion. The streams in this ecoregions are usually perennial, benefiting from the contribution of cool springs that occur in valleys and along streams during the summer and fall. Many channel reaches have become braided due to influx of cherty gravel from bank and hillslope erosion. Other reaches have bedrock substrates. The vegetation in this ecoregion is characterized by oak–hickory forest and some oak–hickory–pine forest. Upland areas consist mostly of oak–woodland, mixed deciduous forest, or mixed deciduous–pine forest, which may contain black oak, white oak, blackjack oak, post oak, hickories, and shortleaf pine. North-facing slopes and in ravine areas, mesic forest containing sugar maple, white oak, northern red oak occur. Floodplain areas consist mostly of bottomland oaks, maples, hickories, sycamore, and American elm.

The west side of Fort Gibson Lake lies within the Osage Cuestas of the Central Irregular Plains ecoregion. The Osage Cuestas ecoregions is characterized by irregular to undulating plains that are broken by low hills and cuestas with east-facing scarps. Streams in this ecoregion are dominated by pools having substrates that are composed of sand, mud, and sometimes, gravel and cobbles. Riffle areas are moderately common and tend to occur every 250 to 1,300 feet; their substrates are composed of gravel, cobbles, and boulders. Slower moving and more turbid streams are found in the southern third of the ecoregion. The vegetation in this ecoregion is characterized by mostly tall grass prairie where big bluestem, little bluestem, switchgrass, and Indiangrass dominates. The vegetation then grades eastward into a mosaic of tall grass prairie and oak–hickory forest. Floodplain and low terrace areas consist of bottomland forests. On rocky hills, dry upland forest and woodland is found. On shallow, gravelly soils of limestone scarps, dry prairie composed of short and tall grasses occurs. In riparian areas, forests contain boxelder, silver maple, bur oak, Shumard oak, American elm, hackberry, pecan, walnut, sycamore, and eastern cottonwood.

2.6.6 Wetlands

Table 2.4 lists the acreages of various types of wetlands at the Fort Gibson Lake Project.

Table 2.4 Wetland resources at the Fort Gibson Lake Project.

System	Sub-System	Class	Class Acres*
Lacustrine	Limnetic	Unconsolidated Bottom	19,011
Lacustrine	Littoral	Unconsolidated Bottom	3,770
Palustrine	No Sub-System	Emergent Wetland	199
Palustrine	No Sub-System	Forested Wetland	3,353
Palustrine	No Sub-System	Unconsolidated Shore	216
Riverine	Intermittent	Streambed	96

* Based on the most recent information from OMBIL.

2.7 Cultural Resources

2.7.1 Historic and Archaeological Features

a. *History*. Historic records in the Fort Gibson Reservoir area of eastern Oklahoma date to the early 1700s, as French explorers began to enter the area from the southeast, via New Orleans, or from the northeast, from St. Louis. One of these French explorers was Jean Pierre Chouteau, who established a trading post on the Grand (Neosho) River to the north of Fort Gibson Reservoir. Other French explorers who probably traveled through the area included Claude-Charles du Tisne, and Jean-Baptist Benard Sur de la Harpe. du Tisne and la Harpe were among the first explorers to engage in and establish significant trade relationships with the Wichita Indians, a conglomeration of tribes that occupied the prairie-plains margins and conducted large bison hunting expeditions at times during the year. Several archaeological sites in eastern Oklahoma date to the early- to mid-1700s and exhibit evidence of this French-Wichita trade relationship, as demonstrated by French glass trade beads and metal musket parts.

After the U.S. Government began moving American Indian Tribes to Indian Territory from their homelands in the east, conflicts began to develop between these relocated tribes, tribes indigenous to the Plains, and non-Indians located in neighboring states. To address the instability of the larger area, the U.S. first established Fort Smith, Arkansas

but then in 1824 established Fort Gibson, which is located in the immediate vicinity of the area that is now Muskogee, Oklahoma. The initial primary function of Fort Gibson was to monitor relations between the Cherokee and Osage tribes, both of which had been relocated to northeastern Indian Territory and who had been experiencing conflicts with one another. Once relations between the tribes in the area had improved, Fort Gibson was deactivated. During the Civil War, however, the post was again re-activated, this time for the purpose of guarding the Arkansas River and the Texas Road. Several Civil War battles were fought in northeastern Oklahoma, the most significant of which was the Battle of Honey Springs, located to the southwest of Fort Gibson Reservoir.

b. *Archaeology*. Archaeological sites representative of the Paleo-Indian, Archaic, Woodland, Caddoan/Mississippian, Protohistoric (Contact), and Historic Periods are known in the larger vicinity of Fort Gibson Reservoir in northeastern Oklahoma. This culture-historical sequence falls generally within the overall sequence that has been established for eastern Oklahoma. Many archaeological sites in this area have undisturbed, deeply-buried deposits; many are comprised of multi-component prehistoric and/or historic occupations. Several cultural resources investigations, including archaeological survey and excavation, were conducted incident to and post-construction of Fort Gibson Reservoir. In the larger regional area there are hundreds of archaeological sites and historic standing structures on record with the Oklahoma State Historic Preservation Office (SHPO) and Oklahoma Archeological Survey (OAS). Ultimately, as a major river flowing out of the western Ozarks, the entire Grand (Neosho) River Valley can be classified as an area of high sensitivity for the location of cultural resources.

2.7.2 Cultural History Sequence

The following regional chronology is adopted in this Master Plan.

- Paleo-Indian 12,000 to 8500 BP
- Archaic 8500 to 2000 BP
- Woodland 2000 to 1200 BP (AD 1 to 800)
- Caddoan/Mississippian AD 800 to 1500
- Protohistoric (Contact) AD 1500 to 1825
- Historic AD 1825 to present

To aid in comparing divergent cultures and sequences in eastern Oklahoma, the following general adaptation types are used to characterize prehistoric cultural traditions.

a. *Paleo-Indian*. Specialized, large-game hunting by small bands of hunter-gatherers was the adaptation type associated with this period. Signature stone tools are unnotched projectile points of fluted or lanceolate type, often found in contexts where mammoth or

bison remains also occur. Structural remains are poorly understood, the probable result of a mobile lifestyle and the use of perishable construction materials. Three main complexes identified within this period are Clovis, Folsom, and Late Paleo-Indian (e.g., Dalton). The extent of the Paleo-Indian period was approximately 12,000 BP to 8,500 BP.

b. *Archaic*. Plant foraging was an important subsistence strategy of hunter gatherer groups in this period and was associated with increased seasonal variability of resources during the mid-Holocene Hypsithermal period. Repeated occupation of sites and features such as rock-lined hearths and roasting pits, and grinding tools reflect intensive plant processing and the cyclical exploitation of resources. Bison were hunted on a smaller scale than previously, with greater reliance on small mammals, mussels and fish. Stone tools were often thermally cured, and included distinctive stemmed and notched projectile points. The Archaic period is traditionally divided into Early, Middle, and Late periods, the overall extent of which was approximately 8,500 BP to 2,000 BP.

c. *Woodland*. Archaeologists in Oklahoma associate the use of ceramics in describing Woodland cultural components. Incipient horticulture was the adaptation type associated with this period, marked by the introduction of cultigens in eastern Oklahoma. Evidence for semi-permanent villages, increased reliance on wild and domestic plants, widespread use of ceramics and elaborate burials reflect the more sedentary lifestyle of Woodland cultures. Small game remained essential in subsistence. Tool assemblages are distinguished by small, corner-notched projectile points, which suggest invention of the bow and arrow.

d. *Caddoan/Mississippian*. Agriculture, supplemented by hunting and gathering, was the adaptation type associated with village societies. Agricultural tools were recognized in artifact assemblages, along with triangular arrowpoints for hunting and pottery types that in eastern Oklahoma serve to denote this period as the Caddoan/Mississippian. Village cultures are often identified in lowland terraces of waterways where agriculture was viable. Some archaeological sites from this time period have mounds associated, suggesting that those sites have some larger ceremonial or social function. Some mounds contain primary or secondary burials, but a few represent mounds on which a structure was located. Mounds such as these likely had a very specific role in the ceremonial lives of the region's inhabitants.

e. *Protohistoric (Contact).* This period was defined by transitory contacts of European explorers in the eastern woodlands and central plains, substantiated by little or no historical documentation. Lifeways were subsumed under the Plains Village adaptation type, which is the Plains adaptation largely contemporaneous with Caddoan/Mississippian villages. Protohistoric sites in Oklahoma appear to be directly

related to an earlier manifestation of similar village sites located further north in Kansas, including the Great Bend aspect with sites in south-central Kansas. Great Bend manifestations likely represent the proto-Wichita villages encountered by Francisco Coronado in 1541. Slightly later Proto-Wichita sites from the early 1700's have been identified in Kay County, north-central Oklahoma, and closer to the Fort Gibson Reservoir area in Tulsa County, Oklahoma. These early 1700's Proto-Wichita sites are evidence of French influence on the southern Plains, as artifact assemblages from these sites contain metal musket parts from French firearms, glass trade beads (French), and European gunflints.

f. *Historic*. The Reservation Period (1825-1900) was marked by the displacement and resettling of Native American tribes throughout the greater Oklahoma region. The Cherokee Nation was created in northeastern Oklahoma in 1828, soon thereafter incorporating the Quapaw and Seneca tribes. After the Civil War, the area was further divided into reserves for the Peoria, Ottawa, Wyandotte and others. From 1838 to 1871 the Neosho Agency held jurisdiction over all tribes but the Cherokee. Between the 1830s and 1850s Anglo-Americans legally occupied tribal lands to operate mission schools, trading posts, ferries, mills and blacksmith shops. The period 1850-1900 was marked by increasing Anglo-American land speculation and enhanced military supply lines through the study region that connected Fort Gibson, Fort Scott and Fort Leavenworth during the Civil War. Pioneer settlement of homesteads and towns began in earnest in southeastern Kansas during the 1860s following the removal of Native American tribes to Oklahoma. This trend was somewhat delayed in northeastern Oklahoma where the Cherokee Nation maintained a loose hold on sovereignty. By the 1890s, however, towns such as Miami and Ottawa in northeastern Oklahoma were firmly rooted.

2.8 Recreation Facilities, Activities and Needs

2.8.1 Zones of Influence

The primary area of influence encompasses portions of the counties of Adair, Cherokee, Delaware, Haskell, Mayes, McIntosh, Muskogee, Okmulgee, Rogers, Sequoyah, Tulsa, and Wagoner. This 12-county region has been utilized as the basis in summarizing the population characteristics of Fort Gibson Lake; more detail about the population characteristics can be found in the Draft Environmental Assessment for this Master Plan (Appendix A). The three-county region in which the lake is located (Cherokee, Mayes, and Wagoner counties) has an estimated 2013 census population of 162,675 inhabitants. This estimated population represents a gain of 14.9% or 24,294 persons, over the 2000 population of 138,381.

2.8.2 Visitation Profile

The majority of visitors to Fort Gibson Lake come from within a 100 mile radius of the lake area. Fort Gibson Lake visitors are a diverse group ranging from campers who utilize the campgrounds around the lake, full time and part time residents that border the lake, hunters who utilize the Wildlife Management Areas around the lake, day users who picnic in the city, state and federally operated parks, marina customers and many other user groups. The peak visitation months on Fort Gibson Lake are April through September when 89% of the visits occur. June is the highest visitation month and accounts for 17 to 19% of the annual total. Approximately 50% of visits to recreation areas occur in USACE managed recreation areas.

2.8.3 Recreation Analysis

Recreational use at Fort Gibson Lake continues to evolve, while visitation in recreational areas remains strong. Facilities installed in an outgranted area indicate that there is demand for recreational opportunities not offered in traditional USACE managed parks. There is also demand for boat docks and vegetative modification in areas adjacent to many subdivisions located around the lake. Increased development around the lake area has been shown to decrease the natural vegetation in the developed areas both on and off Government property. That natural vegetation has been shown to be more efficient than mowed grass in capturing nutrients and sediments before they reach the lake. The challenge for the future will be meeting recreational demand while improving water quality.

2.8.4 Recreation Carrying Capacity

The carrying capacity of a lake is the amount of development, use, and activity that any lake and associated recreational lands can sustain without being permanently adversely impacted. No recreation carrying capacity studies have been conducted at Fort Gibson Lake. Project staff continues to monitor and manage recreation areas using historic visitation data and best management practices to identify and address overcrowding, overuse, or underuse.

2.9 Real Estate

The acquisition policy for purchasing lands for Fort Gibson Lake were: (a) fee area encompassing elevation 585.0 feet msl, which is the top of flood control pool and (b) the upper guide line for flowage easement acquisition was elevation 585.0 feet msl., or the elevation of the envelope curve of backwater effects of the 50-year flood occurring after 50 years of sedimentation, whichever is higher. For those areas above 585.0 feet msl, the acquisition policy was to purchase flowage easement to provide the right to temporarily store flood waters.

2.10 Pertinent Public Laws

The following public laws are applicable to Fort Gibson Lake. Additional Federal Statutes applicable to Fort Gibson Lake can be found in Appendix B and in the Draft Environmental Assessment for the Fort Gibson Master Plan revision (Appendix D).

a. *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.

b. *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".

c. *Title 16 U.S. Code §§ 668-668a-d, 54 Stat. 250, Bald and Golden 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.

d. *Public Law 78-534, Flood Control Act of 1944, as amended*. Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes the Corps 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.

e. *Public Law 85-624, Fish and Wildlife Coordination Act 1958, as amended*. This Act amends PL 79-732. 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.

f. *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.

g. *Public Law 86-717, Forest Conservation*. This act provides for the protection of forest cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.

h. *Public Law 87-88, Federal Water Pollution Control Act Amendments of 1961, as amended*. Section 2(b)(1) of this Act gives Corps responsibility for water quality management of Corps reservoirs. This law was amended by the Federal Water Pollution Control Act Amendment of 1972, Public Law 92-500.

i. *Public Law 88-578, Land and Water Conservation Fund Act of 1965, as amended*. 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.

j. *Public Law 89-72, Federal Water Project Recreation Act of 1965, as amended*. 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. An OCE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.

k. *Public Law 89-80, 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.

l. *Public Law 89-272, Solid Waste Disposal Act of 1965, as amended by PL 94-580, dated October 21, 1976 (see below).* 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. Recognizing the insufficient structure of the Act to resolve the growing waste disposal issues facing the country, significant amendments were made to the Act with the passage of the Resource Conservation and Recovery Act of 1976 (RCRA). RCRA created a national "cradle to grave" hazardous waste management tracking program to deal with the nation's annual production of discarded material.

m. *Public Law 89-665, Historic Preservation Act of 1966, as amended*. 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.

n. *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 Corps lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.

o. *Public Law 91-190, National Environmental Policy Act of 1969, as amended (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. Section 102(2)(c) required a five-point environmental impact statement (EIS) on proposed Federal actions affecting the environment. The Final EIS for Fort Gibson Lake was filed with the Council on Environmental Quality on 30 July 1975.

p. *Public Law 91-604, Clean Air Act of 1970, as amended*. The purpose of this Act is to protect public health and welfare by the control of air pollution at its source, and to set forth primary and secondary National Ambient Air Quality Standards to establish criteria for states to attain, or maintain.

q. *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.

r. *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 the Corps of Engineers from collecting entrance fees to projects.

s. *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 (P.L. 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."

t. *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.

u. *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.

v. *Public Law 93-205, 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.

w. *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 plan installations.

x. *Public Law 93-291, Archeological and Historic Preservation Act of 1974, as amended*. 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 nonreimbursable project costs.

y. *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.

z. *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.

aa. *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.

bb. *Public Law 94-580, Resource Conservation and Recovery Act of 1976*. Section 1003 of this Act lists the objectives for solid waste management that will promote the protection of health and the environment and will conserve valuable material and energy resources.

cc. *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.

dd. *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.

ee. *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.

ff. *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.

gg. *Public Law 97-98, Farmland Protection Policy Act*. This Act instructs the Department of Agriculture, in cooperation with other Federal departments, agencies, independent commissions and other units of the Federal government, to develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses.

hh. *Public Law 98-63, Supplemental Appropriations Act of 1983*. This Act authorized the Corps of Engineers Volunteer Program. The United States Army Chief of Engineers may accept the services of volunteers and provide for their incidental expenses to carry out any activity of the Army Corps of Engineers, except policymaking or law or regulatory enforcement.

ii. *Public Law 99-662, Water Resources Development Act of 1986*. Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

jj. *Public Law 101-233, North American Wetlands Conservation Act*. This Act establishes the North American Wetlands Conservation Council (16 U.S.C. 4403) to recommend wetlands conservation projects to the Migratory Bird Conservation Commission. Section 9 of the Act addresses the restoration, management, and protection of wetlands and habitat for migratory birds on Federal lands. Federal agencies acquiring, managing, or disposing of Federal lands and waters are to cooperate with the U.S. Fish and Wildlife Service to restore, protect, and enhance wetland ecosystems and other habitats for migratory birds, fish, and wildlife on their lands, to the extent consistent with their missions and statutory authorities.

kk. *Public Law 101-601, Native American Graves Protection and Repatriation Act*. This Act provides for the protection of Native American and Native Hawaiian cultural items. It establishes a process for the authorized removal of human remains, funerary, sacred, and other objects of cultural patrimony from sites located on land owned or controlled by the Federal government. This Act requires Federal agencies and Federally assisted museums to return specified Native American cultural items to the Federally recognized Indian tribes or Native Hawaiian groups with which they are associated. Notification of all inadvertent discoveries of

such items covered by the Act is reported to the appropriate affiliated descendant or tribe in order of precedence as set by the Act.

ll. *Public Law 110-114, Water Resources Development Act of 2007, Section 3134*. This act requires lakes within the State of Oklahoma under Corps of Engineers jurisdiction to research methods for demonstration projects to benefit and enhance recreation.

2.11 Executive Orders and Circulars

The following Executive Orders and Circulars are applicable to Fort Gibson Lake.

a. *Executive Order 11752, 17 December 1973, Prevention, Control, and Abatement of Environmental Pollution at Federal Facilities*. The purpose of this order is to assure that the Federal Government, in the design, construction, management, operation, and maintenance of its facilities, shall provide leadership in the nationwide effort to protect and enhance the quality or air, water, and land resources through compliance with applicable standards for the prevention, control, and abatement of environmental pollution. Section 4 listed the requirements for federal facility design, construction, management, operation, and maintenance.

b. *Executive Order 11593, 13 May 1971, Protection and Enhancement of the Cultural Environment*. This Presidential Order mandates that all Executive Branch agencies, bureaus, and offices: (1) compile an inventory of the cultural resources – archeological, architectural and historical structures, sites and districts – for which they are trustee; (2) nominate all eligible Government properties to the National Register of Historic Places; (3) preserve and protect their cultural resources; and (4) insure that agency activities contribute to the preservation and protection of non-federally owned cultural resources. The deadline for Federal agency compliance with Executive Order 11593 was 1 July 1973.

c. *Executive Order 11988, 24 May 1977, Floodplain Management*. This order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should not undertake actions that directly or indirectly induce growth in the floodplain, unless there is no practical alternative. Agency regulations and operating procedures for licenses and permits should include provisions for evaluation and consideration of flood hazards. Construction of structures and facilities on floodplains must incorporate flood proofing and other accepted flood protection measures. Agencies shall attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties.

d. *Executive Order 11990, 24 May 1977, Protection of Wetlands*. This order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands.

e. *Executive Order 12898, 11 February 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.

f. *Executive Order 12962, 7 June 1995, Recreational Fisheries*. This order mandates that Federal agencies, to the extent permitted by law and where practicable, improve the quality, function, and sustainable productivity and distribution of aquatic resources for increased recreational fishing opportunities.

g. *Executive Order 13007, 24 May 1996, Indian Sacred Sites*. This Executive Order requires that agencies avoid damage to Indian sacred sites on Federal land, and avoid blocking access to such sites for traditional religious practitioners.

h. *Executive Order 13045, 21 April 1997, Protection of Children from Environmental Health Risks and Safety Risks*. This order mandates that Federal agencies, to the extent permitted by law and appropriate and consistent with the agency's mission, make it a priority to identity 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.

i. *Executive Order 13112, 3 February 1999, Invasive Species*. The purpose of this order mandates that each Federal agency whose actions may affect the status of invasive species shall identify the actions, use relevant programs and authorities to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, monitor invasive species populations, provide for restoration of native species and habitat conditions in ecosystems that have been invaded, conduct research on invasive species, and promote public education on invasive species. Federal agencies are further mandated not to authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species. The order also establishes an Invasive Species Council and outlines the duties of the Council. USACE responded with a Policy Memorandum on 2 June 2009, which implements USACE Invasive Species Policy. The policy memorandum establishes a consistent, nationwide policy that will be applied to all Civil Works projects and programs. Specifically for Operations, the memorandum states that "Operating projects will include strategies for invasive species management in their project Operations and Maintenance responsibilities." The strategies are to be coordinated with other Federal, State, and local agencies. The National Invasive Species Management Plan, developed by the National Invasive Species Council, serves as a blueprint for USACE action on both aquatic and terrestrial invasive species.

j. *Executive Order 13186, 10 January 2001, Protection of Migratory Birds*. This order requires that each Federal agency taking actions that have, or are likely to have, a measureable negative effect on migratory bird populations develop and implement a Memorandum of Understanding with the Fish and Wildlife Service that shall promote the conservation of migratory bird populations.

k. *Executive Order 13474, 26 September 2008, Recreational Fisheries*. This order amends Executive Order 12962.

CHAPTER 3 – RESOURCE OBJECTIVES

3.1 Resource Objectives

Resource considerations at Fort Gibson Lake exist primarily due to user demands on the project. Multiple user types have interests in the project lands, recreation facilities, and waters, and such demands regularly create conflicts. USACE is obligated to manage these resources for the overall interest of the public and not just for a select group of individuals. It is the responsibility of the project and the agency to attempt to provide an environmentally sound balance of these demands. Impacts on the environment will be assessed during the decision making process prior to any change to management plans or strategies. The following goals are the priorities for consideration when determining management objectives and development activities.

1. To increase the value of all project lands and waters for recreation, fisheries, and wildlife.

2. Manage the existing natural resources and recreation facilities in compliance with all pertinent laws, regulations and policies.

3. Develop and manage the area for maximum enjoyment of the recreating public.

4. Protect and preserve the existing native wildlife species and improve wildlife habitat for now and in the future.

5. To protect and preserve the existing shoreline from erosion and overuse through natural resource management and cooperation with adjacent landowners.

6. To inform the public, through programs and personal contacts, about the project and resource management purposes and objectives.

7. Integrate fish and wildlife management practices with other natural resource management practices while working closely with state and local natural resource agencies.

8. Identify safety hazards or unsafe conditions; correct infractions and implement safety standards in accordance with EM 385-1-1.

9. Avoid the appearance of private exclusive use in areas zoned for limited development in the Fort Gibson Lake SMP.

10. Encourage non-consumptive use of project lands.

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 objectives 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 Fort Gibson Project to provide a realistic approach to the management of all resources.

The natural resource elements within the identified objectives come in several different categories of work at Fort Gibson Lake. They can be broken into fisheries, game, non-game, and shoreline use. Management objectives for these categories are dependent on the individual resource, location, and lead agency.

3.1.1 Shoreline Management

The objective for this program is to manage public lands in accordance with the Fort Gibson Lake SMP. The purpose of the SMP is to manage activities considered as private use on public lands without allowing degradation to natural resources or creating the appearance of private exclusive use. Refer to the Fort Gibson Lake SMP for descriptions of authorized activities within this program.

3.1.2 Wildlife and Fisheries Management

Wildlife and fisheries are managed cooperatively between the ODWC and USACE. USACE currently licenses 21,800 acres of land and water to ODWC. These areas are primarily located in Wagoner and Cherokee County portions of Fort Gibson Lake. ODWC's primary objective in these areas is to manage game species with the understanding those actions benefit both game and non-game species. These areas will continue being managed by this agency under their license.

ODWC is also the primary agency responsible for performing fisheries management. ODWC objectives for fisheries are to continue to monitor current population and insure they are healthy and stable. ODWC does annual sampling and data analysis to assure fisheries populations stay within an acceptable range. They also make adjustments in creel and size limits as necessary to keep existing populations healthy. ODWC can also supplement fish populations with their hatchery program.

USACE is not directly involved with management within the ODWC areas of responsibility. However, USACE has determined that ODWC's objectives compliment our goals for fish and wildlife management and should remain as the primary objectives for these

locations. Another USACE objective for ODWC areas of responsibility will be to continue providing support when resources are available. USACE often provides support with assistance in the placement of fish structures, archeological reviews for proposals involving soil disturbance, and assistance with GIS mapping.

In addition to the ODWC licensed areas, USACE has several additional management units established for the purpose of wildlife management. The objectives for these lands are to preserve the existing native wildlife species and improve their habitat. The management plans written within this objective will be centered on both game and non-game species and can be found in the OMP.

3.1.3 Recreation

Recreation falls within two categories and can be identified as either land or water based recreation. Management objectives for each type vary depending on the location and the intensity of use. General objectives are provided in this master plan as to the work necessary to meet the public's needs for land and/or water based recreation.

Land-based recreation includes opportunities, activities, areas and facilities that typically occur on, or adjacent to, USACE land and water, such as camping, hiking, hunting, picnicking, wildlife/bird viewing, sightseeing, etc. Land-based recreation areas include campgrounds, day-use areas, overlooks, hunting areas, and wildlife management areas,. Facility types typically found within these recreation areas include campsites, picnic sites, bathrooms, roads, boat ramps, courtesy docks, and trails. These recreation areas are managed by several entities: USACE, State of Oklahoma, county and city governments, and private/commercial concessionaires. Land-based recreation objective will be to continue providing service and rehabilitate existing parks to a "Justified Level of Service".

Water-based outdoor recreation includes opportunities, activities, areas and facilities that occur on water managed by USACE. These activities include; fishing, boating, swimming, scuba diving, operating seaplanes, kayaking, etc. Unlike land-based recreation the majority of water-based is managed by USACE with some assistance from the Oklahoma Lake Patrol. The objective of this program is to insure public safety while providing recreational opportunities on the water. This program will involve looking at recreation carrying capacity vs. current use patterns, zoning requirements for no-wake or restricted areas, and areas to remain open for public recreation. USACE will keep in close coordination with the Oklahoma Lake Patrol in determining use patterns within the water portions of the project and promote water safety.

3.1.4 Oklahoma State comprehensive Recreation Program

The 2012 Oklahoma State Comprehensive Recreation Plan (SCORP) is prepared every five years as a requirement in participation in the Land & Water Conservation Fund Act of 1965.

Each SCORP is required to, in part, evaluate the demand for and supply of outdoor recreation resources and facilities in the state and present a comprehensive coverage of the issues of statewide importance, demand or preferences for public outdoor recreation, and supply of outdoor recreation resources and facilities. The results of the 2012 SCORP evaluation of outdoor recreation resources indicates 1) there is an increased awareness regarding water quality and water quantity issues throughout the state, 2) the public is primarily concerned with maintaining access to public lands while providing a wide variety of recreation opportunities, 3) Oklahomans under-value public recreation, and 4) Oklahoma lacks trails or a plan for trails to link communities or populations to outdoor recreation resources. The 2012 SCORP includes 14 recommendations that address the outdoor recreation concerns and issues in the state; those recommendations that maximize project benefits, meet public needs, and foster environmental sustainability will be considered.

3.1.5 Resource Objective Priorities

Execution of resource objectives at a large multi-purpose project such as Fort Gibson Lake is a delicate balance between items that often compete for funds, time, and other resources. Priority will be given to those items required by law with an attempt to provide continued public use of Government land. Public access will still be a priority to service all ethnic and economical groups. Access will be in the form of offering hunting, fishing, camping, bird watching, boating, and other various lake related recreational opportunity locations.

The intention is to continue allowing shoreline use activities in areas where private exclusive use can be avoided as well as continued protection of the natural resources. The shoreline use program will need to be monitored closely to assure permitted activities do not exceed the carrying capacity of Fort Gibson Lake.

CHAPTER 4 – LAND ALLOCATION, LAND CLASSIFICATION, WATER SURFACE, AND PROJECT EASEMENTS

4.1 Land Allocation

Land allocation is identified as the congressionally authorized purpose for which the project lands were purchased. There are four categories of allocation identified as: Operations, Recreation, Fish and Wildlife, and Mitigation. There was a total of 75,169 acres of land originally purchased for the construction of Fort Gibson Lake.

a. *Operations*. These are lands which were acquired specifically to meet the requirements of the congressionally authorized purpose of constructing and operating the project (i.e. flood control, hydropower, water supply etc.). There are 75,169 acres originally purchased for the purpose of operating the project.

b. *Recreation*. These would be lands acquired specifically for recreation. There were no lands congressionally authorized for the purpose of Recreation at the project.

c. *Fish and Wildlife*. These would be lands that were purchased specifically for the purpose of managing or protecting fish and wildlife. There were no lands congressionally authorized for the purpose of Fish and Wildlife.

d. *Mitigation*. These would be lands purchased for the specific intention of offsetting the losses associated with the creation of the project. There were no lands congressionally authorized for the purpose of Mitigation.

4.2 Land Classification

Since construction, total fee acres managed as part of Fort Gibson Lake have been reduced through disposal of some project lands. Project lands currently include 71,213 acres in fee, of which 55,815 acres are usable at the conservation pool (554.0 ft). Land classification indicates the primary use for which project lands are managed. There are five categories of classification identified as: Project Operations, High Density Recreation, Mitigation, Environmentally Sensitive Areas, and Multiple Resource Managed Lands.

4.2.1 Project Operations

This category includes the lands managed for the dam, spillway, hydropower plant, switch yard, project office, and maintenance yards. There are 733 acres classified under Project Operations.

4.2.2 High Density Recreation

These are lands developed for intensive recreational activities for the visiting public including day use areas, campgrounds, and concession areas. There are 5,485 acres of land classified for high density recreation.

4.2.3 Environmentally Sensitive Areas

This classification is only used for the lands allocated for mitigation for the purpose of offsetting losses associated with the development of the project. There are no lands classified as mitigation since this land allocation was not congressionally authorized.

4.2.4 Multiple Resource Management Lands

This classification is for the predominate use of an area with the understanding that other compatible uses can occur within the area. This classification is divided into four subcategories identified as: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. There are 49,359 acres of lands that are under this classification. The following identifies the amount contained in each subcategory of this classification.

a. *Low Density Recreation*. These are lands with minimal development or infrastructure that support passive public use (e.g. fishing, hunting, wildlife viewing, shoreline use, hiking etc.). They were lands purchased for project operations but classified for low density recreation. The intention of these classified lands is to assure available lands for low density recreation as opposed to areas classified as high density recreation. There are 113 acres under this classification at Fort Gibson Lake.

b. *Wildlife Management*. These are lands designated for the management of Fish and Wildlife resources. They were lands purchased for project operations but classified for the purpose of wildlife management. There are 49,246 acres under this classification at Fort Gibson Lake.

c. *Vegetative Management*. These are lands that were previously designated as protected under the original MP, a designation which no longer exists within the current MP guidance. Lands zoned for vegetative management are for the management of areas containing vegetation considered to be important to save or conserve. Examples of these vegetative types would be wetlands, forests, prairie, or other native vegetation. There are no lands classified as vegetative management at Fort Gibson Lake.

d. *Future/Inactive Recreation Areas*. These are lands with site characteristics compatible with potential future recreational development or recreation areas that are

closed or open but no longer maintained. These areas will be managed as a multiple resource land until an opportunity arises to develop or reopen these areas. There are no lands classified as future/inactive recreation areas at Fort Gibson Lake.

Table 4.1 provides a summary of land classifications at Fort Gibson Lake. Maps showing the various land classifications can be found in the Plates section (Appendix A) of this MP.

Table 4.1 Land Classification Acres at the Fort Gibson Lake Project.

Classification	**Acres**
Project Operations	733
High Density Recreation	5,485
Environmentally Sensitive Areas	238
Multiple Resource Managed Lands Low Density Recreation	113
Multiple resource Managed Lands Wildlife Management	49,246
Multiple Resource Managed Lands Vegetative Management	0
Multiple Resource Managed Lands Future/Inactive Recreation Areas	0

4.3 Water Surface

Fort Gibson Lake has 19,900 acres of surface water at the conservation pool (554.0 ft), for which the project administers a surface water zoning program. The four categories of water surface zoning classifications are identified as: Restricted, Designated No-Wake, Fish and Wildlife Sanctuary, and Open Recreation.

In addition to the above mentioned water surface zoning areas, the Fort Gibson Lake project has seaplane landing areas; seaplanes are only authorized to land on the lake within certain locations of the lake. A map of the locations where seaplanes are authorized to land can be found in the Plates section (Appendix A).

4.3.1 Restricted

These water areas are restricted for project operations, safety, and security purposes. There are areas upstream and downstream of the dam are identified for no boat entry. The

project uses the buoy system to identify these areas that are restricted from access for public awareness and safety. The area restricted area of the lake just upstream of the dam is approximately 46 acres and the restricted area below the dam (the tailwaters) is approximately 24.5 acres.

4.3.2 Designated No-Wake

These designated water areas are intended to protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety. The project uses the buoy system to identify these areas as well. Additionally, no boating is permitted around the swim beaches; buoys are also used to identify the designated swim beaches areas around the lake.

4.3.3 Fish and Wildlife Sanctuary

These water areas have annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. The water surface area within ODWC's waterfowl refuge license area does have seasonal restricted access; the seasonal zoning for public awareness is managed by ODWC.

4.3.4 Open Recreation

These waters are available for year round or seasonal water-based recreational use. The remainder of the lake's surface water is open to recreational use. There is no specific zoning for these areas, but there is a buoy system in place to help aid in public safety while on the lake. These buoys mark hazards in addition to no wake areas. The buoy system is managed by USACE with close coordination with the Oklahoma Department of Public Safety.

4.4 Project Easement Lands

These are lands on which easement interests are held but no fee title ownership. These are typically composed of three different classification identified as Operations Easement, Flowage easement, and Conservation Easement. There are 1,421 acres of easement lands at Fort Gibson Lake.

a. *Operations Easement*. These are easements USACE purchased for the purpose of project operations. There are 320 acres of operation easements at Fort Gibson Lake, which consists of relocated local State and County roads, as well as railroad easements.

b. *Flowage Easement*. These are easements purchased by USACE giving the right to temporarily flood private land during flood risk management operations. There are 1,101 acres

of flowage easement lands located at Fort Gibson Lake. The purpose of these easements is to provide adequate storage for flood waters.

c. *Conservation Easement*. These are easements USACE purchased for the purpose of protecting wildlife, fisheries, recreation, vegetation, archeological, endangered species, or other environmental benefits. There are no conservation easements lands at Fort Gibson Lake.

CHAPTER 5 – RESOURCE PLAN

5.1 Classification and Justification

This chapter describes the management plans for each area of classification within the MP. The classifications which exist at Fort Gibson Lake are Project Operations, High Density Recreation, Environmentally Sensitive, and Multiple Resource Managed Lands. The management plans identified are in broad terms of how these project lands will be managed by classification category. A more descriptive plan for managing these lands can be found in the Fort Gibson Lake OMP.

5.1.1 Project Operations

These lands are classified for security reasons and pertain to the project operations associated with the dam and related facilities. There are 733 acres of lands under this classification all of which are managed by the USACE. The management plan for this area is to continue providing physical security necessary to insure continued operations of the dam, hydropower plant, and related facilities. This means that public access must be restricted in hazardous locations, near the dam and spillway, and within the hydropower plant. Authorization for the public to moor private floating facilities and/or the modification of land form and vegetation are not permitted within this area. The goal for these classified lands is to continue operating as done historically in order to insure project operations and security.

5.1.2 High Density Recreation

There are numerous areas around Fort Gibson Lake that are designated as High Density Recreation in this and previous master plans. Fort Gibson Lake has a total of 5,485 acres classified as High Density Recreation; of the areas classified as High Density Recreation, the park areas compose 5,231 acres. Description of high density recreation is provided in two separate types of park areas. First are park areas that include classification for high density recreation but are leased to another agency/entity for management and operation. USACE does not provide any maintenance within any of these locations but there are times when support is provided to the managing agency. USACE has to provide review of requests and make sure they are in accordance with applicable laws and regulations for the proposed activity within an area zoned high density recreation. Second are high density areas which USACE still manages and operates.

There are several areas currently classified as high density recreation which are leased to other organizations for operation and management. The areas currently leased to other agencies can be found in Table 5.1. The goal for these areas is to work with USACE partners to assure

recreation areas are being managed in accordance with resource objectives identified in Chapter 3.

Table 5.1 Leased recreation area managing agency at Fort Gibson Lake Project.

Park	Number of Acres	Managing Agency
NE Christian Churches of OK	90	Christian Church
Camp Inhofe	45	Private
Camp Waluhili	134	Camp Fire
Camp Guts	52	Guts Church
Camp Pauline Williams	51	Girl Scouts
Methodist Church Camp	45	Methodist Church
Cherokee Nation Retreat	38	Cherokee Nation
Tulakogee	186	Baptist Church
Takatoka	255	Tulsa YMCA
Pryor City Park	491	City of Pryor
Oklahoma Parks & Tourism	2,360	State of Oklahoma
Jackson Bay Marina	38	Private
Long Bay Marina	57	Private
Mazie Landing	99	Private
Taylor Ferry Marina	44	Private
Whitehorn Cove Marina	163	Private
Pryor Creek Concession	48	Private
Dam Site Concession	1	Private

A map showing managing agencies and their locations can be found in the Plates section (Appendix A) of this MP.

USACE still operates and manages numerous public use areas designated as high density recreation. These areas include locations that were originally classified recreation areas but have since been turned into access points, as well as locations where developed recreational areas are still managed and maintained for high density use. Table 5.2 shows the public use areas currently managed by USACE.

Table 5.2 Management goals for designated public use areas at Fort Gibson Lake Project.

Park	Number of Acres	Management Goal
Big Hollow	154	Access Point
Blue Bill Point	55	Maintained Facility
Dam Site	30	Maintained Facility
Dam Site East	13	Maintained Facility
Earbob	94	Access Point
Flat Rock Creek	38	Maintained Facility
Hulbert Landing	18	Access Point
Jackson Bay	50	Maintained Facility
Mallard Bay	59	Access Point
Mission Bend	40	Access Point
Overlook	2	Maintained Facility
Rocky Point	127	Maintained Facility
Spring Creek	108	Access Point
Taylor Ferry	57	Maintained Facility
Taylor Ferry Beach	13	Maintained Facility
Taylor Ferry North	18	Maintained Facility
Toppers	4	Maintained Facility
Wahoo Bay	53	Maintained Facility
Wildwood	101	Maintained Facility

A map showing existing parks and facilities managed by USACE can be found in the Plates section (Appendix A) of this MP.

5.1.3 Environmentally Sensitive Areas

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the ESA, the NHPA, or applicable State statues. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration.

There are three areas at Fort Gibson Lake that fit this description. A total of 238 acres on USACE managed lands were classified as Environmentally Sensitive Areas due to their significance and need for conservation. The goal for these areas is to be managed for preservation in compliance with the NHPA.

5.1.4 Multiple Resource Management Lands

These are areas where predominant use is that of the classification. However, there are other compatible uses which may occur on these lands without impacting the predominant use. These lands can be divided into four sub-categories for the purposes of this master plan. These categories are Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. The following is a description of each sub-categories resource objectives, acreages, and description of use.

a. *Low Density Recreation*: These are lands with minimal development or infrastructure that support passive public use. There are 113 acres zoned Low Density Recreation. The allowable uses within these lands can be categorized as either shoreline use (private floating structures/vegetative modification) or low density recreation.

Portions of the Low Density Recreation lands are areas where USACE has determined that Limited Development can occur under a Shoreline Use Permit. These permits can authorize construction of private floating facilities on the lake as well as vegetative modification on fee owned land. Shoreline use is the major portion of work effort at Fort Gibson Lake when it comes to natural resources management. These activities may be authorized in designated areas consistent with approved use allocations specified in the Lake Fort Gibson SMP. The intention of the SMP is to protect natural resources while still providing limited private use activities. The issuance of a private shoreline use permit does not convey any real estate or personal property rights or exclusive use rights to the permit holder.

The current status of shoreline management at Fort Gibson Lake is that there are approximately 528 permits issued for boat docks and related land-based activities; a minimal increase in the number of permits issued is expected. Consult the Fort Gibson Lake Shoreline Management Plan for specific information on how shoreline use is managed.

The intention for these lands is to assure they are being managed in accordance with the objectives identified in Chapter 3, and the requirements in CFR, Title 36, Section 327.30. Fort Gibson Lake staff will monitor permitted shoreline use in these areas to accomplish this task. Staff will assure the appearance of private exclusive use is not occurring and that USACE resource objectives are being met. If areas become saturated, USACE will notify the public why additional shoreline use permits cannot be issued within that area.

b. *Wildlife Management*. These are lands designated for the management of wildlife resources. Wildlife management is conducted by USACE and the State of Oklahoma.

There are currently 49,246 acres of land classified for wildlife management, and 1,320 acres of water licensed to the ODWC for a waterfowl refuge.

c. *Vegetative Management*. These are lands that have vegetative types considered to be sensitive and needing special classification to ensure success. There are no lands classified for vegetative management at Fort Gibson Lake.

d. *Future/Inactive Recreation Areas*. These are areas that were classified for recreation but were never developed. There are no lands classified for future/inactive recreation areas at Fort Gibson Lake.

5.1.5 Water Surface

This is in reference to water surface management needs which the project utilizes to ensure project operations. There are four types of water surface zoning utilized at Fort Gibson Lake.

a. *Restricted*. The purpose of the restricted water areas is limit public access to ensure the security of project operations, safety, and security. There are two restricted water areas in which the public is not allowed to enter; one area includes approximately 46 acres of water just upstream of the dam, the other area includes approximately 24.5 acres below the dam in the tailwaters. The project uses the buoy system to identify these areas that are restricted from access for public awareness and safety zoned this way in accordance with ER 1130-2-520.

b. *Designated No-Wake*. The purpose of theses designated water areas are to protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety. These areas occur throughout the lake area; the project uses the buoy system to identify these areas. Additionally, no boating is permitted around the swim beaches; buoys are also used to identify the designated swim beaches areas around the lake.

c. *Fish and Wildlife Sanctuary*. The purpose of these water areas is to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. The ODWC manages the annual or seasonal access to the water surface area within ODWC's waterfowl refuge license area.

d. *Open Recreation*. These waters are available for year round or seasonal water-based recreational use. There is no specific zoning for these areas, but there is a buoy system in place to help aid in public safety while on the lake. These buoys mark hazards in

addition to no wake areas. The buoy system is managed by USACE with close coordination with the Oklahoma Department of Public Safety.

5.1.6 Seaplane Instructions.

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 Plates section (Appendix A). The USACE imposed restrictions that apply to seaplane operations are published by the Federal Aviation Administration in their Notice to Airmen and are also set forth in Title 36 of the Code of Federal Regulations, Chapter III, Part 327.4.

5.2 Special Considerations

a. *Cultural Resources*. There are a large number of sensitive, potentially significant cultural resources located around and within Fort Gibson Lake. Cultural resources sites at this reservoir and within the Grand/Neosho River valley in general have the potential to be eligible for the National Register of Historic Places because of the amount of data about prehistoric human lifeways that they may yield. Therefore, special consideration should be given to any activity that may have an adverse impact on cultural resources. A thorough review of all actions that have soil disturbance components must be conducted and reviewed by the District Archaeologists. Actions with a soil disturbance component may require an on-site investigation by a professional archaeologist, the results of which may subsequently be required to be coordinated with the Oklahoma State Historic Preservation Office (SHPO) and appropriate Tribal Nations before authorization of work is granted. Actions without an immediate, presumed soil disturbance component – such as leases, licenses, and permits – also require review by the District Archaeologists. These types of actions have the potential to adversely affect cultural resources because of the types of activities involved, and also because of the aspect of (stakeholder) control over the land itself. Finally, the existing 1995 Historic Properties Management Plan (HPMP) should be revised and implemented for managing cultural resources at Fort Gibson Reservoir. The revision is pending acquisition of appropriate funding.

b. *Endangered Species*. There are several endangered species that have a home range within the Fort Gibson Lake area (Table 2.2). Therefore, any work conducted on this project has to be in accordance to the ESA. The methodology to assure all work is done in compliance with ESA is to review the proposed action for impacts and follow the requirements of Section 7 of the ESA.

c. *Shoreline Management*. Shoreline management at Fort Gibson Lake is an integral part of the project. Therefore, it is a management topic that must be identified to help lay the ground work to assure compliance of the regulations. 36 CFR Section 32.30(d)(1) states:

"It is the policy of the Chief of Engineers to protect and manage shorelines of all Civil Works water resource development projects under Corps jurisdiction in a manner which will promote the safe and healthful use of these shorelines by the public while maintaining environmental safeguards to ensure a quality resource for use by the public. The objectives of all management actions will be to achieve a balance between permitted private uses and resource protection for general public use. Public pedestrian access to and exit from these shorelines shall be preserved. For projects or portions of projects where Federal real estate interest is limited to easement title only, management actions will be appropriate within the limits of the estate acquired. "

Generally, Fort Gibson Lake has been historically managed to achieve the results required in the above policy statement. The intention is to continue managing in this fashion to achieve a balance between public desires for shoreline use and environmental sustainability.

CHAPTER 6 – SPECIAL TOPICS

6.1 Competing Interests on the Natural Resource

Fort Gibson Lake is a large multi-use project with numerous authorized purposes. The authorized purposes have industries and/or user types which have developed over time and are reliant on their provided benefits. These benefits are critical to the local and regional economies and are of great interest to the public. Due to these interests, competing desires on the natural resources develop. It is very difficult to balance these interests so the customer can benefit while insuring there are no adverse impacts. It is the intention of this document to outline a plan, which when executed, provides customer service and appropriate natural resource management.

6.2 American Burying Beetle

American burying beetles (ABBs) can be found at Fort Gibson Lake. The species was proposed for federal listing in October 1988 (53 FR 39617) and designated as an endangered species on July 13, 1989 (54 FR 29652). The ABB is an annual species and typically reproduces once in its lifetime. It competes with other invertebrate and vertebrate species for carrion. Although ABBs are considered feeding habitat generalists, they are believed to be more selective regarding breeding habitat. Direct adverse impacts to ABBs during their inactive and active periods may occur as a result of impacts from clearing vegetation, soil compaction due to heavy equipment operation, fuel and chemical contamination of the soil, grading, soil excavation and filling, and re-vegetation and reseeding of disturbed areas. During construction activities and development of access roads, soil is excavated and vegetation is cleared. Excavating soils, clearing vegetation, and constructing access roads involve displacement of soils that could uncover ABBs or adversely modify their habitat. Uncovered ABBs could be exposed to predation, adverse environmental conditions, or crushed by equipment. If construction occurs during the active season, ABB broods could be displaced during soil excavation, adults could be separated from larvae/eggs, and/or both could be crushed by equipment.

Section 7(a)(2) of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to: 1) jeopardize the continued existence of any endangered or threatened species, or 2) result in the destruction or adverse modification of critical habitat. The term, "jeopardize the continued existence of", means to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the species' reproduction, numbers, or distribution.

While the action of revising a master plan is not likely to jeopardize the continued existence of the ABB, and is not likely to destroy or adversely modify critical habitat, it is possible that lake management in accordance with the proposed action could result in incidental take of ABBs. For future activities at Fort Gibson lake that could adversely affect the ABB, the

Tulsa District will consult with the U.S. Fish and Wildlife Service and comply with measures outlined in the most current Biological Opinion (BO) issued by the Service.

6.3 Invasive Species

Executive Order 13112 outlines requirements of Federal agencies whose actions may affect the status of invasive species. The Executive Order requires, in part, federal agencies to 1) use relevant program to prevent the introduction of invasive species, 2) detect and respond rapidly to and control populations of such species, 3) monitor invasive species populations, 4) provide restoration of native species and habitat conditions in ecosystems that have been invaded, 5) conduct research on invasive species and provide for environmentally sound control of invasive species, and 6) promote public education on invasive species and the means to address them.

In Oklahoma, the Arkansas River basin has been identified as a major pathway for the introduction of aquatic nuisance species. The following aquatic vegetative species are considered of special concern in Oklahoma: alligator weed (*Alternanthera philoxeroides*), Eurasian watermilfoil (*Myriophyllum spicatum),* hydrilla *(Hydrilla verticillata*), purple loosestrife (*Lythrum salicaria*), salvinia (*Salvinia molesta),* and water hyacinth (*Eichhornia crassipes*). Human transport aids in the spread of these species, with plants adhering to anything entering infested waters including boats, trailers, vehicular wheels, intakes, and gear. None of the aforementioned aquatic species have been reported with significant impact at Fort Gibson Lake; however, due to the its proximity to the MKARNS, Fort Gibson Lake remains particularly vulnerable to the transport by boaters of these aquatic invasive plants as well as other aquatic invasive animal species like grass carp (*Ctenopharyngodon idella),* bighead carp (*Hypophthalmichthys nobilis),* silver carp (*Hypophthalmichthys molitrix),* and zebra mussels (Dreissena polymorpha).

The only aquatic invasive animal species reported in Fort Gibson Lake to date is the zebra mussel. The first confirmed establishment of zebra mussels in Oklahoma occurred in the McClellan-Kerr Arkansas River Navigation System in January 1993. Zebra mussels have since been confirmed in numerous lakes within USACE, Tulsa District; establishment of the invasive species in Fort Gibson Lake was confirmed in 2010. The zebra mussel is a fresh water invertebrate that has a high filtration rate, high reproductive rate, strong byssal threads for substrate attachment, and limited number of natural predators. Due to these characteristics, zebra mussels are able to populate and invade an aquatic ecosystem relatively quickly and out-compete native mussel populations. Economic impacts caused by the invasive species include fouling water intake pipes, cooling systems, filtration systems, and fouling boat engine cooling systems. Zebra mussels fouling filtration systems (associated with fire suppression at facilities that use raw water) can impede effectiveness of the system, increasing the potential of damage to the facility and danger human welfare. When a zebra mussel "die-off" occurs, thousands of shells

can wash up on the shoreline and/or beach area; the sharp edges of the mussels' shells could potentially cause human harm and subsequent public beach closure for public safety.

In addition to aquatic invasive species, Oklahoma has invasive terrestrial plant species on the Oklahoma Invasive Plant Council problem list. Invasive terrestrial plants known to occur on Fort Gibson Lake Project lands include Japanese honeysuckle (*Lonicera japonica*), Chinese privet (*Ligustrum sinense*), sericea lespedeza (*Lespedeza cuneata*), musk/nodding thistle (*Carduus nutans*), johnsongrass (*Sorghum halepense*), tree of heaven (*Ailanthus altissima*), and hemp sesbania (*Sesbania exaltata*). Invasive terrestrial animal species at Fort Gibson Lake Project include European starling (*Sturnus vulgari*s) and the feral hog (*Sus scrofa*). Impacts from these species vary from minor to moderate impacts, as listed in Table 2.3.

Native plant and animal species can also present problems. Eastern redcedar is present at Fort Gibson Lake and its surrounding lands. The spread of Eastern redcedar, which is due to fire suppression, reduces biodiversity and limits food supplies for various animal species by crowding out other plants that produce food. Other native species presenting problems on Fort Gibson Lake project lands is heartleaf peppervine (*Ampelopsis cordata*) and burr cucumber (*Sicyos angulattus*).

For established populations of invasive species, monitoring and various management techniques are implemented to control and eradicate the species in the area. Project offices also implement Hazard Analysis and Critical Control Point Plans to prevent introduction of invasive species onto project lands and help eliminate spreading invasive species via human transport pathways. Public education, early detection, and rapid response will continue to be the best avenue to protect, and minimize impacts of newly introduced invasive species to Fort Gibson Lake and associated lands.

CHAPTER 7 – AGENCY AND PUBLIC COORDINATION

7.1 Agency and Public Coordination

The objectives for the revision of the Fort Gibson Lake MP were to update the land classifications to reflect changes in USACE land management policies and to update the MP in accordance with ER 1130-2-550, Change 7, dated 30 Jan 13 and EP 1130-2-550, Change 5, dated 30 Jan 13, which details new agency requirements for MPs. In order to conduct these changes an Environmental Assessment (EA) needed to be performed on the proposed changes and how they would impact the natural and human environment. Coordination of revising the MP was done concurrently with the scoping and public review periods of the EA.

The first step was to schedule a public scoping meeting allowing the public to participate and have an avenue to ask questions and provide comments. The public scoping meeting was held on April 15, 2014 at the Civic Center in Wagoner, OK. The Tulsa District sent out a letter to stakeholders and Native American Tribes, as well as placed commercial paid advertisements in the *Muskogee Phoenix, Sequoyah County Times, The Paper (Mayes County), Pryor Daily Times, Wagoner Tribune, Tahlequah Daily Press, The Times Record (Ft. Smith, AR),* and *Tulsa World* on multiple dates during the two weeks prior to the public scoping meeting. Copies of the letter, the mailing lists, and the commercial ad can be found in Appendix C.

USACE employees hosted the workshop, which was conducted in a semi-structured manner. Participants were asked to sign-in at a table where staff provided the participants with information regarding the structure of the scoping meeting, comment forms, and postage paid envelopes to return comment forms. After signing in, participants were directed to an area where topic-specific information tables were set up. Large-scale boards were displayed at each table to convey information about the following topics:

- Public Involvement Process
- Project Overview
- Overview of the NEPA Process
- Environmental Assessment Information
- Master Plan Information
- How to Submit Comments

At each of the information tables and throughout the meeting room, USACE representatives were available to answer questions and receive comments. Interested persons had

the opportunity to comment about the project using a variety of methods, including the following:

- Filling out a comment form at the open house;
- Taking a comment form home to be returned in a pre-stamped envelope;
- Submitting a comment using electronic mail; and
- Submitting a comment and mailing it in on letterhead or choice of paper.

Any comments were to be considered a proposal for review in making changes to the MP. These proposals would then be integrated into the review process for the EA after each proposal was analyzed for potential impacts to the environment should they be approved. However, no comments were received from the public following the public workshop on April 15, 2015.

Note – After EA and Draft of MP have been available to Public, note comments here: Comments were received from concerned citizens, interest groups, partner agencies, other government agencies, and businesses. In total, xx comments of some form were received. Describe comments. Refer reader to Appendix E.

The information provided in the feedback from these agencies and the public was then utilized to formulate a final version of the MP. A summary of these comments and their responses can be found in Appendix E.

CHAPTER 8 – SUMMARY OF RECOMMENDATIONS

8.1 Summary Overview

Following are the recommendations for the courses of action necessary to manage Fort Gibson Lake's current and future issues. The belief is actions taken today can ensure the future health and longevity of Fort Gibson Lake while still allowing continued use and development. The factors considered cover a broad spectrum of public use, environmental, socioeconomic, and manpower. Information on each one of these topics was thoroughly researched before the final decision was made. The final MP for Fort Gibson Lake will continue to provide for and enhance recreational opportunities for the public, improve the environmental quality and create a management philosophy more conducive to existing staffing levels at the Fort Gibson Project.

8.2 Recreation

USACE still maintains and operates numerous recreation areas at Fort Gibson Lake. The recommendation is to continue to provide the service to which the public has grown accustomed, however, this service is increasing in cost each year and has become a substantial part of the operating budget. USACE should continue to develop innovative and cost efficient methods to conduct business. Should budget constraints not allow for continued service then the recommendation is to either reduce services or campground availability or a combination of both in order to manage costs. Funds spent on recreational improvements would be allocated using a priority system that would be used to determine which areas would receive existing funds.

8.3 Need for Environmentally Sensitive Areas

Environmentally Sensitive Areas are areas where scientific, ecological, cultural, or aesthetic features have been identified on project lands. At Fort Gibson Lake Project, three areas were identified as such due to their significance and need for protection and conservation. Management of these areas must be as such to ensure no adverse impacts occur; management strategies such as agricultural or grazing permits may be permitted on these lands if deemed necessary for a specific resource management benefit.

8.4 American Burying Beetle

The ABB is identified as a federally-listed endangered species with distribution on Fort Gibson Lake Project lands. Under Section 7 of the Endangered Species Act, as amended, the Tulsa District continues to assess project operation and maintenance impacts to the ABB under a BO from the U.S. Fish and Wildlife (USFWS). The BO allows for incidental take for flood control activities within the reservoir. It is required that the Fort Gibson Project staff continue to ensure all project and outgrant related earth disturbing activities are conducted in a manner that ensures compliance with all applicable laws, policy, and guidance and minimize, to the extent

practicable, adverse impacts to the ABB at Fort Gibson Lake. One additional option recommended is to implement an ABB mitigation area. Currently, portions of Fort Gibson Lake project lands lie within ABB Conservation Priority Areas for the ABB in Mayes and Wagoner counties, as delineated by the USFWS. The location of the ABB mitigation area would be coordinated with USFWS and ODWC; development of and ABB management plan would need to be coordinated with the USFWS.

8.5 Partnerships

Partnerships are a new trend which USACE has embraced when it comes to providing services to the public. This typically entails a second party that has resources with which to develop an area for a more enhanced recreational experience beyond what the USACE can provide. These opportunities should be researched to determine if they are beneficial to the public without negative effects to the lake or the overall USACE mission.

CHAPTER 9 – BIBLIOGRAPHY

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APPENDIX A

PLATES
Project Location & Index
Managing Agency
Seaplane Operation Guide
Public Use Areas
Land Use Classifications

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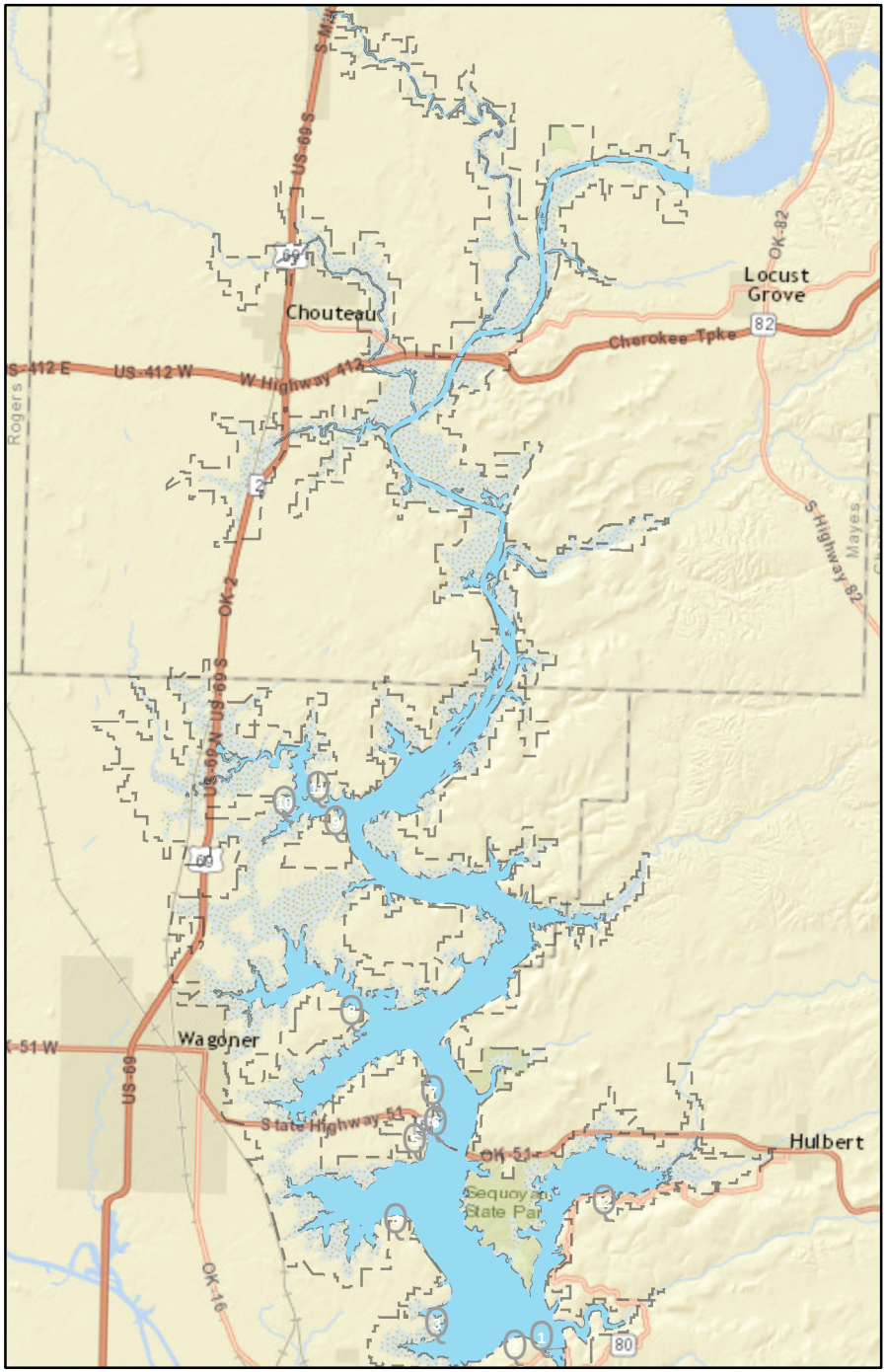
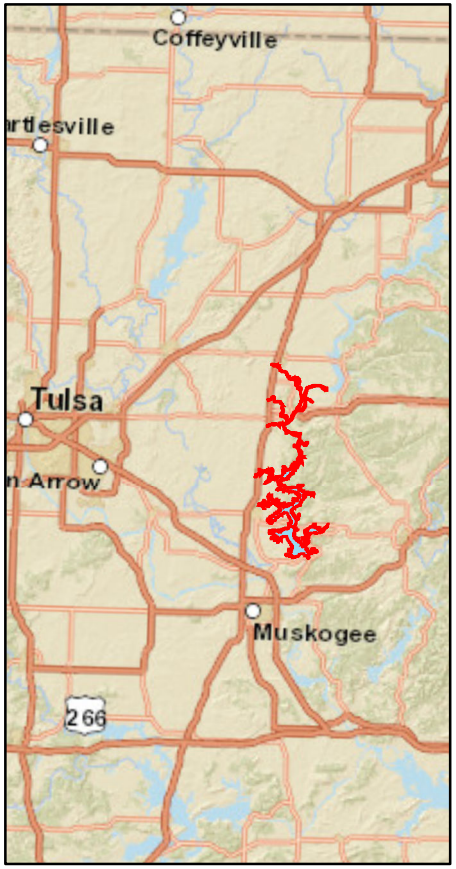


INDEX TO MAPS



GENERAL

PLATE NUMBER	TITLE
FG15MP-IP-00	PROJECT LOCATION & INDEX
FG15MP-MP-01	MANAGING AGENCY
FG15MP-SP-01	SEAPLANE OPERATION GUIDE

LAND CLASSIFICATION

PLATE NUMBER	TITLE
FG15MP-CP-01	LAND USE CLASSIFICATIONS (SHEET 01)
FG15MP-CP-02	LAND USE CLASSIFICATIONS (SHEET 02)
FG15MP-CP-03	LAND USE CLASSIFICATIONS (SHEET 03)
FG15MP-CP-04	LAND USE CLASSIFICATIONS (SHEET 04)
FG15MP-CP-05	LAND USE CLASSIFICATIONS (SHEET 05)
FG15MP-CP-06	LAND USE CLASSIFICATIONS (SHEET 06)
FG15MP-CP-07	LAND USE CLASSIFICATIONS (SHEET 07)
FG15MP-CP-08	LAND USE CLASSIFICATIONS (SHEET 08)
FG15MP-CP-09	LAND USE CLASSIFICATIONS (SHEET 09)
FG15MP-CP-10	LAND USE CLASSIFICATIONS (SHEET 10)
FG15MP-CP-11	LAND USE CLASSIFICATIONS (SHEET 11)
FG15MP-CP-12	LAND USE CLASSIFICATIONS (SHEET 12)
FG15MP-CP-13	LAND USE CLASSIFICATIONS (SHEET 13)
FG15MP-CP-14	LAND USE CLASSIFICATIONS (SHEET 14)
FG15MP-CP-15	LAND USE CLASSIFICATIONS (SHEET 15)

RECREATION AREAS

PLATE NUMBER	TITLE
FG15MP-RP-01	BLUE BILL
FG15MP-RP-02	DAM SITE
FG15MP-RP-03	FLAT ROCK
FG15MP-RP-04	OVERLOOK
FG15MP-RP-05	ROCKY POINT
FG15MP-RP-06	TAYLOR FERRY SWIM BEACH
FG15MP-RP-07	TAYLOR FERRY NORTH
FG15MP-RP-08	TAYLOR FERRY SOUTH
FG15MP-RP-09	TOPPERS
FG15MP-RP-10	WAHOO BAY
FG15MP-RP-11	WILDWOOD
FG15MP-RP-12	JACKSON BAY

PUBLIC USE AREAS

- DAM SITE
- OVERLOOK
- WAHOO BAY
- JACKSON BAY
- TAYLOR FERRY SOUTH
- TAYLOR FERRY SWIM BEACH
- TAYLOR FERRY NORTH
- TOPPERS
- ROCKY POINT
- BLUEBILL
- FLAT ROCK
- WILDWOOD

The maps within this document contain data from multiple different sources and have an unquantified level of accuracy. The information is approximate and is for visual representation only.

U.S. Army Corps of Engineers
Tulsa District

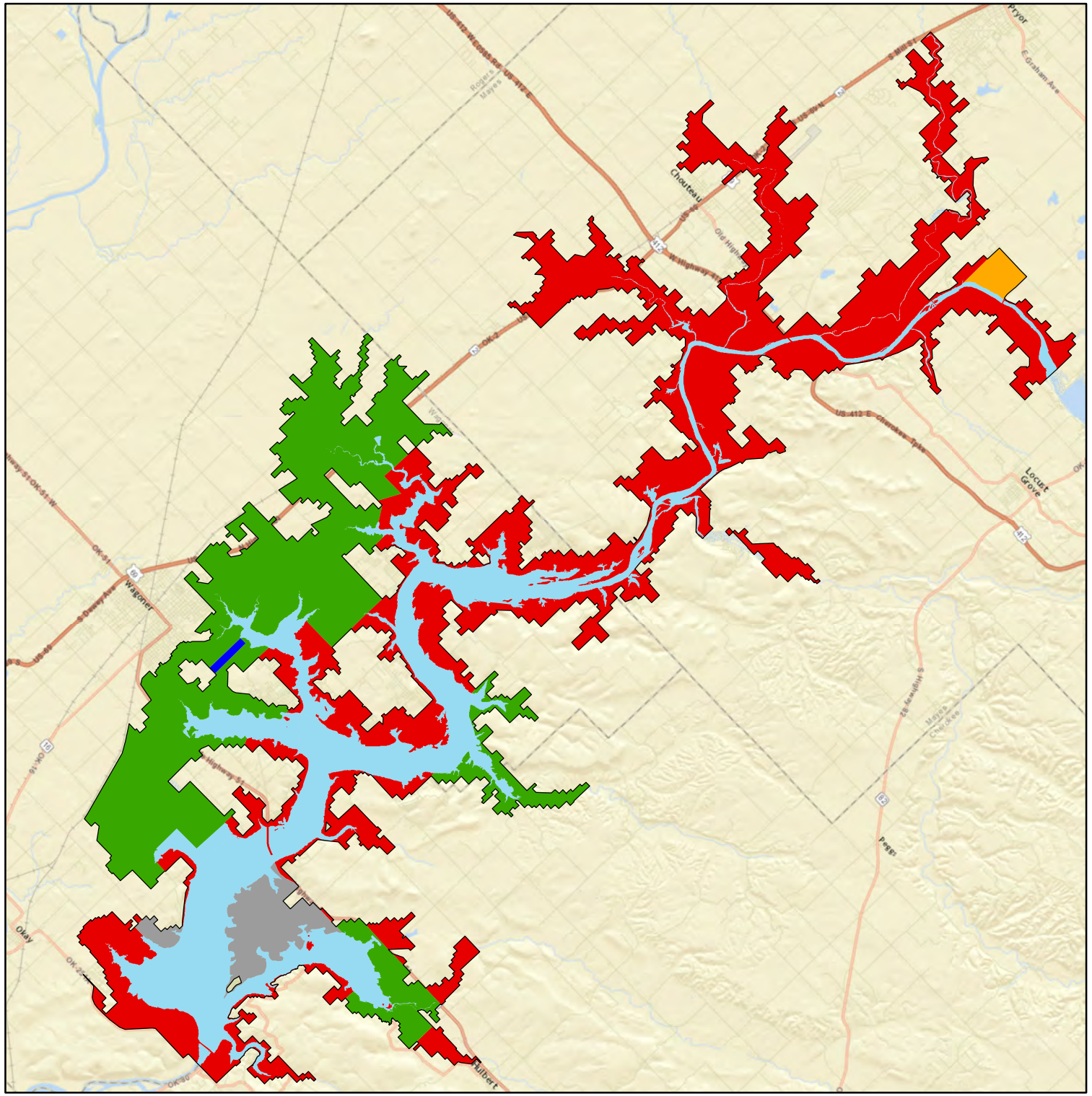
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

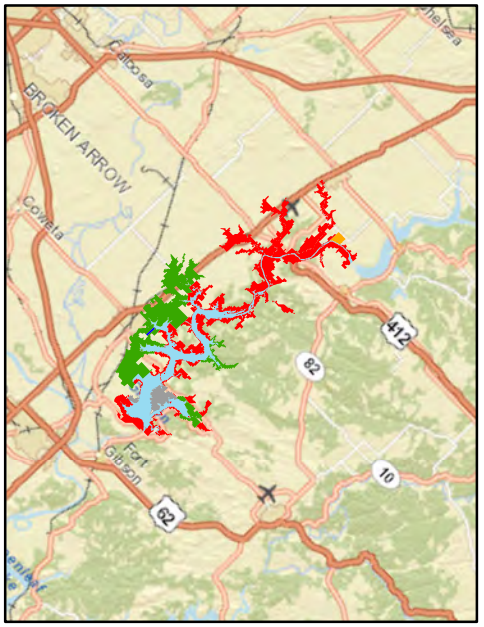
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

PROJECT LOCATION & INDEX

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-IP- 00





Legend

- Project Boundary
- City of Pryor
- City of Wagoner
- Corps of Engineers
- Department of Tourism
- ODWC

0 1.5 3 4.5 6

Miles

U.S. Army Corps of Engineers
Tulsa District

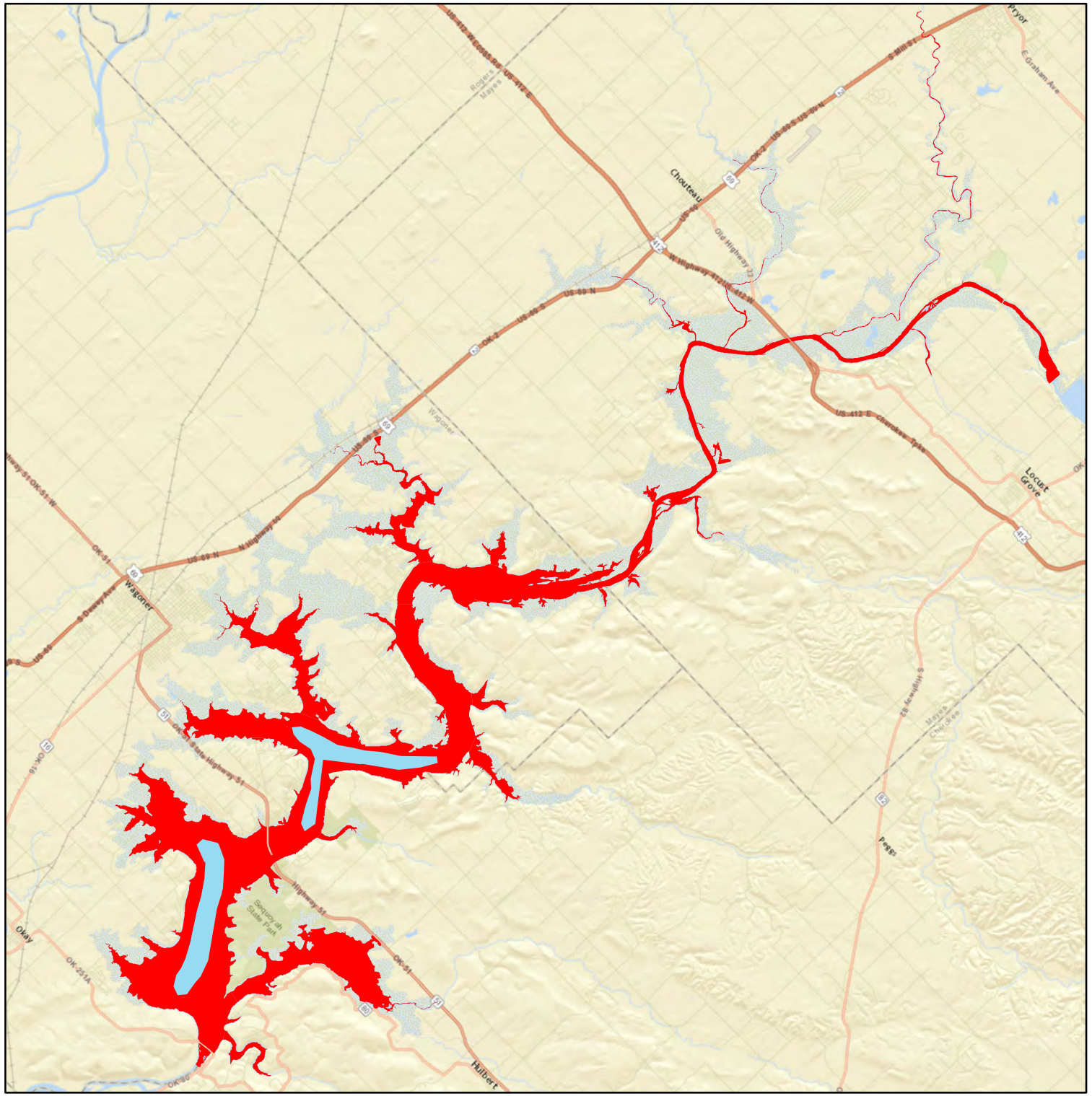
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

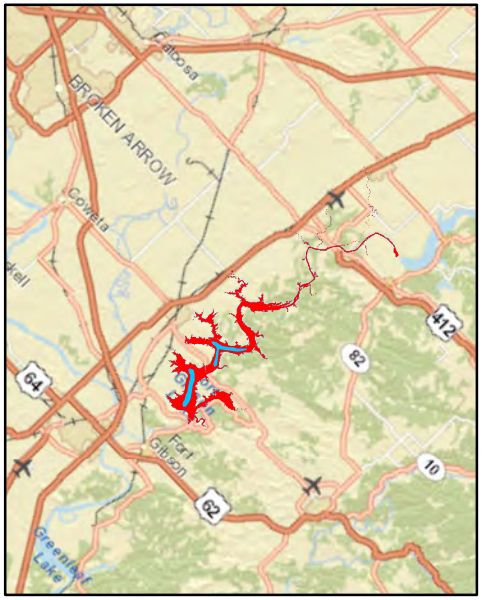
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

MANAGING AGENCY

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-MP-01





Operation of a seaplane at USACE projects is at the risk of the plane's owner, operator, and/or passenger(s).

NOTE:
TAKEOFF AND LANDING PROHIBITED WITHIN 2,000' OF DAM STRUCTURE, BRIDGES, AND RECREATION AREAS.

Legend

- Restricted Area
- Water Unrestricted

0 1.5 3 4.5 6

Miles

U.S. Army Corps of Engineers
Tulsa District

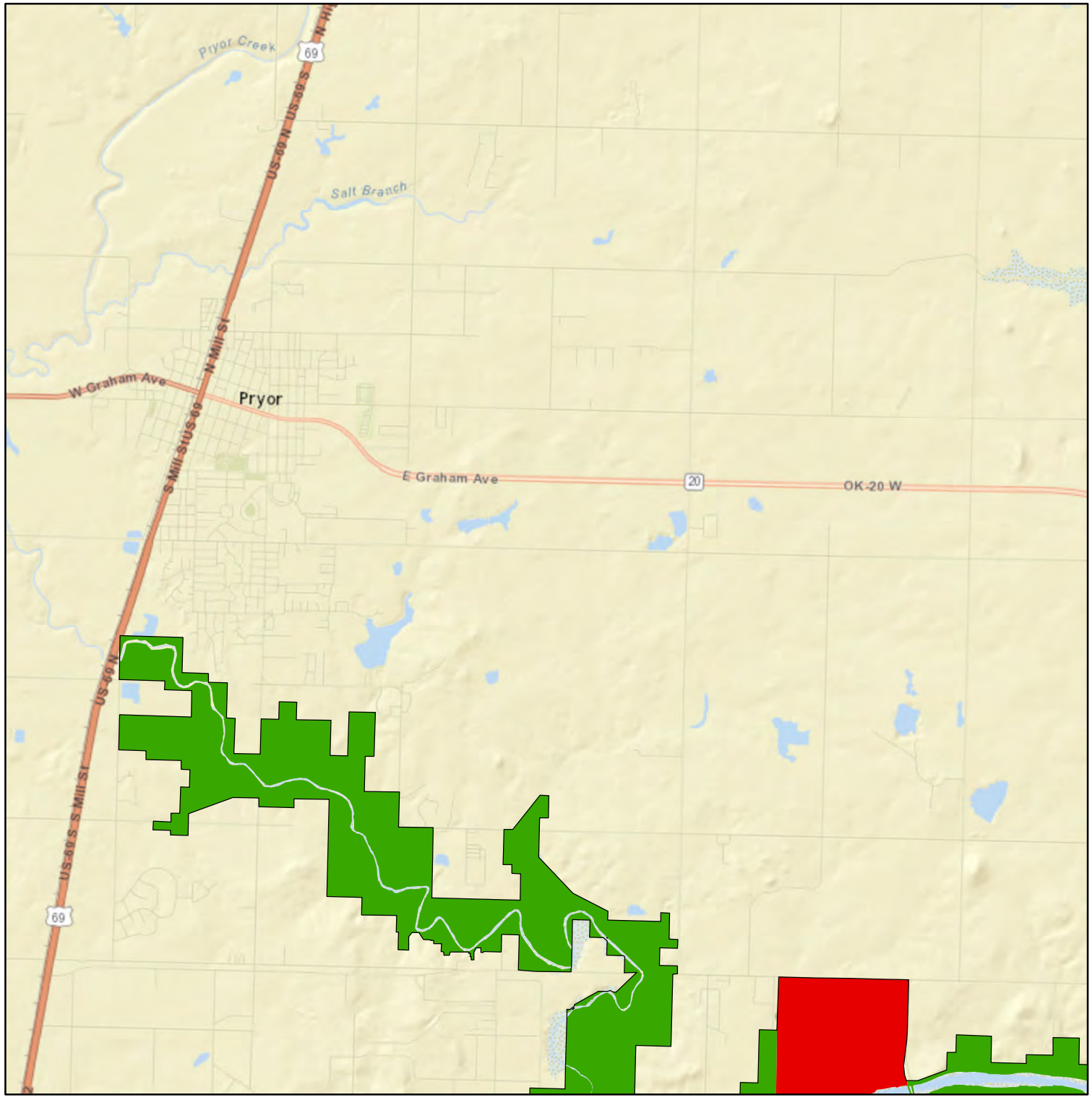
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

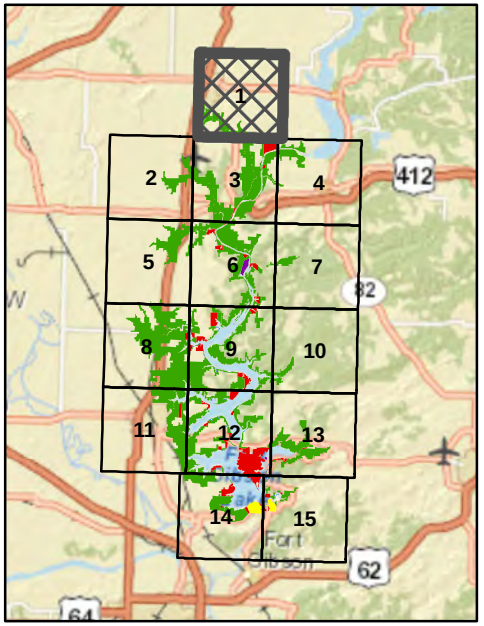
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

SEAPLANE OPERATION GUIDE

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-SP-01





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

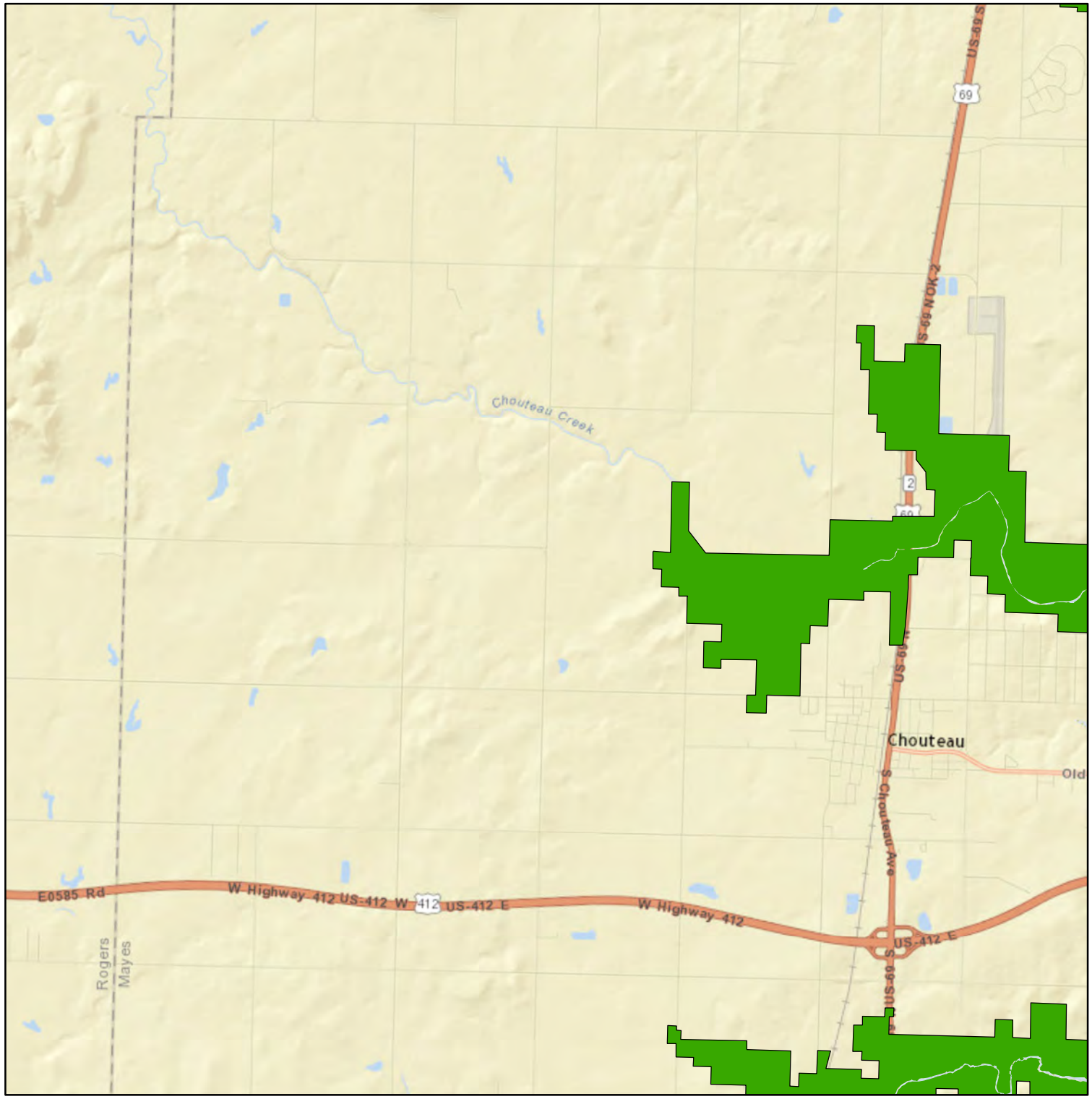
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

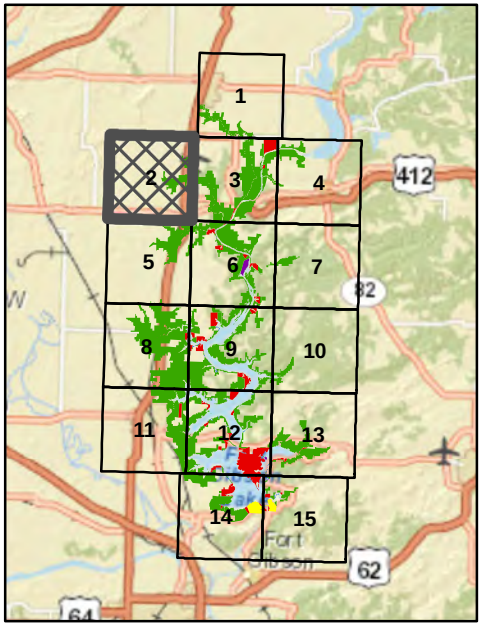
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-01





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

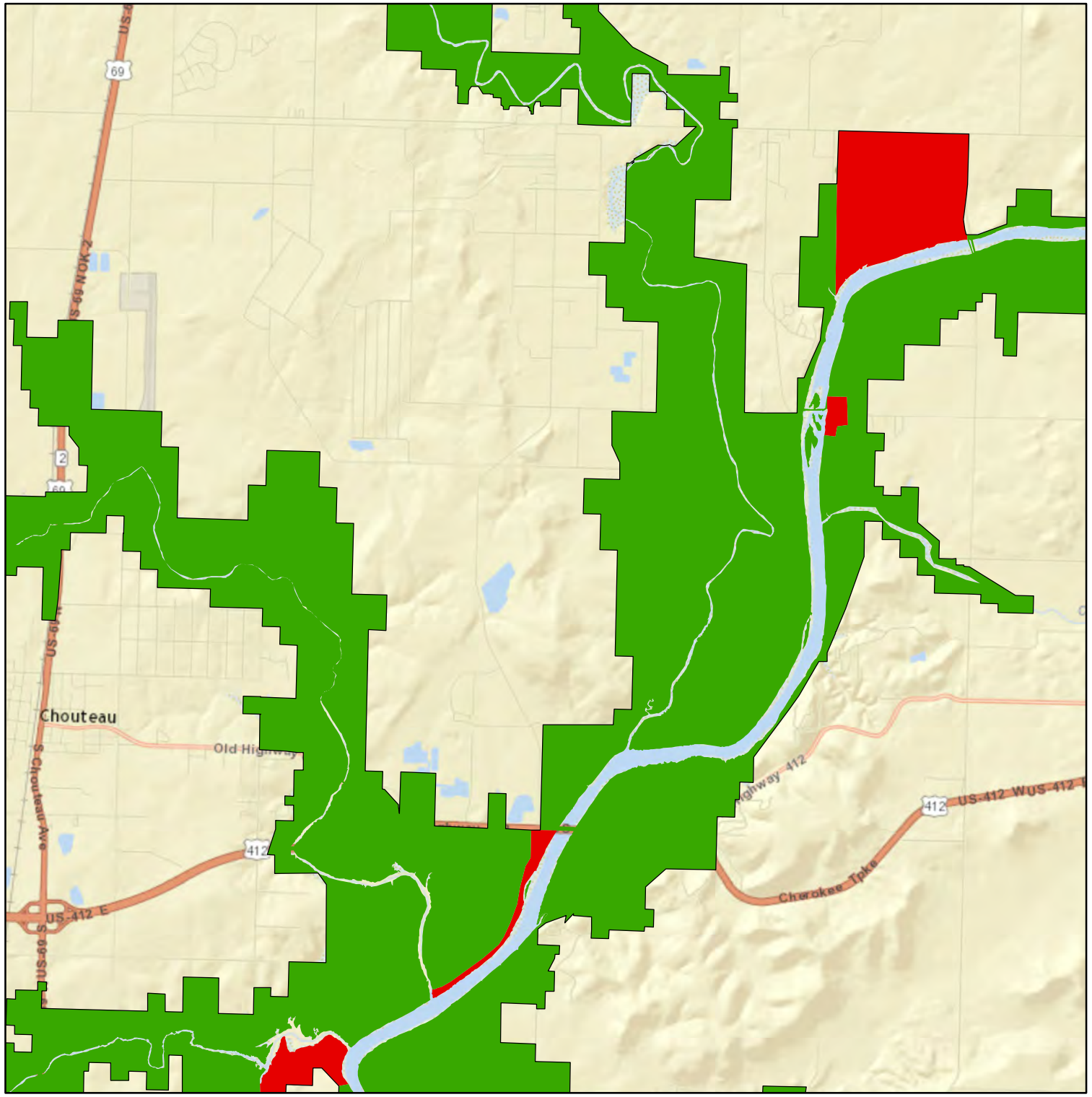
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

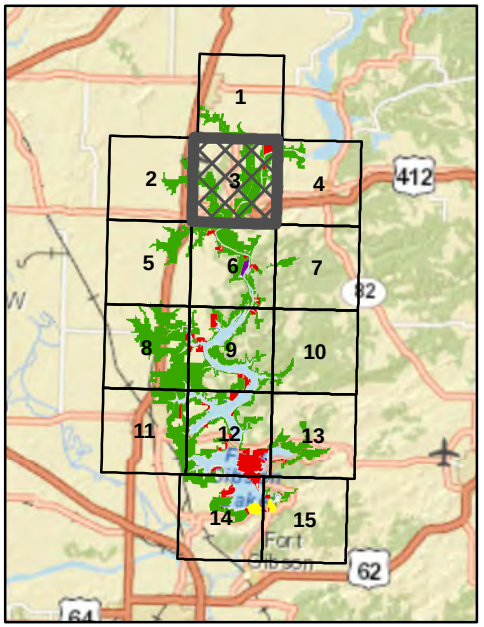
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-02





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

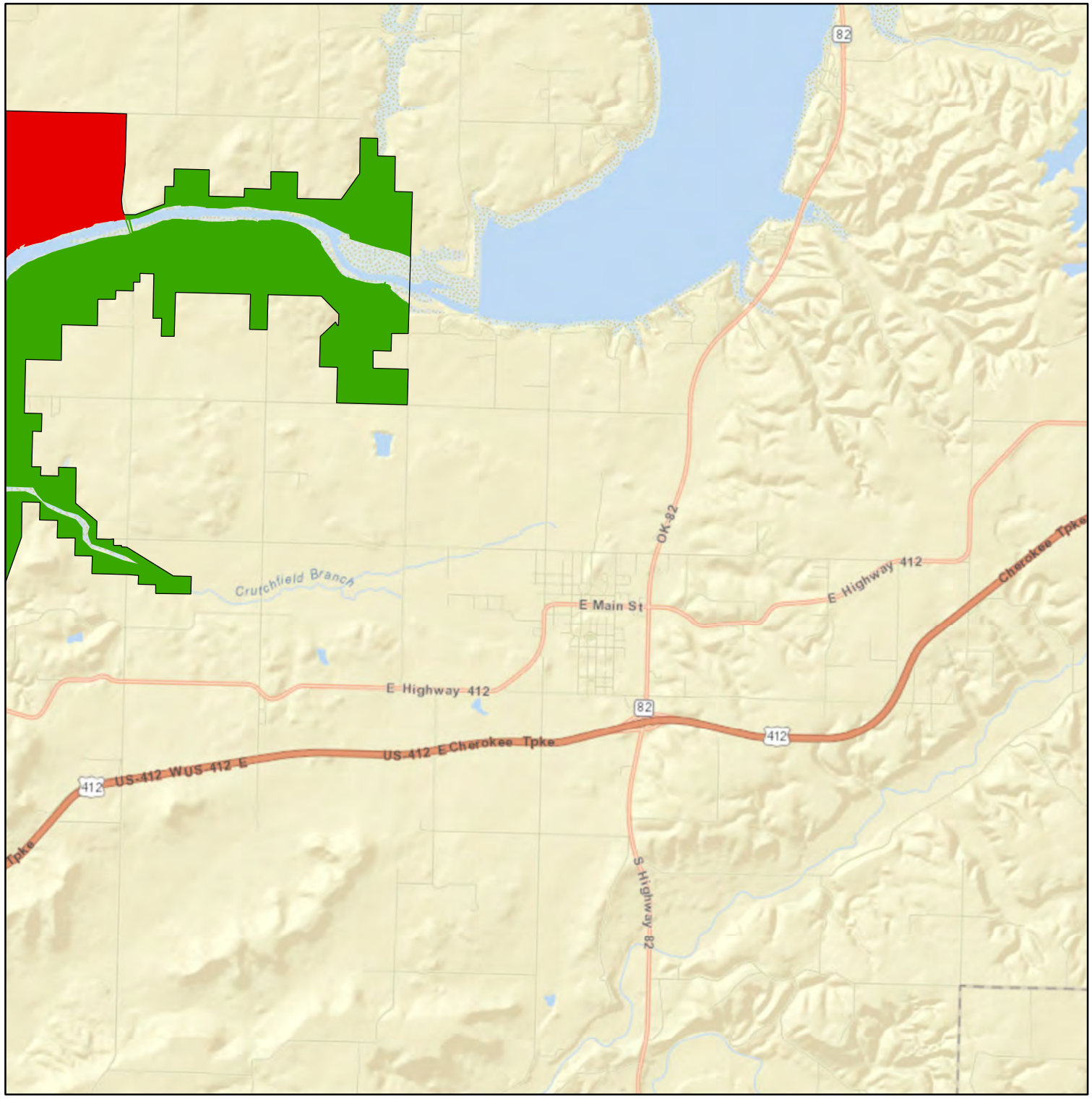
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

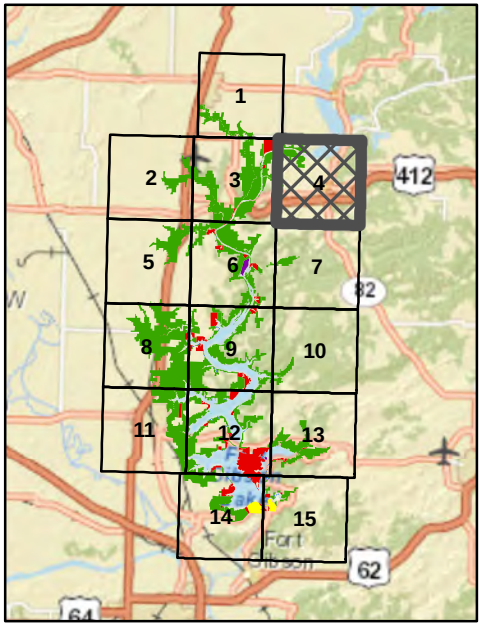
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-03





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

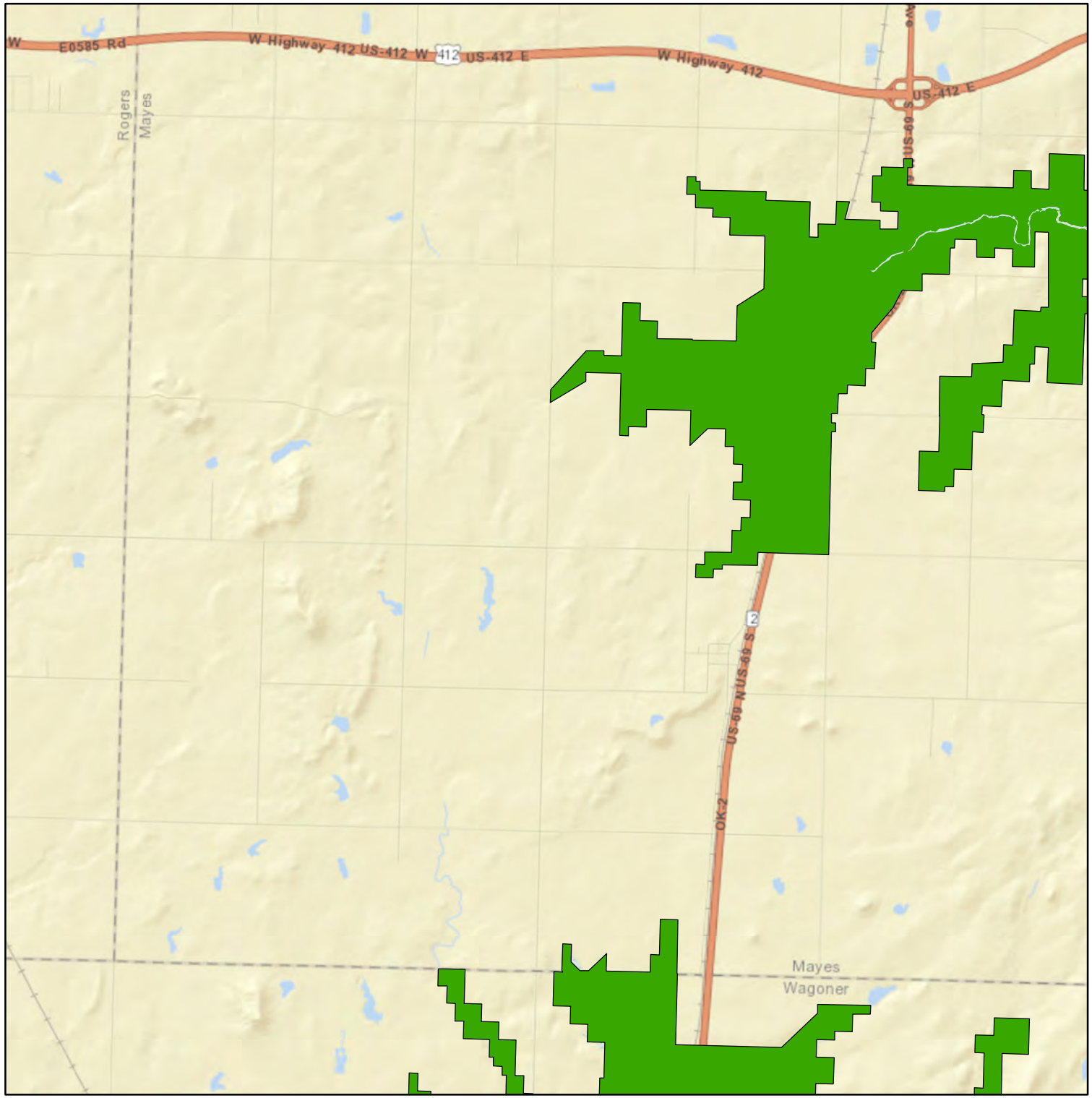
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

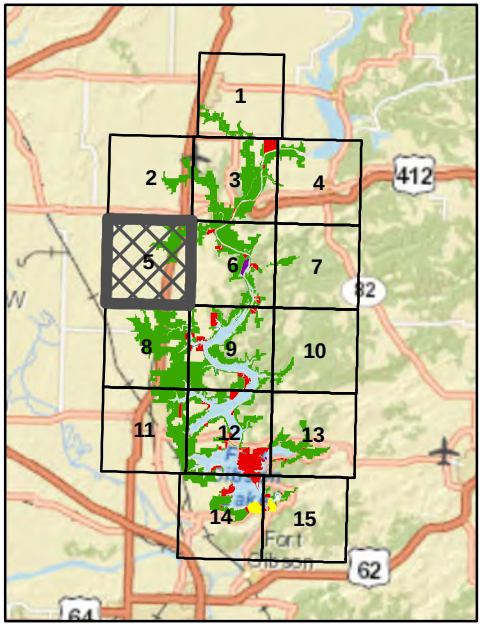
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-04





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

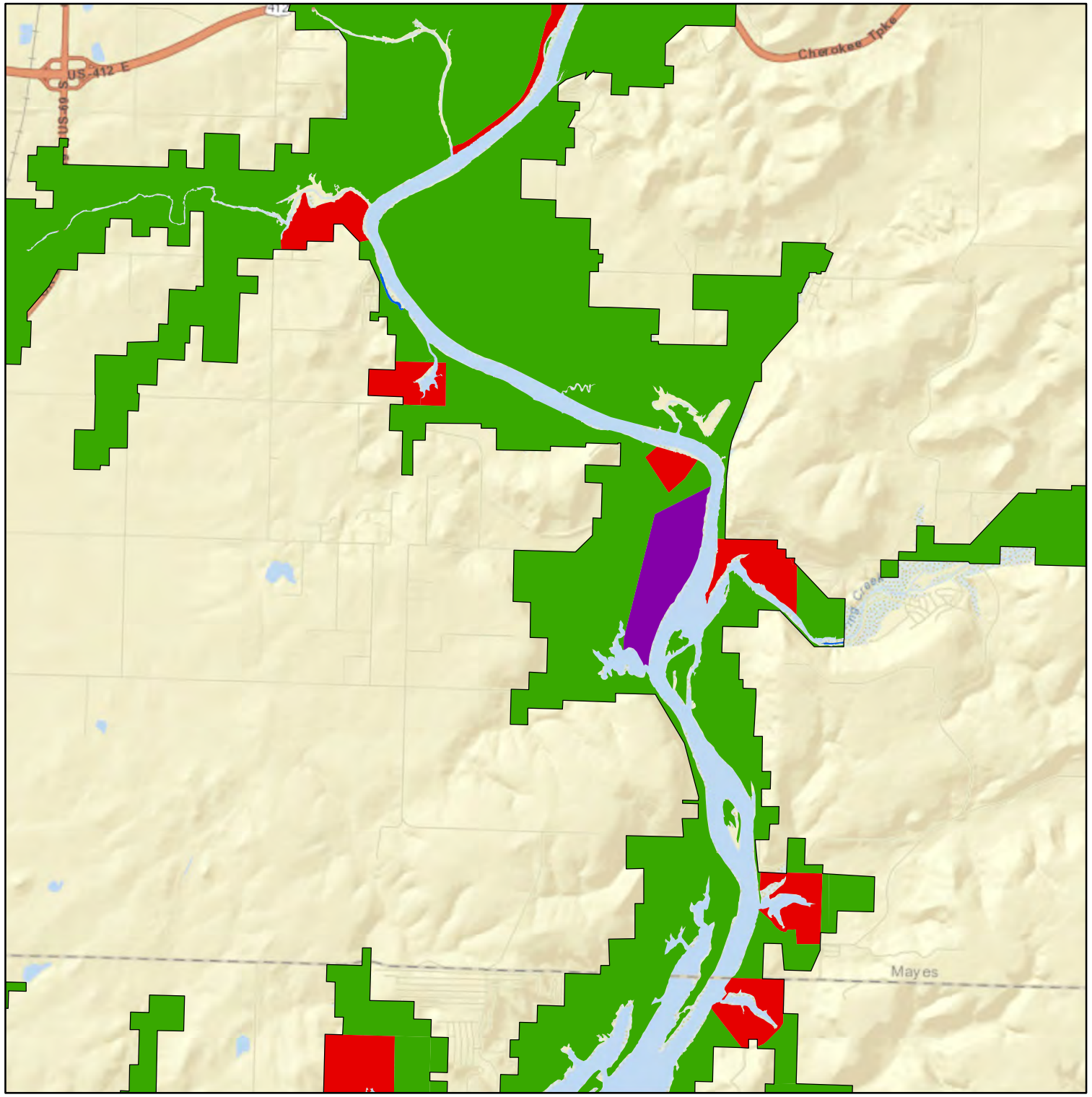
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

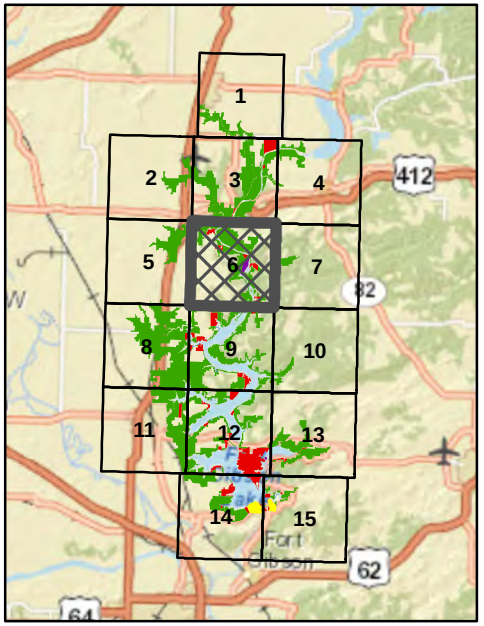
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-05





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

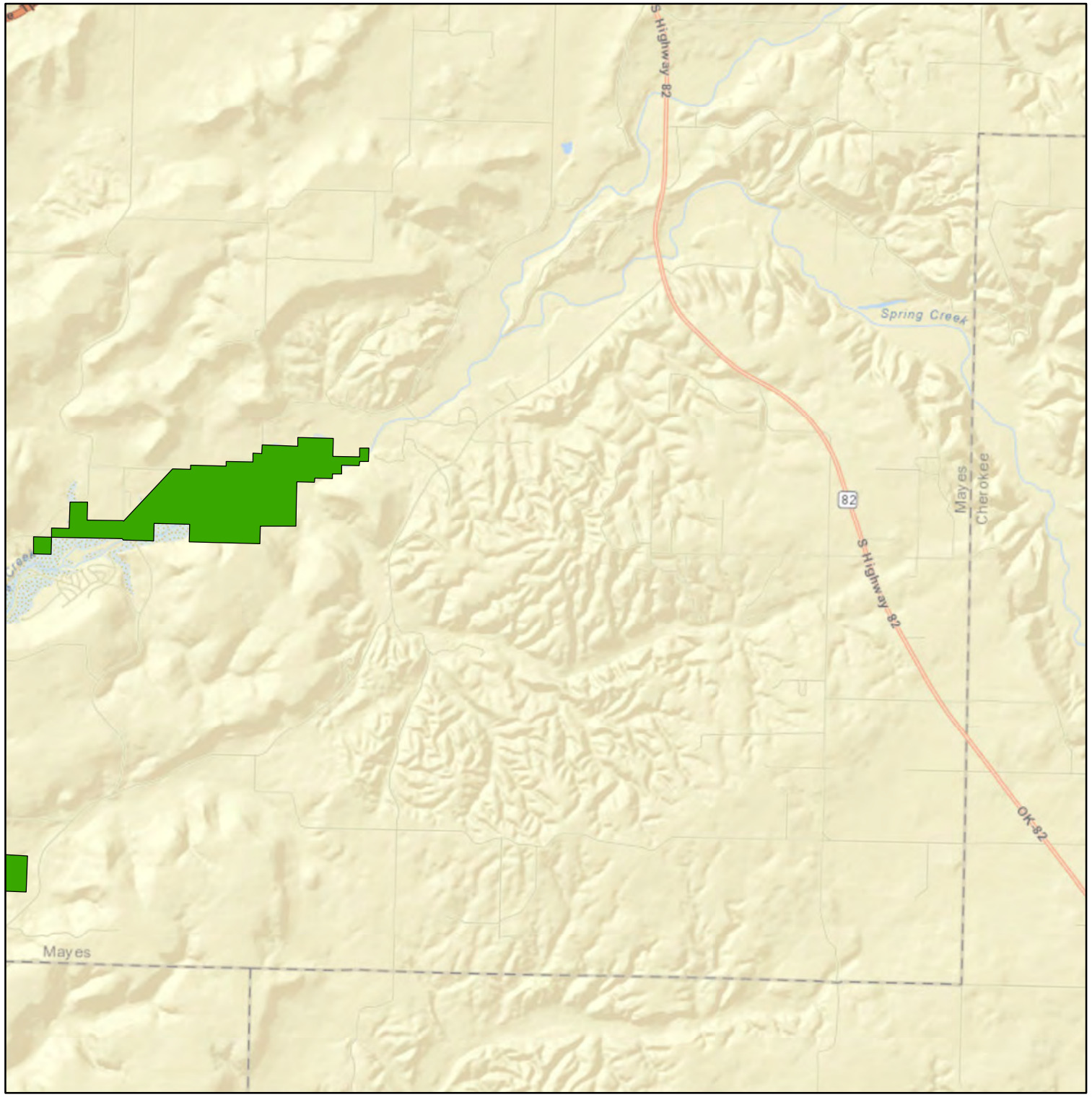
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

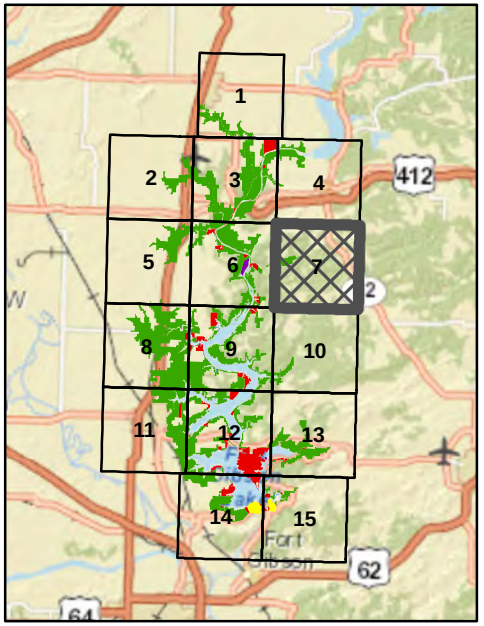
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-06





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

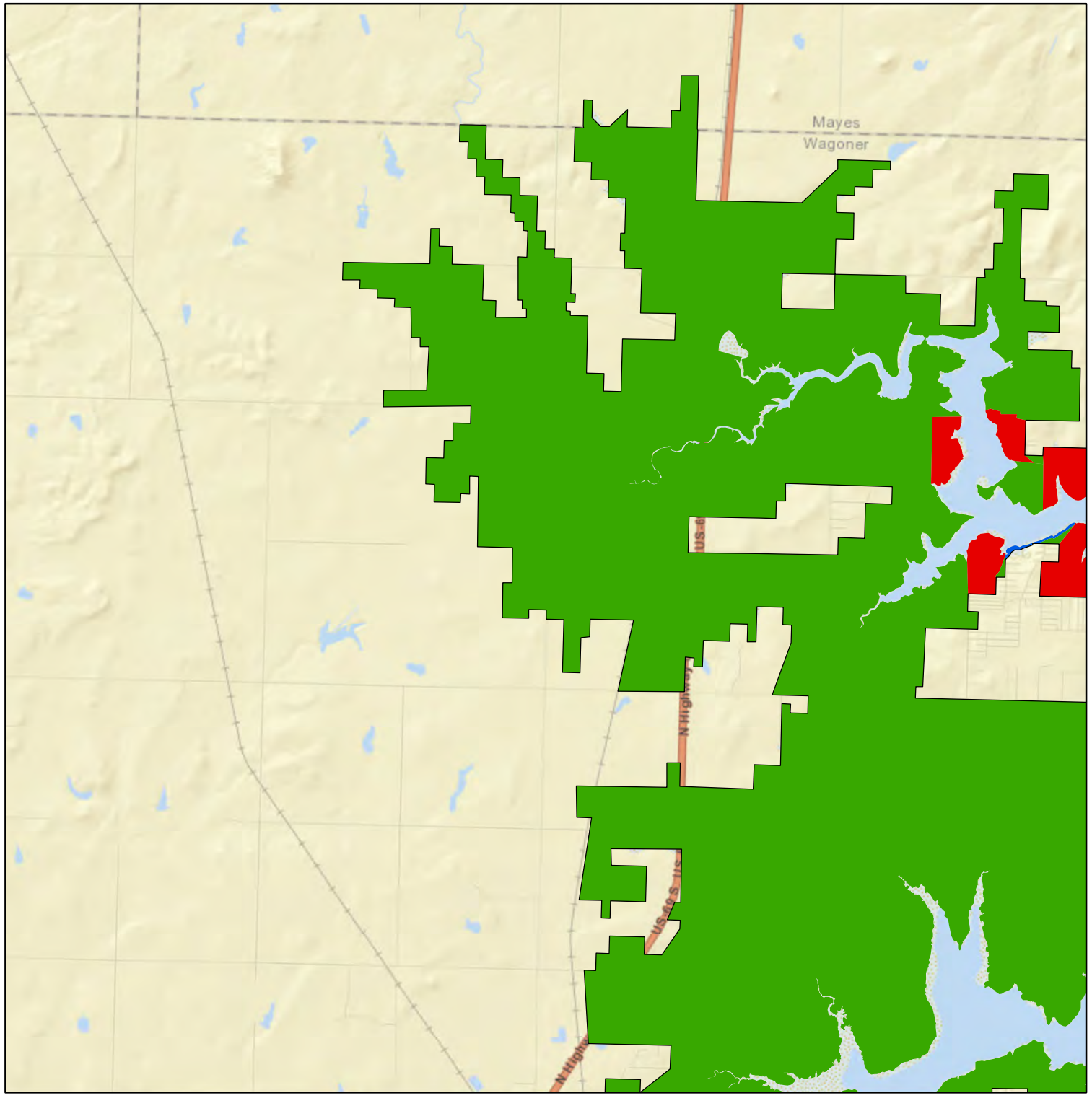
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

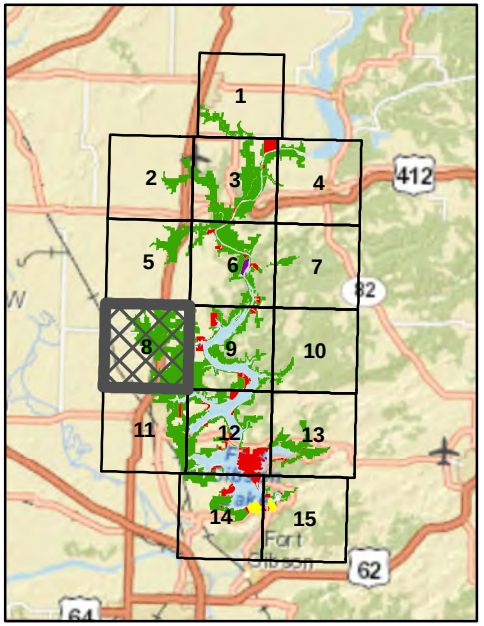
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-07





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

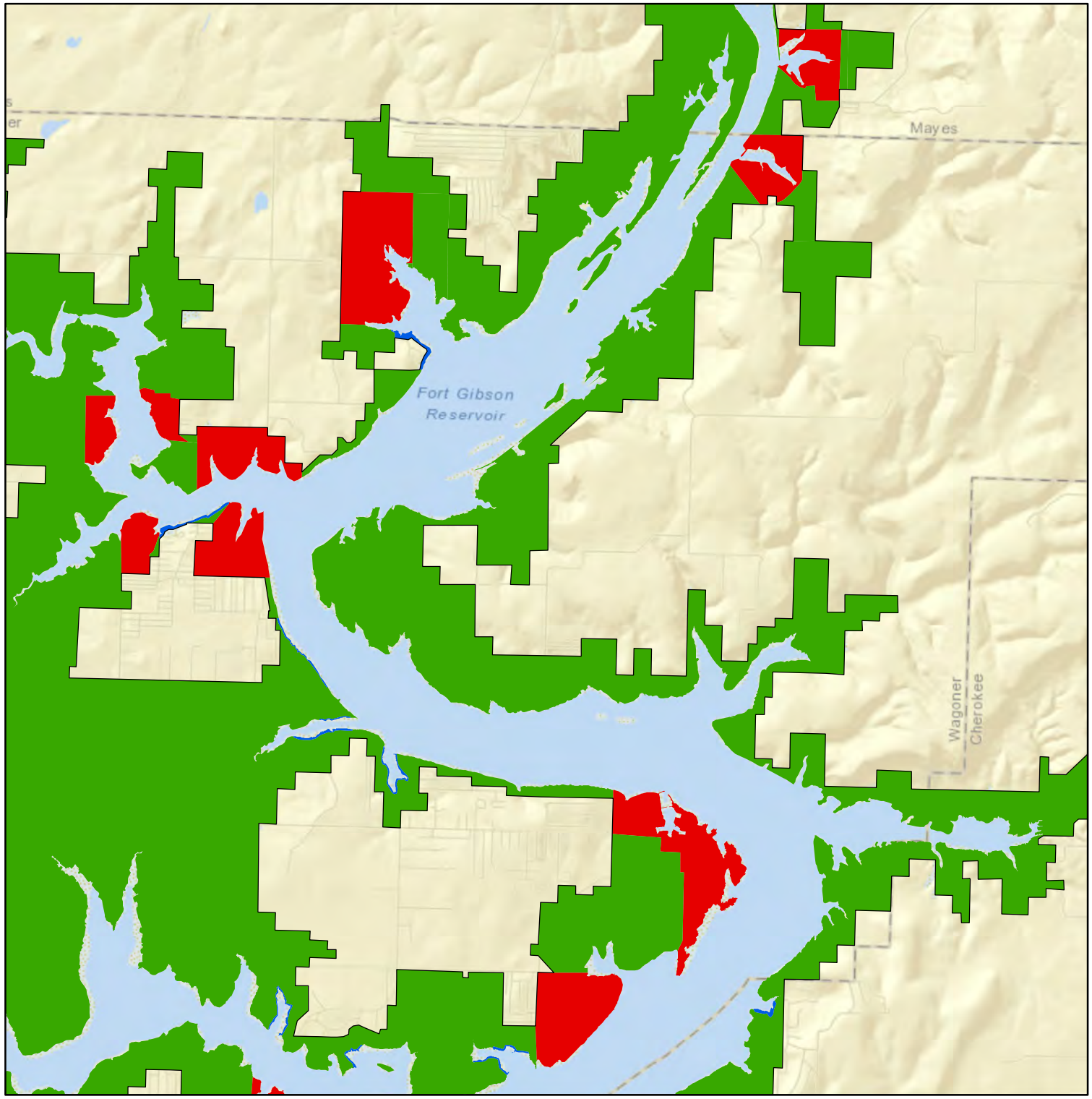
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

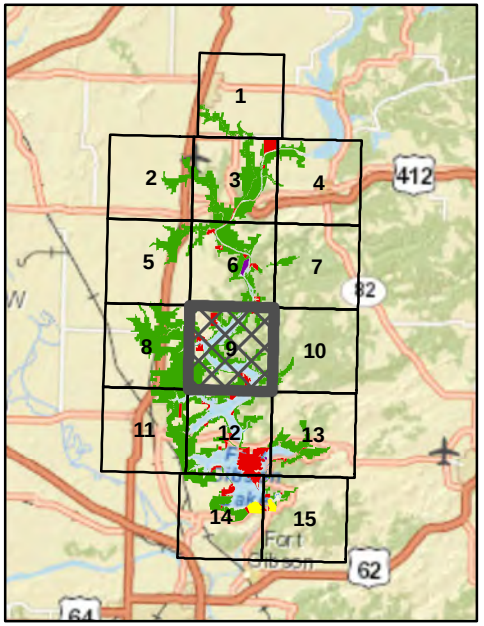
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-08





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

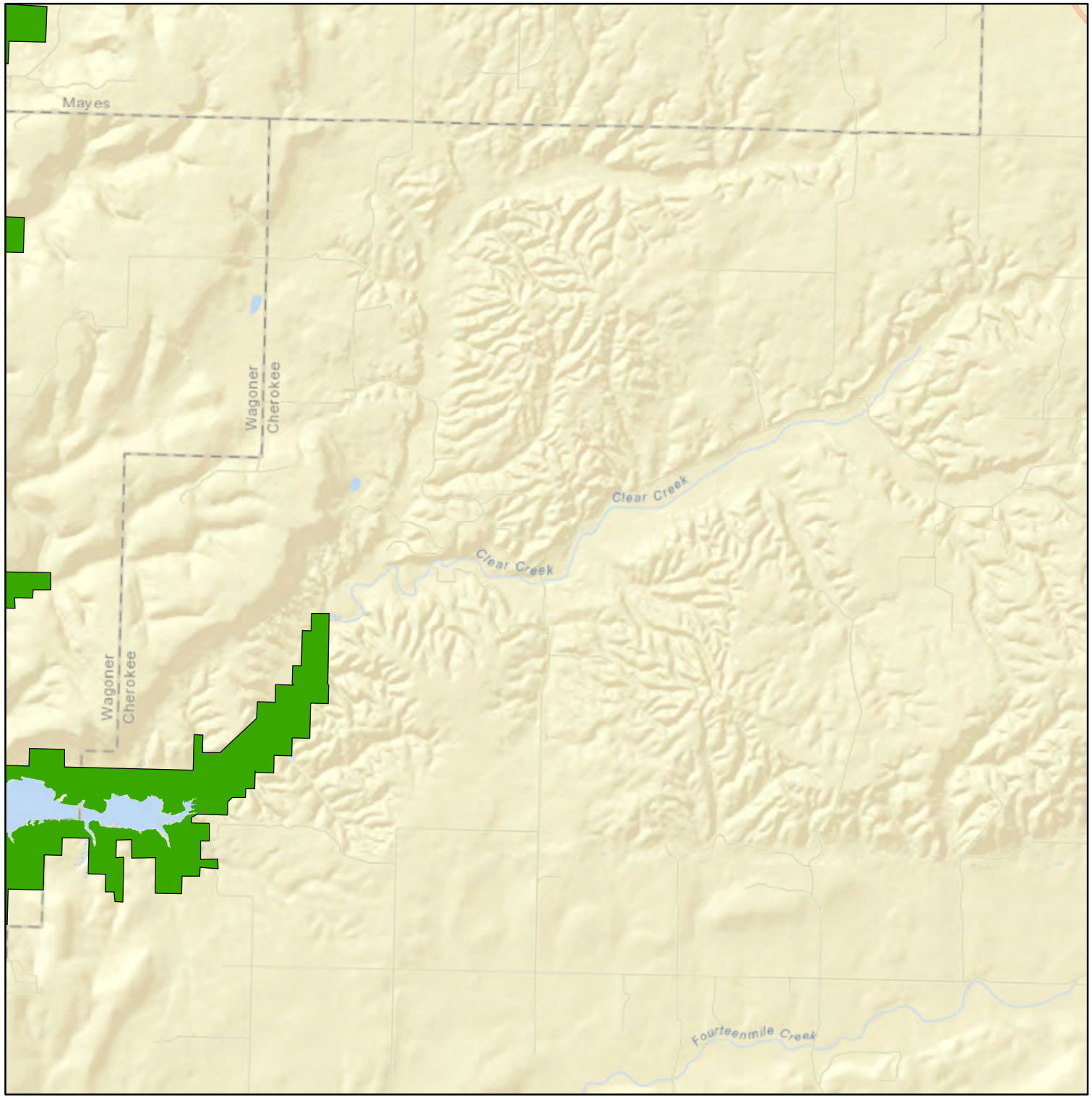
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

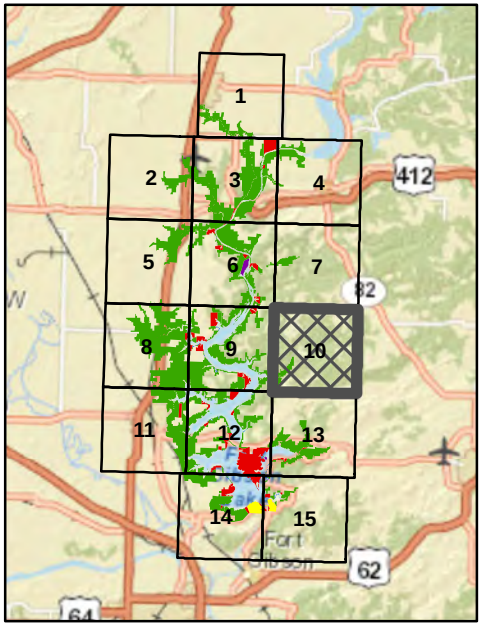
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-09





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

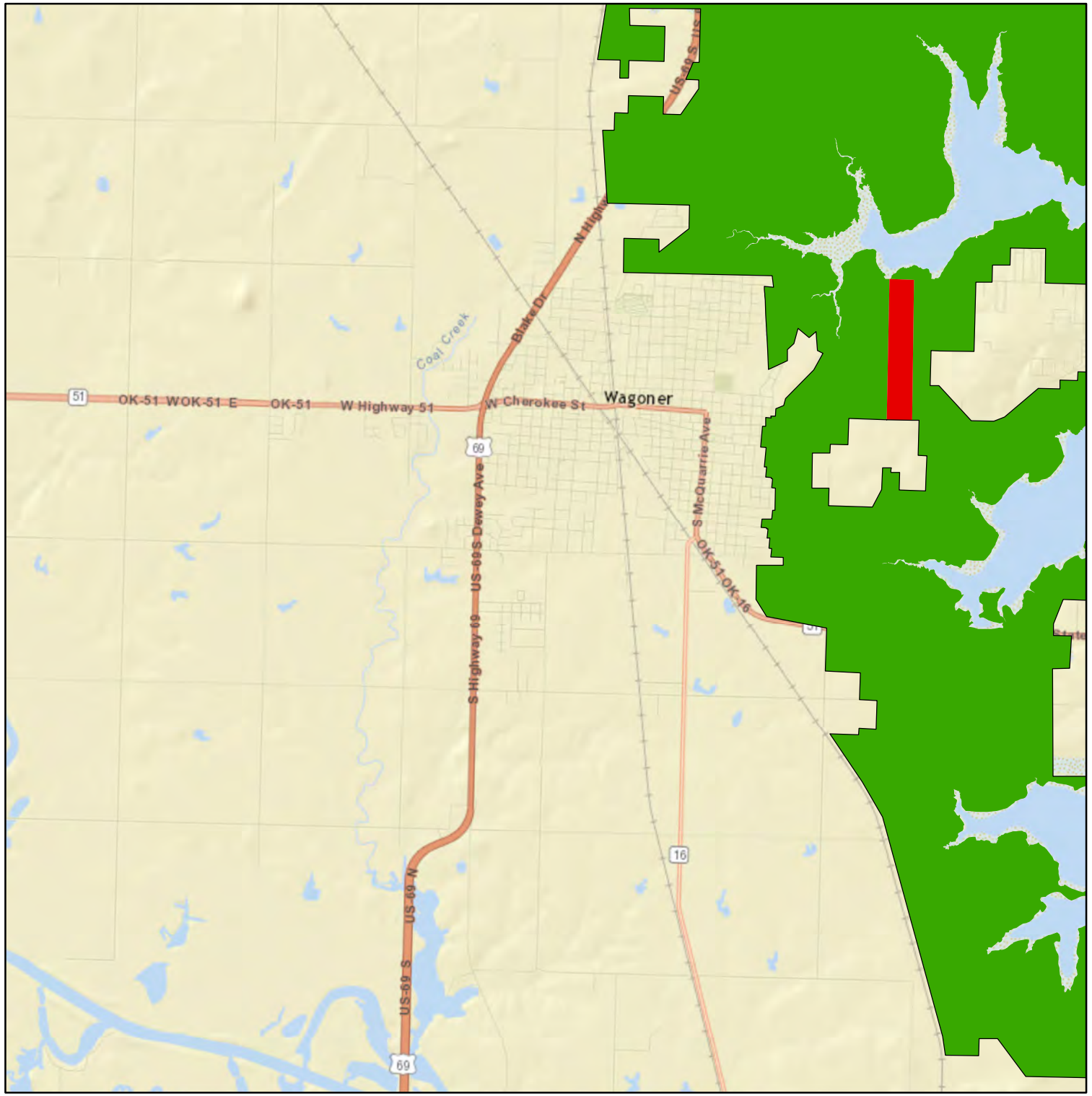
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

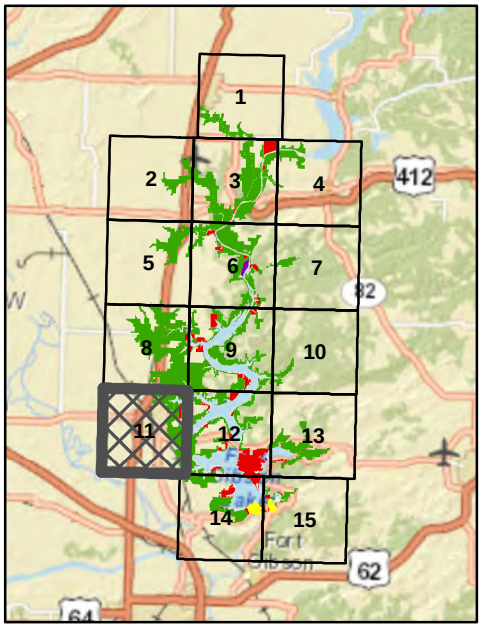
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-10





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

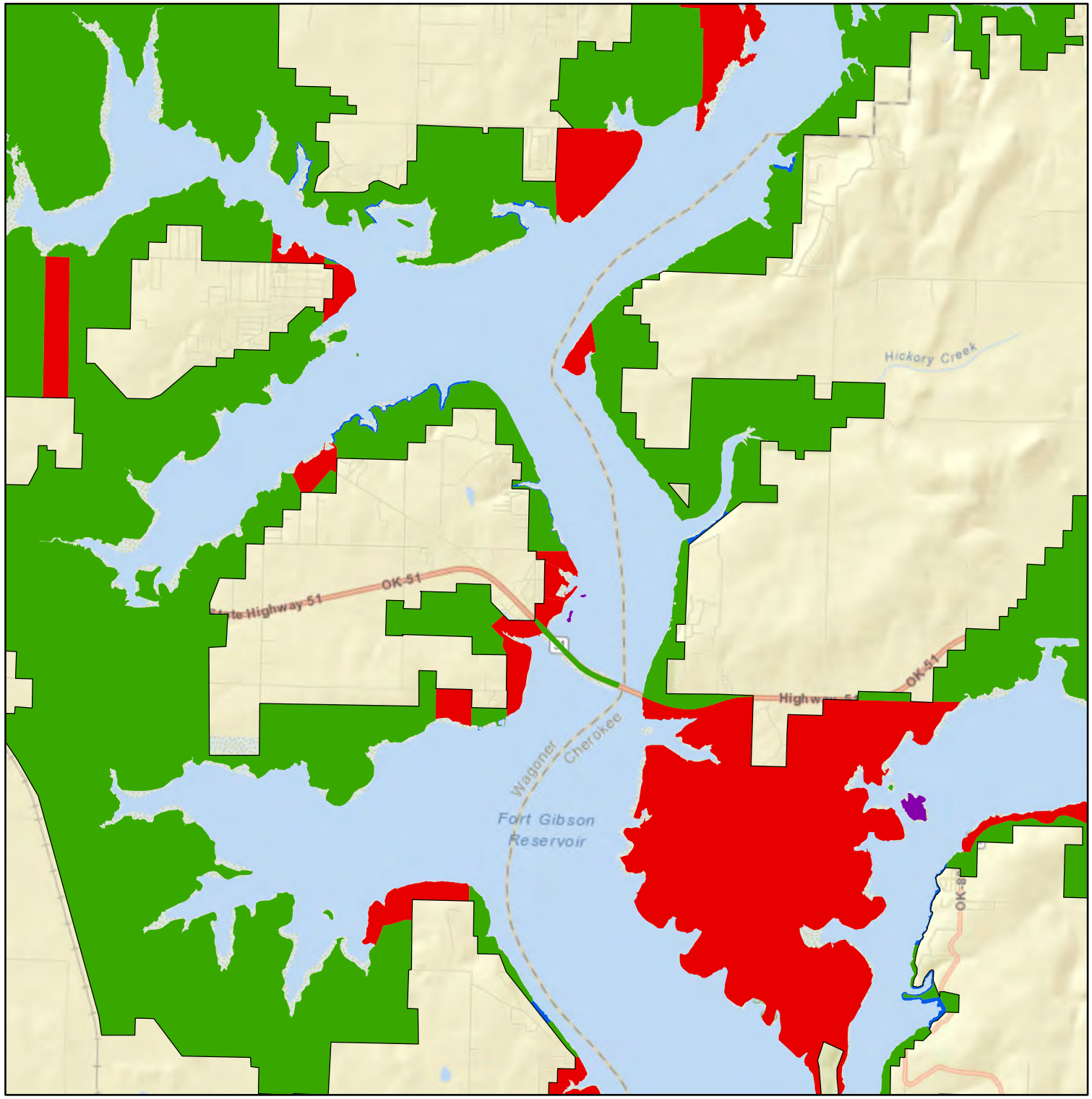
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

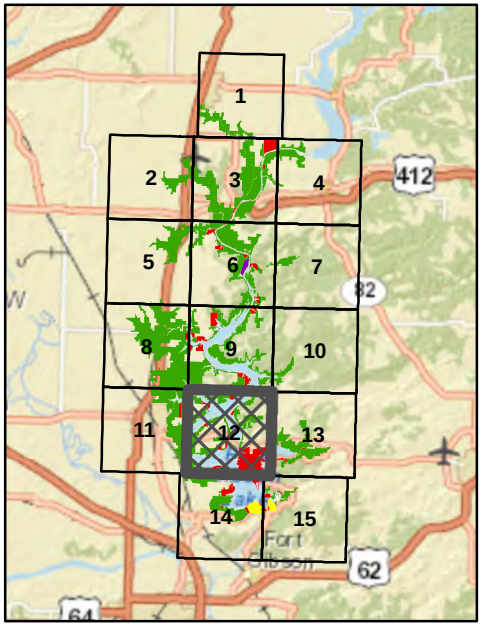
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-11





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

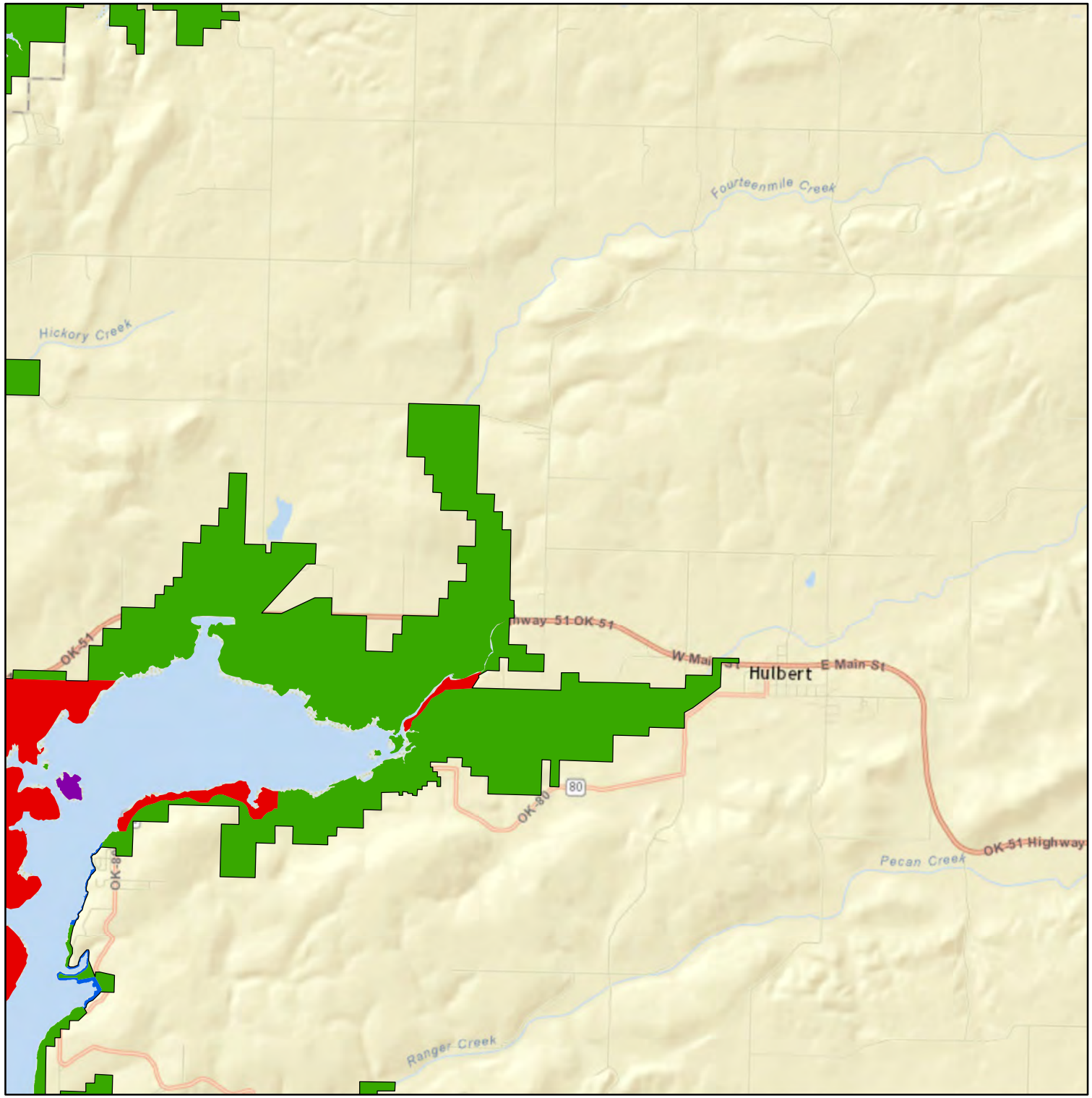
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

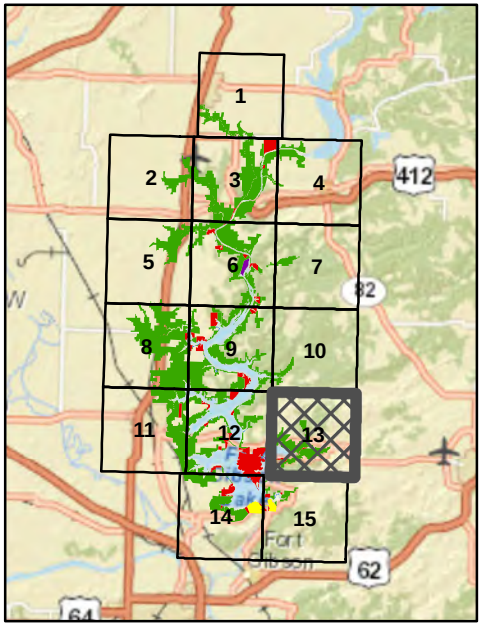
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-12





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

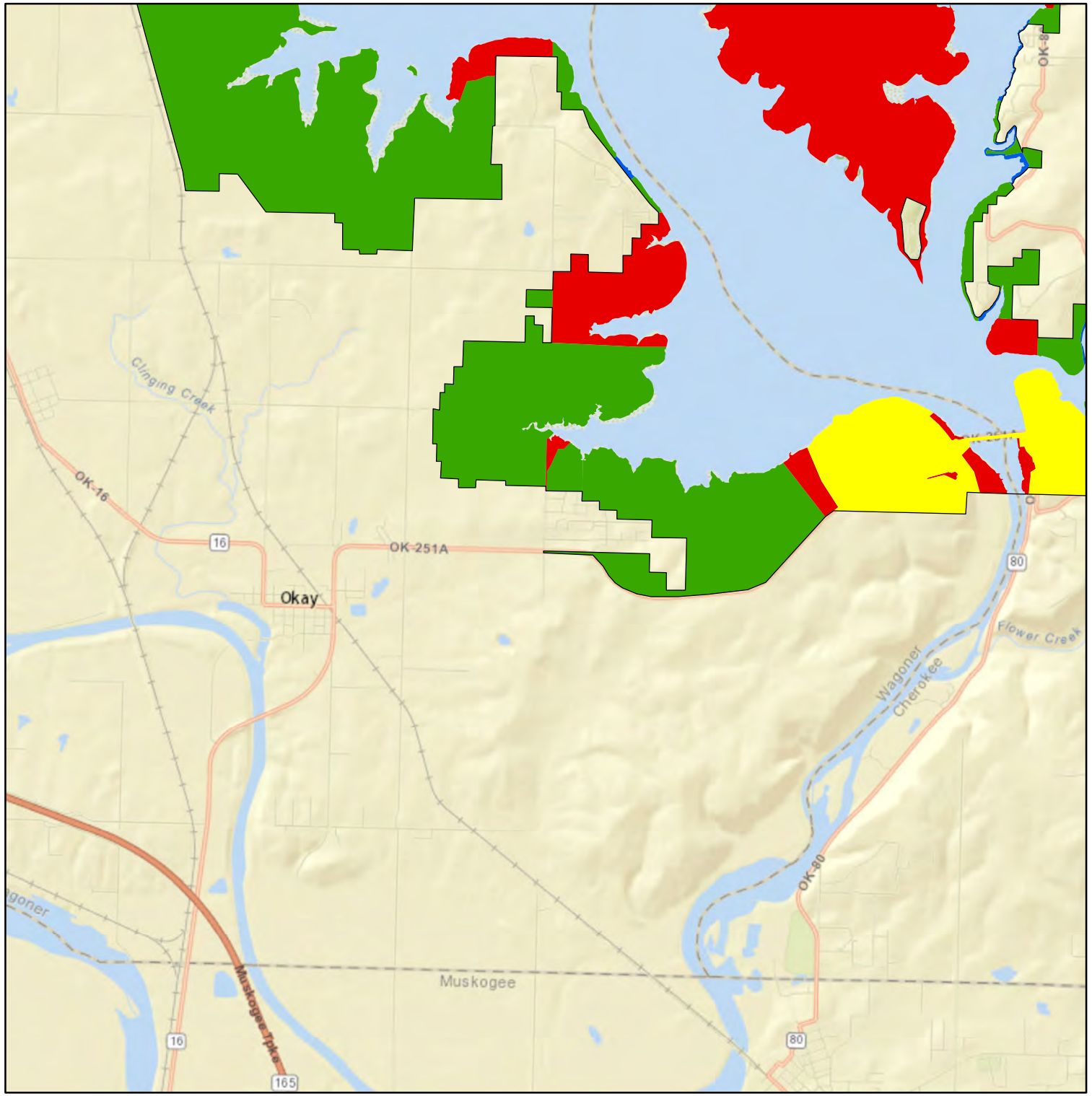
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

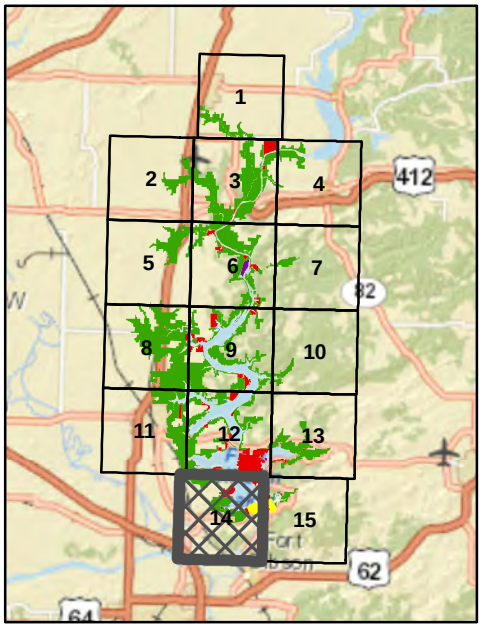
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-13





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

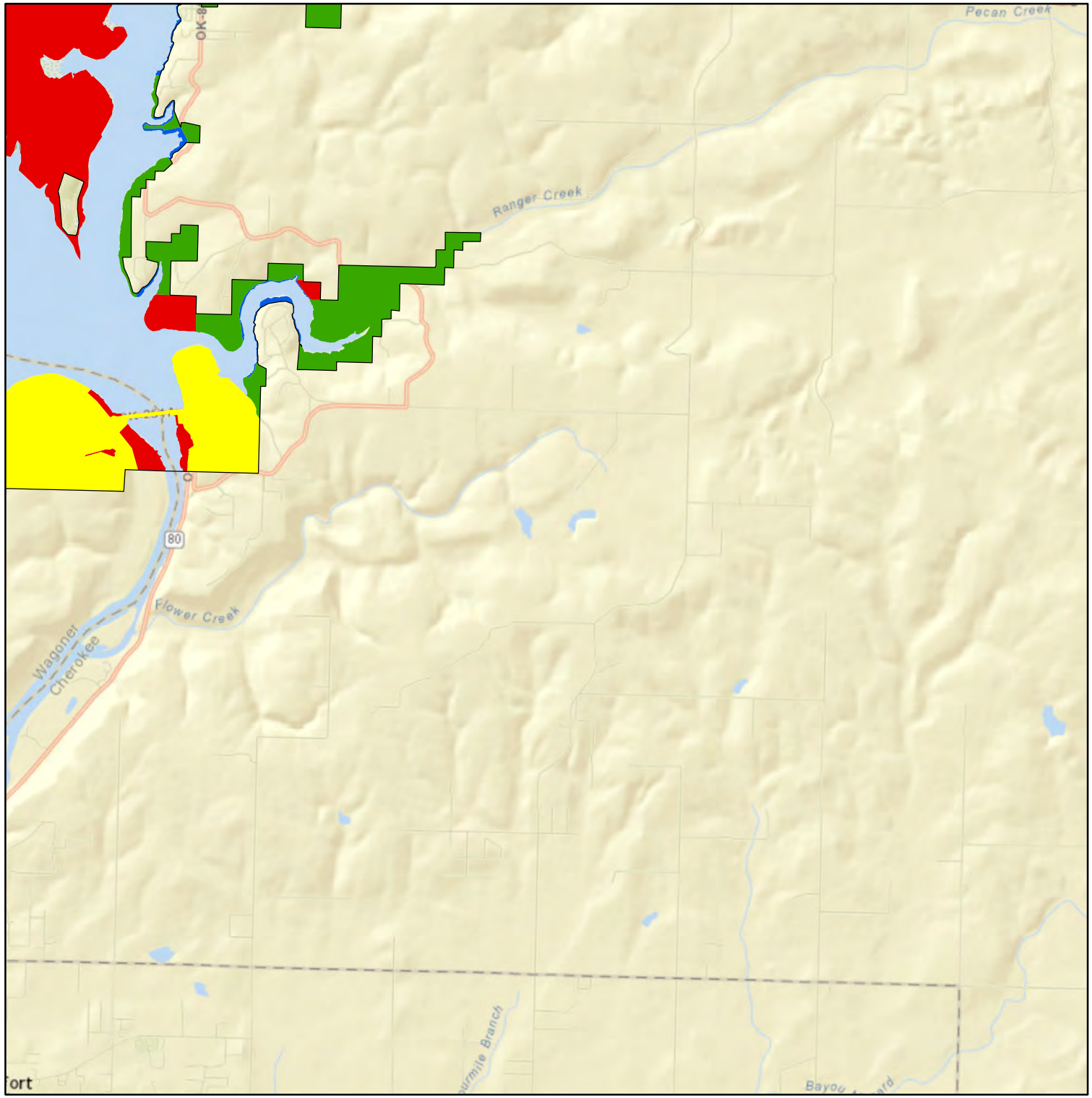
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

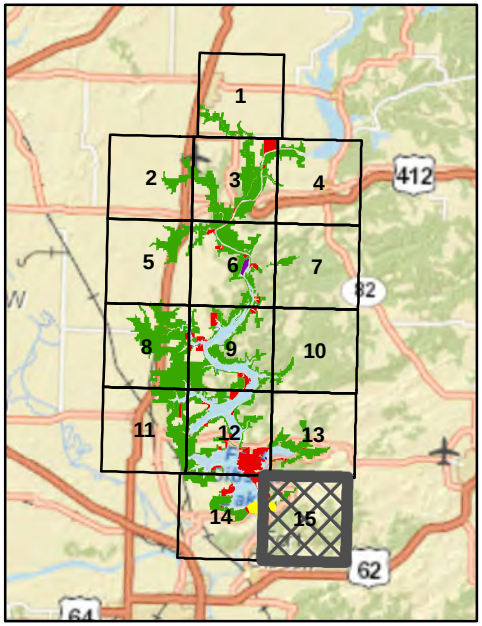
FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-14





Legend

- Project Boundary
- Environmentally Sensitive Areas
- High Density Recreation
- Low Density Recreation
- Project Operations
- Wildlife Management

0 0.5 1 1.5 2

Miles

U.S. Army Corps of Engineers
Tulsa District

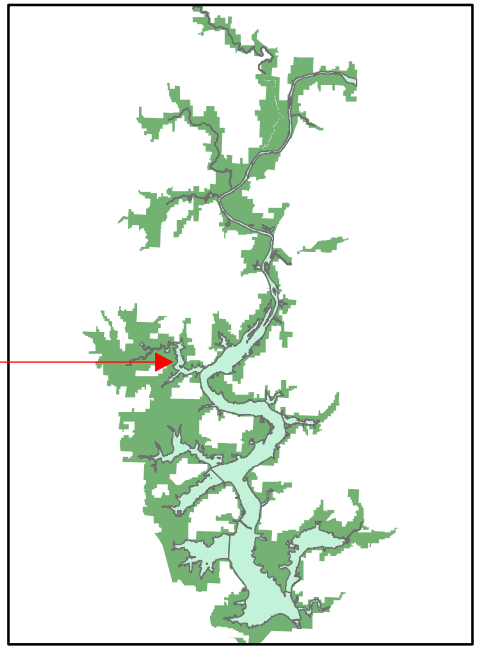
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

LAND USE CLASSIFICATIONS

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-CP-15



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 100 200 300 400

Feet

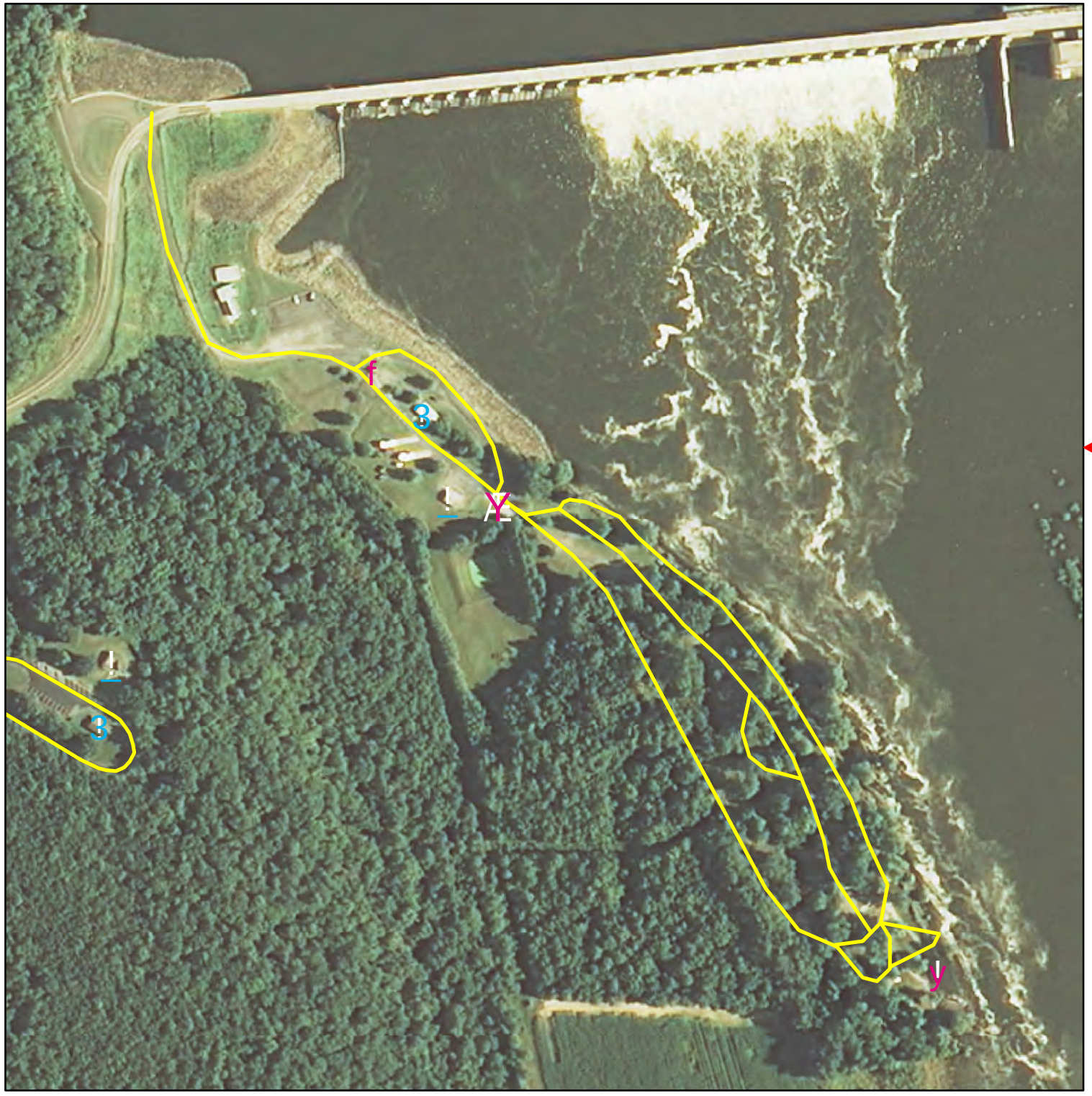
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

BLUE BILL
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-01



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 140 280 420 560

Feet

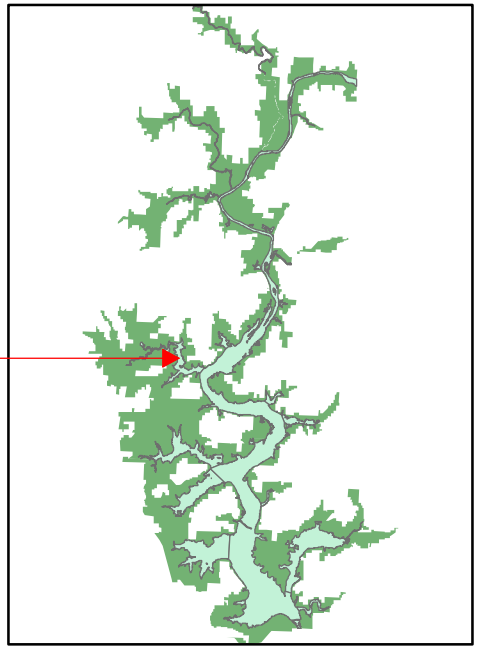
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

DAM SITE
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-02



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 120 240 360 480

Feet

U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

FLAT ROCK
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-03

Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 80 160 240 320

Feet

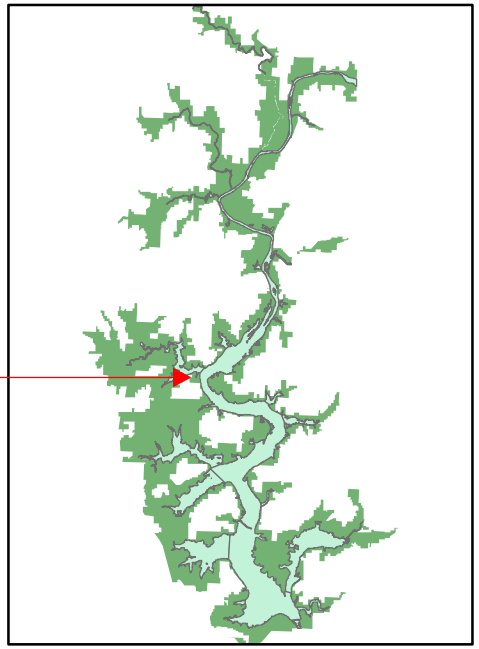
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

OVERLOOK
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-04



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 200 400 600 800

Feet

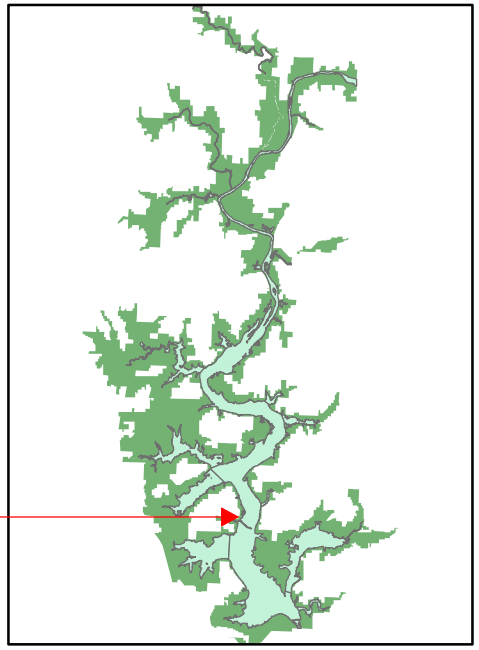
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

ROCKY POINT
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-05



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 75 150 225 300

Feet

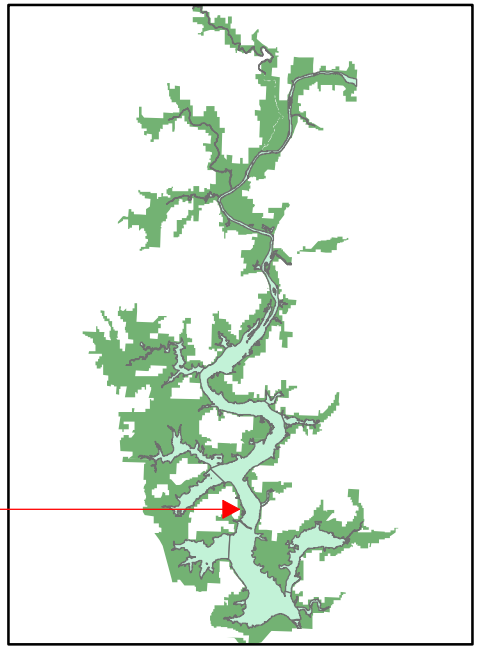
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

TAYLOR FERRY SWIM BEACH
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-06



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 80 160 240 320

Feet

U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

TAYLOR FERRY NORTH
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-07

Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 300 600 900 1,200

Feet

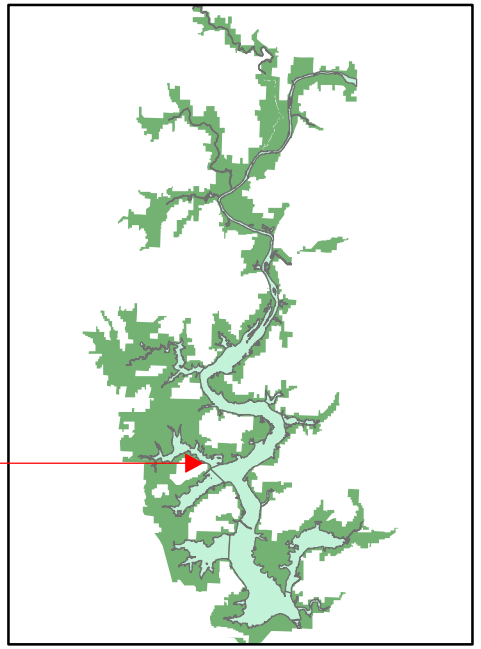
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

TAYLOR FERRY SOUTH
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-08



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 75 150 225 300

Feet

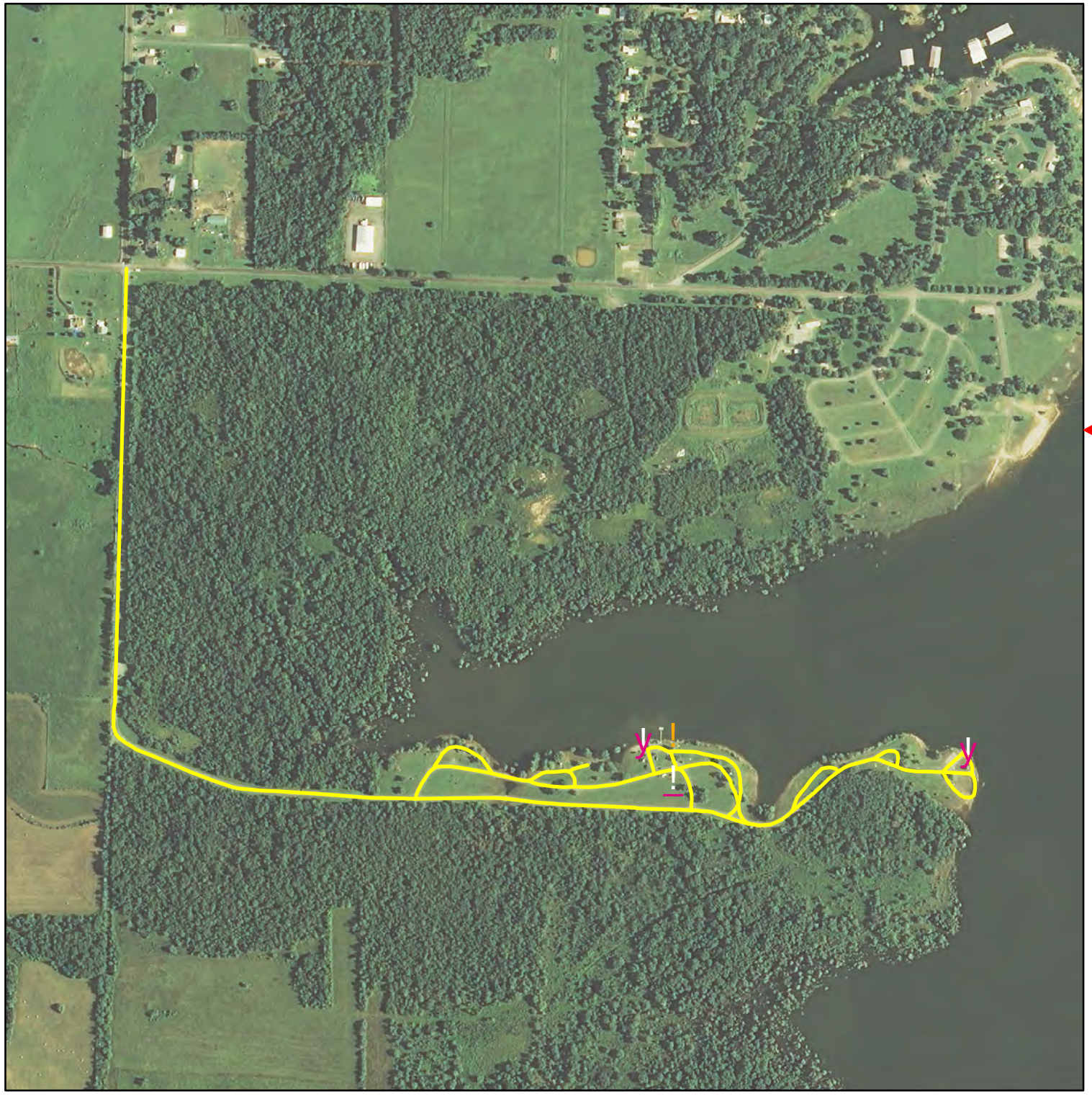
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

TOPPERS
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-09



Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 310 620 930 1,240

Feet

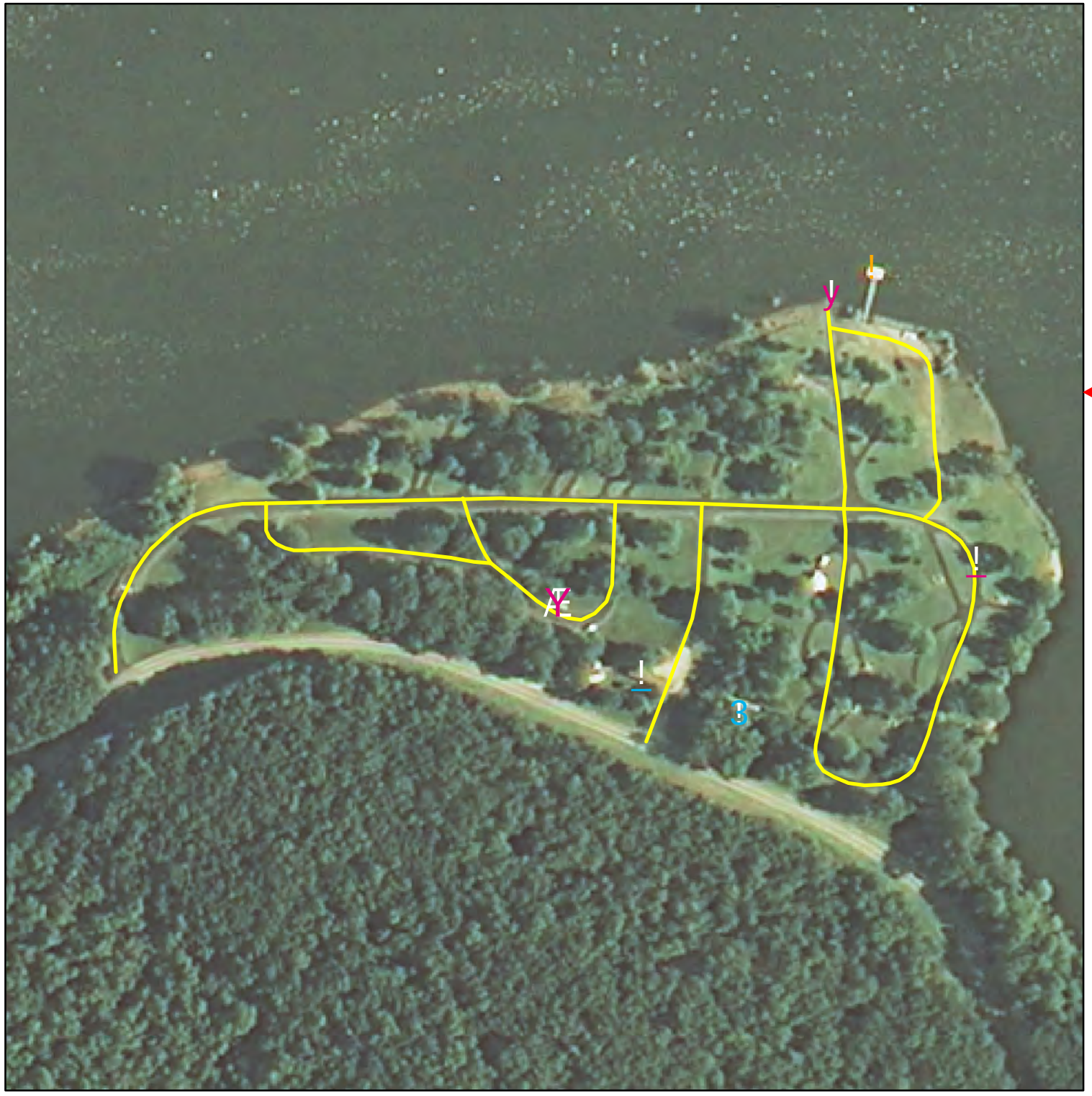
U.S. Army Corps of Engineers
Tulsa District

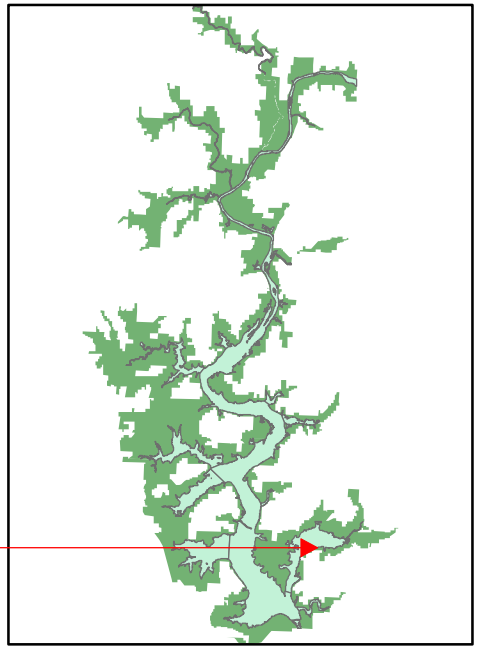
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

WAHOO BAY
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-10





Legend

- Boat Ramp
- Courtesy Dock
- Dump Station
- Gate Shack
- Picnic Shelter
- Playground
- Restroom (Waterborne)
- Showers
- Swim Beach
- Vault Toilet
- Park Roads

0 90 180 270 360

Feet

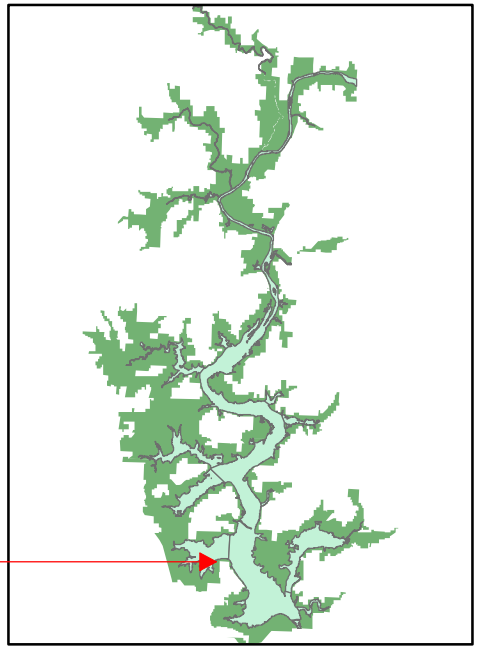
U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

WILDWOOD
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-11



Legend

- y Boat Ramp
- ! Courtesy Dock
- Y Dump Station
- f Gate Shack
- 3 Picnic Shelter
- 8 Playground
- Restroom (Waterborne)
- p Showers
- r Swim Beach
- Vault Toilet
- Park Roads

0 180 360 540 720

Feet

U.S. Army Corps of Engineers
Tulsa District

Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE
FORT GIBSON MASTER PLAN

JACKSON BAY
PUBLIC USE AREA

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-RP-12

APPENDIX B

APPLICABLE FEDERAL STATUTES

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Statute	Compliance
PL 88-578, Land and Water Conservation Act of 1965, as amended, (USC 4601)	✓
PL 89-72, Federal Water Project Recreation Act of 1965	✓
PL 91-190, The National Environmental Policy Act of 1969 (42 USC 4321)	✓
PL 91-611, Flood Control Act of 1970, Section 234 (84 Stat. 1833)	✓
PL 94-587, Section 120 (90 Stat. 2917), Water Resources Development Act (WRDA) of 1976, as amended by PL 96-536, (94 Stat. 3166)	✓
PL 95-224, (92 Stat. 3), Federal Grant and Cooperative Agreement Act of 1977	✓
PL 98-63, Section 164 (5 USC 5901)m Supplemental Appropriations Act of 1983	✓
PL 102-580, WRDA of 1992, (106 Stat. 4838, 33usc 2328, Sec. 203)	✓
PL 103-66, Omnibus Budget Reconciliation Act of 1993	✓
EO 11644, "Use of Off-Road Vehicles on the Public Lands," February 8, 1972 (37 FR 2877, February 9, 1973)	✓
5 CFR, Part 1320	✓
36 CFR, Part 71, Recreation Fees	✓
36 CFR, Chapter III, Part 327, Rules and Regulations Governing Public Use of Water Resources Development Projects Administered by the Chief of Engineers (38 FR 75520, 23 March 1973)	✓
AR 335-15, Management Information Control System	✓
Supplement 1 to AR 190-40, Serious Incident Report, (RCS CSGPA-1340 (R1))	✓
ER 25-1-90, Visual Information Management	✓
ER 37-2-10, Accounting and Reporting Civil Works Activities	✓

ER 190-1-50, Law Enforcement Policy, U.S. Army Corps of Engineers	✓
Statute	**Compliance**
ER 360-1-1, Public Affairs	✓
ER 405-1-12, Real Estate Handbook	✓
ER 1110-2-400, Design of Recreation Sites, Areas and Facilities	✓
ER 1130-2-500, Work Management Policies	✓
ER 1130-2-520, Navigational Dredging Operations and Maintenance Policies	✓
ER 1130-2-540, Environmental Stewardship Policies	✓
ER 1165-2-30, Acceptance and Return of Contributed or Advanced Funds	✓
EP 310-1-6, Graphics Standards Manual	✓
EP 310-1-6a, Corps of Engineers Sign Standards Manual, Vol 1	✓
EP 310-1-6b, Corps of Engineers Sign Standards Manual, Vol 2	✓
EP 690-2-2, Career Development Guide for Civil Works Natural Resources Management Team Members	✓
EP 1130-2-434, Volume 1-5, JS, DI, FS, Interpretive Services and Outreach Program	✓
EP 1130-2-500, Work Management Procedures	✓
EP 1130-2-550, Recreation Operations and Maintenance	✓
EM 385-1-1, Safety and Health Requirements Manual	✓
EM 1110-1-400, Recreation Planning and Design Criteria	✓

APPENDIX C

PUBLIC SCOPING MEETING ANNOUNCEMENTS

For
The Master Plan
And
The Draft Environmental Assessment

Fort Gibson Lake
Cherokee, Mayes, and Wagoner Counties
OKLAHOMA
April 2015

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~ Announcing ~
OPEN HOUSE WORKSHOP
as related to the
Master Plan Review/Revision
Fort Gibson Lake, Oklahoma

The Tulsa District, U.S. Army Corps of Engineers will host an open house workshop related to the review and revision of the project master plan (MP) for Fort Gibson Lake, Mayes, Wagoner, and Cherokee Counties, Oklahoma. Interested persons are invited to stop by the open house to visit the information tables and discuss the project with Corps personnel. The open house will be conducted between 6:00 - 8:00 p.m. on Tuesday, April 15, 2014 in an informal, come-and-go format with no formal presentation. While attendees will be provided forms for providing input and comments on revision of the lake master plan, comments are welcome in any form throughout the MP revision process. The open house workshop will be held at:

City of Wagoner Civic Center
301 South Grant Avenue · Wagoner, OK 74467
Tuesday, April 15, 2014
6:00-8:00 p.m.
Master Plan (MP)

The Tulsa District is initiating a review and revision of the MP for Fort Gibson Lake. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. It is important to note that the MP does not address issues associated with private boat docks or permits for shoreline vegetation modification. These issues are specifically addressed in the shoreline management plan (SMP) for a lake project. The SMP for Fort Gibson Lake will be reviewed and potentially revised at a later date. Private dock and shoreline vegetation modification permits will be addressed at that time, and not in the current MP review process. Comments and questions regarding the open house workshop or MP review process can be directed to:

Mr. Tom Heathcock
Fort Gibson Lake Manager
8568 State Highway 251-A
Fort Gibson, OK 74434
Phone: 918-682-4314
e-mail: Tom.Heathcock@usace.army.mil

DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Ron Curry
Federal Region VI Administrator
U. S. Environmental Protection Agency
1445 Ross Ave., Suite 1200
Dallas, TX 75202

Dear Mr. Curry:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

It is important to note that a master plan does not address issues associated with private boat docks or permits for shoreline vegetation modification. These issues are specifically addressed in the shoreline management plan (SMP) for a lake project. The SMP for Fort Gibson Lake will be reviewed and revised at a later date. Private dock and shoreline vegetation modification permits will be addressed at that time and not in the current MP revision process.

An informal public workshop for discussion of the MP revision for Fort Gibson Lake is scheduled for 6:00 to 8:00 p.m. on April 15, 2014, at the City of Wagoner Civic Center, 301 S. Grant Avenue, Wagoner, Oklahoma. The workshop will be come-and-go format with no formal presentation. We invite and encourage you to attend this workshop anytime between listed times, visit the information tables, and discuss MP issues with our staff. Comment forms will be provided at the workshop or you are welcome to submit comments in any form throughout the MP revision process.

Thank you for your interest in Fort Gibson Lake. We welcome your comments and participation at the public workshop and throughout the master plan review process. Questions should be directed to Mr. Tom Heathcock, Fort Gibson Lake Manager, at 918-682-4314 or e-mail Tom.Heathcock@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

Mailing list

Mr. Ron Curry
Federal Region VI Administrator
U. S. Environmental Protection Agency
1445 Ross Ave., Suite 1200
Dallas, TX 75202

Mr. Jontie Aldrich, Acting Field Supervisor
U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 E. 21st St.
Tulsa, OK 74129- 1428

Mr. Gary O'Neill
State Conservationist
USDA, Natural Resources Conservation Service
100 USDA, Suite 206
Stillwater, OK 74074-2655

Mr. Richard Hatcher
Director
Oklahoma Department of Wildlife Conservation
1801 N. Lincoln Blvd.
Oklahoma City, OK 73105

Mr. Steve Thompson
Executive Director
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

Mr. J. D. Strong
Executive Director
Oklahoma Water Resources Board
3800 N. Classen Boulevard
Oklahoma City, OK 73118

Mr. Derek Smithee
Chief, Water Quality Programs Division
Oklahoma Water Resources Board
3800 North Classen Boulevard
Oklahoma City, OK 73118

Mr. Mike Thralls
Executive Director
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Ms. Shanon Phillips, Director
Water Quality Programs
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Mr. Ian H. Butler
Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
111 E. Chesapeake Street
Norman, OK 73019-0575

Dr. Robert L. Brooks
University of Oklahoma
Oklahoma Archeological Survey
111 E. Chesapeake
Norman, OK 73019-0575

Dr. Bob Blackburn
State Historic Preservation Officer
Oklahoma Historical Society
Oklahoma History Center
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

Ms. Deby Snodgrass
Executive Director
Oklahoma Tourism and Recreation Department
120 N. Robinson
Oklahoma City, OK 73102

Fort Gibson Lake Association
Visitor Center / Blake Park
300 S. Dewey, Wagoner, OK 74467
918-485-4623

Sequoyah State Park/Sequoyah Bay State Park
17131 Park 10
Hulbert, OK 74441
Phone: 918-772-2545
Toll Free: 800-654-8420

Oklahoma Department of Wildlife Conservation

Street Address	Postal Address
1801 N. Lincoln Blvd	PO Box 53465
OKC, OK 73105	OKC, OK 73152

Oklahoma Department of Wildlife Conservation
Northeast Regional Office – Mike Plunkett
ODWC
9097 N. 34th St. West
Porter, Ok 74454

U.S. Fish and Wildlife Service
222 S Houston Ave, #A,
Tulsa, OK 74127

Wagoner County Commissioners
307 E Cherokee St.
Wagoner, OK 74467

Cherokee County Commissioners
213 W. Delaware St.
Tahlequah, OK 74464

Mayes County Commissioners
1 Court Place, Ste 140
Pryor, OK 74361

Mid America Industrial Park
Larry Williams
MidAmerica Industrial Park
P O Box 945
Pryor Creek OK 74362-0945

Pryor Creek Concession
PO Box 130
Chouteau, OK 74337
Taylor Ferry Marina
34179 Marina Dr.
Wagoner, OK 74467

Long Bay Marina
8431 E. 570 Rd.
Catoosa, OK 74015

Jackson Bay Marina
4828 E. 115th St. N.
Wagoner, OK 74467

Whitehorn Cove Marina
34561 E. 700 Rd.
Wagoner, OK 74467

Mazie Landing
PO Box 490
Chouteau, OK 74437

Sequoyah Bay Marina
6372 E. 101st N.
Wagoner, OK 74467

Paradise Cove Marina
2429 Park 56
Hulbert, OK 74441

Oklahoma Department of Transportation
200 N.E. 21st Street
Oklahoma City, OK 73105

Mayor, Hulbert, Oklahoma
Honorable Shirley Teague
PO Box 147
Hulbert, OK 74441

Mayor, Fort Gibson, Oklahoma
Honorable Brad Clinkenbeard
PO Box 218
Fort Gibson, OK 74434

Mayor, Wagoner, Oklahoma
Honorable James Jennnings
PO Box 406
Wagoner, OK 74477

Mayor, Pryor, Oklahoma
Honorable Jimmy Tramel
PO Box 1167
Pryor, OK 74362

Mayor, Chouteau, Oklahoma
Honorable Jerry Floyd
PO Box 819
Chouteau, OK 74337

Mayor, Okay, Oklahoma
Honorable Clarence Ashley
PO Box 505
Okay, OK 74446

Chief Tarpie Yargee
Alabama-Quassarte Tribal Town, Oklahoma
P.O. Box 187
Wetumka, OK 74883

Chairperson Brenda Shemayme Edwards
Caddo Indian Tribe of Oklahoma
P.O. Box 487
Binger, OK 73009

Principal Chief Bill John Baker
Cherokee Nation, Oklahoma
P.O. Box 948
Tahlequah, OK 74465

Mekko Tiger Hobia
Kialegee Tribal Town, Oklahoma
P.O. Box 332
Wetumka, OK 74883

Principal Chief A.D. Ellis
Muscogee (Creek) Nation, Oklahoma
P.O. Box 580
Okmulgee, OK 74447

Principal Chief Scott Bighorse
Osage Nation, Oklahoma
P.O. Box 779
Pawhuska, OK 74056

Principal Chief Leonard Harjo
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Mekko George Scott
Thlopthlocco Tribal Town, Oklahoma
P.O. Box 188
Okemah, OK 74859

Chief George Wickliffe
United Keetoowah Band of Cherokee Indians in Oklahoma
P.O. Box 746
Tahlequah, OK 74465-0746

President Leslie Standing
Wichita and Affiliated Tribes of Oklahoma
P.O. Box 729
Anadarko, OK 73005

APPENDIX D

NEPA DOCUMENTATION

Draft Environmental Assessment
for the
Master Plan
Fort Gibson Lake
Cherokee, Mayes, and Wagoner Counties
OKLAHOMA
October 2015

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US Army Corps of Engineers
Tulsa District

DRAFT

Environmental Assessment

FOR THE

MASTER PLAN

Fort Gibson Lake

Cherokee, Mayes, and Wagoner Counties

OKLAHOMA

Tulsa District

U.S. Army Corps of Engineers

October 2015

DRAFT FINDING OF NO SIGNIFICANT IMPACT
FORT GIBSON LAKE MASTER PLAN
GRAND (NEOSHO) RIVER, OKLAHOMA

In accordance with the National Environmental Policy Act of 1969, including guidelines in 33 Code of Federal Regulations, Part 230, the Tulsa District has assessed the environmental impacts of the Fort Gibson Lake Master Plan revision.

The revised Master Plan will provide guidance for stewardship of natural resources and management for long-term public access to, and use of, the natural resources of Fort Gibson Lake. The Master Plan provides a comprehensive description of the project, a discussion of factors influencing resource management and development, an identification and discussion of special problems, a synopsis of public involvement and input to the planning process, and descriptions of existing development. The Master Plan revision only concerns areas under the ownership of the U.S. Army Corps of Engineers and does not directly address issues associated with private boat docks or permits for shoreline vegetation modification.

Under the No Action alternative, the 1978 Master Plan would not be revised. The No Action alternative was eliminated from further consideration because the 1978 Master Plan is out of date due to changes in project use conditions and pertinent laws and policies. If the 1978 Master Plan was not revised, future developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of an overall plan.

The recommended alternative would result in the classification and reclassification of lands allowing for the most efficient and cost-effective management, development, and use of areas under the ownership of the U.S. Army Corps of Engineers. Land reclassification components of the recommended alternative include:

ID#	DESCRIPTION	JUSTIFICATION
1	2.1 acres nearshore southwest of Wildwood PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
2	2.9 acres nearshore at cove 0.65 miles southeast of Snug Harbor PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
3	0.7 acre nearshore north of Jackson Bay PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
4	1.1 acre nearshore south of Snug Harbor PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
5	0.3 acre nearshore south of Taylors Ferry PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
6	3.5 acres nearshore near Rocky Point PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
7	45.5 acres north of Mallard Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
8	0.6 acre island in Fourteen Mile Creek east of Sequoyah State Park classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
9	15.1 acres north of Sequoyah State Park classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
10	54.9 acres near Wildwood PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat

ID#	DESCRIPTION	JUSTIFICATION
11	3.3 acres near Hulbert Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
12	460.4 acres around Hickory Cove on east side of lake classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
13	58.2acres in two areas near Big Hollow Creek PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
14	29.3 acres just north of Mazie Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
15	24.3 acres just north of Chouteau Creek confluence near Chouteau Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
16	91.8 acres near Mission Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
17	105.8 acres north of Cat Creek Cove classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
18	67.0 acres, in two areas, near Jackson Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
19	155.7 acres, in two areas, near Wahoo Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
20	1.6 acres north of Sequoyah Bay Marina classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
21	273.4 acres south of Whitehorn Cove PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
22	76.9 acres southeast of Snug Harbor PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
23	253.5 acres, in two areas, near Flat Rock Creek PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
24	207.0 acres near Blue Bill Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
25	236.4 acres on the south side of North Bay west of Toppers PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
26	1.3 acre near Toppers PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
27	3.0 acres near Rocky Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
28	138.4 acres near Snug Harbor PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
29	9.4 acres near Long Bay Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
30	11.4 acres near Long Bay Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
31	64.7 acres south of North Bay and east of Wagoner classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
32	5.1 acres south of Taylors Ferry PUA, south of Hwy 51, classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
33	28.4 acres, in three areas, near Taylors Ferry PUA and along Hwy 51 classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
34	54.2 acres north of Sequoyah State Park and Hwy 51 classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
35	211.4 acres near Beg Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
36	5 acres near Rocky Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
37	106.3 acres, in three areas, west of dam classified as High Density Recreation reclassified as Project Operations	Area(s) not properly classified in 1978 MP
40	1.1 acre island just east of Taylor Ferry PUA north of Hwy 51 classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
41	221.2 acres south of Mission Bend PUA classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
42	0.4 acre island just east of Taylor Ferry PUA north of Hwy 51 classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area

ID#	DESCRIPTION	JUSTIFICATION
44	302.3 acres west of dam classified as Low Density Recreation reclassified as Project Operations	Area incorrectly classified in 1978 MP
45	237.0 acres east of dam classified as Low Density Recreation reclassified as Project Operations	Area incorrectly classified in 1978 MP
46	42.3 acres north of and adjacent to Ear Bob Cove classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
47	23.2 acres east of Low Water Dam classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
48	20.0 acres south of Mazie Landing classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
49	107.8 acres on western shore just south and east of Whitehorn Cove classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
50	480.8 acres east of Spring Creek PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
51	53.6 acres adjacent to Basore Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
52	41.4 acres nearshore north of Basore Cove extending up Fourteen Mile Creek classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
53	21.1 acres, in three areas, on the east side of Fourteen Mile Creek classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
54	704.3 acres near and east of Mallard Bay PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
55	8.1 acres just south of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
56	241.7 acres at the east end of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
57	74.4 acres north of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
58	1,394.3 acres south of Big Hollow PUA and south of Big Bend PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
59	1,820.9 acres on the western side south of Mission Bend PUA and North of Cat Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
60	618.8 acres on the eastern side of reservoir near and south of Spring Creek PUA extending south to near Big Hollow PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
61	11,544.2 acres on the western side of the reservoir extending south, west, and north of Brushy Creek Cove, extending north along Chouteau Creek, and continuing north along Pryor Creek, classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
62	376.6 acres north of Hulbert Landing PUA and north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
63	329.5 acres east of Hulbert Landing PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
64	339.5 acres, in two parts, north of Fourteen Mile Creek and north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

ID#	DESCRIPTION	JUSTIFICATION
65	51.9 acres on the east side of the reservoir north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
66	160.3 acres near Taylor Ferry PUA south of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
67	405.2 acres on eastern side of reservoir near Big Bend PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
68	212.4 acres near Big Hollow PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
69	314.7 acres between Mazie Landing and Mission Bend PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
70	46.9 acres north of Mazie Landing PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
71	139.3 acres on the west side of the reservoir between Flat Rock Creek Cove and Cat Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
72	65.5 acres west of Hickory Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
73	4,620.0 acres extending north from Spring Creek PUA along the eastern side of the reservoir along the Grand River, extending up Crutchfield Branch, up to near the Markham Ferry Dam classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
74	596.8 acres west of Mallard Bay PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
75	39.6 acres south of Jackson Bay PUA on the western side of the reservoir classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
76	171.0 acres southwest of Whitehorn Cove PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
77	953.7 acres along the northern side of North Bay classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
78	43.6 acres nearshore west of Whitehorn Cove PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
79	627.2 acres near Flat Rock Bay north and northwest of Flat Rock Creek PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
80	16.0 acres south of Blue Bill Point and west of Rocky Point PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
81	234.5 acres north of Long Bay south and southwest of Toppers classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
82	283.0 acres between Long Bay Landing and Taylor Ferry PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
83	12.6 acres near the northern mouth of Jackson Bay classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

ID#	DESCRIPTION	JUSTIFICATION
84	59.6 acres north of Snug Harbor and south of Rocky Point PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
85	84.5 acres south of Snug Harbor PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
86	1.4 acre in the Hulbert Landing area just east of Fourteen Mile Creek Cove classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
87	19.9 acres south of North Bay and east of Wagoner classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
88	25.3 acres just east of Wildwood PUA classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
89	0.6 acre on the east nearshore area just downstream of the dam classified as Project Operations reclassified as High Density Recreation	New classification represents current use
90	15.2 acre island in Fourteen Mile Creek east of Sequoyah State Park classified as High Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
91	29.6 acres adjacent to the eastern portion of Hickory Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

The EA and comments received from other agencies have been used to determine whether the recommended alternative requires the preparation of an environmental impact statement (EIS). All environmental, social, and economic factors that are relevant to the recommended alternative were considered in this assessment. These include, but are not limited to, climate and climate change, environmental justice, cultural resources, air quality, prime farmland, water quality, wild and scenic rivers, wetlands, fish and wildlife, invasive species, migratory birds, recreational fisheries, and threatened and endangered species.

It is my finding, based on the EA, that the revision of the 1978 Master Plan for Fort Gibson Lake will have no significant adverse impact to the environment and will not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an EIS will not be prepared.

_____ _____

Date

Richard A. Pratt
Colonel, U.S. Army
District Commander

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) evaluates the effects of implementing the revised Master Plan for Fort Gibson Lake, Cherokee, Mayes, and Wagoner Counties, Oklahoma. This EA facilitates the decision process regarding the proposed action and alternatives.

SECTION 1	*INTRODUCTION, PURPOSE, NEED AND SCOPE* of the proposed action summarizes the purpose of a need for the proposed action, provides relevant background information and describes the scope of the EA.
SECTION 2	*ALTERNATIVES INCLUDING PROPOSED ACTION* examines alternatives for implementing the proposed action and describes the recommended action.
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, including cumulative effects. *MITIGATION* summarizes mitigation actions required to enable a Finding of No Significant Impact for the proposed alternative.
SECTION 4	*APPLICABLE ENVIRONMENTAL LAWS, REGULATIONS, and POLICY* provides a listing of environmental protection statutes and other environmental requirements.
SECTION 5	*FEDERAL, STATE AND LOCAL AGENCY COORDINATION* provides a listing of individuals and agencies consulted during preparation of the EA.
SECTION 6	*LIST OF PREPARERS* identifies persons who prepared the document and their areas of expertise.
SECTION 7	*REFERENCES* provides bibliographical information for cited sources.
APPENDICES	*A* NEPA Coordination and Scoping *B* Fish and Wildlife Coordination *C* Maps of Land Use Classification Change

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

DRAFT
ENVIRONMENTAL ASSESSMENT

Master Plan Revision

Fort Gibson Lake
Cherokee, Mayes, and Wagoner Counties, Oklahoma

1.0 INTRODUCTION

The Master Plan (MP) is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. The MP guides the efficient and cost-effective management, development, and use of project lands. It is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

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

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

1.1 PURPOSE AND NEED FOR THE ACTION

The MP for Fort Gibson Lake was last approved in 1978 and supplemented in 1993 (Sup. No. 8), 1987 (Sup. No. 7, 6, 5), 1986 (Sup. No. 4), 1984 (Sup. No. 3), 1982 (Sup. No. 2), and 1981 (Sup. No. 1). Revision of the MP is now required for the following reasons:

- Most of the approved plans in the supplements have been implemented;
- The existing plan format and mapping technology is outdated and not compliant with current MP format and technology requirements;
- Current USACE policies/regulations, budget processes, business line performance measures, and priorities are not reflected;

- Customer uses, trends, and facility and service demands have changed significantly the past 30 years;
- Shoreline Management development demands, and resulting environmental and management issues have continued to increase causing sustainability concerns; and
- Partners and stakeholders are increasingly more engaged with the USACE and seek to leverage improvements and innovations to increase and sustain benefits provided by the lake.

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

The MP is not intended to address the specifics of regional water quality, shoreline management, or water level management; these areas are covered in a project's shoreline management plan or water management plan. However, specific issues identified through the MP revision process can still be communicated and coordinated with the appropriate internal USACE resource (i.e. Operations for shoreline management) or external resource agency (i.e. Oklahoma State agencies such as Oklahoma Department of Wildlife Conservation [ODWC] , Oklahoma Department of Environmental Quality [ODEQ], Oklahoma Water Resources Board [OWRB], etc.) responsible for that specific area.

1.2 PROJECT HISTORY AND SETTING

The Fort Gibson Lake Dam is located on the Grand (Neosho) River at river mile 7.7, in Cherokee and Wagoner Counties, Oklahoma (Figure 1.1). The project dam site is approximately five miles north of the town of Fort Gibson, Oklahoma, about 12 miles northeast of Muskogee, and approximately 50 miles southeast of Tulsa, Oklahoma. The reservoir extends north upstream from the dam about 39 miles through Cherokee, Wagoner, and Mayes counties to a point just downstream from the Markham Ferry Dam Site (Lake Hudson).

This EA includes all of Fort Gibson Lake and its appurtenant structures including the earthen embankment (dam), spillway, and outlet works; and surrounding lands managed by the USACE as part of Fort Gibson Lake. Total drainage area for the lake is 12,494 square-miles.

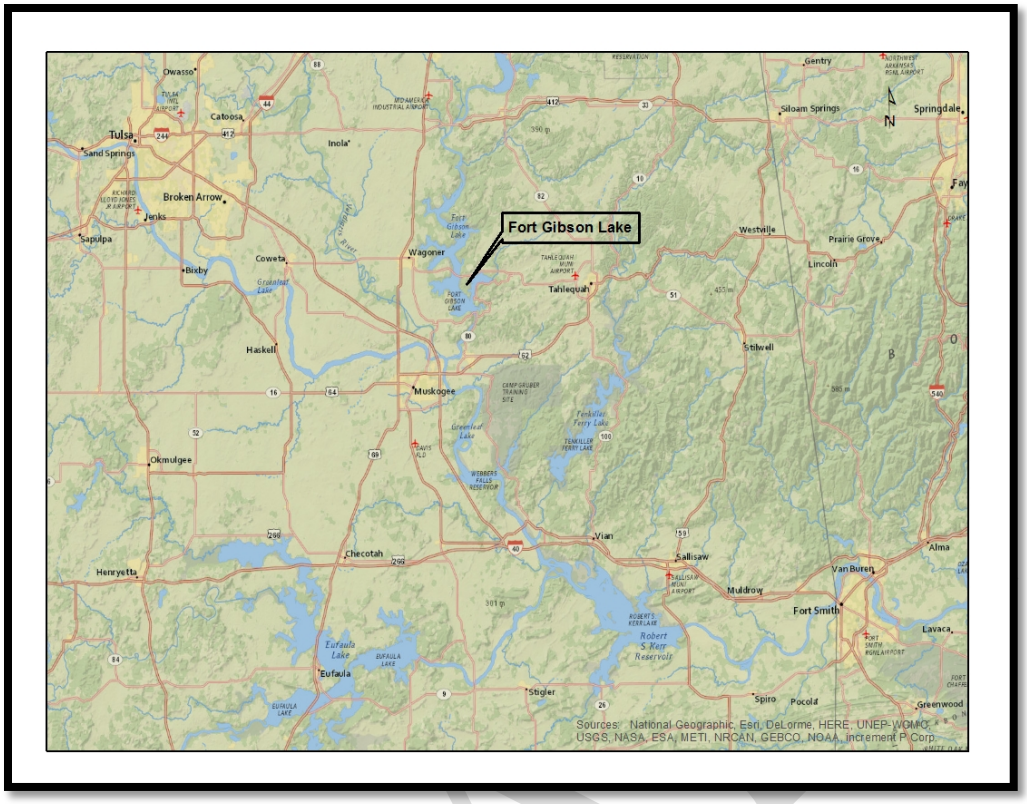

Figure 1.1 Vicinity Map

Fort Gibson Dam and Reservoir was authorized by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session). The departmental authority for administration of land and water areas related to Fort Gibson Lake is contained in Section 4 of the Flood Control Act, approved 22 December 1944 (58 Stat. 889), and by Section 4 of the Flood Control Act of 1946 (60 Stat. 642), as further amended by Section 209 of the Flood Control Act of 1954, which was approved 3 September 1954. Fort Gibson Lake was incorporated in the Arkansas River multipurpose plan by the River and Harbor Act of 24 July 1946; Project document HD 107, 76th Congress, 1st Session; and the Water Resources Development Act of 1986 (Public Law 99-662). Project purposes are flood control and hydroelectric power generation. The authority relative to the initial preparation of the MP is contained in ER 1130-2-550.

Construction of the dam and reservoir was initiated in 1941, was suspended during World War II, and resumed in May 1946. Closure of the embankment was completed in June 1949. The project became fully operational when the last of the four generators started producing commercial power in September 1953.

The dam includes two concrete, gravity, non-overflow sections. One section is 285 feet long and extends from the spillway to the earth embankment at the right abutment. The other section is 460 feet long and extends from the intake structure to the earth embankment at the left abutment. The dam also includes two earth embankment sections, one of which extends about 374 feet from the natural ground at the right abutment to the right bank, concrete, non-overflow section. The other embankment is 63 feet long,

extending from the left abutment to the left bank, concrete, non-overflow section. The powerhouse intake structure is located adjacent to the spillway on the left and is 318 feet long. The total length of the structures, including the spillway, is 2,990 feet, and the maximum height above the streambed is 110 feet. Oklahoma State Highway 251A extends across the top of the structures. There are seven rolled earth-filled dikes on the west side of the reservoir, which have a total length of 21,678 feet.

The spillway section is a concrete, gravity, ogee weir that extends across the existing river channel and a major portion of the right bank floodplain. Spillway capacity is 986,000 cubic feet per second at the top of the flood control pool. The spillway is equipped with thirty 40- by 35-foot tainter gates operated by individual electric-motored hoists. The total length of the spillway is 1,490 feet. Outlet works consist of ten 5-foot-8-inches by 7-foot rectangular sluices located through the spillway weir. Capacity of the outlet works varies from 21,000 cfs, at the flood control pool elevation with no spillway discharge, to 14,400 cfs at the flood control pool elevation with the spillway discharging at full capacity. Flows through the sluices are controlled by a means of hydraulically operated, cast-iron slide gates. Emergency closure of the sluices can be accomplished using a bulkhead lowered by a hoist into frames provided at the sluice entrances. A 48-inch-diameter pipe is located through the right abutment of the dam for municipal water supply for the city of Muskogee. Bank-full capacity on the Grand (Neosho) River below the dam is about 100,000 cfs. The area of the lake at the top of the power pool (554.0 feet MSL) is 19,900 acres with shoreline length of approximately 225 miles. The powerhouse contains four 11,250-kilowatt generators and a concrete penstock provides water for each power unit. Flow through each penstock is controlled by two 14-foot-6 inches by 20-foot-2.25-inches caterpillar type gates. Pertinent lake data is shown in Table 1-1.

Table 1-1 Fort Gibson Lake Pertinent Data*.

Feature	Elevation (feet MSL)	Area (acres)	Capacity (acre-feet)	Equivalent Runoff [(1)] (inches)
Top of Dam	593.0	-	-	-
Maximum Pool	582.0	-	-	-
Top of Spillway Gates and Flood Control Pool	582.0	51,000	1,284,400	1.93
Flood Control Storage	554.0 – 582.0	-	919,200	1.38
Top of Power Pool	554.0	19,900	365,200	0.55
Bottom of Power Pool	551.0	16,950	311,300	0.50
Spillway Crest	547.0	14,500	248,400	0.37

[(1)] From the 12,494 square-mile drainage area above the dam.

*Source: US Army Corps of Engineers, Tulsa District, PERTINENT DATA BOOK, March 2004 (U.S. ACE - Tulsa District, 2004)

The Grand River, in the Fort Gibson project area, forms a boundary between Level III Ecoregions including the Central Irregular Plains to the west, and the Ozark Highlands and the Boston Mountains to the east. Within the western portion of the project area the Level IV Ecoregion is the Osage Cuestas characterized by irregular to undulating plains broken by low hills and cuestas with east facing scarps where elevations range from 500 to 1050 feet above sea level with local relief varying by 50 to 200 feet. Perennial streams occur dominated by pools having substrates composed of sand, mud, and some gravel and cobbles. Riffle areas are moderately common. In the area of the Fort Gibson Lake project, streams often move slowly and are fairly turbid.

The southeastern portion of the project area, south of Clear Creek, is within the Lower Boston Mountains Level IV Ecoregion. This area, within the Ozark Plateau physiographic province, is characterized by low mountains, rounded hills, and benches with elevations ranging from 475 to 1700 feet above sea level and local relief of 150 to 800 feet. In summer, streams typically have little or no flow, but enduring pools fed by interstitial flow occur. Some larger pools may have organic or mud substrates. Stream substrates are mostly rocky consisting of gravel, cobbles, and boulders.

North of the Lower Boston Mountains ecoregion, the bulk of the eastern portion of the project area lies within the Dissected Springfield Plateau-Elk River Hills Level IV Ecoregion of the Ozark Highlands. This area is a moderately to highly dissected portion of the Springfield Plateau physiographic region. Here narrow ridgetops are separated by steep V-shaped valleys where Karst features are common. Elevations range from 550 to 1600 feet above sea level while local relief ranges from 50 to 400 feet. Cool springs occur in valleys and along streams which substantially contribute to streamflow in the summer and fall resulting perennial streams. Bank and hillslope erosion chokes some channel reaches with cherty gravel resulting in braiding, while other reaches have bedrock substrates.

A much smaller portion of the eastern Fort Gibson Lake project area, north of US 412, is within the Springfield Plateau Level IV Ecoregion. This is a nearly level to rolling, undissected to slightly dissected, portion of the Springfield Plateau physiographic province with elevations ranging from 600 to 1200 feet above sea level with local relief in the range of 50 to 200 feet. Karst features are common including caves, sinkholes, solution valleys, and dry valleys, and underground drainage is widespread. Cool springs are common and contribute substantially to stream flow in the summer and fall resulting in many perennial streams. Small cobble and gravel stream substrates are common, but occasional areas of boulders and bedrock occur.

2.0 ALTERNATIVES AND PROPOSED ACTION

Alternatives evaluated in this Environmental Assessment are compared to each other and to the No Action Alternative. Based on the public comments received, the final EA compares all action and no action alternatives to present a preferential alternative called the Preferred Alternative.

2.1 ALTERNATIVES

Alternative 1: No Action
The No Action Alternative is defined as the USACE taking no action and not updating the December 1993, Supplement Number 8, of the 1978 MP. With this alternative, no new resources analysis and classification would occur at the project. The present allocation (now termed "classification") of project land area includes Project Operations (88.4 acres), Recreation – Intensive Use (8,051.2 acres, including leased and licensed areas, and Public Use Areas), Recreation – Low Density (28,813.3 acres), and Wildlife Management (19,342.8 acres). The operation and management of Fort Gibson Lake would continue as outlined in the current MP. Since construction, total fee acres managed as part of Fort Gibson Lake have been reduced through disposal of some project lands. Project lands currently include 75,168.80 acres in fee, of which 55,814.89 acres are usable at the conservation pool (554.0 ft).

Alternative 2: Land classification naming convention updated, classifications remain unchanged, and total fee area adjusted to meet current mapped boundary (480.8 acres, primarily classified as Recreation - Low Density, disposed).

With the updated naming convention the classifications would be as follows:

- Project Operations, 88.4 acres
- High Density Recreation, 8,051.2 acres
- Low Density Recreation, 28,332.4 acres
- No Environmentally Sensitive Areas
- Wildlife Management, 19,342.8 acres

Alternative 3: Land allocation changes to reflect changes in land classifications to meet authorized project purposes, natural resource management objectives, and recreation management objectives. Land classification changes include:

- Project Operations area increase to 733.2 acres
- High Density Recreation area decrease to 5,485.2 acres
- Low Density Recreation area decrease to 112.7 acres
- Environmentally Sensitive Areas established accounting for 237.8 acres
- Wildlife Management area increase to 49,245.9 acres

Alternative 4: Reclassification of all project lands to High Density Recreation, excluding Project Operations and ODWC managed wildlife areas, to meet authorized project purposes and maximize recreation management objectives:

- Project Operations area increase to 733.2 acres
- High Density Recreation area increase to 35,738.8 acres
- Low Density Recreation areas eliminated (0 acres)
- No Environmentally Sensitive Areas
- Wildlife Management area as in Alternative2, 19,342.8 acres

Alternative 5: Reclassification of all project lands to wildlife management, excluding areas required for Project Operations and leased and licensed areas, to meet authorized project purposes and maximize natural resource management objectives:

- Project Operations area increase to 733.2 acres
- High Density Recreation area 5,485.2 acres
- Low Density Recreation area eliminated (0 acres)
- No Environmentally Sensitive Areas
- Wildlife Management area increase to 49,596.4 acres

2.2 PROPOSED ACTION

The proposed action is **Alternative 3**. The proposed action would result in the classification and/or reclassification allowing for the most efficient and cost-effective management, development, and use of project lands. Components of the proposed action are presented in Table 2-1. Maps identifying locations of the reclassified areas, by identification number (ID#), are included in Appendix C.

Table 2-1 Land Use Changes Associated with the Proposed Action.

ID#	DESCRIPTION	JUSTIFICATION
1	2.1 acres nearshore southwest of Wildwood PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
2	2.9 acres nearshore at cove 0.65 miles southeast of Snug Harbor PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
3	0.7 acre nearshore north of Jackson Bay PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
4	1.1 acre nearshore south of Snug Harbor PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
5	0.3 acre nearshore south of Taylors Ferry PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
6	3.5 acres nearshore near Rocky Point PUA classified as High Density Recreation reclassified as Low Density Recreation	Area not suitable for High Density Recreation
7	45.5 acres north of Mallard Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
8	0.6 acre island in Fourteen Mile Creek east of Sequoyah State Park classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
9	15.1 acres north of Sequoyah State Park classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
10	54.9 acres near Wildwood PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat

ID#	DESCRIPTION	JUSTIFICATION
11	3.3 acres near Hulbert Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
12	460.4 acres around Hickory Cove on east side of lake classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
13	58.2acres in two areas near Big Hollow Creek PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
14	29.3 acres just north of Mazie Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
15	24.3 acres just north of Chouteau Creek confluence near Chouteau Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
16	91.8 acres near Mission Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
17	105.8 acres north of Cat Creek Cove classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
18	67.0 acres, in two areas, near Jackson Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
19	155.7 acres, in two areas, near Wahoo Bay PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
20	1.6 acres north of Sequoyah Bay Marina classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
21	273.4 acres south of Whitehorn Cove PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
22	76.9 acres southeast of Snug Harbor PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
23	253.5 acres, in two areas, near Flat Rock Creek PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
24	207.0 acres near Blue Bill Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
25	236.4 acres on the south side of North Bay west of Toppers PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
26	1.3 acre near Toppers PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
27	3.0 acres near Rocky Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
28	138.4 acres near Snug Harbor PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
29	9.4 acres near Long Bay Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
30	11.4 acres near Long Bay Landing PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
31	64.7 acres south of North Bay and east of Wagoner classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
32	5.1 acres south of Taylors Ferry PUA, south of Hwy 51, classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
33	28.4 acres, in three areas, near Taylors Ferry PUA and along Hwy 51 classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
34	54.2 acres north of Sequoyah State Park and Hwy 51 classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
35	211.4 acres near Beg Bend PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
36	5 acres near Rocky Point PUA classified as High Density Recreation reclassified as Wildlife Management	Area currently managed for Wildlife Habitat
37	106.3 acres, in three areas, west of dam classified as High Density Recreation reclassified as Project Operations	Area(s) not properly classified in 1978 MP
40	1.1 acre island just east of Taylor Ferry PUA north of Hwy 51 classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
41	221.2 acres south of Mission Bend PUA classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area

ID#	DESCRIPTION	JUSTIFICATION
42	0.4 acre island just east of Taylor Ferry PUA north of Hwy 51 classified as Low Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
44	302.3 acres west of dam classified as Low Density Recreation reclassified as Project Operations	Area incorrectly classified in 1978 MP
45	237.0 acres east of dam classified as Low Density Recreation reclassified as Project Operations	Area incorrectly classified in 1978 MP
46	42.3 acres north of and adjacent to Ear Bob Cove classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
47	23.2 acres east of Low Water Dam classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
48	20.0 acres south of Mazie Landing classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
49	107.8 acres on western shore just south and east of Whitehorn Cove classified as Low Density Recreation reclassified as High Density Recreation	New classification represents current use
50	480.8 acres east of Spring Creek PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
51	53.6 acres adjacent to Basore Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
52	41.4 acres nearshore north of Basore Cove extending up Fourteen Mile Creek classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
53	21.1 acres, in three areas, on the east side of Fourteen Mile Creek classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
54	704.3 acres near and east of Mallard Bay PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
55	8.1 acres just south of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
56	241.7 acres at the east end of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
57	74.4 acres north of Ranger Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
58	1,394.3 acres south of Big Hollow PUA and south of Big Bend PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
59	1,820.9 acres on the western side south of Mission Bend PUA and North of Cat Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
60	618.8 acres on the eastern side of reservoir near and south of Spring Creek PUA extending south to near Big Hollow PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
61	11,544.2 acres on the western side of the reservoir extending south, west, and north of Brushy Creek Cove, extending north along Chouteau Creek, and continuing north along Pryor Creek, classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
62	376.6 acres north of Hulbert Landing PUA and north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
63	329.5 acres east of Hulbert Landing PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
64	339.5 acres, in two parts, north of Fourteen Mile Creek and north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

ID#	DESCRIPTION	JUSTIFICATION
65	51.9 acres on the east side of the reservoir north of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
66	160.3 acres near Taylor Ferry PUA south of Hwy 51 classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
67	405.2 acres on eastern side of reservoir near Big Bend PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
68	212.4 acres near Big Hollow PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
69	314.7 acres between Mazie Landing and Mission Bend PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
70	46.9 acres north of Mazie Landing PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
71	139.3 acres on the west side of the reservoir between Flat Rock Creek Cove and Cat Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
72	65.5 acres west of Hickory Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
73	4,620.0 acres extending north from Spring Creek PUA along the eastern side of the reservoir along the Grand River, extending up Crutchfield Branch, up to near the Markham Ferry Dam classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
74	596.8 acres west of Mallard Bay PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
75	39.6 acres south of Jackson Bay PUA on the western side of the reservoir classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
76	171.0 acres southwest of Whitehorn Cove PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
77	953.7 acres along the northern side of North Bay classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
78	43.6 acres nearshore west of Whitehorn Cove PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
79	627.2 acres near Flat Rock Bay north and northwest of Flat Rock Creek PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
80	16.0 acres south of Blue Bill Point and west of Rocky Point PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
81	234.5 acres north of Long Bay south and southwest of Toppers classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
82	283.0 acres between Long Bay Landing and Taylor Ferry PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
83	12.6 acres near the northern mouth of Jackson Bay classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

ID#	DESCRIPTION	JUSTIFICATION
84	59.6 acres north of Snug Harbor and south of Rocky Point PUAs classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
85	84.5 acres south of Snug Harbor PUA classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage
86	1.4 acre in the Hulbert Landing area just east of Fourteen Mile Creek Cove classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
87	19.9 acres south of North Bay and east of Wagoner classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
88	25.3 acres just east of Wildwood PUA classified as Wildlife Management reclassified as High Density Recreation	New classification represents current use
89	0.6 acre on the east nearshore area just downstream of the dam classified as Project Operations reclassified as High Density Recreation	New classification represents current use
90	15.2 acre island in Fourteen Mile Creek east of Sequoyah State Park classified as High Density Recreation reclassified as Environmentally Sensitive Area	Provide maximum protection for Environmentally Sensitive Area
91	29.6 acres adjacent to the eastern portion of Hickory Creek Cove classified as Low Density Recreation reclassified as Wildlife Management	Area is reclassified to reflect existing management strategy and usage

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A summary of the environmental and social impacts of the "No Action" and the "Proposed Action" alternative are presented in Table 3-1 and Table 3-2. The reasoning for selection of magnitudes of beneficial or adverse impacts presented in the tables is documented in Sections 3.2 through 3.18.

3.1 PROJECT SETTING

Fort Gibson Lake covers 19,900 surface acres at normal conservation pool (elevation 554 feet, mean sea level [MSL]) and increases to 51,000 surface acres at flood pool elevation 582 MSL. The lake has approximately 225 miles of shoreline and provides aquatic habitat for diverse fish communities. The lake watershed is a mosaic of forest, grassland, agriculture, and generally smaller to medium-sized communities and municipalities. The typically undulating topography, with its steep slopes and ravines, is a limiting factor in large-scale intensive, urban development in this part of Oklahoma.

Fort Gibson Lake serves as the downstream unit of a three-lake system on the lower Grand (Neosho) River in Oklahoma, and as a unit in the comprehensive plan for the Arkansas River Basin. Although built primarily for flood risk management and hydroelectric power generation, Fort Gibson is instrumental in the development of the Arkansas River and the McClellan-Kerr Arkansas River Navigation System. Potable water for many area communities is also supplied by storage in the lake.

Topography: Topography at Fort Gibson is undulating to rolling valleys, steep ravines, and hilly slopes. Although clearing activity has taken place over the years, many areas remain forested, especially on steeper slopes. The principal tributaries to the lake in eastern portions of the watershed include Ranger, Double Spring, Fourteen Mile, Clear, and Spring Creeks. Brush, Choteau, Pryor, and Jackson Creeks drain the western portions of the watershed.

The Grand (Neosho) River forms the boundary line between the Cherokee Plains to the east and the Springfield Plateau in the lower part of the dissected ancient westerly sloping plain, which forms the western slope of the Ozark dome. The Grand River watershed to the east reaches isolated elevations in excess of a thousand feet, rising approximately 500 feet above the valley bottom. Adjacent to the river, the higher sections of the Springfield Plateau have an average elevation of 800 feet, approximately 300 feet above the valley bottom. The flat divide between the Grand River and the Verdigris River to the west (Cherokee Plains) has isolated maximum elevations of 800 feet and minimum elevations in low saddles of 573 feet, but the area as a whole averages approximately 600 feet in elevation. The Grand River valley flood plain averages 510 feet in elevation at the proposed site, rising to 580 feet at the upstream edge of the reservoir.

Table 3-1 No Action Impact Assessment Matrix.

Name of Parameter	Magnitude of Probable Impact						
	Increasing Beneficial Impact			No Appreciable Effect	Increasing Adverse Impact		
	Significant	Substantial	Minor		Minor	Substantial	Significant
A. Social Effects							
1. Noise Levels				X			
2. Aesthetic Values					X		
3. Recreational Opportunities				X			
4. Transportation				X			
5. Public Health and Safety					X		
6. Community Cohesion (Sense of Unity)				X			
7. Community Growth and Development				X			
8. Business and Home Relocations				X			
9. Existing/Potential Land Use					X		
10. Controversy				X			
B. Economic Effects							
1. Property Values				X			
2. Tax Revenues				X			
3. Public Facilities and Services					X		
4. Regional Growth				X			
5. Employment				X			
6. Business Activity				X			
7. Farmland/Food Supply				X			
8. Flooding Effects				X			
C. Natural Resource Effects							
1. Air Quality				X			
2. Terrestrial Habitat					X		
3. Wetlands					X		
4. Aquatic Habitat				X			
5. Habitat Diversity and Interspersion					X		
6. Biological Productivity					X		
7. Surface Water Quality				X			
8. Water Supply				X			
9. Groundwater				X			
10. Soils				X			
11. Threatened and Endangered Species					X		
D. Cultural Resources							
1. Historic Architectural Values						X	
2. Pre-Historic & Historic Archeological Values						X	

Table 3-2 Proposed Action Impact Assessment Matrix.

Name of Parameter	Magnitude of Probable Impact						
	Increasing Beneficial Impact			No Appreciable Effect	Increasing Adverse Impact		
	Significant	Substantial	Minor		Minor	Substantial	Significant
A. Social Effects							
1. Noise Levels				X			
2. Aesthetic Values			X				
3. Recreational Opportunities				X			
4. Transportation				X			
5. Public Health and Safety			X				
6. Community Cohesion (Sense of Unity)				X			
7. Community Growth and Development				X			
8. Business and Home Relocations				X			
9. Existing/Potential Land Use		X					
10. Controversy				X			
B. Economic Effects							
1. Property Values				X			
2. Tax Revenues				X			
3. Public Facilities and Services				X			
4. Regional Growth				X			
5. Employment				X			
6. Business Activity				X			
7. Farmland/Food Supply				X			
8. Flooding Effects				X			
C. Natural Resource Effects							
1. Air Quality				X			
2. Terrestrial Habitat		X					
3. Wetlands			X				
4. Aquatic Habitat				X			
5. Habitat Diversity and Interspersion		X					
6. Biological Productivity		X					
7. Surface Water Quality				X			
8. Water Supply				X			
9. Groundwater				X			
10. Soils				X			
11. Threatened and Endangered Species			X				
D. Cultural Resources							
1. Historic Architectural Values			X				
2. Pre-Historic & Historic Archeological Values			X				

Physiography: The Fort Gibson Lake and watershed is situated in three physiographic provinces: the Ozark and Springfield Plateaus in the eastern portions of the lake and watershed, and the Central Irregular Plains in the western portions of the lake and watershed. Within the Ozark and Springfield Plateaus, the Level IV ecoregions of Lower Boston Mountains, Springfield Plateau, and Dissected Springfield Plateau-Elk River Hills comprise the eastern portions of the watershed.

Low mountains, rounded high hills, and benches characterize the Lower Boston Mountains ecoregion. In drier summer months, streams typically have little to no flow, but water still moves through the landscape in interstitial spaces between pools. Stream substrates are mostly rocky and consist of gravel, cobbles, and boulders. In larger water bodies, some organic material or mud substrates may occur.

The Springfield Plateau ecoregion is characterized by nearly level to rolling, undissected to slightly dissected portion of the Springfield Plateau physiographic region. Karst features are common, and include caves, sinkholes, solution valleys, and dry valleys. Underground drainage is widespread. Cool springs are common and substantially contribute to stream flow in the summer and fall. As a result, there are many perennial streams. Small cobble and gravel substrates are common, but occasional areas of boulders and bedrock occur.

The Dissected Springfield Plateau-Elk River Hills ecoregion is characterized by moderately to highly dissected, hilly part of the Springfield Plateau physiographic region. Narrow ridgetops are separated by steep V-shaped valleys. Karst features, including dry valleys, are common. Many cool springs occur in valleys and along streams; they substantially contribute to stream flow in the summer and fall. As a result, streams are usually perennial. Bank and hillslope erosion has choked many channel reaches with cherty gravel, causing them to become braided. Other reaches have bedrock substrates.

The western portions of the lake and watershed are situated in the Osage Cuestas ecoregion of the Central Irregular Plains physiographic province. Cuestas are hills or ridges with a gentle slope on one side and a steep slope on the other side. This ecoregion is characterized by irregular to undulating plains that are broken by low hills and Cuestas with generally east-facing scarps. Perennial streams occur and are dominated by pools having substrates composed of sand, mud, gravel, and/or cobbles. Riffle areas are also generally common composed of gravel, cobbles, and boulders (Woods, et al., 2005).

3.2 CLIMATE AND CLIMATE CHANGE

3.2.1 Affected Environment

The climate of eastern Oklahoma, including Fort Gibson, lies within the humid, subtropical region, with warm, moist air moving northward from the Gulf of Mexico exerting much influence over the eastern and southern portions of the state. This region is characterized by moderate winters and comparatively long, hot summers, with the mean air temperatures of 37°F in January, to 81°F in July, and average annual air temperature around 61ºF. Generally, this part of Oklahoma experiences approximately 60 days annually with maximum temperatures 90 °F or higher, and also about 60 days annually with minimum temperatures of 32°F or lower. The average length of the growing season, or frost-free period, in this region of Oklahoma is 210 to 220 days. The typical annual precipitation is approximately 40 to 49 inches per year, with greater than 60% occurring during the growing season, April to September. Mean annual

precipitation for the period 1930 to 2010, measured in the basin upstream of the Fort Gibson dam, is 41.5 inches. Prevailing wind is from a south-southeasterly direction, with the greatest wind movements occurring in the spring months.

Based on the 2014 U.S. National Climate Assessment report (Melillo, Richmond, & Yohe, 2014), an assessment of potential climate change impacts within the U.S., the Great Plains Region, including all of the state of Oklahoma, under either a lower or higher GHG emissions scenario, can expect more hot days, more warm nights, nominally more heavy precipitation days, and more consecutive dry days in an average year by mid-century (2041 – 2070). Temperature increases lead to increased demands for water and energy which may constrain development, stress natural resources, and increase competition for water among various uses. Potential changes and stresses to natural vegetation and crop growth cycles will require adaptation and innovative management strategies. The Oklahoma Comprehensive Water Plan (OWRB, 2012) projects a 59% increase in water demand over 2010 levels by mid-century in the Grand Region, Basin 80, which includes Fort Gibson Lake, Lake Hudson, Spavinaw Lake, and Lake Eucha. Projections suggest moderate probabilities of alluvial groundwater storage depletions, and surface water supply gaps by 2020.

3.2.2 Environmental Consequences

No significant impacts to the regional climate would be expected to occur by adoption of the Fort Gibson Lake MP revision. Should the effects of climate change become significant enough to impact the operation of Fort Gibson Lake, the MP, water control plan, and associated documents would be reviewed and revised as necessary.

3.3 GEOLOGYAND SOILS

3.3.1 Affected Environment

Geology: Within the Lower Boston Mountains, slopes are mantled by Quaternary colluvium, and valleys are veneered with Quaternary alluvium. The area is mostly underlain by Pennsylvanian-age sandstone and shale; and minor amounts of Pennsylvanian- and Mississippian-age limestone occur. The Lower Boston Mountains is a part of the Ozark Plateau; and strata are much less deformed than in the Ouachita Mountains. Mountaintops are often capped by resistant sandstone. Sideslopes are often underlain by interbedded sandstone and shale. Rock outcrops are common (Woods, et al., 2005).

The Dissected Springfield Plateau-Elk River Hills includes mantles of Quaternary cherty clay solution residuum, colluvium, and alluvium, and uplands are underlain by Mississippian-age limestone and interbedded chert. The deepest valleys expose early Mississippian- or Devonian-age shale, dolomite, and limestone. Rock outcrops are common (Woods, et al., 2005).

The Osage Cuestas physiographic province is mantled by Quaternary alluvium, terrace deposits, and fine sandy, silty and clayey decomposition residuum. The area is mostly underlain by Pennsylvanian-age sandstone and shale; limestone and coal occur in some areas (Woods, et al., 2005).

Soils: The Fort Gibson Project area includes broad areas of three Oklahoma counties and a diversity of soil types associated with mountains, rocky outcrops, Karst features, hills and hill slopes, valleys, flood plains, and prairies. Based on State Soil Geographic (STATSGO2) data (USDA-NRCS, 2006), the Fort Gibson Project area is comprised of eight general soil associations. They include Steprock-Nella-

Mountainburg-Linker-Enders (25.5% of total project area), Verdigris-Taloka-Dennis-Bates (19.8% of project area), Dennis-Coweta-Collinsville-Bates (17.3% of project area), Eldorado-Dennis-Craig (4.6% of project area), Verdigris-Osage-Lanton (3.9% of project area), Taloka-Parsons-Dennis (1.6% of project area), Summit-Catoosa (1.0% of project area), and Rueter-Moko-Clarksville (0.5% of project area). 25.8% of the total project area is water with lake elevation at the top of the power pool.

An ecological site, with respect to soils, attempts to summarize environmental factors responsible for soil development over time. A condensed list of ecological sites within the Fort Gibson Project area that includes the bulk of specific soil types occurring in the area includes Heavy Bottomland, Loamy Bottomland, Claypan Prairie, Eroded Claypan Prairie, Loamy Prairie, Eroded Loamy Prairie, Shallow Prairie, Sandy Savannah, Shallow Savannah, Smooth Chert Savannah, Savannah Breaks, and Very Shallow. Detailed data indicating soils occurring within these ecological sites, listed below, are taken from data available through USDA-NRCS Web Soil Survey (2015), USDA-NRCS SSURGO data compiled through ESRI (2015), and State Soil Geographic (STATSGO2) data for Oklahoma (USDA-NRCS, 2006). Brief description of each of the above ecological sites and associated soils follow.

Heavy Bottomland

Typical soils occurring on bottomlands often overflowed include Quarles silt loam (0 to 1% slopes, occasionally flooded) and Verdigris silty clay loam (0 to 1% slopes, occasionally flooded). The Quarles series consists of deep, poorly drained, slowly permeable soils formed in alluvium. These soils are on stream terraces and have slopes of 0 to 2%. The Verdigris series consists of very deep, well drained soils that formed in silty alluvium on floodplains in the Cherokee Prairies. Slope ranges from 0 to 3%. Most areas of Verdigris soils are cultivated. Corn, sorghum, alfalfa, and wheat are the principal crops. The remainder is used as woodland, rangeland, or pastureland. Native vegetation is grass or lowland deciduous forest with an understory of grass.

Loamy Bottomland

This site is in areas of highly productive, deep, loamy soils on bottomlands. Soils include Elsah very gravelly loam (0 to 3% slopes, frequently flooded), Healing silt loam (0 to 1% slopes, occasionally flooded), Mason silt loam (0 to 1% slopes, rarely flooded), Radley silt loam (0 to 1% slopes, frequently flooded), Razort gravelly loam (0 to 3% slopes, occasionally flooded), and Verdigris silty clay loam (0 to 1% slopes, frequently flooded). The Elsah series consists of very deep, well drained and somewhat excessively drained soils on floodplains formed in loamy alluvium that contains angular gravel and cobbles of chert rock that typically increases in content with increasing depth. The Healing series consists of well-drained moderately permeable soils on level to nearly level stream terraces and flood plains. They formed in alluvial sediments weathered from limestone, cherty limestone, and shale. The Mason series consists of very deep moderately well drained soils that formed in material weathered from silty alluvium of Pleistocene Age. These nearly level to gently sloping soils are on broad flood plains in the Cherokee Prairies. The Radley series consists of very deep, moderately well drained soils that formed in stratified silty alluvium. The Razort series consists of very deep, well-drained, moderately permeable soils. They formed in silty alluvium on level or nearly level flood plains and low terraces. The Verdigris series is briefly described in the 'Heavy Bottomland' paragraph above.

Claypan Prairie

This site is in areas of nearly level to moderately sloping soils on uplands. Soils found here include Mayes silty clay loam (0 to 1% slopes), Parsons silt loam (0 to 1% slopes), and Pharoah silt loam (0 to 1% slopes). The Mayes series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in material weathered from loamy and clayey sediments of Pennsylvanian and Mississippi age. These nearly level soils are on broad, smooth uplands in the Cherokee Prairie. The Parsons series consists of very deep somewhat poorly drained soils that formed in material weathered from predominantly clayey alluvium or weathered fissile shales. These nearly level to very gently sloping soils are on broad smooth uplands in the Cherokee Prairies. The Pharoah series consists of very deep somewhat poorly drained soils that were formed in fine textured residuum, on the uplands in the Cherokee Prairies.

Eroded Claypan Prairie

This site is in areas where part or all of the A horizon has been removed by erosion. The soil integrity has been changed because of past erosion and the probability of ongoing erosion. The soil type typical in this area is Apperson silty clay loam (3 to 5% slopes, eroded). The Apperson series consists of deep, moderately well drained, slowly permeable soils that formed in calcareous residuum weathered from limestone of Pennsylvanian age. These nearly level to gently sloping soils are on broad, smooth ridges and slightly convex side slopes of prairie uplands in the Cherokee Prairies.

Loamy Prairie

This site is on uplands and the soils are nearly level to moderately steep and are on convex slopes of low ridges and on the side slopes of moderately steep ridges in broad valleys. Soils in the Fort Gibson Project Area include Bates fine sandy loam (1 to 5% slopes), Bates loam (3 to 5% slopes), Bates-Collinsville complex (1 to 5% slopes), Catoosa-Rock outcrop-Shidler complex (1 to 8% slopes), Choteau silt loam (0 to 3% slopes), Craig silt loam (1 to 5% slopes), Dennis silt loam (1 to 3% slopes), Dennis-Radley complex (0 to 15% slopes), Eldorado gravelly silt loam (1 to 8% slopes), Eram-Verdigris complex (0 to 15% slopes), Jay silt loam (1 to 3% slopes), Lula silt loam (1 to 3% slopes), Newtonia silt loam (1 to 5% slopes), Okemah silt loam (0 to 1% slopes), Okemah silty clay loam (0 to 3% slopes), Riverton gravelly loam (1 to 5% slopes), Summit silty clay loam (0 to 1% slopes), and Taloka silt loam (0 to 1% slopes). The Bates series consists of moderately deep, well-drained, moderately permeable soils on broad smooth ridge crests and sideslopes of hill within the Cherokee Prairies. They formed in residuum weathered from sandstone that commonly contains thin beds of silty or sandy shale. The Collinsville series consists of very shallow and shallow, well drained to somewhat excessively drained, moderately rapid permeable soils that formed in residuum weathered from sandstone of Pennsylvania age. These very gently sloping to steep soils are on prairie uplands. The Catoosa series consists of moderately deep, well drained, moderately permeable upland soils that formed in material weathered from limestone of Pennsylvanian age. These soils are on nearly level to sloping convex uplands. The Shidler series consists of very shallow and shallow, well drained, moderately permeable upland soils that formed in material weathered from limestone and chert of Permian and Pennsylvanian age. The Choteau series consists of very deep, somewhat poorly drained soils that formed in material weathered from loamy and clayey alluvium or colluvium over shale of Pennsylvanian age. These nearly level to gently sloping soils are on high terraces or uplands. The Craig soils are formed in residuum weathered from cherty limestones on uplands. The Dennis series consists of very deep, somewhat poorly drained soils that formed in material weathered from shale of Pennsylvanian age. These soils are on nearly level to sloping uplands. The Eldorado series

consists of very deep, well drained, moderately permeable soils that formed in residuum weathered from Pennsylvanian age chert limestone. The Eram series consists of moderately deep, moderately well drained soils that formed from shale interbedded with thin layers of sandstone of Pennsylvanian age. These very gently sloping to moderately steep soils are on ridges and side slopes of uplands. The Jay series consists of very deep, moderately well drained, slowly permeable soils that formed in loamy material overlying siltstone or cherty limestone. These nearly level to gently sloping soil are on uplands on the Ozark Highlands. The Lula series consists of deep, well-drained, moderately permeable upland soils. These soils are formed in material weathered from limestone of Pennsylvanian age. These soils are on nearly level to gently sloping uplands in the Cherokee Prairies. The Newtonia series consists of very deep well drained soils that formed in loess and residuum of the Cherokee Prairies. The Okemah series consists of very deep, somewhat poorly drained, slowly permeable soils that formed in material weathered from loamy and clayey alluvium or colluvium and from shale of Pennsylvanian age. These nearly level to gently sloping soils are on broad smooth high terraces or on the lower slopes of uplands. The Summit series consists of very deep, moderately well drained, slowly permeable soils that formed in material weathered from residual shales or colluvial calcareous clays of Pennsylvanian age. These nearly level to strongly sloping soils are on slightly convex uplands and foot slopes in the Cherokee Prairies. Riverton soils are on very gently sloping to gently sloping uplands. They formed in gravelly sediments. The Taloka series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey material weathered from colluvium and alluvium over interbedded shales and sandstone of Pennsylvanian age. These nearly level to very gently sloping soils are on broad smooth uplands or high terraces.

Eroded Loamy Prairie

This site is in areas where part or all of the A horizon has been removed by erosion. The soil integrity has been changed because of past erosion and the probability of ongoing erosion. Typical soils here include Bates fine sandy loam (3 to 5% slopes, eroded). Characteristics of the Bates series are included in the 'Loamy Prairie' paragraph above.

Shallow Prairie

This site is in areas of rocky sandstone and limestone slopes and ridges in the Bluestem Hills and Cherokee Prairies major land resource areas. Typical soils found here include Collinsville loam (5 to 30% slopes, extremely stony), Coweta fine sandy loam (3 to 5% slopes, very rocky), Coweta stony fine sandy loam (5 to 30% slopes), Coweta-Bates complex (3 to 5% slopes), Hector-Enders-Linker complex (1 to 5% slopes), Lenapah silty clay loam (0 to 3% slopes), and Lenapah-Rock outcrop complex (1 to 8% slopes). Characteristics of the Collinsville series are described in the paragraph 'Loamy Prairie' above. The Coweta series consists of shallow, well drained to somewhat excessively drained soils on uplands. These have formed in material weathered from residuum from sandstone interbedded with shale of Pennsylvanian age. These very gently sloping to steep soils are on broad smooth ridges in the Cherokee Prairies. The Hector series consists of shallow, well-drained, moderately rapidly permeable soils that formed in residuum from sandstone bedrock. These soils are on nearly level to moderately steep ridgetops and steep and very steep mountainsides. The Enders series consists of deep, well-drained, very slowly permeable soils that formed in loamy and clayey residuum from shale, or interbedded shale and sandstone. These soils are on nearly level to moderately steep upland mountaintops and ridges and gently sloping to very steep mountain sideslopes and footslopes. The Linker series occurs on summits of hills

and mountains formed in loamy residuum of sandstone. The Lenapah series consists of shallow, well-drained, slowly permeable soils that formed in material weathered from limestone of Pennsylvanian age. These nearly level to strongly sloping soils are on broad, slightly convex uplands in the Cherokee Prairies.

Sandy Savannah

This site is in areas of nearly level to steep, sandy soils on uplands. Enders-Linker-Hector association (5 to 30% slopes) and Linker fine sandy loam (1 to 3% slopes) are found in the Fort Gibson Project area. Brief descriptions of these series are included in the 'Shallow Prairie' paragraph above.

Shallow Savannah

This site is in areas of rugged topography on low, mountainous ridges. The historic climax vegetation includes big bluestem, little bluestem, and Indiangrass. Woody species include post oak, blackjack oak, and shortleaf pine. Soils found here include Hector fine sandy loam (3 to 5% slopes), Hector-Enders complex (5 to 30% slopes), Hector-Linker complex (1 to 5% slopes), and Linker fine sandy loam (3 to 5% slopes). Characteristics of these series are discussed in paragraph 'Shallow Prairie' above.

Smooth Chert Savannah

This site is on cherty uplands on the more gently sloping ridges and footslopes in the Ozark Highlands. Soils found here include Britwater gravelly silt loam (1 to 8% slopes), Britwater silt loam (1 to 3% slopes), Clarksville gravelly silt loam (1 to 8% slopes), Clarksville very gravelly silt loam (5 to 50% slopes, stony), Razort gravelly loam (0 to 1% slopes, occasionally flooded), and Stigler silt loam (0 to 1% slopes). The Britwater series consists of very deep, well drained soils formed in alluvial sediments washed from cherty limestone or cherty dolomite uplands. These soils are on old, high stream terraces. The Clarksville series consists of very deep, somewhat excessively drained soils formed in hillslope sediments and the underlying clayey residuum from cherty dolomite or cherty limestone on steep side slopes and narrow ridgetops. The Razort series is described in the 'Loamy Bottomland' paragraph above. The Stigler series consists of deep, moderately well drained, very slowly permeable upland soils that formed in loamy and clayey colluvium or alluvium over interbedded shale and sandstone. The shale and sandstone is of Pennsylvanian age. These nearly level to gently sloping upland soils are in the valleys of the Ouachita Mountains and the Arkansas Valley and Ridges.

Savannah Breaks

This site is in steep and very steep, rocky areas that have large sandstones on or near the surface. Large amounts of bare rock on the surface restrict forage production. Soils occurring here include Hector-Rock outcrop complex (20 to 50% slopes), Hector-Steprock-Rock outcrop complex (20 to 50% slopes), Rock outcrop-Hector complex (40 to 100% slopes). Characteristics of Hector series soils are discussed in the 'Loamy Prairie' paragraph above. The Steprock series consists of moderately deep, well-drained, moderately permeable soils formed in residuum and colluvium weathered from interbedded sandstone, siltstone, and shale. These soils are on hillsides and ridges.

Very Shallow

This site is in areas of nearly level to gently sloping, very shallow soils. The surface layer is 6 to 10 inches deep over limestone. The soil series represented on project lands is Shidler-Rock outcrop complex

(2 to 8% slopes). As stated earlier, the Shidler series consists of very shallow and shallow, well-drained, moderately permeable upland soils that formed in material weathered from limestone and chert of Permian and Pennsylvanian age.

3.3.2 Environmental Consequences

Development history, geology, and properties of soil types present on Fort Gibson Project fee lands have been considered in recommended zoning classifications and reclassifications. No significant impacts to geology and soils would occur by adoption of the Fort Gibson MP revision.

3.4 SOCIAL AND ECONOMIC CONDITIONS

3.4.1 Affected Environment

Zone of Interest: The zone of interest for the socio-economic analysis consists of Adair, Cherokee, Delaware, Haskell, Mayes, McIntosh, Muskogee, Okmulgee, Rogers, Sequoyah, Tulsa, and Wagoner Counties in Oklahoma.

Population: The total population for the zone of interest is 1,109,281, as shown in Table 3-3. Almost 55% of the population is in Tulsa County, 8% in Rogers County, 7% in Wagoner County, 6% in Muskogee County and 4% each in Cherokee, Delaware, Mayes, Okmulgee, and Sequoyah Counties. Each of the remaining counties makes up less than 4% each of the total population. The population in the zone of interest makes up approximately 29% of the total population of Oklahoma. From 2013 to 2065, the population in the zone of interest is expected to increase to 1,670,096, an annual growth rate of 0.8% per year. By comparison, the population of Oklahoma is projected to increase at an annual rate of 0.7% per year. The distribution of the population among gender is approximately 49% male and 51% female in most geographical areas, as shown in Table 3-4.

Table 3-3 2013 Population Estimates and 2065 Projections.

Geographic Area	2013 Population Estimate	2065 Population Projection
Oklahoma	**3,785,742**	**5,280,026**
Adair Co.	22,427	32,391
Cherokee Co.	47,488	79,980
Delaware Co.	41,394	74,060
Haskell Co.	12,849	16,060
Mayes Co.	41,110	64,237
McIntosh Co.	20,358	30,026
Muskogee Co.	70,657	85,457
Okmulgee Co.	39,747	43,698
Rogers Co.	87,730	159,586
Sequoyah Co.	41,834	67,920
Tulsa Co.	609,610	882,936
Wagoner Co.	74,077	133,745
Zone of Interest Total	**1,109,281**	**1,670,096**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)); Oklahoma State Data Center (2065 Projections, OK (Oklahoma Department of Commerce, 2015)).

Table 3-4 2013 Percent of Population Estimate by Gender.

Geographic Area	Male	Female
Oklahoma	**49.5**	**50.5**
Adair Co.	49.9	50.1
Cherokee Co.	49.1	50.9
Delaware	49.3	50.7
Haskell Co.	49.3	50.7
Mayes Co.	49.7	50.3
McIntosh Co.	49.3	50.7
Muskogee Co.	48.9	51.1
Okmulgee Co.	50.0	50.0
Rogers Co.	49.7	50.3
Sequoyah Co.	49.4	50.6
Tulsa Co.	48.8	51.2
Wagoner Co.	49.5	50.5
Zone of Interest Total	**49.1**	**50.9**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

Table 3-5 shows the population by age group. The distribution by age group is similar among the counties, zone of interest and the state overall. The largest age group is the 45 to 54, with 14% of the total population for each geographic area. Approximately 12%-13% of the total population for each area is between 35 and 44 years of age, and 11 to 12% for the 25 to 34 age group.

Table 3-5 2013 Population Estimate by Age Group.

Area	Age Group (Years)												
	<5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 59	60 to 64	65 to 74	75 to 84	85 and over
Oklahoma	**264,159**	**262,213**	**256,923**	**260,843**	**277,306**	**512,819**	**464,680**	**513,248**	**243,245**	**208,692**	**292,159**	**165,856**	**63,599**
Counties:													
Adair	1,540	1,701	1,840	1,690	1,314	2,700	2,874	3,090	1,392	1,283	1,805	957	241
Cherokee	3,240	3,134	3,028	3,983	4,782	5,751	5,272	6,007	3,027	2,637	3,927	1,968	732
Delaware	2,155	2,698	2,549	2,660	2,052	4,008	4,465	5,762	3,011	3,287	5,406	2,697	647
Haskell	840	970	839	851	734	1,440	1,477	1,654	703	959	1,358	694	330
Mayes	2,779	2,629	3,111	2,959	2,325	4,634	4,945	5,796	3,111	2,292	3,885	1,905	739
McIntosh	1,079	975	1,422	1,240	936	1,908	2,140	2,894	1,537	1,542	2,673	1,546	466
Muskogee	4,985	4,573	5,039	4,716	4,699	8,938	8,563	9,687	4,406	4,494	5,797	3,389	1,371
Okmulgee	2,537	2,852	2,652	2,880	2,656	4,537	4,693	5,405	2,706	2,472	3,509	2,029	819
Rogers	5,274	6,199	6,762	6,611	5,252	9,932	11,539	13,216	5,659	5,028	7,223	3,667	1,368
Sequoyah	2,548	2,844	3,212	2,900	2,332	4,777	5,457	6,011	2,829	2,409	3,883	1,958	674
Tulsa	45,272	42,442	43,010	40,651	42,637	88,396	79,017	82,375	38,826	31,912	40,393	23,927	10,752
Wagoner	4,999	5,457	5,627	5,174	3,913	9,159	10,101	10,434	4,886	4,505	6,401	2,671	750
Zone of Interest Total	**77,248**	**76,474**	**79,091**	**76,315**	**73,632**	**146,180**	**140,543**	**152,331**	**72,093**	**62,820**	**86,260**	**47,408**	**18,889**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

Population by Race and Hispanic Origin is displayed in Table 3-6. For the zone of interest, 65% of the population is White, 9% American Indian or Native Alaskan, 9% two or more races, 8% Hispanic, and 7% Black. The remainder of the races makes up less than 2% each. By comparison, for the Oklahoma, 68% of the population is White, 9% Hispanic, 7% each for Black, American Indian/Native Alaskan, and two or more races, 2% Asian, with the remaining less than 1% each.

Table 3-6 Population Estimate by Race/Hispanic Origin.

Geographic Area	White	Black	American Indian and Alaska Native Alone	Asian alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino
Oklahoma	**2,582,335**	**269,717**	**255,929**	**66,720**	**4,208**	**2,854**	**258,840**	**345,139**
Adair Co.	9,453	80	8,102	144	3	13	3,383	1,249
Cherokee Co.	23,699	547	13,304	304	59	51	6,489	3,035
Delaware Co.	27,151	108	8,831	513	22	3	3,488	1,278
Haskell Co.	9,358	101	1,747	43	4	0	1,142	454
Mayes Co.	27,330	139	3,398	171	26	0	8,851	1,195
McIntosh Co.	14,069	694	2,914	76	0	0	2,164	441
Muskogee Co.	40,984	7,766	9,610	411	11	23	8,050	3,802
Okmulgee Co.	25,506	3,443	5,018	116	28	16	4,254	1,366
Rogers Co.	64,456	785	10,763	751	7	114	7,458	3,396
Sequoyah Co.	27,200	787	4,965	257	0	6	7,133	1,486
Tulsa Co.	395,223	62,041	27,906	14,588	440	866	40,286	68,260
Wagoner Co.	54,261	2,530	6,143	1,030	0	25	6,412	3,676
Zone of Interest Total	**718,690**	**79,021**	**102,701**	**18,404**	**600**	**1,117**	**99,110**	**89,638**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

Education and Employment: In the zone of interest, for 30% of the population 25 years old and older, the highest level of education attained is a high school diploma or equivalent. Twenty-four percent have some college, but no degree, 17% have a Bachelor's degree, 9% have 9-12 years of school but with no diploma, 8% have an Associate degree, 8% have a graduate or professional degree, and 4% have less than nine years of education. For Oklahoma, 32% have a high school diploma or equivalent, 24% have some college but no degree, 16% have a Bachelor's degree, 9% have 9-12 years of school but no diploma, 8% have a graduate or professional degree, 7% have an Associate degree, and 5% less than nine years of schooling. Table 3-7 shows the population over 25 years of age by highest level of educational attainment for each of the geographical areas.

Table 3-7 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older.

Geographic Area	Highest Level of Educational Attainment							
	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's degree	Bachelor's degree	Graduate or Professional degree
Oklahoma	**2,464,298**	**113,560**	**221,671**	**782,753**	**595,862**	**171,995**	**387,885**	**190,572**
Adair Co.	14,342	1,133	2,094	5,780	2,983	531	1,305	516
Cherokee Co.	29,321	1,407	2,932	8,620	7,535	1,642	4,398	2,785
Delaware Co.	29,280	1,113	3,396	11,448	6,793	1,845	3,162	1,523
Haskell Co.	8,615	698	1,206	3,291	1,680	750	750	241
Mayes Co.	27,307	1,174	3,113	10,377	6,663	1,802	2,949	1,229
McIntosh Co.	14,706	824	1,912	5,603	3,426	1,044	1,235	662
Muskogee Co.	46,645	2,192	4,898	15,346	11,894	3,965	5,877	2,472
Okmulgee Co.	26,170	1,151	2,669	9,814	5,914	2,957	2,722	942
Rogers Co.	57,632	1,787	3,746	19,076	14,581	5,245	9,567	3,631
Sequoyah Co.	27,998	1,624	3,584	11,395	5,712	1,960	2,548	1,176
Tulsa Co.	395,598	16,220	28,879	103,647	96,130	33,230	79,911	37,582
Wagoner Co.	48,907	1,467	4,010	16,628	12,373	3,864	7,874	2,690
Zone of Interest Total	**726,521**	**30,790**	**62,439**	**221,026**	**175,686**	**58,833**	**122,298**	**55,449**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

Employment by sector is presented in Table 3-8. In the zone of interest, approximately 22% of the workforce is employed in the Educational Services, Health Care and Social Assistance Sector, followed by 13% in Manufacturing, 11% in Retail Trade, 9% Arts, Entertainment, Recreation and Accommodation, 9% in Professional, Scientific, and Management Services, and 7% in Construction. Similarly, the largest employment sector for Oklahoma was also Educational Services Health Care and Social Assistance, with 23% and 24%, respectively, of the total employment. While manufacturing has importance in both the zone of interest and state, it is evident that the economies are driven by service sector employment.

Table 3-8 2013 Annual Average Employment by Sector.

Employment Sector	Oklahoma (State)	Adair Co.	Cherokee Co.	Delaware Co.	Haskell Co.	Mayes Co.	McIntosh Co.	Muskogee Co.	Okmulgee Co.	Rogers Co.	Sequoyah Co.	Tulsa Co.	Wagoner Co.	Zone of Interest Total
Civilian employed population 16 years and over	**1,686,404**	8,346	19,139	16,187	4,578	16,653	7,070	27,835	15,195	41,358	15,796	292,199	33,687	**498,043**
Agriculture, forestry, fishing and hunting, and mining	**82,345**	536	875	707	852	527	353	390	460	820	761	5,404	621	**12,306**
Construction	**121,090**	666	1,539	1,457	507	1503	599	2,125	927	2,638	1,032	19,621	2,660	**35,274**
Manufacturing	**164,597**	1,712	1,452	2,321	266	3485	633	3,831	2,378	7,054	2,048	33,133	4,926	**63,239**
Wholesale trade	**46,259**	177	584	424	106	302	64	736	276	1338	294	9898	1,062	**15,261**
Retail trade	**195,647**	766	2,155	1,887	591	1855	1,004	3,133	1,672	4,782	1,835	32,729	4,108	**56,517**
Transportation, warehousing, and utilities	**86,728**	328	895	788	221	905	489	1,441	713	3,536	981	15,917	2,105	**28,319**
Information	**31,422**	115	168	197	25	192	74	410	211	803	258	8717	812	**11,982**
Finance and insurance, real estate, and rental and leasing	**97,958**	223	757	782	137	547	269	1,423	851	2297	503	20,021	2,326	**30,136**
Professional, scientific, management, administrative, and waste management services	**135,765**	308	1,063	970	132	829	549	1,178	923	3030	753	33,312	2,623	**45,670**
Educational services, health care, and social assistance	**381,408**	2,036	5,216	3,407	1,073	3,875	1,608	6,922	3,579	8,430	4,088	61,711	7,165	**109,110**
Arts, entertainment, recreation, accommodation, and food services	**150,284**	543	1,790	1,594	254	1072	576	2,636	1,260	2,870	1,509	28,273	2,273	**44,650**
Other services, except public administration	**86,763**	260	913	992	214	938	301	1,540	991	2135	752	15,675	1,643	**26,354**
Public administration	**106,138**	676	1,732	661	200	623	551	2,070	954	1,625	982	7788	1,363	**19,225**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015))

As shown in Table 3-9, the civilian labor force in the zone of interest accounts for approximately 29% of the civilian labor force of Oklahoma. The unemployment rate is very close, in the zone of interest at 4.8%, to that of Oklahoma, 4.5%. Some of the counties within the zone of interest, however, have much higher unemployment rates, with almost 9% in McIntosh County, 7-8% in Adair, Haskell, and Sequoyah Counties and 5-7% in Delaware, Cherokee, Muskogee, and Okmulgee Counties.

Table 3-9 Labor Force, Employment and Unemployment Rates, 2014 Annual Averages.

Geographic Area	Civilian Labor Force	Employed	Unemployed	Unemployment Rate
Oklahoma	**1,784,035**	**1,703,832**	**80,203**	**4.5%**
Adair Co.	8,052	7,439	613	7.6%
Cherokee Co.	18,297	17,207	1,090	6.0%
Delaware Co.	16,917	15,935	982	5.8%
Haskell Co.	4,311	4,001	310	7.2%
Mayes Co.	18,554	17,638	916	4.9%
McIntosh Co.	6,969	6,349	620	8.9%
Muskogee Co.	28,988	27,310	1,678	5.8%
Okmulgee Co.	16,152	15,063	1,089	6.7%
Rogers Co.	43,412	41,586	1,826	4.2%
Sequoyah Co.	16,566	15,405	1,161	7.0%
Tulsa Co.	308,610	295,315	13,295	4.3%
Wagoner Co.	35,639	34,131	1,508	4.2%
Zone of Interest Total	**522,467**	**497,379**	**25,088**	**4.8%**

Source: U.S. Bureau of Labor Statistics (U.S. Department of Labor, 2015).

Households, Income and Poverty: For the State of Oklahoma, there are 1.4 million households, with an average size of households at 2.55 persons, as shown in Table 3-10. There are approximately 429,500 households in the zone of interest (30% of the state total) with an average household size of 2.58 persons.

As shown in Table 3-11, several of the counties in the zone of interest are slightly poorer in terms of income than the state overall. In the counties in zone of interest, the median household income ranges from $33,000 in Adair County to $59,000 in Rogers County, compared to the state median household income of $45,000 in Oklahoma. Rogers, Wagner and Tulsa Counties have higher median household incomes, Mayes County is very near the state median income, and Adair, Cherokee, Delaware, Haskell, McIntosh, Muskogee, Okmulgee and Sequoyah Counties have median incomes less that the state figure. The zone of interest per capita income ($24,913) is very similar compared to Oklahoma ($24,208). While Rogers, Tulsa, and Wagner Counties have higher per capita incomes than the state, the remainder have lower per capita incomes. Per capita incomes range from $15,000 in Adair County to $28,000 in Tulsa County.

Table 3-10 2013 Households and Household Size.

Geographic Area	Total Number of Households	Average Household Size
Oklahoma	**1,444,081**	**2.55**
Adair Co.	8,046	2.76
Cherokee Co.	16,875	2.68
Delaware Co.	16,589	2.47
Haskell Co.	4,713	2.70
Mayes Co.	15,896	2.55
McIntosh Co.	8,092	2.48
Muskogee Co.	26,802	2.51
Okmulgee Co.	15,214	2.55
Rogers Co.	32,693	2.65
Sequoyah Co.	15,624	2.65
Tulsa Co.	241,916	2.48
Wagoner Co.	27,016	2.73
Zone of Interest Total	**429,476**	**2.58**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

Table 3-11 Median and Per Capita Income, 2012.

Geographic Area	Median Household Income	Per Capita Income
Oklahoma	**45,339**	**24,208**
Adair Co.	32,556	15,116
Cherokee Co.	37,260	18,582
Delaware Co.	36,588	21,109
Haskell Co.	35,334	18,896
Mayes Co.	42,751	20,585
McIntosh Co.	36,096	19,100
Muskogee Co.	38,502	19,868
Okmulgee Co.	39,156	19,753
Rogers Co.	58,525	27,365
Sequoyah Co.	35,742	18,131
Tulsa Co.	48,181	27,676
Wagoner Co.	55,723	24,874
Zone of Interest Total	**N/A**	**24,913**

Source: U.S. Census Bureau, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

The number of persons whose income was below the poverty level was similar in the zone of interest (17%) as compared to Oklahoma (17%). Most of the counties in the zone of interest showed between 20% and 26% of all persons having incomes below the poverty level, and Roger County had a much lower percentage, with 9%, as shown in Table 3-12.

Table 3-12 Percent of Families and People With Income in the Past 12 Months is Below the Poverty Level (2013).

Geographic Area	All Persons
Oklahoma	16.9%
Adair County	26.4%
Cherokee County	22.8%
Delaware County	21.2%
Haskell County	17.4%
Mayes County	19.7%
McIntosh County	20.7%
Muskogee County	22.9%
Okmulgee County	19.5%
Rogers County	9.3%
Sequoyah County	21.4%
Tulsa County	15.9%
Wagoner County	11.2%
Zone of Interest Total	**16.8%**

Source: U.S. Bureau of the Census, American Fact Finder (2013 Estimate (U.S. Census Bureau, 2015)).

3.4.2 Environmental Consequences

Social and economic conditions have been considered in recommended zoning classifications and reclassifications. No significant impacts to social and economic conditions would be expected to occur by adoption of the Fort Gibson Lake MP revision.

3.5 EXECUTIVE ORDER 12898 (ENVIRONMENTAL JUSTICE)

3.5.1 Affected Environment

President Bill Clinton signed Executive Order 129898 on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directs federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment. The Presidential Memorandum accompanying the Order underscores certain provisions of existing law that can help ensure that all communities and persons across this nation live in a safe and healthful environment.

Under NEPA, the identification of a disproportionately high and adverse human health or environmental effect on a low-income population, minority population, or Indian tribe does not preclude a proposed agency action from going forward, nor does it necessarily compel a conclusion that a proposed action is environmentally unsatisfactory. Rather, the identification of such an effect serves to heighten agency attention to alternatives (including alternative sites), mitigation strategies, monitoring needs, and preferences expressed by the affected community or population.

Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the Bureau of the Census Reports on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.

Minorities are comprised of individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Minority populations are identified where either: (a) the minority populations of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In identifying minority communities, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native American), where either type of group experiences common conditions of environmental exposure or effect. The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit that is to be chosen so as to not artificially dilute or inflate the affected minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds.

Disproportionately high and adverse human health effects: When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

a) Whether the health effects, which may be measured in risks and rates, are significant or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death;

b) Whether the risk or rate of hazard exposure by a minority population, low-income population, or Indian tribe to an environmental hazard is significant and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and

c) Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

Disproportionately high and adverse environmental effects: When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

a) Whether there is or will be an impact on the natural or physical environment that significantly and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelate to impacts on the natural or physical environment;

b) Whether environmental effects are significant and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group; and

c) Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposure from environmental hazards (Council on Environmental Quality, 1997).

3.5.2 Environmental Consequences

Disproportionately high and adverse human health and environmental effects on minority and low-income populations have been considered in recommended zoning classifications and reclassifications. No significant impacts to minority and low-income communities would occur by adoption of the Fort Gibson Lake MP revision.

3.6 EXECUTIVE ORDER 13045 (PROTECTION OF CHILDREN)

3.6.1 Affected Environment

Executive Order 13045 requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that may affect children disproportionately. The executive order defines environmental health and safety risks as risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to). The Order further requires Federal agencies to ensure that its policies, programs, activities, and standards address these disproportionate risks. Executive Order 13045 is addressed in this NEPA document to examine the effects this action will have on children.

3.6.2 Environmental Consequences

Environmental health and safety risks to children have been considered in recommended zoning classifications and reclassifications and no significant impacts to children would occur by adoption of the Fort Gibson Lake MP revision. Furthermore, the review conducted indicates, at present, a low to moderate environmental health risk to children due to the presence of cyanobacteria at cellular densities high enough to merit administrative action (World Health Organizations (WHO), 1999) and capable of producing neurotoxins (nerve toxins) and hepatotoxins (liver toxins). Symptoms experienced due to acute exposure to neurotoxins could possibly include muscle cramps, twitching, paralysis, cardiac or respiratory failure, death in animals (World Health Organizations (WHO), 1999). While the MP will result in no significant impacts to environmental health and safety to children, it is recommended that information regarding possible adverse health effects related to primary and secondary water contact be posted at public use facilities when cyanobacteria bloom conditions warrant.

3.7 CULTURAL RESOURCES

3.7.1 Affected Environment

History: Written history in the Fort Gibson Lake area of eastern Oklahoma began in the early 1700s, as French explorers entered the area from the southeast, via New Orleans, or from the northeast, from St. Louis. One of these French explorers was Jean Pierre Chouteau, who established a trading post on the

Grand (Neosho) River to the north of Fort Gibson Lake. Other French explorers who probably traveled through the area included Claude-Charles du Tisne, and Jean-Baptist Benard Sur de la Harpe. du Tisne and la Harpe were among the first explorers to engage in and establish significant trade relationships with the Wichita Indians, a conglomeration of tribes that occupied the prairie-plains margins and conducted large bison hunting expeditions at times during the year. Several archaeological sites in eastern Oklahoma date to the early- to mid-1700s and exhibit evidence of this French-Wichita trade relationship, as demonstrated by French glass trade beads and metal musket parts.

After the U.S. Government began moving American Indian Tribes to Indian Territory from their homelands in the east, conflicts began to develop between these relocated tribes, tribes indigenous to the Plains, and non-Indians located in neighboring states. To address the instability of the larger area, the U.S. first established Fort Smith, Arkansas but then in 1824 established Fort Gibson, which is located in the immediate vicinity of the area that is now Muskogee, Oklahoma. The initial primary function of Fort Gibson was to monitor relations between the Cherokee and Osage tribes, both of which had been relocated to northeastern Indian Territory and who had been experiencing conflicts with one another. Once relations between the tribes in the area had improved, Fort Gibson was deactivated. During the Civil War, however, the post was again re-activated, this time for the purpose of guarding the Arkansas River and the Texas Road. Several Civil War battles were fought in northeastern Oklahoma, the most significant of which was the Battle of Honey Springs, located to the southwest of Fort Gibson Reservoir.

Archaeology: Archaeological sites representative of the Paleo-Indian, Archaic, Woodland, Caddoan/Mississippian, Protohistoric (Contact), and Historic Periods are known in the larger vicinity of Fort Gibson Reservoir in northeastern Oklahoma. This culture-historical sequence falls generally within the overall sequence that has been established for eastern Oklahoma. Many archaeological sites in this area have undisturbed, deeply-buried deposits; many are comprised of multi-component prehistoric and/or historic occupations. Several cultural resources investigations, including archaeological survey and excavation, were conducted incident to and post-construction of Fort Gibson Reservoir. In the larger regional area, there are hundreds of archaeological sites and historic standing structures on record with the Oklahoma State Historic Preservation Office (SHPO) and Oklahoma Archeological Survey (OAS). Ultimately, as a major river flowing out of the western Ozarks, the entire Grand (Neosho) River Valley can be classified as an area of high sensitivity for the location of cultural resources.

Cultural History Sequence: The following regional chronology is adopted in this Master Plan.

- Paleo-Indian, 12,000 to 8500 BP;
- Archaic, 8500 to 2000 BP;
- Woodland, 2000 to 1200 BP (AD 1 to 800);
- Caddoan/Mississippian, AD 800 to 1500;
- Protohistoric (Contact), AD 1500 to 1825; and
- Historic, AD 1825 to present.

To aid in comparing divergent cultures and sequences in eastern Oklahoma, the following general adaptation types are used to characterize prehistoric cultural traditions.

Paleo-Indian: Specialized, large-game hunting by small bands of hunter-gatherers was the adaptation type associated with this period. Signature stone tools are unnotched projectile points of fluted or lanceolate type, often found in contexts where mammoth or bison remains also occur. Structural remains are poorly understood, the probable result of a mobile lifestyle and the use of perishable construction materials. Three main complexes identified within this period are Clovis, Folsom, and Late Paleo-Indian (e.g., Dalton). The extent of the Paleo-Indian period was approximately 12,000 BP to 8,500 BP.

Archaic: Plant foraging was an important subsistence strategy of hunter gatherer groups in this period and was associated with increased seasonal variability of resources during the mid-Holocene Hypsithermal period. Repeated occupation of sites and features such as rock-lined hearths and roasting pits, and grinding tools reflect intensive plant processing and the cyclical exploitation of resources. Bison were hunted on a smaller scale than previously, with greater reliance on small mammals, mussels and fish. Stone tools were often thermally cured, and included distinctive stemmed and notched projectile points. The Archaic period is traditionally divided into Early, Middle, and Late periods, the overall extent of which was approximately 8,500 BP to 2,000 BP.

Woodland: Archaeologists in Oklahoma associate the use of ceramics in describing Woodland cultural components. Incipient horticulture was the adaptation type associated with this period, marked by the introduction of cultigens in eastern Oklahoma. Evidence for semi-permanent villages, increased reliance on wild and domestic plants, widespread use of ceramics and elaborate burials reflect the more sedentary lifestyle of Woodland cultures. Small game remained essential in subsistence. Tool assemblages are distinguished by small, corner-notched projectile points, which suggest invention of the bow and arrow.

Caddoan/Mississippian: Agriculture, supplemented by hunting and gathering, was the adaptation type associated with village societies. Agricultural tools were recognized in artifact assemblages, along with triangular arrowpoints for hunting and pottery types that in eastern Oklahoma serve to denote this period as the Caddoan/Mississippian. Village cultures are often identified in lowland terraces of waterways where agriculture was viable. Some archaeological sites from this time period have mounds associated, suggesting that those sites have some larger ceremonial or social function. Some mounds contain primary or secondary burials, but a few represent mounds on which a structure was located. Mounds such as these likely had a very specific role in the ceremonial lives of the region's inhabitants.

Protohistoric (Contact): This period was defined by transitory contacts of European explorers in the eastern woodlands and central plains, substantiated by little or no historical documentation. Lifeways were subsumed under the Plains Village adaptation type, which is the Plains adaptation largely contemporaneous with Caddoan/Mississippian villages. Protohistoric sites in Oklahoma appear to be directly related to an earlier manifestation of similar village sites located further north in Kansas, including the Great Bend aspect with sites in south-central Kansas. Great Bend manifestations likely represent the proto-Wichita villages encountered by Francisco Coronado in 1541. Slightly later Proto-Wichita sites from the early 1700's have been identified in Kay County, north-central Oklahoma, and closer to the Fort Gibson Lake area in Tulsa County, Oklahoma. These early 1700's Proto-Wichita sites are evidence of French influence on the southern Plains, as artifact assemblages from these sites contain metal musket parts from French firearms, glass trade beads (French), and European gunflints.

Historic: The Reservation Period (1825-1900) was marked by the displacement and resettling of Native American tribes throughout the greater Oklahoma region. The Cherokee Nation was created in northeastern Oklahoma in 1828, soon thereafter incorporating the Quapaw and Seneca tribes. After the Civil War, the area was further divided into reserves for the Peoria, Ottawa, Wyandotte, and others. From 1838 to 1871, the Neosho Agency held jurisdiction over all tribes but the Cherokee. Between the 1830s and 1850s, Anglo-Americans legally occupied tribal lands to operate mission schools, trading posts, ferries, mills, and blacksmith shops. The period 1850-1900 was marked by increasing Anglo-American land speculation and enhanced military supply lines through the study region that connected Fort Gibson, Fort Scott, and Fort Leavenworth during the Civil War. Pioneer settlement of homesteads and towns began in earnest in southeastern Kansas during the 1860s following the removal of Native American tribes to Oklahoma. This trend was somewhat delayed in northeastern Oklahoma where the Cherokee Nation maintained a loose hold on sovereignty. By the 1890s, however, towns such as Miami and Ottawa in northeastern Oklahoma were firmly rooted.

3.7.2 Environmental Consequences

Effects to Cultural Resources have been considered in recommended zoning classifications and reclassifications. Minor beneficial impacts to Cultural Resources would be expected to occur by adoption of the Fort Gibson Lake MP revision implementing the proposed action. Reclassification of areas where scientific, ecological, cultural, or aesthetic features exist as Environmentally Sensitive Areas (237.8 acres) provides protection and conservation by limiting and prohibiting development in these areas. Additionally, the reclassification of Intensive Use areas (or High Density Recreation), with a cumulative area of 2,693.3 acres, to Wildlife Management, would limit development in these areas, enhancing protection of potential cultural resource sites within these areas.

3.8 AIR QUALITY

3.8.1 Affected Environment

The air quality of any region is controlled primarily by the magnitude and distribution of pollutant emissions and the regional climate. The transportation of air pollutants from specific source areas is often augmented by local topography and meteorology. As with many areas throughout the Great Plains, relatively level topography of Oklahoma allows for uninhibited circulation of air pollutants. The State of Oklahoma ranks high in the nation in average daily wind speed. Average annual wind speed in the Tulsa, OK region is 10.2 miles per hour based on 64 years of records through 2012 (NOAA, 2015).

The primary legislation governing federal air quality is the Clean Air Act (CAA) last amended in 1990. The CAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (U.S. EPA) requiring the agency to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants considered harmful to human health and the environment. U.S. EPA has set NAAQS for six principal pollutants identified as “criteria” pollutants including carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The U.S. EPA published a conformity rule on November 30, 1993, requiring all federal actions to conform to appropriate State Implementation Plans (SIPs) established to improve ambient air quality. Areas are classified as either in “attainment” or “nonattainment” with respect to state and federal ambient air quality standards. The classifications are made by comparing actual monitored air pollutant concentrations to state and federal standards. The Conformity Rule applies to Federal actions in non-attainment areas. Cherokee Co. is with the

Metropolitan Fort Smith Interstate Air Quality Control Region (AQCR), Mayes and Wagoner Counties are within the Northeastern Oklahoma Intrastate AQCR, and both of these regions are designated in attainment, meeting NAAQS for all pollutants designated in the CAA. The ODEQ monitors air quality in Oklahoma for criteria pollutants and additional toxic air contaminants

3.8.2 Environmental Consequences

Air quality within the Metropolitan Fort Smith Interstate and the Northeastern Oklahoma Intrastate AQCRs has been considered in recommended zoning classifications and reclassifications. No significant impacts to air quality would occur by adoption of the Fort Gibson Lake MP revision.

3.9 TERRESTRIAL VEGETATION

3.9.1 Affected Environment

Forest resources in Oklahoma are influenced by the geographical and seasonal variability in precipitation and temperature. As a consequence of this dynamic, the largest expanses of deciduous forests in the state generally occur in the eastern third of the state. The eastern forests transition into tall grass prairie in the central portions of the state, which transition to the short grass prairie in the western parts of the state.

In the physiographic regions that comprise the Fort Gibson Lake watershed, natural vegetation generally consists of woody and herbaceous species typically found in the oak–hickory forest association with some areas of species in the oak-hickory-pine forest association. Native upland tree species in this forest association include blackjack oak (*Quercus marilandrica*), post oak (*Quercus stellata*), white oak (*Quercus alba*), burr oak (*Quercus macrocarpa*), various hickory species (*Carya* sp.), and persimmon (*Diospyros virginiana*) in the drier upland areas. Where the forest association is comprised of species in the oak-hickory-pine association, shortleaf pine (*Pinus echinata*) can be found along with the previously-mentioned upland species. In many areas that have been cleared but lie fallow, eastern redcedar (*Juniperus virginiana*) has become dominant.

Species that are generally found along stream banks and on floodplains typically consist of bottomland forests and include species of pecan (*Carya illinoensis*), pin oak (*Quercus palustris*), silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), Boxelder (*Acer negundo*), river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), elm species (*Ulmus sp.*), and willow (*Salix nigra*). Common understory species include woody species of redbud (*Cercis canadensis*), sumac (*Rhus sp.*), hawthorn (*Crataegus viridis*), Chickasaw plum (*Prunus angustifolia*), and rough leaved dogwood (*Cornus drummondi*). Herbaceous species include bluestems, sedges, panic grass, and broomsedge.

In the western portions of the watershed, natural vegetation includes predominately the tall grass prairie species of big bluestem (*Andropogon gerardii*), broomsedge (*Andropogon virginicus*), little bluestem (*Schizachyrium scoparium*), switch grass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*), interspersed with species from the oak-hickory forest association. On rocky hilltops, cross timbers mosaics are generally dominated by blackjack oak, post oak and little bluestem. Tall grass prairie species are generally native to deep loam derived from limestone and shale. Bottomland forests are generally native to floodplains and low terraces, and include species such as boxelder, pecan, walnut (*Juglans nigra*), silver maple, bur oak, Shumard oak (*Quercus shumardii*), elm, hackberry (*Celtis occidentalis*), willow, and eastern cottonwood.

3.9.2 Environmental Consequences

Terrestrial vegetation communities and resources have been considered in recommended zoning classifications and reclassifications. Substantial beneficial impacts to terrestrial vegetation communities would be expected by adoption of the Fort Gibson Lake MP revision proposed action. The net increase in area reclassified to Wildlife Management (29,903.2 acres, formerly High and Low Density Recreation) would apportion substantial additional area to be managed for natural terrestrial vegetative proliferation.

3.10 PRIME FARMLAND

3.10.1 Affected Environment

According to the U.S. Department of Agriculture (USDA), the definition of "prime farmland" is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and does not flood frequently during the growing season, or is protected from flooding.

Soils identified as prime farmland within the Fort Gibson Project area include Bates fine sandy loam (1 to 5% slopes), Bates loam (1 to 5% slopes), Bates-Collinsville complex (1 to 5% slopes), Britwater gravelly silt loam (1 to 8% slopes), Britwater silt loam (1 to 3% slopes), Choteau silt loam (1 to 3% slopes), Craig silt loam (1 to 5% slopes), Dennis silt loam 1 to 5% slopes), Healing silt loam (0 to 1% slopes), Jay silt loam (1 to 3% slopes), Linker fine sandy loam (1 to 5% slopes), Lula silt loam (1 to 3% slopes), Mason silt loam (0 to 1% slopes), Newtonia silt loam (1 to 5% slopes), Okemah silt loam (0 to 1% slopes), Okemah silty clay loam (0 to 3% slopes), Parsons silt loam (0 to 1 % slopes), Radley silt loam (0 to 1% slopes), Razort gravelly loam 0 to 3% slopes), Riverton loam (1 to 5% slopes), Stigler silt loam (0 to 1% slopes), Summit silty clay loam (0 to 5% slopes), Taloka silt loam (0 to 3% slopes), and Verdigris silty clay loam (0 to 1% slopes). These soils account for approximately 23,250 acres, or about 30.6% of project lands (USDA-NRCS, 2015).

3.10.2 Environmental Consequences

While significant areas of prime farmland exist on public lands managed by the USACE at the Fort Gibson Lake Project, no significant impacts to prime farmland would result from adoption of the Fort Gibson Lake MP revision.

3.11 WATER QUALITY

3.11.1 Affected Environment

Designated beneficial uses of Fort Gibson Lake include public and private water supply, fish and wildlife propagation as a warm water aquatic community (FWP-WWAC), agriculture, recreation including primary body contact (PBCR), and aesthetics. The Fort Gibson watershed downstream from Lake

Hudson to the Fort Gibson dam is listed in Oklahoma's Water Quality Standards [WQS] (OWRB, 2013) as a 'nutrient limited watershed', implying a designated beneficial use, in this case aesthetics, is adversely affected by excess nutrients. The most recent assessment of impaired waters of the State of Oklahoma Water (ODEQ, 2012) lists Fort Gibson Lake as impaired for fish and wildlife propagation as a warm water aquatic community due to low dissolved oxygen (DO) levels lake-wide and excessive turbidity in the upper portion of the lake. The draft 2014 Oklahoma Integrated Report (ODEQ, 2014) proposes delisting the turbidity impairment due to WQS attainment. Listed potential sources of impairments include grazing in riparian or shoreline zones, rangeland grazing, wastes from pets, wildlife other than waterfowl, and sources unknown.

Water quality data collected by the OWRB from Fort Gibson Lake in 2006 and 2007, as part of their Beneficial Use Monitoring Program (BUMP), indicated fair water quality relative to other regions in the state, with all measured turbidity observations below 25 Nephelometric Turbidity Units (NTU), average Secchi depths between 0.73 and 0.86 meters, specific conductance ranging from 164.9 to 351.1 micro-Siemens per centimeter (µS/cm), surface total nitrogen ranging from 0.62 to 1.43 milligrams per liter (mg/l), and surface total phosphorus ranging from 0.034 to 0.261 mg/l. Water quality observations not supporting beneficial uses included dissolved oxygen concentrations, where up to 80% of the water column at certain locations was <2 mg/l in mid-summer, and greater than 12% of the pH observations (observed range of 6.04 to 8.91) were < 6.5 standard units.

The aesthetics beneficial use was not supported due to Fort Gibson Lake's classification as eutrophic to hypereutrophic because of high primary productivity, estimated via chlorophyll-a concentrations, and elevated nutrient concentrations. The OWRB uses a Trophic State Index (Carlson's TSI) to classify the productivity of lake systems, and the average TSI, based on chlorophyll-a concentration, was 61. The value results in classifying the lake as hypereutrophic, indicative of variable oxygen concentrations, nutrient rich conditions, and limited benthic species diversity. Nutrient data collected suggest phytoplankton growth, or primary production, in Fort Gibson Lake is limited by phosphorus.

Certain segments of tributary streams to the reservoir are designated as 'high quality waters' indicating existing water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife and recreation in and on the water. Portions of streams with this designation in the watershed include Fourteen Mile Creek, Spring Creek, Little Spring Creek, and Snake Creek.

Segments of several tributaries to Fort Gibson Lake, within project boundaries, are included on the 303(d) list (ODEQ, 2012). Pryor Creek is listed as impaired by *E. coli*, *Enterococcus*, and low dissolved oxygen concentrations, impairing beneficial uses PBCR and FWP-WWAC. Ranger Creek is listed as impaired by *E. coli*, and low DO affecting beneficial uses PBCR and FWP-WWAC. Spring Creek is listed as impaired by *Enterococcus* affecting PBCR. Chouteau Creek is listed as impaired by low DO affecting FWP-WWAC. And finally, the Neosho River is listed as impaired by low DO and lead concentrations affecting beneficial use FWP-WWAC. Some of these listed impairments are recommended for delisting (Pryor Creek, *E. coli* and *Enterococcus*; and Ranger Creek, *E. col*i and DO) in the draft 2014 Integrated Report (ODEQ, 2014) due to meeting WQS and development and completion of TMDL documents.

The frequency and duration of harmful algal blooms (HABs) are of concern in Fort Gibson Lake. Recorded cyanobacterial bloom cell densities in 2013 and 2014 frequently exceed established public health guidelines (World Health Organization (WHO), 2003) for primary body contact for low (> 20,000 cells/ml cyanobacteria) and moderate (> 100,000 cells/ml cyanobacteria) risk of adverse health effects. In association with these blooms, the presence of a hepatotoxin, microcystin (a liver toxin), has been regularly detected with a maximum concentration of 0.616 micrograms per liter (µg/l), below the WHO guideline of 20 µg/l.

3.11.2 Environmental Consequences

Water resources and water quality have been considered in recommended zoning classifications and reclassifications. No significant impacts to water quality would occur by adoption of the Fort Gibson Lake MP revision.

3.12 WILD AND SCENIC RIVERS

3.12.1 Affected Environment

Pursuant to the Wild and Scenic River Act (Public Law 90-542), Wild River Areas are defined as those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Scenic river areas are defined as those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. There are no designated wild and scenic rivers in the State of Oklahoma, nor are any streams in the Fort Gibson watershed designated as 'scenic rivers' pursuant to the Oklahoma Scenic Rivers Act (82 O.S. § 1451-1470 as amended).

As stated earlier, certain segments of tributary streams to the reservoir are designated as 'high quality waters' by the State of Oklahoma indicating existing water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife and recreation in and on the water. Portions of streams with this designation in the watershed include Fourteen Mile Creek, Spring Creek, Little Spring Creek, and Snake Creek.

3.12.2 Environmental Consequences

No significant impacts to designated wild and scenic rivers, or State of Oklahoma designated high quality waters, would occur by adoption of the Fort Gibson Lake MP revision.

3.13 WETLANDS

3.13.1 Affected Environment

USFWS National Wetlands Inventory data (U.S. Fish and Wildlife Service, 2014) identifies about 23,243 acres of wetlands on Fort Gibson Project lands as indicated in Table 3-13. The majority of identified wetlands are within the area defined by the 'Top of Power Pool' at an elevation of 554 feet above MSL. Other wetland areas consist of lacustrine areas outside the power pool; palustrine wetlands categorized as emergent, forested, and scrub-shrub; and riverine areas.

Table 3-13 Designated Wetlands Within the Fort Gibson Project area (U.S. Fish and Wildlife Service, 2014).

Wetland Code	Description	Acres
L1UBHh	LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, Permanently Flooded, Diked/Impounded	19,191.69
L1UBHx	LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, Permanently Flooded, Excavated	173.84
L2UBFh	LACUSTRINE, LITTORAL, UNCONSOLIDATED BOTTOM, Semipermanently Flooded, Diked/Impounded	11.05
L2USCh	LACUSTRINE, LITTORAL, UNCONSOLIDATED SHORE, Seasonally Flooded, Diked/Impounded	0.72
PAB4H	PALUSTRINE, AQUATIC BED, Floating Vascular, Permanently Flooded	0.35
PAB4Hx	PALUSTRINE, AQUATIC BED, Floating Vascular, Permanently Flooded, Excavated	0.89
PEM1A	PALUSTRINE, EMERGENT, Persistent, Temporary Flooded	12.85
PEM1Ah	PALUSTRINE, EMERGENT, Persistent, Temporary Flooded, Diked/Impounded	101.21
PEM1C	PALUSTRINE, EMERGENT, Persistent, Seasonally Flooded	28.52
PEM1Ch	PALUSTRINE, EMERGENT, Persistent, Seasonally Flooded, Diked/Impounded	46.14
PEM1F	PALUSTRINE, EMERGENT, Persistent, Semipermanently Flooded	5.56
PEM1Fh	PALUSTRINE, EMERGENT, Persistent, Semipermanently Flooded, Diked/Impounded	6.15
PFO1/EM1Ah	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, EMERGENT, Persistent, Temporary Flooded, Diked/Impounded	7.56
PFO1/EM1C	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, EMERGENT, Persistent, Seasonally Flooded	40.33
PFO1/EM1Ch	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, EMERGENT, Persistent, Seasonally Flooded, Diked/Impounded	38.57
PFO1/SS1A	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, SCRUB-SHRUB, Broad-Leaved Deciduous, Temporary Flooded	54.41
PFO1/SS1Ah	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, SCRUB-SHRUB, Broad-Leaved Deciduous, Temporary Flooded, Diked/Impounded	120.81
PFO1/SS1C	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, SCRUB-SHRUB, Broad-Leaved Deciduous, Seasonally Flooded	1.90
PFO1/SS1Ch	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, SCRUB-SHRUB, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded	18.14
PFO1A	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, Temporary Flooded	1,296.32
PFO1Ah	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, Temporary Flooded, Diked/Impounded	1,112.62
PFO1C	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, Seasonally Flooded	63.31
PFO1Ch	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded	280.54
PFO1Fh	PALUSTRINE, FORESTED, Broad-Leaved Deciduous, Semipermanently Flooded, Diked/Impounded	6.70
PFO5/UBH	PALUSTRINE, FORESTED, Dead, UNCONSOLIDATED BOTTOM, Permanently Flooded	3.71
PFO5/UBHh	PALUSTRINE, FORESTED, Dead, UNCONSOLIDATED BOTTOM, Permanently Flooded, Diked/Impounded	20.58
PSS1/EM1A	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, EMERGENT, Persistent, Temporary Flooded	6.75
PSS1/EM1Ad	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, EMERGENT, Persistent, Temporary Flooded, Partially Drained/Ditched	13.02
PSS1/EM1Ah	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, EMERGENT, Persistent, Temporary Flooded, Diked/Impounded	74.97
PSS1/EM1C	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, EMERGENT, Persistent, Seasonally Flooded	3.36
PSS1/EM1Ch	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, EMERGENT, Persistent, Seasonally Flooded, Diked/Impounded	99.61
PSS1A	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Temporary Flooded	14.16
PSS1Ah	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Temporary Flooded, Diked/Impounded	9.56
PSS1C	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Seasonally Flooded	1.88
PSS1Ch	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded	60.15
PSS1F	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Semipermanently Flooded	2.72
PSS1Fh	PALUSTRINE, SCRUB-SHRUB, Broad-Leaved Deciduous, Semipermanently Flooded, Diked/Impounded	0.72
PUBF	PALUSTRINE, UNCONSOLIDATED BOTTOM, Semipermanently Flooded	1.48
PUBFh	PALUSTRINE, UNCONSOLIDATED BOTTOM, Semipermanently Flooded, Diked/Impounded	0.67
PUBFx	PALUSTRINE, UNCONSOLIDATED BOTTOM, Semipermanently Flooded, Excavated	0.15
PUBH	PALUSTRINE, UNCONSOLIDATED BOTTOM, Permanently Flooded	12.83
PUBHh	PALUSTRINE, UNCONSOLIDATED BOTTOM, Permanently Flooded, Diked/Impounded	96.30
PUBHx	PALUSTRINE, UNCONSOLIDATED BOTTOM, Permanently Flooded, Excavated	99.02
PUSC	PALUSTRINE, UNCONSOLIDATED SHORE, Seasonally Flooded	5.14
R2UBH	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, Permanently Flooded	94.77
R2USC	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED SHORE, Seasonally Flooded	0.91
R4SBC	RIVERINE, INTERMITTENT, STREAMBED, Seasonally Flooded	0.25
	TOTAL	**23,242.83**

3.13.2 Environmental Consequences

Minor beneficial impacts to designated wetlands would occur by adoption of the Fort Gibson Lake MP revision implementing the proposed action. Additional area classified as Wildlife Management, in particular areas formerly classified as High Density Recreation reclassified as Wildlife Management (2,693.3 acres), can be expected to offer additional protection and preservation of existing wetland areas.

3.14 FISH AND WILDLIFE

3.14.1 Affected Environment

The impoundment of the Grand (Neosho) River and other tributary streams that form Fort Gibson Lake changed the composition of fish populations from riverine species to lacustrine species. The lake offers excellent game fishing and is a regional asset for fishermen. Wildlife and fisheries within the project area are managed cooperatively between the ODWC and USACE. Shoreline habitat in Fort Gibson Lake is primarily comprised of rock and gravel. Additional habitat includes man-made structures such as rip-rap, brush piles, and boat docks. Little aquatic vegetation or standing timber exists within the lake. Flooded brush can be found in some areas along the shoreline and most creek arms have some timber and stumps present. The ODWC has established and maintained 17 brush piles on Fort Gibson Lake. These brush piles were refurbished with cedar trees and spider blocks in 2011 (Johnston & Foster, 2011).

The major sport fish in Fort Gibson Lake include largemouth bass (*Micropterus salmoides*), spotted bass (*Micropterus punctulatus*), white bass (*Morone chrysops*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), and paddlefish (*Polyodon spathula*). The primary forage species include threadfin shad (*Dorosoma petenense*) and gizzard shad (*Dorosoma cepedianum*) (Johnston & Foster, 2011). Recently, fish from Fort Gibson Lake have been tested to have lower levels of mercury and can be eaten without excessive exposure to mercury (ODEQ, 2013).

Management goals of the ODWC for Fort Gibson Lake include working with USACE and other appropriate entities to enhance boating and fishing access, conducting public outreach to solicit feedback regarding fisheries management issues, and to coordinate and assist with documentation and monitoring of aquatic nuisance species. Zebra mussel presence in Fort Gibson Lake was confirmed in 2010, and bighead carp have been confirmed in an upstream reservoir, Grand Lake.

Management objectives identified by ODWC in the Fort Gibson Lake Management Plan (Johnston & Foster, 2011) include:

- Maintain total largemouth bass catch rates at or above 100/hour with catch rates of largemouth bass >14 inches at or above 40/hour and relative weights that exceed 90% for all size groups.
- Maintain sufficient levels of forage species.
- Protect and enhance aquatic habitat.

Strategies to accomplish ODWC goals and objectives include the following: conducting sampling and analyzing populations of major sport fish and forage species; determining if current length and creel

limits are appropriate; protecting and enhancing aquatic habitat; monitoring and assessing summer water quality in the forebay and tailrace of the dam; soliciting ideas for additional boating access; and, performing public outreach focused on threats and prevention of, aquatic nuisance species (Johnston & Foster, 2011).

The principle wildlife habitats exist on savannas, oak-hickory forests, old agricultural fields, and forested bottomlands. Each of these vegetative types provide habitat for a variety of organisms at all trophic levels. Most of the project lands have potential for supporting large numbers of desirable wildlife.

Game species found within the project area of influence include whitetail deer, bobwhite quail, mourning dove, fox squirrel, gray squirrel, cottontail rabbit, swamp rabbit, raccoon, turkey, and various waterfowl species. Other species include gray fox, bobcat, coyote, muskrat, beaver, common striped skunk, and opossum. Various species of migratory waterfowl and shorebirds are abundant in the area during the fall, winter, and early spring months.

The Fort Gibson Wildlife Management Area (WMA), managed by the ODWC, covers 21,798 acres in Wagoner and Cherokee Counties and is located north and east of Wagoner, OK. ODWC's primary objective in these areas is to manage game species with the understanding those actions benefit both game and non-game species. The WMA is a mixture of upland and bottomland habitats. Upland areas consist of tall grass prairie mixed with farm fields and brushy thickets. Bottomland areas consist of Crosstimbers oak forest with cottonwood and sycamores in and around Fort Gibson Lake. Game species of interest include white-tailed deer, bobwhite quail, cottontail rabbit, coyote, bobcat, raccoon, mourning dove, fox squirrel, and multiple waterfowl species. Within the WMA, 2,700 acres are planted to row crops annually, and controlled burns are utilized to manage upland habitats. A 3,500-acre waterfowl refuge, in the Jackson Bay area, is managed for waterfowl with nine wetland units and numerous fields planted to wheat, sunflower, milo, and millet (ODWC, 2014).

3.14.2 Environmental Consequences

Impacts to fish and wildlife resources at the Fort Gibson Project have been considered in this assessment. Substantial beneficial impacts to terrestrial wildlife resources would be expected to occur by adoption of the Fort Gibson MP revision implementing the proposed action. Thirty unique areas formerly classified as Intensive Use (or High Density Recreation), with a cumulative area of 2,693.2 acres, would be reclassified as Wildlife Management. Additionally, 37 unique areas formerly classified as Low Density Recreation, with a cumulative area of 27,217.1 acres, would be reclassified as Wildlife Management. With a net increase of 29,903.2 acres reclassified to Wildlife Management, substantial additional Project area would be managed to promote wildlife habitat and propagation.

3.15 EXECUTIVE ORDER 13112 (INVASIVE SPECIES)

3.15.1 Affected Environment

On February 3, 1999, President Clinton issued Executive Order 13112 (EO 13112), Invasive Species, which notes that invasive species annually cause significant economic, ecological, and alien species whose introduction does or is likely to cause economic and environmental harm or harm to human health. EO 13112 requires Federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States; and that all

feasible and prudent measure to minimize risk or harm will be taken in conjunction with the actions. EO 13112 is addressed in this NEPA document to incorporate measures that will prevent the inadvertent spread of exotic and invasive species.

Invasive species known to be present on Fort Gibson Project fee lands, severity, and acres impacted are listed in Table 3-14. Data included in the table was extracted from the USACE's Operations and Maintenance Business Information Link (OMBIL).

Table 3-14 Invasive Species Known to be Present on Fort Gibson Project Fee Lands.

Species Common Name	Type of Occurrence	Acreage Impacted
Zebra Mussel	Significant/Major (Aquatic)	19,900
European Starling	Moderate	10,000
Feral Hog	Moderate	5,000
Red Cedar	Moderate	20,000
Sericea lespedeza	Moderate	20,000
Chinese privet	Minor	1,000
Japanese honeysuckle	Minor	2,000
Musk/nodding thistle	Minor	500
Johnsongrass	Moderate	20,000
Tree of Heaven	Minor	20
False grape	Minor	50
Burr Cucumber	Minor	50
Hemp Sesbania	Minor	200

3.15.2 Environmental Consequences

The effects of invasive species at Fort Gibson Project have been considered. Adoption of the Fort Gibson MP revision would result in no significant impacts to the Fort Gibson Project due to the presence or future introduction of invasive species.

3.16 EXECUTIVE ORDER 13186 (PROTECTION OF MIGRATORY BIRDS)

3.16.1 Affected Environment

On January 10, 2001, President Clinton issued Executive Order 13186 (EO 13186), Responsibility of Federal Agencies to Protect Migratory Birds, which notes that migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats. EO 13186 requires, in part, Federal agencies to integrate conservation principles, measures, and practices into agency activities and prevent or abate the pollution or detrimental alteration of the Environment for the benefit of migratory birds, as practicable.

The USFWS (U.S. Fish and Wildlife Service, 2015) has identified 28 migratory birds potentially present on Fort Gibson Project lands. The Migratory birds of concern list, required under EO 13186, for the Fort Gibson Project includes: Acadian Flycatcher (*Empidonax virescens*), Bachman's sparrow (*Aimophila aestivalis*), Bald eagle (*Haliaeetus leucocephalus*), Bell's Vireo (*Vireo bellii*), Bewick's Wren (*Thryomanes bewickii ssp. bewickii*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Blue-winged Warbler (*Vermivora pinus*), Dickcissel (*Spiza americana*), Field Sparrow (*Spizella pusilla*), Fox Sparrow (*Passerella liaca*), Golden eagle (*Aquila chrysaetos*), Harris's Sparrow (*Zonotrichia querula*), Hudsonian Godwit (*Limosa haemastica*), Kentucky Warbler (*Oporornis formosus*), Le Conte's Sparrow

(*Ammodramus leconteii*), Least Bittern (*Ixobrychus exilis*), Loggerhead Shrike (*Lanius ludovicianus*), Mississippi Kite (*Ictinia mississippiensis*), Northern Flicker (*Colaptes auratus*), Painted Bunting (*Passerina ciris*), Prairie Warbler (*Dendroica discolor*), Prothonotary Warbler (*Protonotaria citrea*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Rusty Blackbird (*Euphagus carolinus*), Sedge Wren (*Cistothorus platensis*), Short-eared Owl (*Asio flammeus*), Swainson's Warbler (*Limnothlypis swainsonii*), and Wood Thrush (*Hylocichla mustelina*).

3.16.2 Environmental Consequences

Effects to migratory birds documented to utilize Fort Gibson Project lands and waters for migration and resting areas, breeding, wintering, and year-round use have been considered. Substantial beneficial impacts to migratory birds would result by adoption of the Fort Gibson Lake MP revision implementing the proposed action due to the net increase in area reclassified to Wildlife Management (29,903.2 acres). Management of these lands for wildlife habitat and propagation would provide enhanced layover, nesting, and foraging areas to the benefit of migratory birds.

3.17 EXECUTIVE ORDERS 12962 AND 13474 (RECREATIONAL FISHERIES)

3.17.1 Affected Environment

Executive Orders 12962 and 13474 (an amendment to Executive Order 12962) require Federal agencies, to the extent permitted by law and where practicable, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities in cooperation with States and Tribes and ensure that recreational fishing shall be managed as a sustainable activity in national wildlife refuges, national parks, national monuments, national marine sanctuaries, marine protected areas, or any other relevant conservation or management areas or activities under any Federal authority, consistent with applicable law.

Fort Gibson Lake provides fishing opportunities for the boater and bank angler. Cooperative efforts between the USACE and the ODWC have improved fishing success rates with installation of fish habitat and maintenance of access areas throughout the project. Common sport fish species present in Fort Gibson Lake include largemouth bass, spotted bass, white bass, white crappie, black crappie, blue catfish, channel catfish, flathead catfish, and paddlefish. Other species include a variety of smaller sunfish, minnows, darters, and shad. Wildlife and fisheries are managed cooperatively between the ODWC and USACE. USACE currently licenses 21,798 acres of land to ODWC. This area comprises the Fort Gibson Wildlife Management Area (WMA). ODWC's primary objective in these areas is to manage game species with the understanding those actions benefit both game and non-game species. These areas will continue being managed by this agency under their license. ODWC is also the primary agency responsible for performing fisheries management. ODWC objectives for fisheries are to continue to monitor current populations, and ensure the populations are healthy and stable. ODWC does annual sampling and data analysis to assure fisheries populations stay within an acceptable range and they make adjustments in creel and size limits as necessary to keep existing populations healthy. ODWC can also supplement fish populations with their hatchery program.

3.17.2 Environmental Consequences

Effects to recreational fisheries have been considered in this assessment. Adoption of the Fort Gibson Lake MP revision would not result in significant impacts to reservoir fisheries, fish, and wildlife management activities (related to fisheries) of the ODWC.

3.18 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

3.18.1 Affected Environment

The U.S. Fish and Wildlife Service has identified 13 threatened, endangered, or candidate species with possible distributions within the outer boundaries of the Fort Gibson Project in Cherokee, Mayes, and Wagoner Counties, Oklahoma. Threatened species include the piping plover (*Charadrius melodus*) and red knot (*Calidris canutus rufa*), the rabbitsfoot clam (*Quadrula cylindrica cylindrica*), the Ozark cavefish (*Amblyopsis rosae*), and the northern long-eared bat (*Myotis septentrionalis*). Endangered species include the least tern (*Sterna antillarum*), the whooping crane (*Grus Americana*), the Neosho mucket (*Lampsilis rafinesqueana*), the American Burying beetle (*Nicrophorus americanus*), the gray bat (*Myotis grisescens*), and the Ozark Big-Eared bat (*Corynorhinus (=plecotus) townsendii ingens*). Candidate species listed include Sprague's Pipit (*Anthus spragueii*) and the Arkansas darter (*Etheostoma cragini*). No critical habitats for any of the species listed lie within the project area. An official list of threatened and endangered species was provided by the USFWS on March 13, 2015 and updated October 5, 2015. The Official Species List, Consultation Tracking Number: 02EKOK00-2015-SLI-0776 (U.S. Fish and Wildlife Service, 2015), is included in Appendix B.

3.18.2 Environmental Consequences

While no critical habitat for any federally listed threatened and endangered species has been identified, within boundaries of the Fort Gibson Project, the area includes possible distributions of these species. Adoption of the Fort Gibson Lake MP revision implementing the proposed action, classifying additional lands to be managed for Wildlife Management, could be expected to have at least minor beneficial impacts on potential habitat for federally listed threatened and endangered species. USACE would continue to comply with applicable laws and USACE policy and guidance related to impacts to threatened and endangered species. Soil disturbing activities associated with land management, public recreation area maintenance, out-granted recreation area maintenance and improvements, and other routine O&M activities will be assessed individually as they arise. Cherokee, Mayes, and Wagoner Counties are within the American burying beetle (ABB) potential occurrence range published March 6, 2014 by the USFWS, and the Fort Gibson Project area falls within the 30 kilometer documented ABB range. Portions of the Fort Gibson Project area are included in ABB Conservation Priority Areas for Oklahoma. The most current ABB positive survey result within the Fort Gibson Project area occurred in 2012 in Wagoner Co. Prior to initiation of any soil disturbing activities at the Fort Gibson Project, the Tulsa District will coordinate ABB survey efforts and data collection under the conditions of the most recent Biological Opinion issued to the Tulsa District by the USFWS in accordance with American Burying Beetle, Reasonable and Prudent Measure #1.

4.0 APPLICABLE FEDERAL LAWS

Table 4-1 Relationship of Plans to Federal Environmental Protection Statutes and Other Environmental Requirements.

Policies	Compliance of Alternatives
Archeological and Historic Preservation Act, 1974, as amended, 16 U.S.C. 469, et seq.	All plans in full compliance
Clean Air Act, as amended, 42 U.S.C. 7609, et seq.	All plans in full compliance
Clean Water Act, 1977, as amended (Federal Water Pollution Control Act, 33 U.S.C. 1251, et seq.	All plans in full compliance
Endangered Species Act, 1973, as amended, 16 U.S.C. 1531, et seq.	All plans in full compliance
Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1-12, et seq.	All plans in full compliance
Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.	All plans in full compliance
Land and Water Conservation Fund Act, 1965, as amended, 16 U.S.C. 4601, et seq.	All plans in full compliance
National Historic Preservation Act, 1966, as amended, 16 U.S.C. 470a, et seq.	All plans in full compliance
National Environmental Policy Act, as amended, 42 U.S.C. 4321, et seq.	All plans in full compliance
Native American Graves Protection and Repatriation Act, 1990, 25 U.S.C. 3001-13, et seq.	All plans in full compliance
Rivers and Harbors Act, 33 U.S.C. 401, et seq.	All plans in full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	All plans in full compliance
Wild and Scenic Rivers Act, as amended, 16 U.S.C. 1271, et seq.	Not Applicable
Water Resources Planning Act, 1965	All plans in full compliance
Floodplain Management (E.O. 11988)	Not Applicable
Protection of Wetlands (E.O. 11990)	All plans in full compliance
Recreational Fisheries (E.O. 12962)	All plans in full compliance
Environmental Justice (E.O. 12898)	All plans in full compliance
Protection of Children (E.O. 13045)	All plans in full compliance
Invasive Species (E.O. 13112)	All plans in full compliance
Protection of Migratory Birds (E.O. 13186)	All plans in full compliance
Recreational Fisheries (E.O. 13474)	All plans in full compliance
Farmland Protection Policy Act, 7 U.S.C. 4201, et seq.	All plans in full compliance

Note: Full compliance – Having met all requirements of the statutes, Executive Orders, or other environmental requirements for the current stage of planning, operations, and or project execution.

5.0 FEDERAL, STATE, AND LOCAL AGENCY COORDINATION

The Draft Environmental Assessment (EA) was coordinated with the following agencies having legislative and administrative responsibilities for environmental protection. A copy of the correspondence from the agencies that provided comments and planning assistance for preparation of the draft EA are in the appendices. The mailing list for the 30-day public review period for this draft EA is in Appendix A.

- U.S. Environmental Protection Agency, Region VI
- U.S. Fish and Wildlife Service
- U.S. Department of Agriculture, Natural Resources Conservation Service
- Southwestern Power Administration
- Oklahoma Department of Wildlife Conservation
- Oklahoma Department of Environmental Quality
- Oklahoma Water Resources Board
- Oklahoma Conservation Commission
- Oklahoma Natural Heritage Inventory
- Oklahoma Archeological Survey
- Oklahoma State Historic Preservation Officer
- Oklahoma Tourism and Recreation Department
- Alabama-Quassarte Tribal Town, Oklahoma
- Caddo Indian Tribe of Oklahoma
- Cherokee Nation, Oklahoma
- Kialegee Tribal Town, Oklahoma
- Muscogee (Creek) Nation, Oklahoma
- Osage Nation, Oklahoma
- Seminole Nation of Oklahoma
- Thlopthlocco Tribal Town, Oklahoma
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Wichita and Affiliated Tribes of Oklahoma

6.0 LIST OF PREPARERS

David Gade, Ph.D. – Limnologist; 15 years , U.S. Army Corps of Engineers, Regional Planning and Environmental Center (RPEC), NEPA & Cultural Resources Section.

Norman Lewis – Regional Economist; 9 years, .S. Army Corps of Engineers, Regional Planning and Environmental Center (RPEC), Economics Section.

Kenneth L. Shingleton – Archeologist; 21 years, U.S. Army Corps of Engineers, Tulsa District, Operations Division, Natural Resources Section.

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APPENDIX A NEPA Coordination and Scoping

US Army Corps of Engineers
BUILDING STRONG®

Open House Workshop planned for Fort Gibson Lake

Posted 4/8/2014

Release no. 14-007

Contact
Sara Goodeyon 918-669-7342

TULSA, Okla. — The Tulsa District, U.S. Army Corps of Engineers will host an open house workshop from 6:00-8:00 p.m., April 15, 2014 related to the review and revision of the project master plan (MP) for Fort Gibson Lake, Mayes, Wagoner, and Cherokee Counties, Okla. The open house will be held at the City of Wagoner Civic Center, 301 South Grant Avenue, Wagoner, Okla., 74467.

This will be an informal come-and-go open house with no formal presentation. Interested persons can stop by the open house to visit the information tables and discuss the project with Corps personnel.

Attendees will be provided forms for providing input and comments about the revision of the lake master plan. Comments are also welcome in any form throughout the MP revision process.

The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps project. It is a tool for efficient and cost-effective management, development, and use of project lands.

The MP does not address issues associated with private boat docks or permits for shoreline vegetation modification. These issues are specifically addressed in the shoreline management plan (SMP) for a lake project. The SMP for Fort Gibson Lake will be reviewed and potentially revised at a later date. Private dock and shoreline vegetation modification permits will be addressed at that time, and not in the current MP review process.

Comments and questions regarding the open house workshop or MP review process can be directed to:

Tom Heathcock

Fort Gibson Lake Manager

8568 State Highway 251-A

Fort Gibson, OK 74434

918-682-4314

Tom.Heathcock@usace.army.mil

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DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Ron Curry
Federal Region VI Administrator
U. S. Environmental Protection Agency
1445 Ross Ave., Suite 1200
Dallas, TX 75202

Dear Mr. Curry:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

It is important to note that a master plan does not address issues associated with private boat docks or permits for shoreline vegetation modification. These issues are specifically addressed in the shoreline management plan (SMP) for a lake project. The SMP for Fort Gibson Lake will be reviewed and revised at a later date. Private dock and shoreline vegetation modification permits will be addressed at that time and not in the current MP revision process.

An informal public workshop for discussion of the MP revision for Fort Gibson Lake is scheduled for 6:00 to 8:00 p.m. on April 15, 2014, at the City of Wagoner Civic Center, 301 S. Grant Avenue, Wagoner, Oklahoma. The workshop will be come-and-go format with no formal presentation. We invite and encourage you to attend this workshop anytime between listed times, visit the information tables, and discuss MP issues with our staff. Comment forms will be provided at the workshop or you are welcome to submit comments in any form throughout the MP revision process.

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Thank you for your interest in Fort Gibson Lake. We welcome your comments and participation at the public workshop and throughout the master plan review process. Questions should be directed to Mr. Tom Heathcock, Fort Gibson Lake Manager, at 918-682-4314 or e-mail Tom.Heathcock@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

1

DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Gary O'Neill
State Conservationist
USDA, Natural Resources Conservation Service
100 USDA, Suite 206
Stillwater, OK 74074-2655

Dear Mr. O'Neill:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

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Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

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DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Steve Thompson
Executive Director
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

Dear Mr. Thompson:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

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Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

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DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. J. D. Strong
Executive Director
Oklahoma Water Resources Board
3800 N. Classen Boulevard
Oklahoma City, OK 73118

Dear Mr. Strong:

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Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

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DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Derek Smithee
Chief, Water Quality Programs Division
Oklahoma Water Resources Board
3800 North Classen Boulevard
Oklahoma City, OK 73118

Dear Mr. Smithee:

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UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Mike Thralls
Executive Director
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Dear Mr. Thralls:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

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UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Ms. Shanon Phillips, Director
Water Quality Programs
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Dear Ms. Phillips:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Dr. Robert L. Brooks
University of Oklahoma
Oklahoma Archeological Survey
111 E. Chesapeake
Norman, OK 73019-0575

Dear Mr. Brooks:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Dr. Bob Blackburn
State Historic Preservation Officer
Oklahoma Historical Society
Oklahoma History Center
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

Dear Dr. Blackburn:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Ms. Deby Snodgrass
Executive Director
Oklahoma Tourism and Recreation Department
120 N. Robinson
Oklahoma City, OK 73102

Dear Ms. Snodgrass:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Chief Tarpie Yargee
Alabama-Quassarte Tribal Town, Oklahoma
P.O. Box 187
Wetumka, OK 74883

Dear Chief Yargee:

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Operations Division
Natural Resources and Recreation Branch

Chairperson Brenda Shemayme Edwards
Caddo Indian Tribe of Oklahoma
P.O. Box 487
Binger, OK 73009

Dear Ms. Edwards:

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UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
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TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Principal Chief Bill John Baker
Cherokee Nation, Oklahoma
P.O. Box 948
Tahlequah, OK 74465

Dear Chief Baker:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mekko Tiger Hobia
Kialegee Tribal Town, Oklahoma
P.O. Box 332
Wetumka, OK 74883

Dear Mr. Hobia:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Principal Chief A.D. Ellis
Muscogee (Creek) Nation, Oklahoma
P.O. Box 580
Okmulgee, OK 74447

Dear Chief Ellis:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Principal Chief Scott Bighorse
Osage Nation, Oklahoma
P.O. Box 779
Pawhuska, OK 74056

Dear Chief Bighorse:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Principal Chief Leonard Harjo
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Dear Chief Harjo:

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mekko George Scott
Thlopthlocco Tribal Town, Oklahoma
P.O. Box 188
Okemah, OK 74859

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MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Chief George Wickliffe
United Keetoowah Band of Cherokee Indians in Oklahoma
P.O. Box 746
Tahlequah, OK 74465-0746

Dear Chief Wickliffe:

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Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

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DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

President Leslie Standing
Wichita and Affiliated Tribes of Oklahoma
P.O. Box 729
Anadarko, OK 73005

Dear President Standing:

The Tulsa District is initiating a review and revision of the master plan (MP) for Fort Gibson Lake, Oklahoma. The MP is the strategic land management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of a Corps lake project. It is a vital tool for efficient and cost-effective management, development, and use of project lands. We welcome your comments and participation in review and revision of the MP for Fort Gibson Lake.

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Sincerely,

Stephen L. Nolen
Chief, Natural Resources
and Recreation Branch

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Mailing List:

Mr. Ron Curry
Federal Region VI Administrator
U. S. Environmental Protection Agency
1445 Ross Ave., Suite 1200
Dallas, TX 75202

Ms. Jonna Polk, Field Supervisor
U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 E. 21st St.
Tulsa, OK 74129-1428

Mr. Gary O'Neill
State Conservationist
USDA, Natural Resources Conservation Service
100 USDA, Suite 206
Stillwater, OK 74074-2655

Mr. Richard Hatcher
Director
Oklahoma Department of Wildlife Conservation
1801 N. Lincoln Blvd.
Oklahoma City, OK 73105

Mr. Scott Thompson
Executive Director
Oklahoma Department of Environmental
Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

Mr. J. D. Strong
Executive Director
Oklahoma Water Resources Board
3800 N. Classen Boulevard
Oklahoma City, OK 73118

Mr. Derek Smithee
Chief, Water Quality Programs Division
Oklahoma Water Resources Board
3800 North Classen Boulevard
Oklahoma City, OK 73118

Mr. Trey Lamb
Executive Director
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Ms. Shanon Phillips, Director
Water Quality Programs
Oklahoma Conservation Commission
2800 N. Lincoln Blvd., Suite 160
Oklahoma City, OK 73105

Mr. Ian H. Butler
Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
111 E. Chesapeake Street
Norman, OK 73019-0575

Dr. Robert L. Brooks
University of Oklahoma
Oklahoma Archeological Survey
111 E. Chesapeake
Norman, OK 73019-0575

Dr. Bob Blackburn
State Historic Preservation Officer
Oklahoma Historical Society
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

Ms. Deby Snodgrass
Executive Director
Oklahoma Tourism and Recreation Department
120 N. Robinson
Oklahoma City, OK 73102

Mr. Marshall Boyken
Southwestern Power Administration
One West Third Street
Tulsa, OK 74103-3502

Chief Tarpie Yargee
Alabama-Quassarte Tribal Town, Oklahoma
P.O. Box 187
Wetumka, OK 74883

Chairman Tamara Francis-Fourkiller
Caddo Nation of Oklahoma
P.O. Box 487
Binger, OK 73009

Principal Chief Bill John Baker
Cherokee Nation, Oklahoma
P.O. Box 948
Tahlequah, OK 74465

Mailing List (continued):

Mekko Tiger Hobia
Kialegee Tribal Town, Oklahoma
P.O. Box 332
Wetumka, OK 74883

Principal Chief George Tiger
Muscogee (Creek) Nation, Oklahoma
P.O. Box 580
Okmulgee, OK 74447

Principal Chief Geoffrey Standing Bear
Osage Nation, Oklahoma
P.O. Box 779
Pawhuska, OK 74056

Principal Chief Leonard Harjo
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

Town King George Scott
Thlopthlocco Tribal Town, Oklahoma
P.O. Box 188
Okemah, OK 74859

Chief George Wickliffe
United Keetoowah Band of Cherokee Indians in Oklahoma
P.O. Box 746
Tahlequah, OK 74465-0746

President Terri Parton
Wichita and Affiliated Tribes of Oklahoma
P.O. Box 729
Anadarko, OK 73005

Mr. Lindel Adair
9500 S. 190 E. Ave.
Broken Arrow, OK 74012

Ms. Ann Davis
Paradise Cove Marina
2429 Park 56
Hulbert, OK 74441

Ms. Jo Ann Cline
2989 W. 351 Rd.
Hulbert, OK 74441

Ms. Karen Ammons
1420 William
Fort Gibson, OK 74434

Ms. Nora Harris
P.O. Box 251
Fort Gibson, OK 74434

Mr. Jack Schultz
1305 Maple St
Muskogee, OK 74403

Mr. Tony Presley
17131 Park 10
Hulbert, OK 74441

Ms. Gina Levesque
918 W. Choctaw, Suite #2
Tahlequah, OK 74467

Ms. Ann Shelton
Sequoyah Lodge
19808 Park 10
Hulbert, OK 74441

Sequoyah State Park/Sequoyah Bay State Park
17131 Park 10
Hulbert, OK 74441

Oklahoma Department of Wildlife Conservation
Northeast Regional Office – Mike Plunkett
9097 N. 34th St. West
Porter, Ok 74454

Wagoner County Commissioners
307 E Cherokee St.
Wagoner, OK 74467

Cherokee County Commissioners
213 W. Delaware St.
Tahlequah, OK 74464

Mayes County Commissioners
1 Court Place, Ste 140
Pryor, OK 74361

Mailing List (continued):

Mid America Industrial Park
Larry Williams
P O Box 945
Pryor, OK 74362-0945

Pryor Creek Concession
PO Box 130
Chouteau, OK 74337

Taylor Ferry Marina
34179 Marina Dr.
Wagoner, OK 74467

Long Bay Marina
8431 E. 570 Rd.
Catoosa, OK 74015

Jackson Bay Marina
4828 E. 115th St. N.
Wagoner, OK 74467

Whitehorn Cove Marina
34561 E. 700 Rd.
Wagoner, OK 74467

Mazie Landing
PO Box 490
Chouteau, OK 74437

Sequoyah Bay Marina
6372 E. 101st N.
Wagoner, OK 74467

Paradise Cove Marina
2429 Park 56
Hulbert, OK 74441

Mr. Randy Shipman
411 Susan Ave.
Wagoner, OK 74467

Oklahoma Department of Transportation

200 N.E. 21st Street
Oklahoma City, OK 73105

Mayor, Hulbert, Oklahoma
Honorable Shirley Teague
PO Box 147
Hulbert, OK 74441

Mayor, Fort Gibson, Oklahoma
Honorable Brad Clinkenbeard
PO Box 218
Fort Gibson, OK 74434

Mayor, Wagoner, Oklahoma
Honorable James Jennnings
PO Box 406
Wagoner, OK 74477

Mayor, Pryor, Oklahoma
Honorable Jimmy Tramel
PO Box 1167
Pryor, OK 74362

Mayor, Chouteau, Oklahoma
Honorable Jerry Floyd
PO Box 819
Chouteau, OK 74337

Mayor, Okay, Oklahoma
Honorable Clarence Ashley
PO Box 505
Okay, OK 74446

Fort Gibson Lake Association
Visitor Center / Blake Park
300 S. Dewey
Wagoner, OK 74467

APPENDIX B Fish and Wildlife Coordination

DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Jontie Aldrich, Acting Field Supervisor
U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 E. 21st St.
Tulsa, OK 74129- 1428

Dear Mr. Aldrich:

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Sincerely,

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Chief, Natural Resources
and Recreation Branch

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UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Richard Hatcher
Director
Oklahoma Department of Wildlife Conservation
1801 N. Lincoln Blvd.
Oklahoma City, OK 73105

Dear Mr. Hatcher:

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UNITED STATES ARMY CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101 EAST AVENUE
TULSA OK 74128-4609

MAR 2 6 2014

Operations Division
Natural Resources and Recreation Branch

Mr. Ian H. Butler
Oklahoma Natural Heritage Inventory
Oklahoma Biological Survey
111 E. Chesapeake Street
Norman, OK 73019-0575

Dear Mr. Butler:

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and Recreation Branch

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 EAST 21ST STREET
TULSA, OK 74129
PHONE: (918)581-7458 FAX: (918)581-7467
URL: www.fws.gov/southwest/es/Oklahoma/

Consultation Code: 02EKOK00-2015-SLI-0776 October 05, 2015
Event Code: 02EKOK00-2016-E-00037
Project Name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/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.

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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:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Non-federal entities conducting activities that may result in take of listed species should consider seeking coverage under section 10 of the ESA, either through development of a Habitat Conservation Plan (HCP) or, by becoming a signatory to the General Conservation Plan (GCP) currently under development for the American burying beetle. Each of these mechanisms provides the means for obtaining a permit and coverage for incidental take of listed species during otherwise lawful activities.

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.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) 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: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

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 through our Project Review step-wise process http://www.fws.gov/southwest/es/oklahoma/OKESFO%20Permit%20Home.htm.

Attachment

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United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Official Species List

Provided by:

Oklahoma Ecological Services Field Office
9014 EAST 21ST STREET
TULSA, OK 74129
(918) 581-7458
http://www.fws.gov/southwest/es/Oklahoma/

Consultation Code: 02EKOK00-2015-SLI-0776
Event Code: 02EKOK00-2016-E-00037

Project Type: LAND - MANAGEMENT PLANS

Project Name: Fort Gibson MP EA -- created on March 13, 2015 08:11
Project Description: Update of Fort Gibson Project (USACE) Master Plan

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

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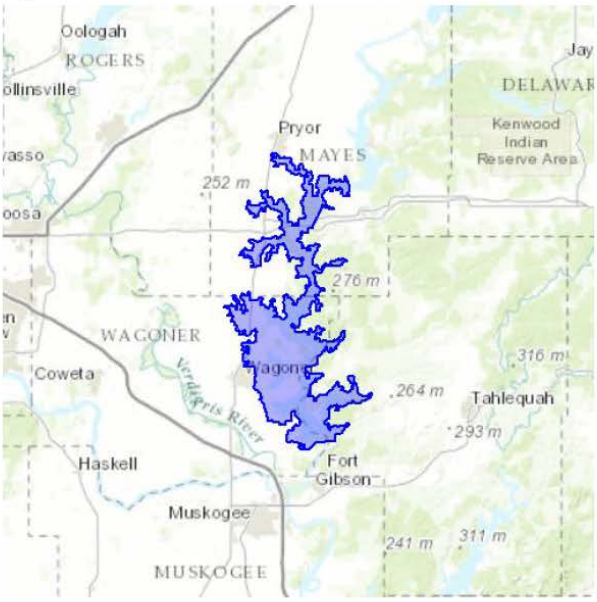
United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Wagoner, OK

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United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Endangered Species Act Species List

There are a total of 13 threatened, endangered, or candidate species on your 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. Note that 1 of these species should be considered only under certain conditions. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		Towers (i.e. radio, television, cellular, microwave, meterological)Wind Turbines and Wind Farms
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened		
Red Knot *(Calidris canutus rufa)*	Threatened		
Sprague's Pipit *(Anthus spragueii)*	Candidate		
Whooping crane *(Grus americana)* Population: except where EXPN	Endangered	Final designated	
Clams			
Neosho Mucket *(Lampsilis rafinesqueana)* Population: Neosho mucket	Endangered	Proposed	
rabbitsfoot *(Quadrula cylindrica ssp.*	Threatened	Final designated	

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cylindrica) Population: Rabbitsfoot			
Fishes			
Arkansas darter *(Etheostoma cragini)*	Candidate		
Ozark cavefish *(Amblyopsis rosae)* Population: Entire	Threatened		
Insects			
American Burying beetle *(Nicrophorus americanus)* Population: Entire	Endangered		
Mammals			
Gray bat *(Myotis grisescens)* Population: Entire	Endangered		
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		
Ozark Big-Eared bat *(Corynorhinus (=plecotus) townsendii ingens)* Population: Entire	Endangered		

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United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Critical habitats that lie within your project area

There are no critical habitats within your project area.

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United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Appendix A: FWS National Wildlife Refuges

There are no refuges within your project area.

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United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Appendix B: FWS Migratory Birds

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no otherwise lawful activities. For more information regarding these Acts see: http://www.fws.gov/migratorybirds/RegulationsandPolicies.html.

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to:
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html.

To search and view summaries of year-round bird occurrence data within your project area, go to the Avian Knowledge Network Histogram Tool links in the Bird Conservation Tools section at:
http://www.fws.gov/migratorybirds/CCMB2.htm.

For information about conservation measures that help avoid or minimize impacts to birds, please visit:
http://www.fws.gov/migratorybirds/CCMB2.htm.

Migratory birds of concern that may be affected by your project:
There are 28 birds on your Migratory birds of concern list.

Species Name	Bird of Conservation Concern (BCC)	Seasonal Occurrence in Project Area
Acadian Flycatcher *(Empidonax virescens)*	Yes	Breeding
Bachman's sparrow	Yes	Breeding

(Aimophila aestivalis)		
Bald eagle *(Haliaeetus leucocephalus)*	Yes	Year-round
Bell's Vireo *(Vireo bellii)*	Yes	Breeding
Bewick's Wren *(Thryomanes bewickii ssp. bewickii)*	Yes	Year-round
Black-crowned Night-Heron *(Nycticorax nycticorax)*	Yes	Breeding
Blue-winged Warbler *(Vermivora pinus)*	Yes	Breeding
Dickcissel *(Spiza americana)*	Yes	Breeding
Field Sparrow *(Spizella pusilla)*	Yes	Year-round
Fox Sparrow *(Passerella liaca)*	Yes	Wintering
Golden eagle *(Aquila chrysaetos)*	Yes	Wintering
Harris's Sparrow *(Zonotrichia querula)*	Yes	Wintering
Hudsonian Godwit *(Limosa haemastica)*	Yes	Migrating
Kentucky Warbler *(Oporornis formosus)*	Yes	Breeding
Le Conte's Sparrow *(Ammodramus leconteii)*	Yes	Wintering
Least Bittern *(Ixobrychus exilis)*	Yes	Breeding

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Loggerhead Shrike *(Lanius ludovicianus)*	Yes	Year-round
Mississippi Kite *(Ictinia mississippiensis)*	Yes	Breeding
Northern Flicker *(Colaptes auratus)*	Yes	Year-round
Painted Bunting *(Passerina ciris)*	Yes	Breeding
Prairie Warbler *(Dendroica discolor)*	Yes	Breeding
Prothonotary Warbler *(Protonotaria citrea)*	Yes	Breeding
Red-headed Woodpecker *(Melanerpes erythrocephalus)*	Yes	Year-round
Rusty Blackbird *(Euphagus carolinus)*	Yes	Wintering
Sedge Wren *(Cistothorus platensis)*	Yes	Migrating
Short-eared Owl *(Asio flammeus)*	Yes	Wintering
Swainson's Warbler *(Limnothlypis swainsonii)*	Yes	Breeding
Wood Thrush *(Hylocichla mustelina)*	Yes	Breeding

United States Department of Interior
Fish and Wildlife Service

Project name: Fort Gibson MP EA -- created on March 13, 2015 08:11

Appendix C: NWI Wetlands

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

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 and/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.

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 tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

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

1

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.

The following NWI Wetland types intersect your project area in one or more locations. To understand the NWI Classification Code, see http://wetlandsfws.usgs.gov/Data/interpreters/wetlands.aspx.

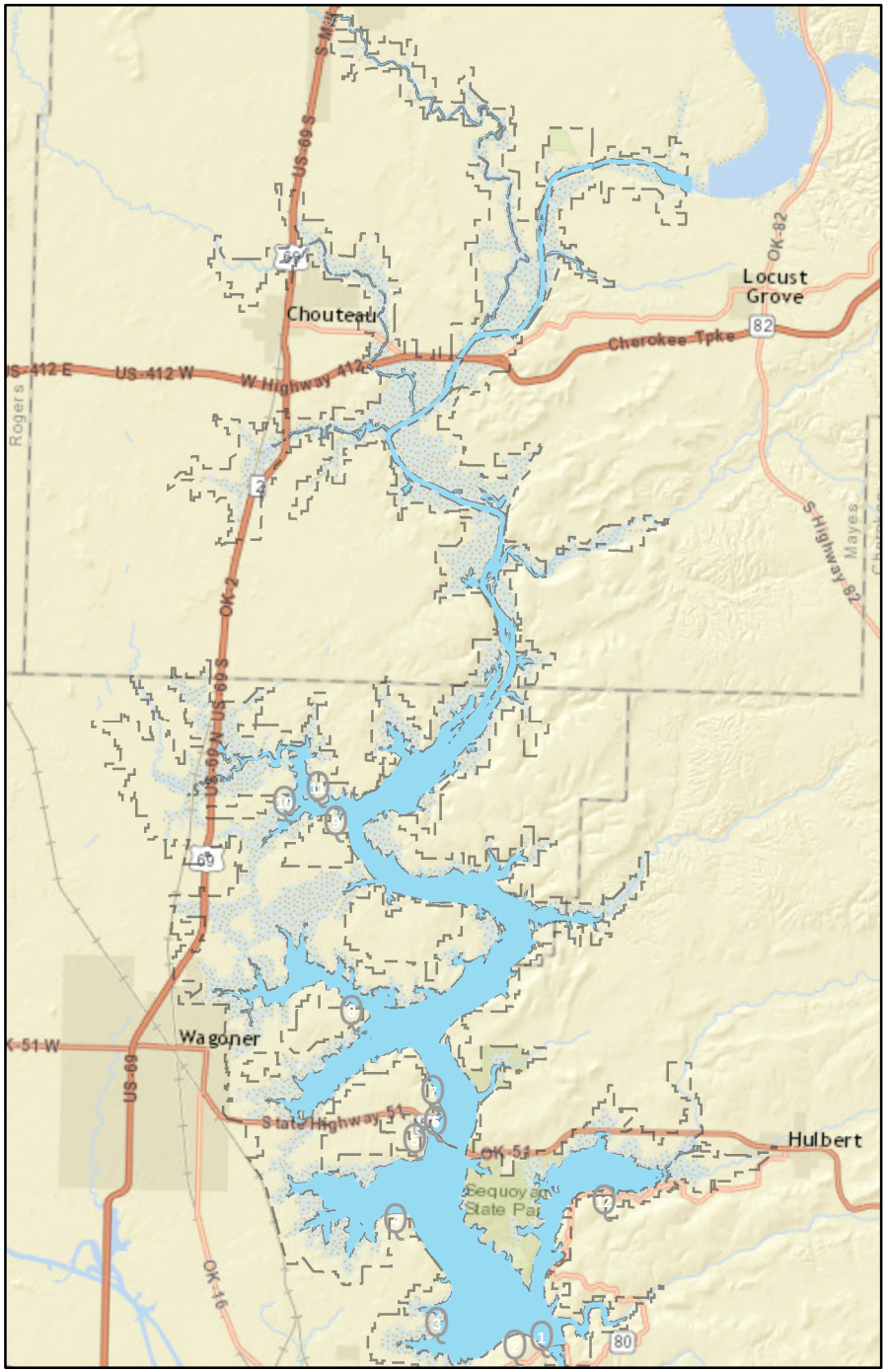
Wetland Types	NWI Classification Code	Total Acres
Freshwater Emergent Wetland	PEM1Ch	46.1
Freshwater Emergent Wetland	PEM1C	33.5
Freshwater Emergent Wetland	PEM1Ah	101.0
Freshwater Emergent Wetland	PEM1Fh	6.15
Freshwater Emergent Wetland	PEM1F	5.46
Freshwater Emergent Wetland	PEM1A	12.9
Freshwater Forested/Shrub Wetland	PFO1Ch	280.0
Freshwater Forested/Shrub Wetland	PFO1Ah	1110.0
Freshwater Forested/Shrub Wetland	PFO1A	1450.0
Freshwater Forested/Shrub Wetland	PFO1C	63.5
Freshwater Forested/Shrub Wetland	PSS1Fh	0.671
Freshwater Forested/Shrub Wetland	PSS1/EM1Ad	13.2
Freshwater Forested/Shrub Wetland	PFO1/SS1Ch	18.0
Freshwater Forested/Shrub Wetland	PSS1Ah	9.57
Freshwater Forested/Shrub Wetland	PSS1/EM1Ch	99.7

Freshwater Forested/Shrub Wetland	PSS1/EM1Ah	74.8
Freshwater Forested/Shrub Wetland	PFO1/EM1C	40.4
Freshwater Forested/Shrub Wetland	PFO1/EM1Ch	38.8
Freshwater Forested/Shrub Wetland	PSS1/EM1A	6.71
Freshwater Forested/Shrub Wetland	PFO1Fh	6.9
Freshwater Forested/Shrub Wetland	PFO1/SS1Ah	121.0
Freshwater Forested/Shrub Wetland	PSS1C	1.86
Freshwater Forested/Shrub Wetland	PFO5/UBHh	20.2
Freshwater Forested/Shrub Wetland	PSS1A	14.1
Freshwater Forested/Shrub Wetland	PSS1Ch	60.1
Freshwater Forested/Shrub Wetland	PFO1/SS1A	54.3
Freshwater Forested/Shrub Wetland	PSS1/EM1C	3.3
Freshwater Forested/Shrub Wetland	PSS1F	2.76
Freshwater Forested/Shrub Wetland	PFO5/UBH	3.72
Freshwater Forested/Shrub Wetland	PFO1/EM1Ah	7.52
Freshwater Forested/Shrub Wetland	PFO1/SS1C	1.88
Freshwater Pond	PUBHx	155.0
Freshwater Pond	PUBHh	174.0
Freshwater Pond	PUBH	13.5
Freshwater Pond	PUBF	1.4
Freshwater Pond	PUSC	5.15
Freshwater Pond	PUBFx	0.145

1

Freshwater Pond	PAB4Hx	1.08
Freshwater Pond	PAB4H	0.358
Freshwater Pond	PUBFh	0.626
Lake	L1UBHh	33600.0
Lake	L2USCh	0.727
Lake	L2UBFh	11.3
Lake	L1UBHx	174.0
Riverine	R2USC	1.17
Riverine	R2UBH	272.0
Riverine	R4SBC	0.293

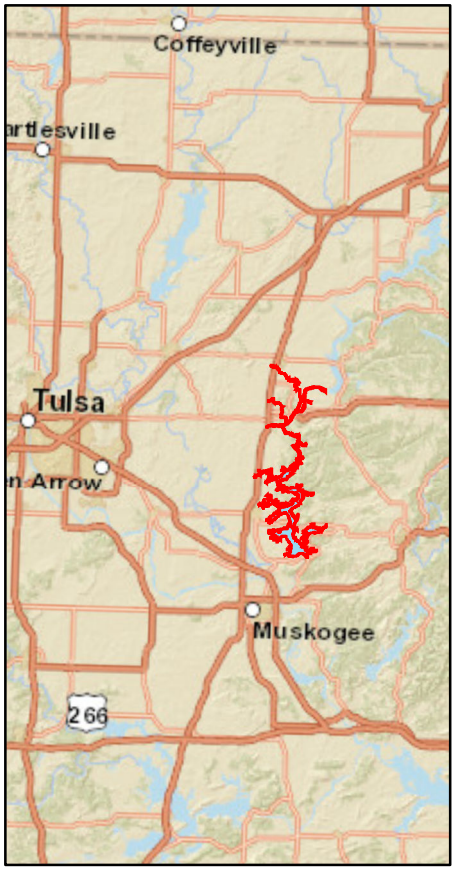
APPENDIX C Maps of Land Use Classification Change



INDEX TO MAPS

LAND USE CLASSIFICATION CHANGES

PLATE NUMBER	TITLE
FG15MP-GP-01	LAND USE CLASSIFICATION CHANGES (SHEET 01)
FG15MP-GP-02	LAND USE CLASSIFICATION CHANGES (SHEET 02)
FG15MP-GP-03	LAND USE CLASSIFICATION CHANGES (SHEET 03)
FG15MP-GP-04	LAND USE CLASSIFICATION CHANGES (SHEET 04)
FG15MP-GP-05	LAND USE CLASSIFICATION CHANGES (SHEET 05)
FG15MP-GP-06	LAND USE CLASSIFICATION CHANGES (SHEET 06)
FG15MP-GP-07	LAND USE CLASSIFICATION CHANGES (SHEET 07)
FG15MP-GP-08	LAND USE CLASSIFICATION CHANGES (SHEET 08)
FG15MP-GP-09	LAND USE CLASSIFICATION CHANGES (SHEET 09)
FG15MP-GP-10	LAND USE CLASSIFICATION CHANGES (SHEET 10)
FG15MP-GP-11	LAND USE CLASSIFICATION CHANGES (SHEET 11)
FG15MP-GP-12	LAND USE CLASSIFICATION CHANGES (SHEET 12)
FG15MP-GP-13	LAND USE CLASSIFICATION CHANGES (SHEET 13)
FG15MP-GP-14	LAND USE CLASSIFICATION CHANGES (SHEET 14)
FG15MP-GP-15	LAND USE CLASSIFICATION CHANGES (SHEET 15)



PUBLIC USE AREAS

- DAM SITE
- OVERLOOK
- WAHOO BAY
- JACKSON BAY
- TAYLOR FERRY SOUTH
- TAYLOR FERRY SWIM BEACH
- TAYLOR FERRY NORTH
- TOPPERS
- ROCKY POINT
- BLUEBILL
- FLAT ROCK
- WILDWOOD

MAP LEGEND DEFINITIONS

HD	= High Density
LD	= Low Density
WM	= Wildlife Management
ESA	= Environmentally Sensitive Area
PO	= Project Operations

The maps within this document contain data from multiple different sources and have an unquantified level of accuracy. The information is approximate and is for visual representation only.

U.S. Army Corps of Engineers
Tulsa District

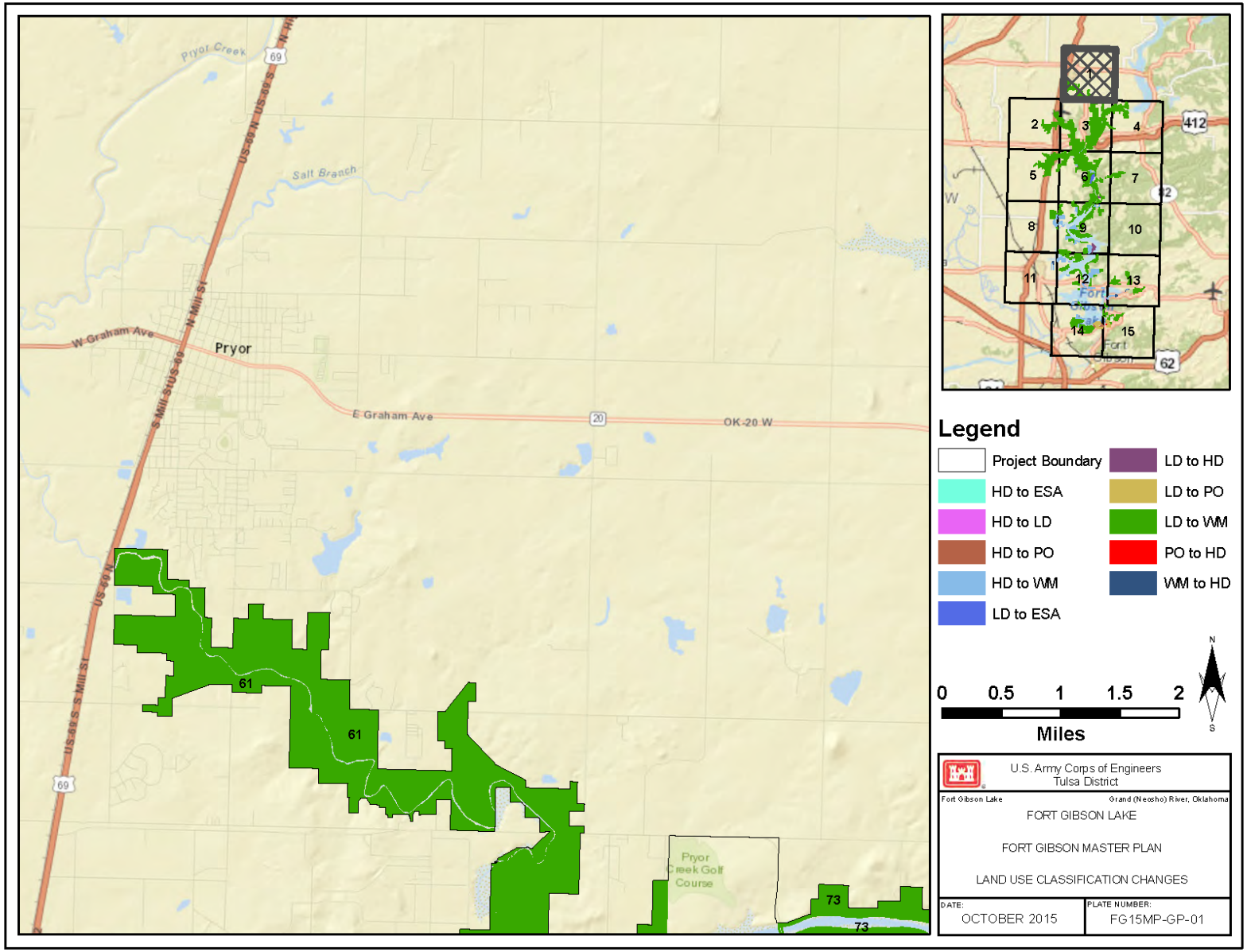
Fort Gibson Lake — Grand (Neosho) River, Oklahoma

FORT GIBSON LAKE

FORT GIBSON MASTER PLAN

PROJECT LOCATION & INDEX

DATE:	PLATE NUMBER:
OCTOBER 2015	FG15MP-IP- 00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US-69 S
N Mill St
Salt Branch
W Graham Ave
Pryor
S Mill St
E Graham Ave
20
OK-20 W
US-69 S
S Mill St
US-69 N
69
61
61
Pryor Creek Golf Course
73
73
412
62
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
HD to WM
LD to ESA
LD to HD
LD to PO
LD to WM
PO to HD
WM to HD
0 0.5 1 1.5 2
Miles
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-01

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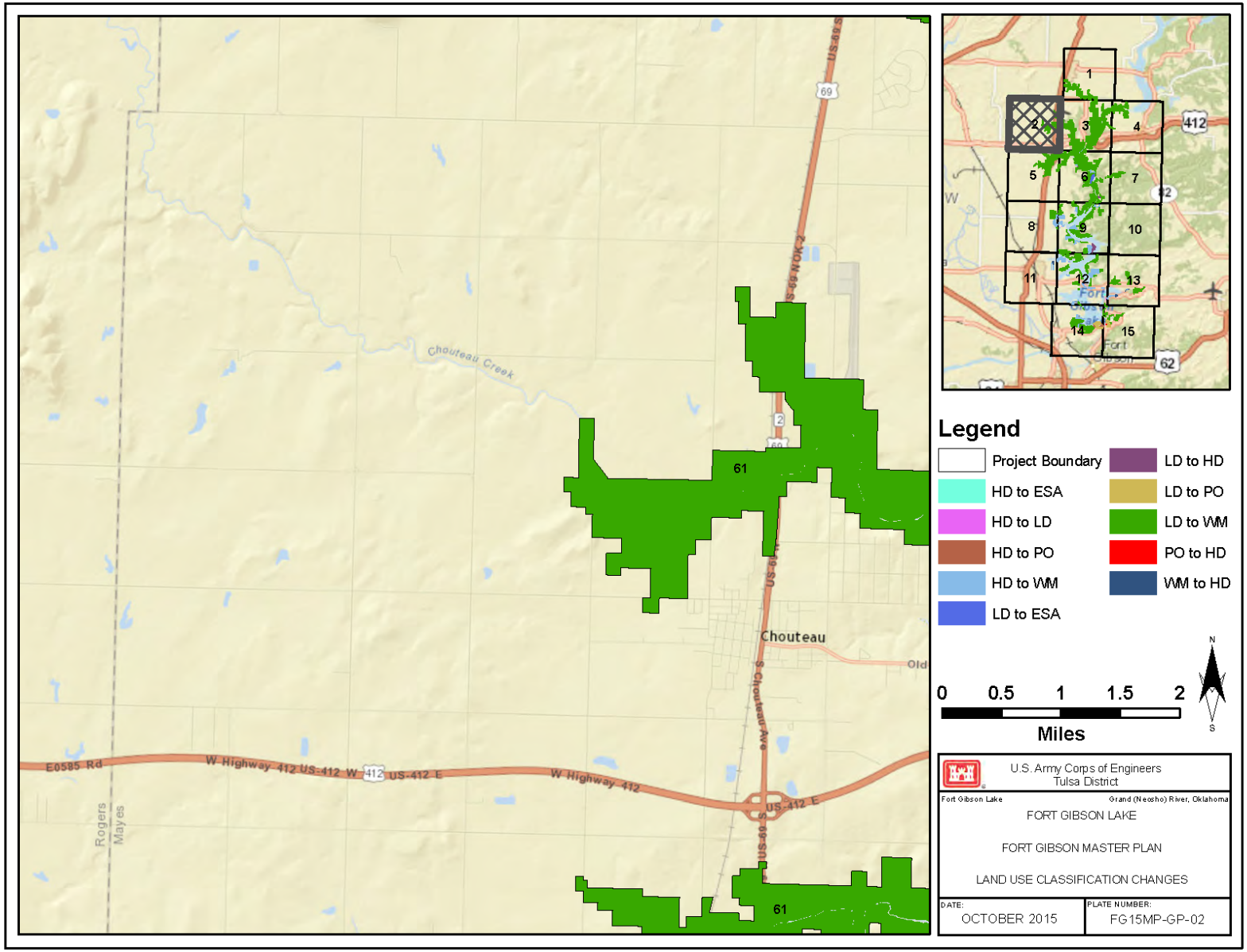
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Old
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W Highway 412 US-412 W
US-412 E
W Highway 412
US-412 E
S Chouteau Ave
US-69 S
US-69 S
US-69 NOK-2
61
61
Rogers
Mayes
69
412
62
Legend
Project Boundary
HD to ESA
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-02

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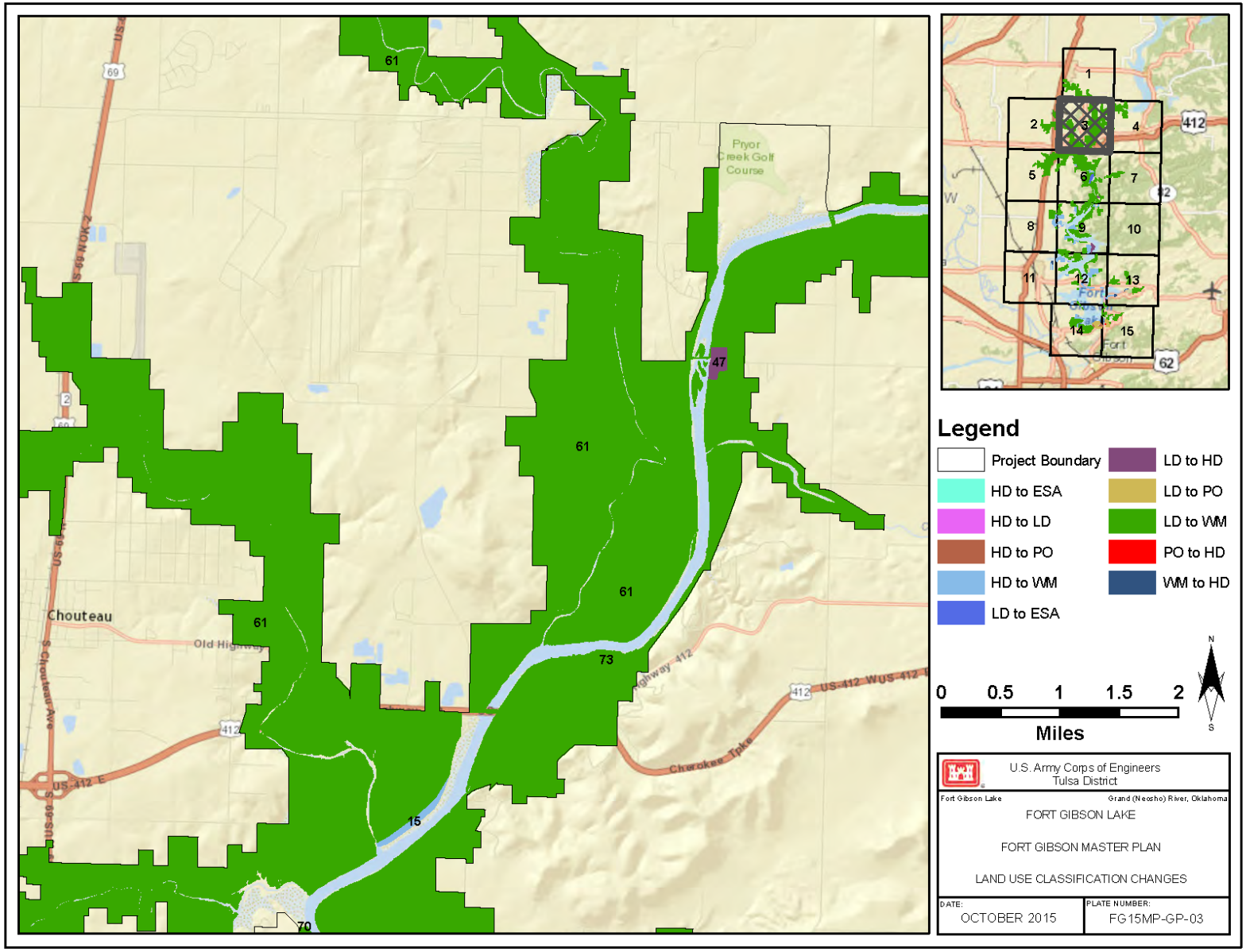
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73
15
70
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US-412 E
US-412 W
Cherokee Tpke
Pryor Creek Golf Course
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
HD to WM
LD to ESA
LD to HD
LD to PO
LD to WM
PO to HD
WM to HD
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-03

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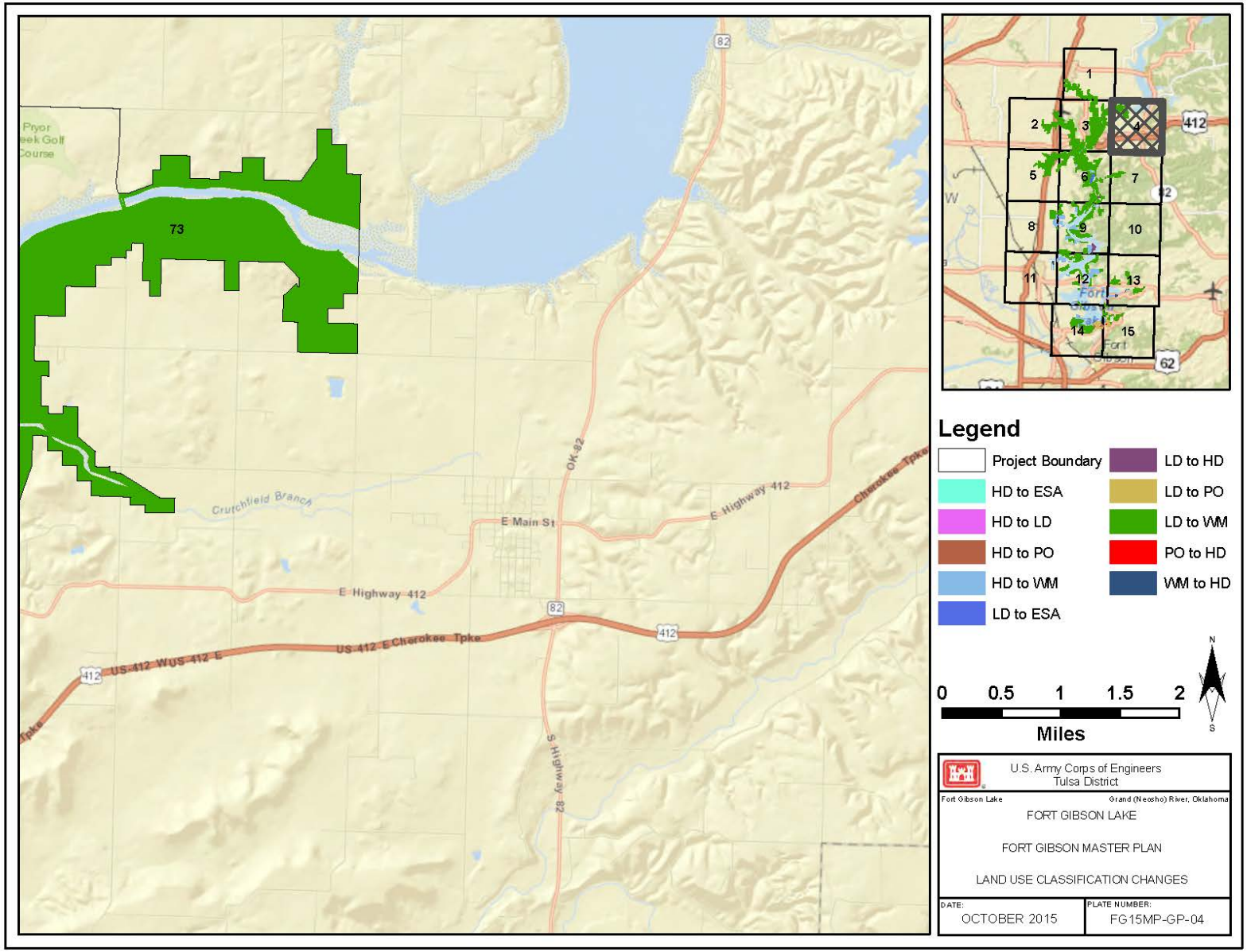
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82
OK-82
Crutchfield Branch
E Main St
E Highway 412
US-412 W
US-412 E
US-412 E Cherokee Tpke
Cherokee Tpke
412
S Highway 82
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62
Legend
Project Boundary
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HD to PO
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WM to HD
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
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LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
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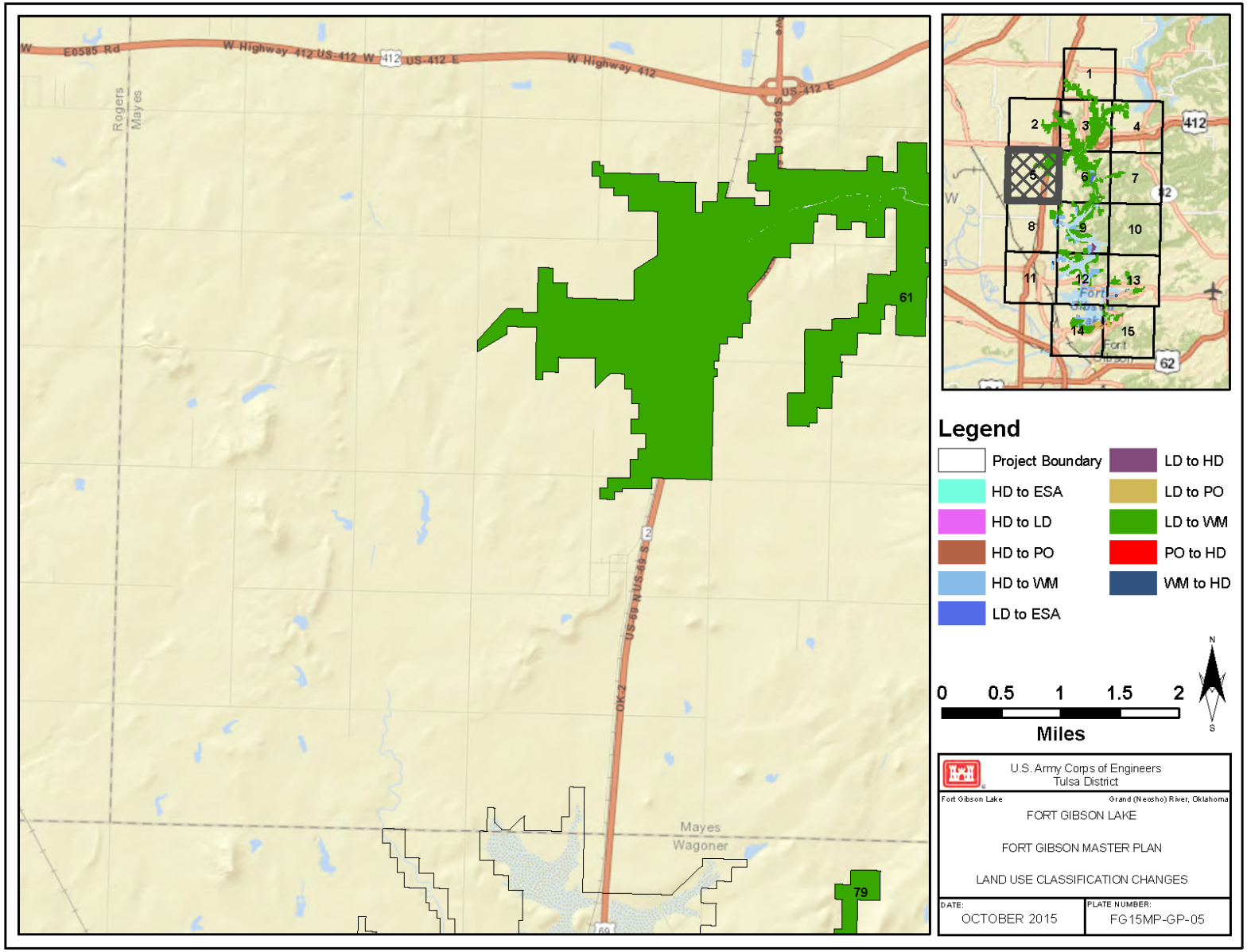
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W Highway 412 US-412 W
412
US-412 E
W Highway 412
US-412 E
Rogers
Mayes
US-69 S
61
OK-2
US-69 N/US-69 S
Mayes
Wagoner
79
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Legend
Project Boundary
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-05

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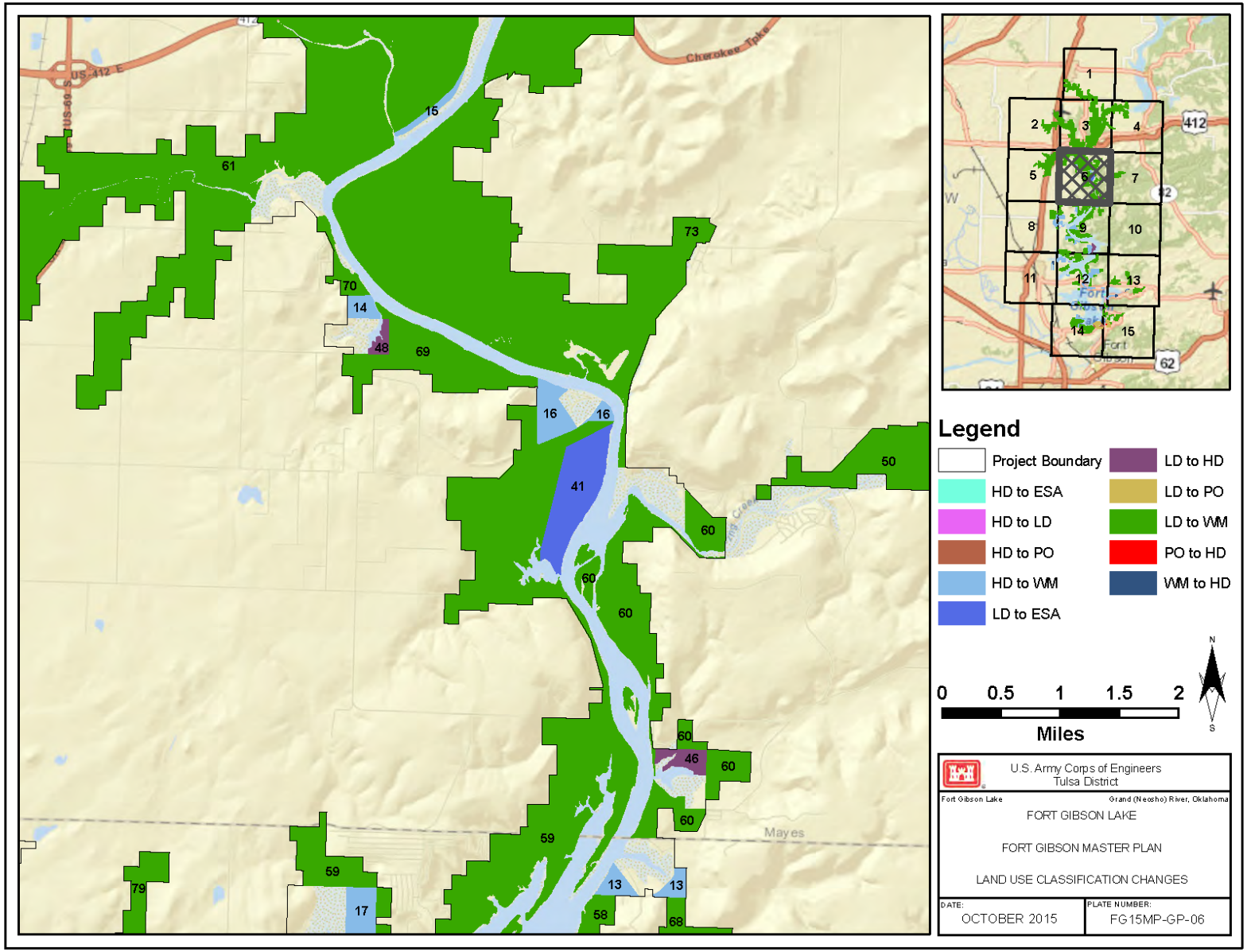
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US-412 E
US-69 S
Mayes
Legend
Project Boundary
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-06

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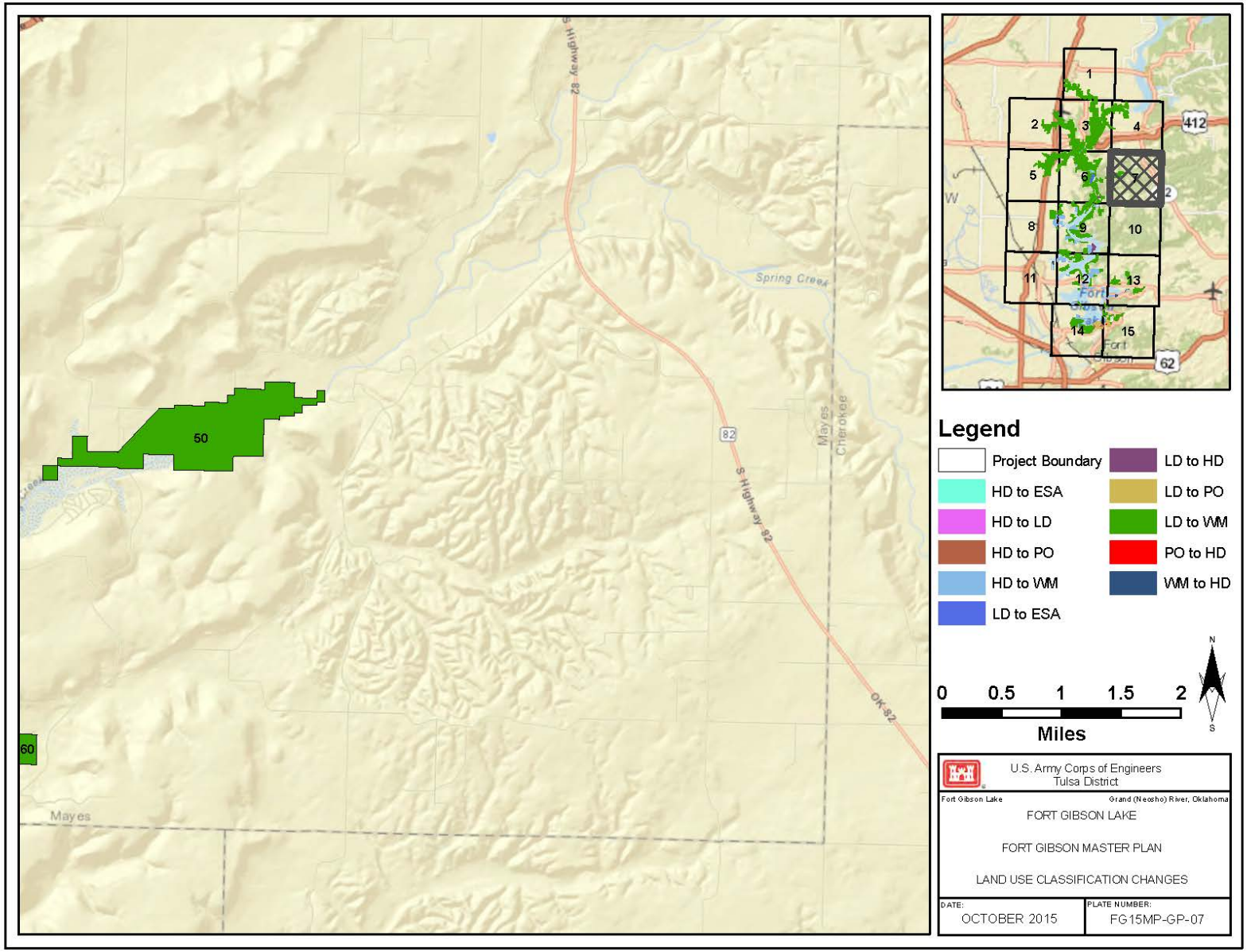
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Spring Creek
Mayes
Cherokee
OK-82
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-07

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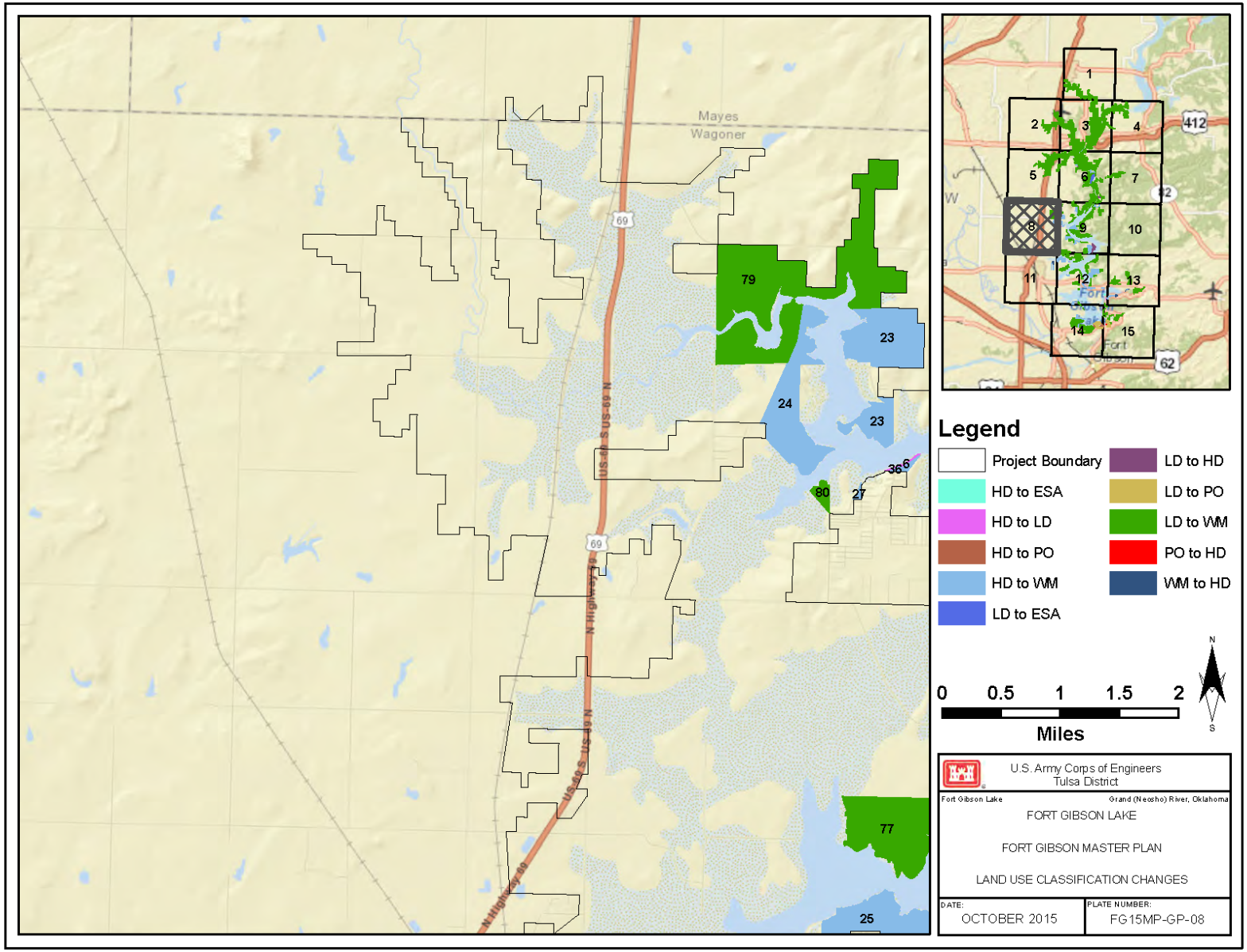
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US-69 S
US-69 N
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-08

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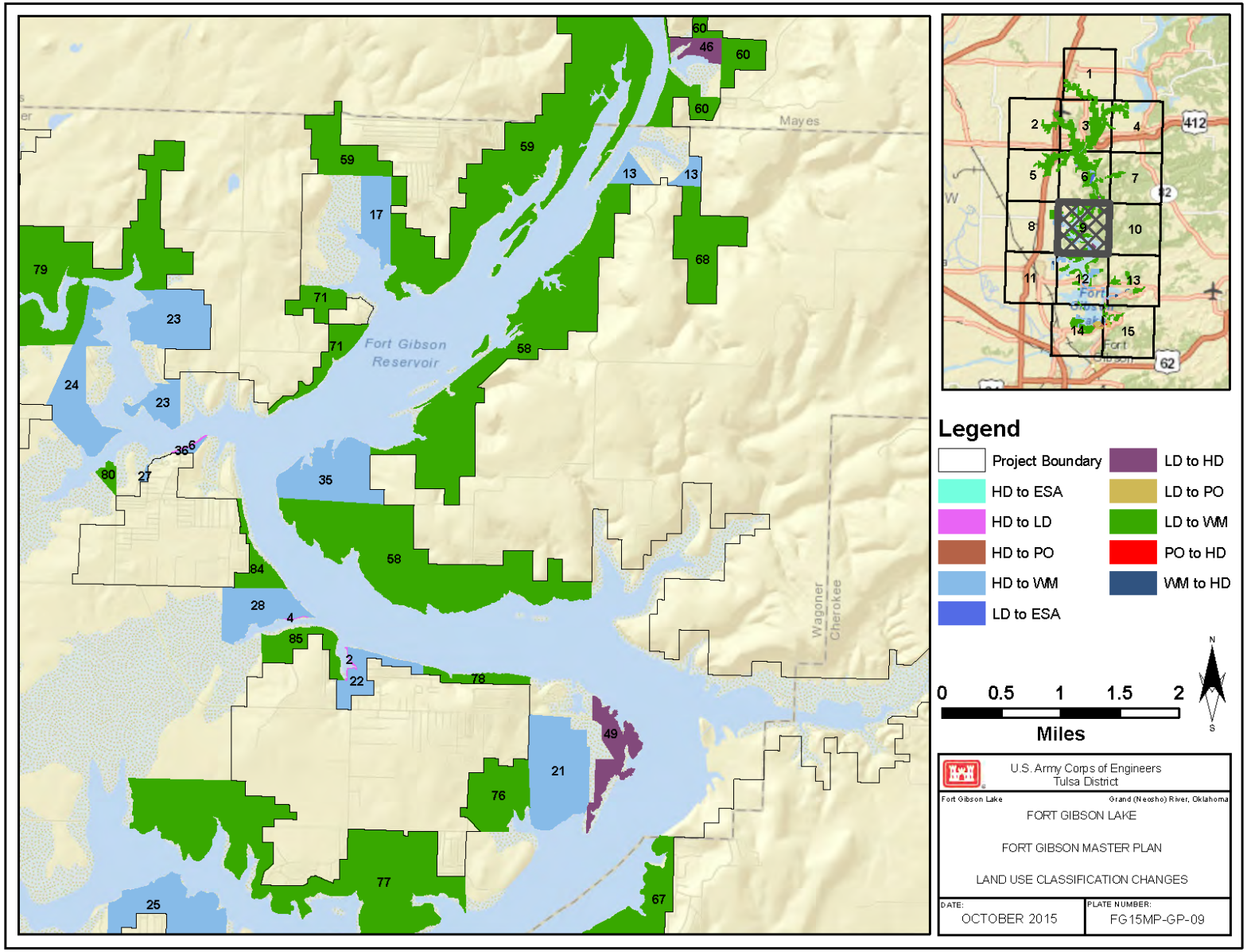
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Wagoner
Cherokee
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WM to HD
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-09

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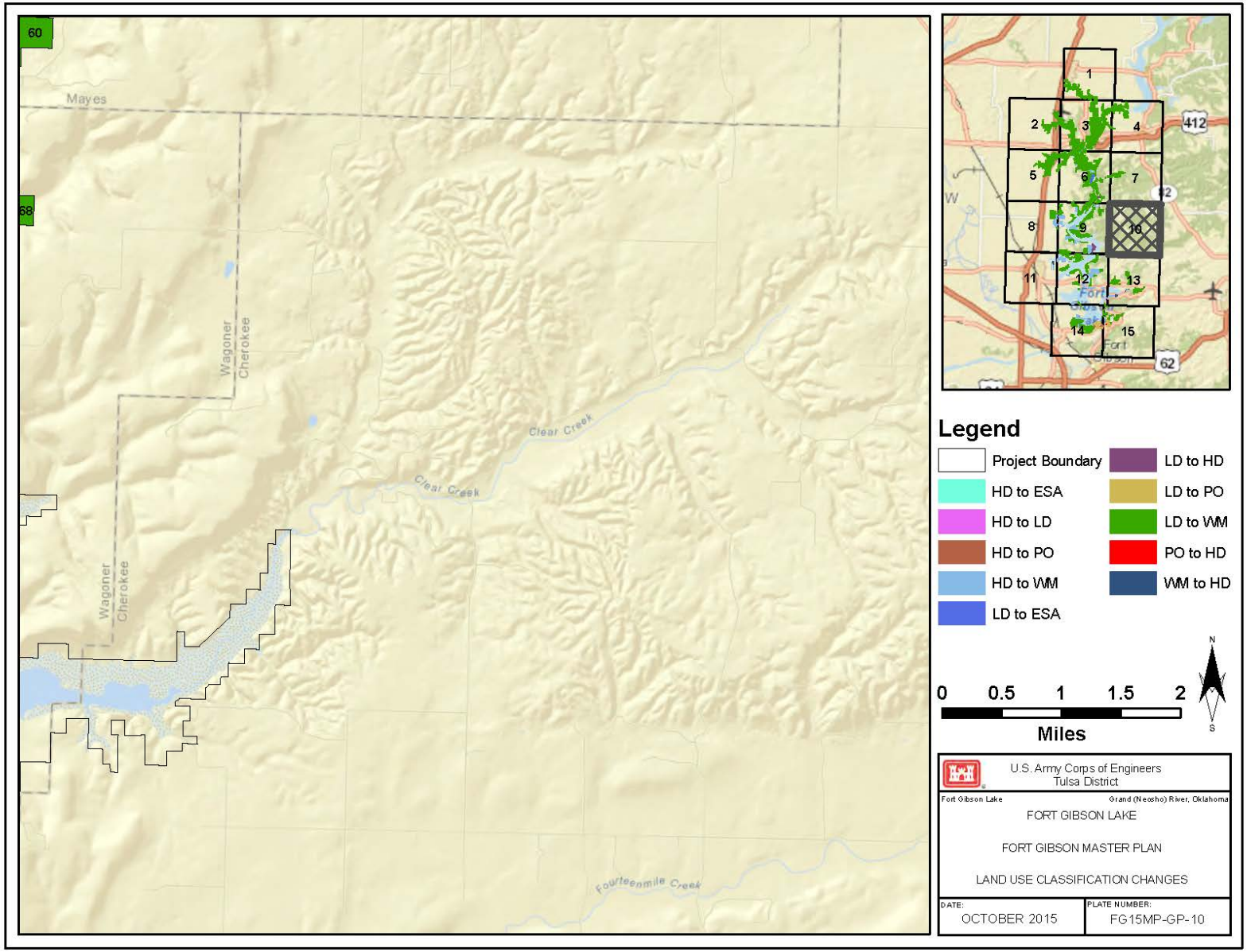
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Mayes
68
Wagoner
Cherokee
Clear Creek
Clear Creek
Wagoner
Cherokee
Fourteenmile Creek
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-10

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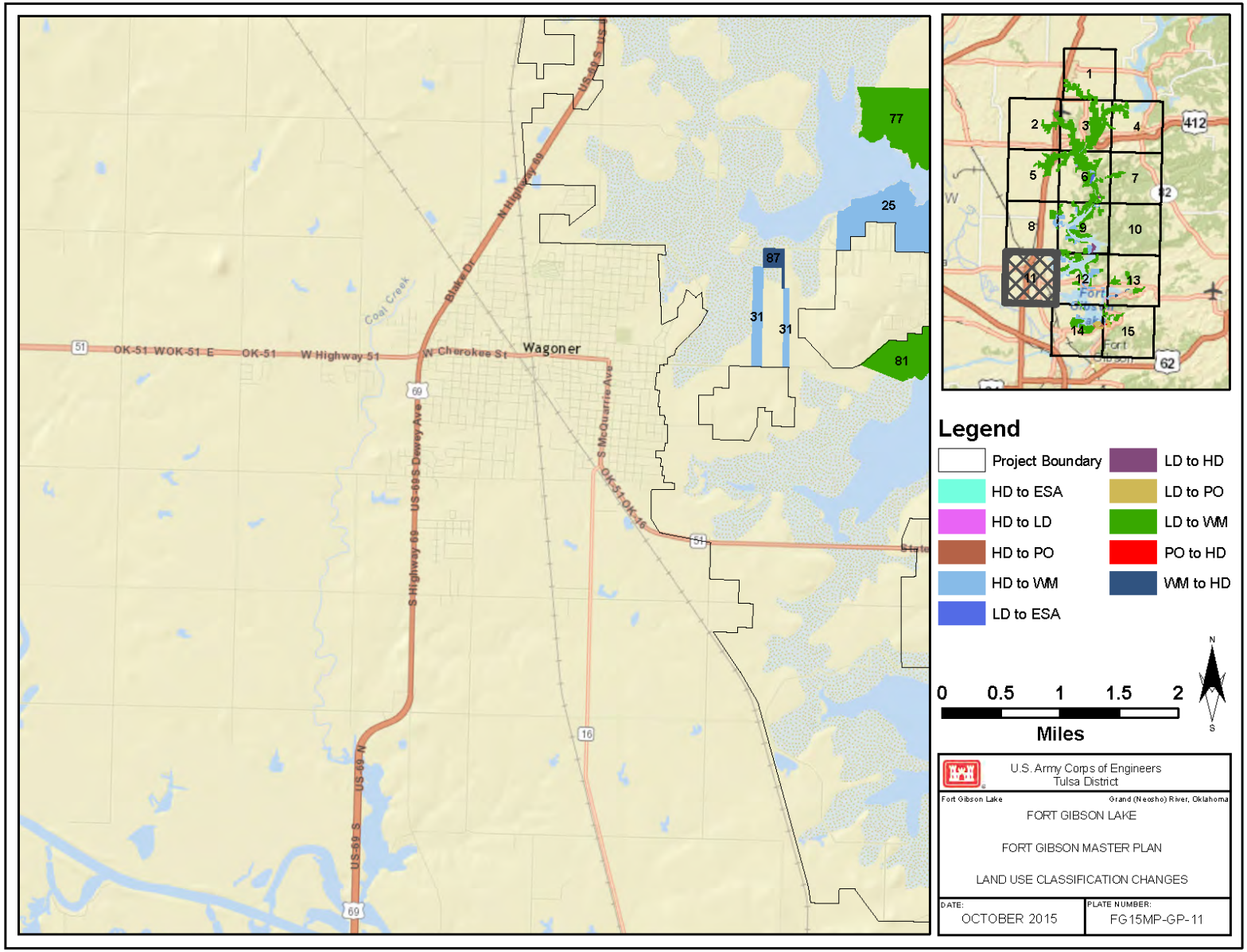
Wagoner
Coal Creek
Blake Dr
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US-69 S
S Highway 69
US-69S Dewey Ave
S McQuarrie Ave
OK-51 WOK-51 E
OK-51
W Highway 51
W Cherokee St
OK-51 OK-16
US-69 W
US-69 S
77
25
87
31
31
81
51
69
16
412
62
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
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LD to ESA
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LD to WM
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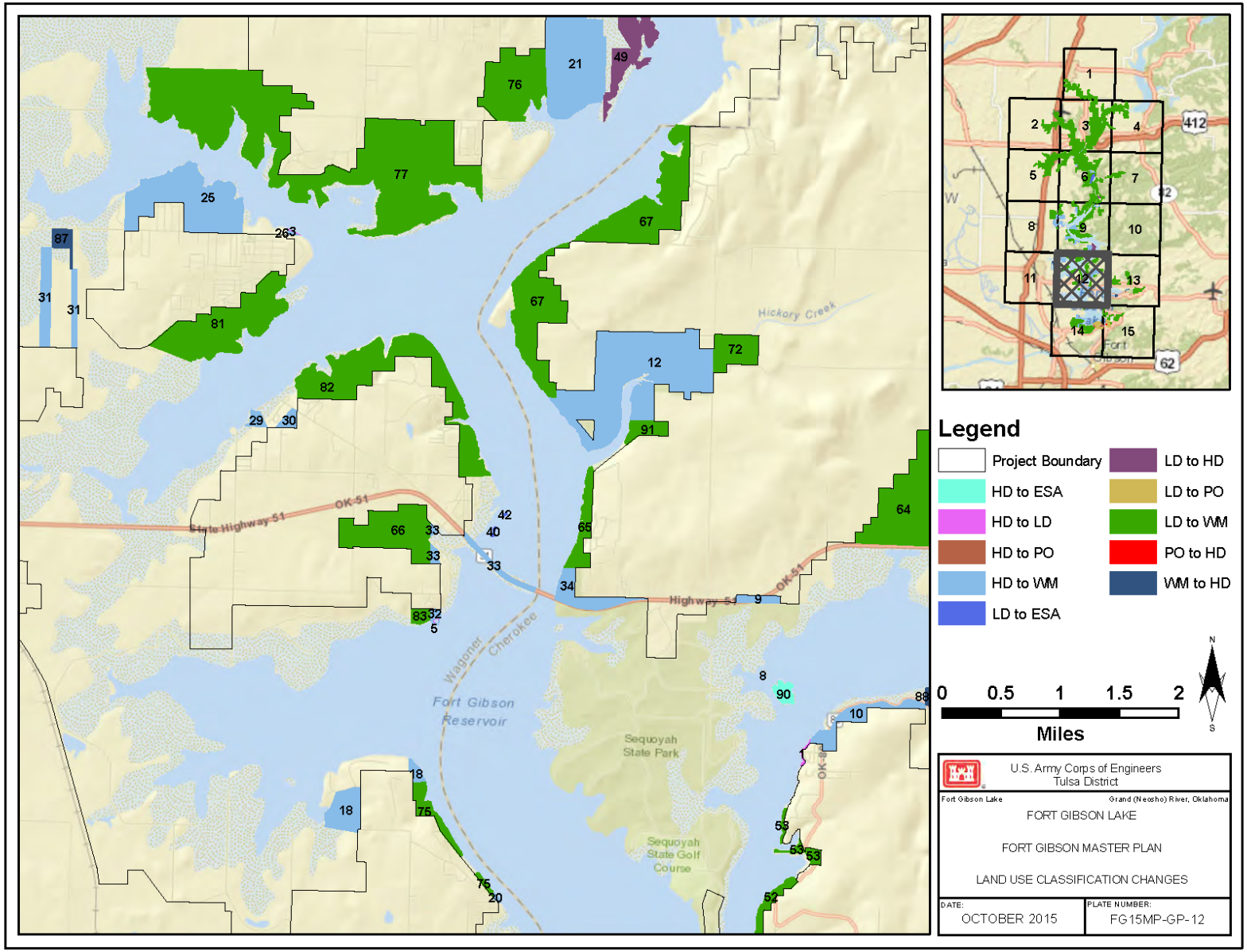
U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-11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HD to WM
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LD to WM
PO to HD
WM to HD
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U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-12
Hickory Creek
Wagoner
Cherokee
Fort Gibson
Reservoir
Sequoyah
State Park
Sequoyah
State Golf
Course
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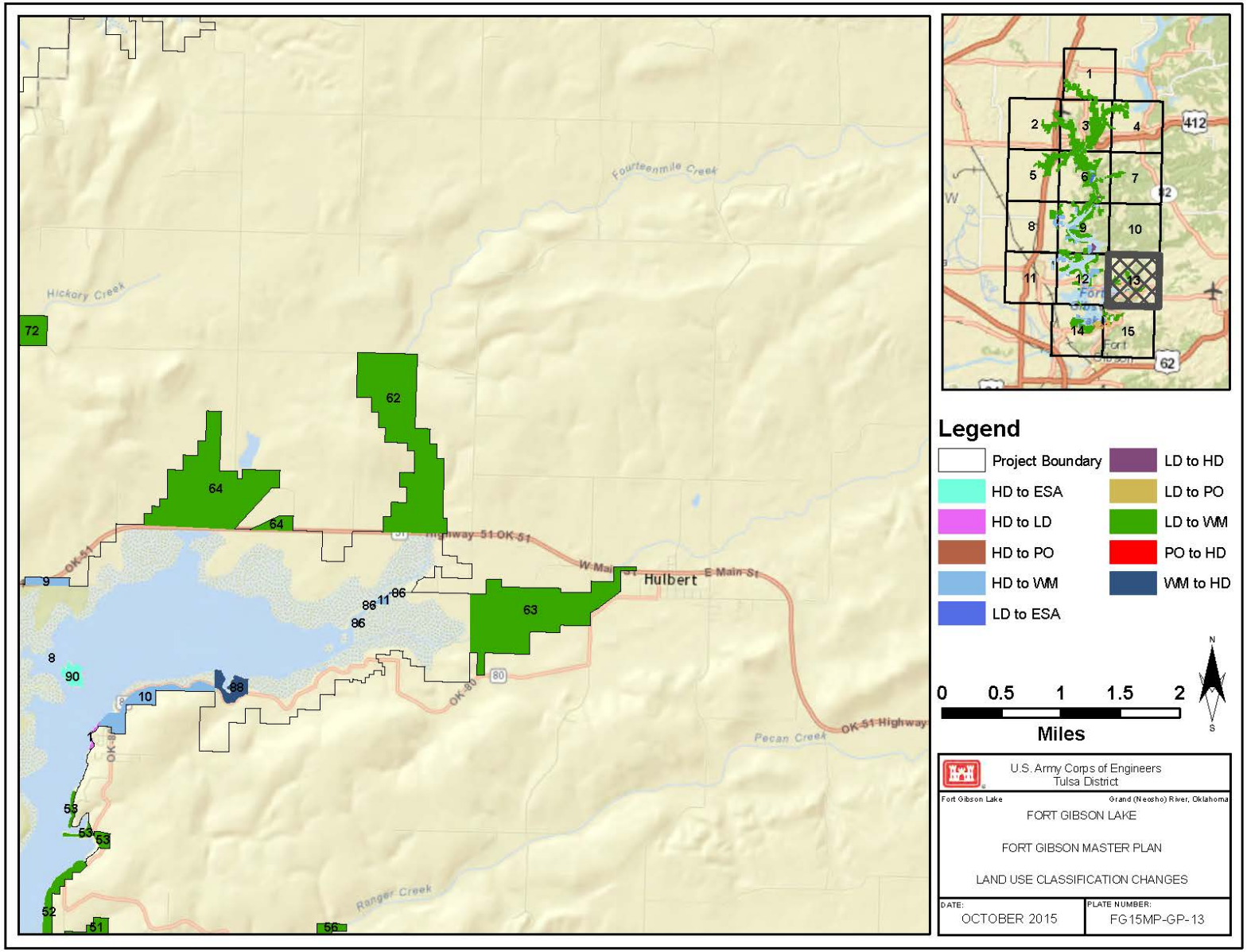
OK-51
Highway 51
OK-51
OK-80
412
62

1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Hickory Creek
Highway 51-OK-51
W Main St
E Main St
Hulbert
OK-80
Pecan Creek
OK-51 Highway
Ranger Creek
72
62
64
63
9
8
90
10
1
53
52
51
56
86
11
88
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
HD to WM
LD to ESA
LD to HD
LD to PO
LD to WM
PO to HD
WM to HD
0 0.5 1 1.5 2
Miles
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S
U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-13

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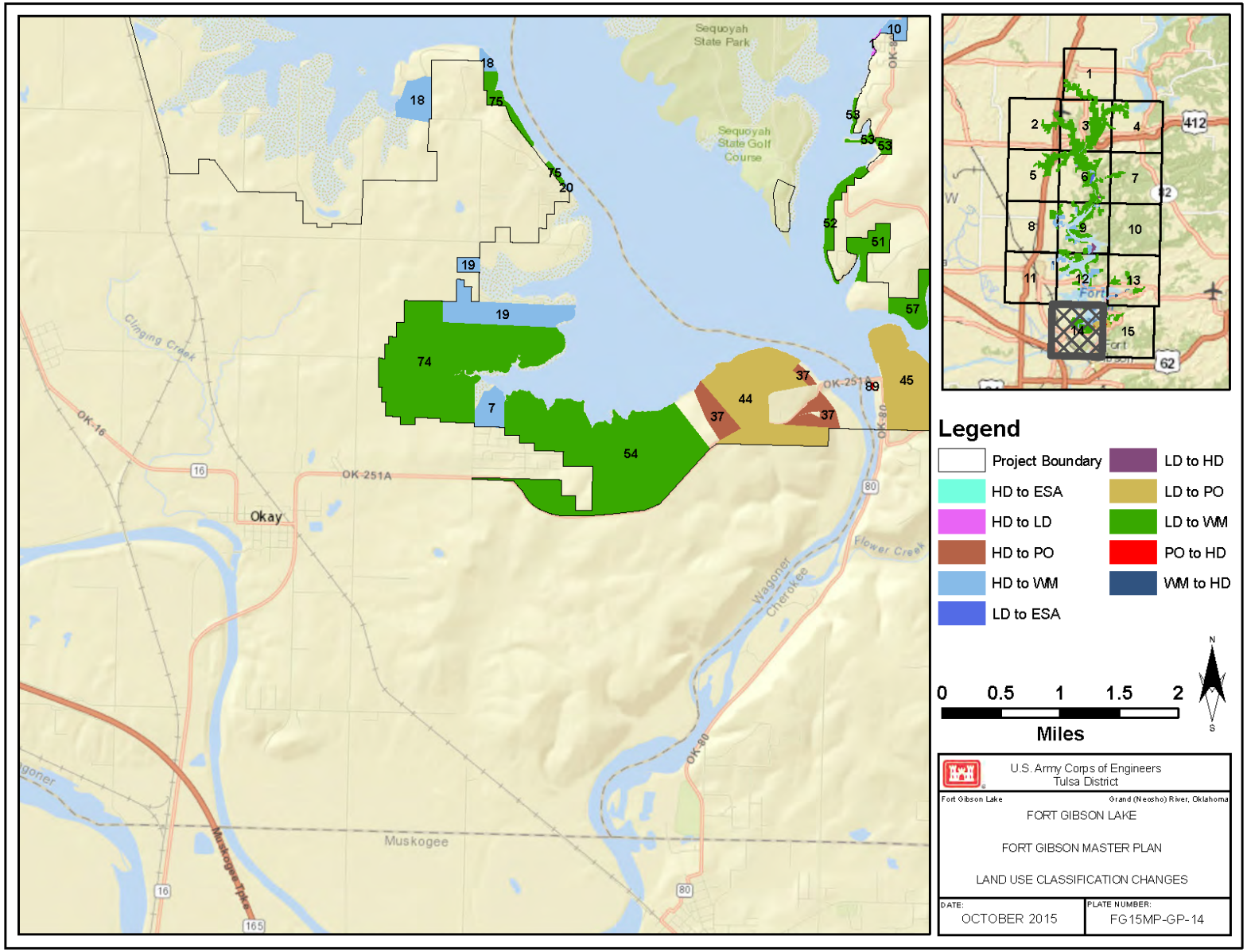
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Sequoyah State Golf Course
Okay
Muskogee
Clinging Creek
Flower Creek
Wagoner
Cherokee
OK-16
OK-251A
OK-80
Muskogee Tpke
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
HD to WM
LD to ESA
LD to HD
LD to PO
LD to WM
PO to HD
WM to HD
0 0.5 1 1.5 2
Miles
U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-14

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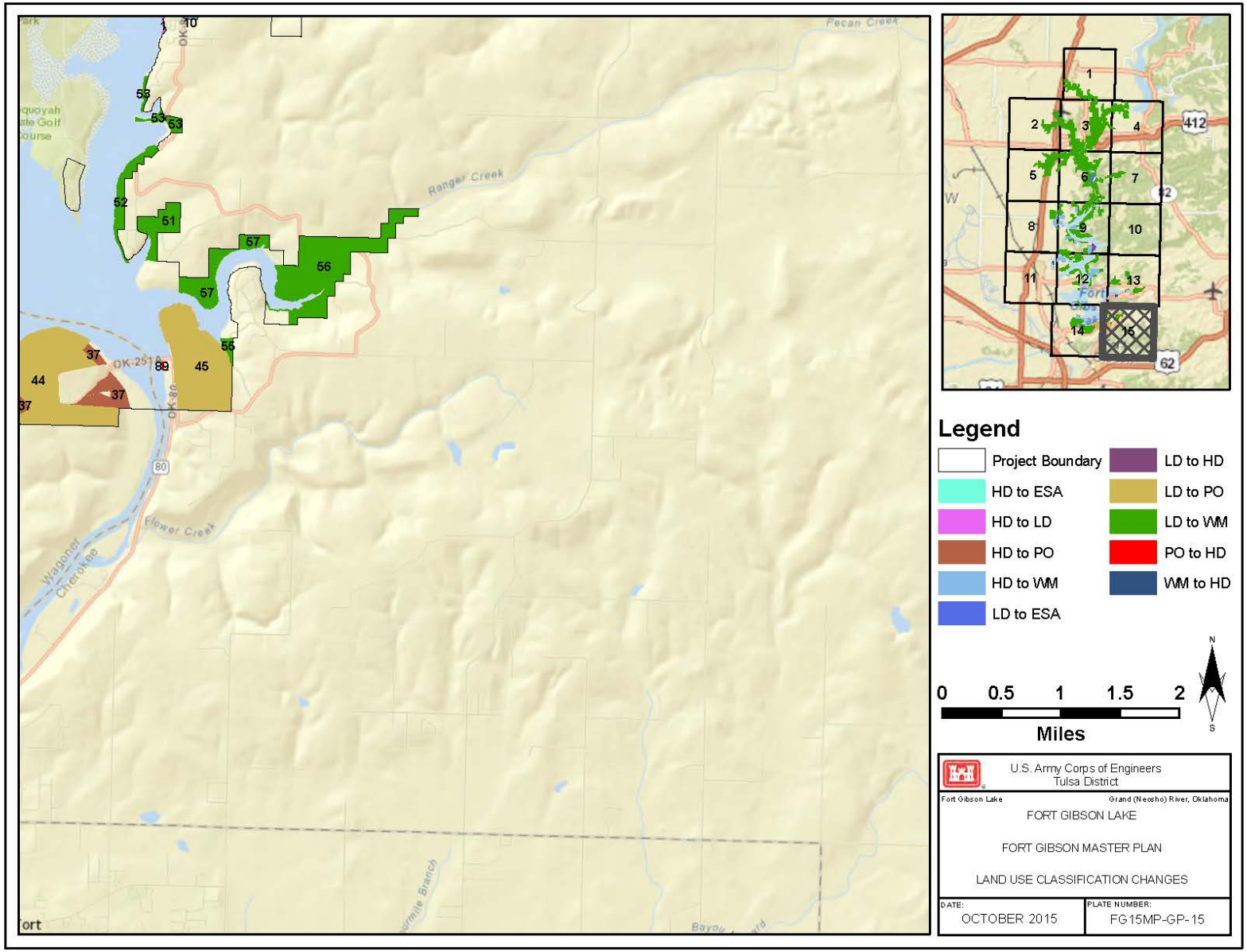
Pecan Creek
Ranger Creek
Flower Creek
Wagoner
Cherokee
OK-251A
OK-80
80
412
62
Legend
Project Boundary
HD to ESA
HD to LD
HD to PO
HD to WM
LD to ESA
LD to HD
LD to PO
LD to WM
PO to HD
WM to HD
0 0.5 1 1.5 2
Miles
N
S
U.S. Army Corps of Engineers
Tulsa District
Fort Gibson Lake
Grand (Neosho) River, Oklahoma
FORT GIBSON LAKE
FORT GIBSON MASTER PLAN
LAND USE CLASSIFICATION CHANGES
DATE:
OCTOBER 2015
PLATE NUMBER:
FG15MP-GP-15

1

APPENDIX E

SUMMARY OF COMMENTS
AND RESPONSES
ON
DRAFT MASTER PLAN
AND
DRAFT ENVIRONMENTAL ASSESSMENT

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