



DEPARTMENT OF THE ARMY  
FORT WORTH DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 17300  
FORT WORTH, TEXAS 76102-0300

CESWF-PEC

05 October 2016

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers (USACE), Fort Worth District (SWF)

SUBJECT: Lavon Lake, Texas Master Plan (September 2016)

1. PURPOSE: Subject Master Plan is enclosed for review and approval in accordance with Engineering Regulations (ER) 1130-2-550, Change 7 and Engineering Pamphlet (EP) 1130-2-550, Change 5.

2. BACKGROUND/DISCUSSION: In accordance with ER 1130-2-550 Change 07, dated 30 January 2013 and EP 1130-2-550 Change 05, dated 30 January 2013, Lake Project master plans are required for most USACE water resources development projects having a federally-owned land base. This revision of the Lavon Lake Master Plan is intended to bring the master plan up to date to reflect ecological, socio-demographic, and outdoor recreation trends that are currently impacting the lake, as well as those anticipated to occur within the planning period of 2016 to 2041, a 25-year period. The prior Lavon Lake Master Plan was approved in May 1972 and no longer serves its intended purpose.

3. SUMMARY OF CHANGES: The revision resulted in the preparation of new resource management objectives, establishment of utility corridors and the following changes to land use classifications:

Prior (1972) Land Classifications		New Land Classifications		Net Difference
	Acres		Acres	
Project Operations	131	Project Operations	508	377
Recreation – Intensive Use	2,971	High Density Recreation	2,007	(960)
Natural Area	527	Environmentally Sensitive Areas	4,319	3,792
Recreation – Low Density Use	6,403	Multiple Resource Management – Low Density Recreation	2,468	(3,935)
Wildlife Management	6,574	Multiple Resource Management – Wildlife Management	6,480	(98)
		Multiple Resource Management – Vegetation Management	824	824

a. The above changes were the result of public and stakeholder review and comment, review of regional trends in outdoor recreation and resource protection, and compliance with Federal policies and mandates governing Federal land use. Environmentally Sensitive Areas were identified for the protection of wildlife and their habitat, as well as culturally significant sites and unique views and landscapes. Some high density recreation areas that have not and will not be developed were moved to other more suitable land classifications.

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b. In accordance with the National Environmental Policy Act of 1969, including guidelines in Title 33 Code of Federal Regulations Part 230, an Environmental Assessment (EA) was prepared to assess the potential impacts that the alternative management scenarios set forth in the 2016 Lavon Lake Master Plan would have on the natural, cultural, and human environments. The EA evaluated and analyzed two alternatives: a No Action Alternative (continued use of the 1972 Master Plan) and the implementation of the 2016 Master Plan. Based on the findings of the EA, the implementation of the 2016 Master Plan would not result in significant adverse impacts on the environment or constitute a major Federal action significantly affecting the quality of the human environment.

c. The Master Plan and EA have been reviewed by the Regional Planning and Environmental Center, SWF Operations, SWF Real Estate and SWF Office of Counsel. The final version of the documents went through a 30-day public and agency review. All comments from the reviews have been addressed.

4. RECOMMENDATION: The Project Delivery Team members have reviewed and approved the Master Plan revision. The team recommends approval by each signatory, as well as approval and signature of the Finding of No Significant Impact by the commander.

Approve 5 Oct  
Disapprove \_\_\_\_\_  
Date 5 Oct

Approve ✓  
Disapprove \_\_\_\_\_  
Date 5 Oct 16

Approve ✓  
Disapprove \_\_\_\_\_  
Date 06 Oct 16

Approve [Signature]  
Disapprove \_\_\_\_\_  
Date 17 Oct 16



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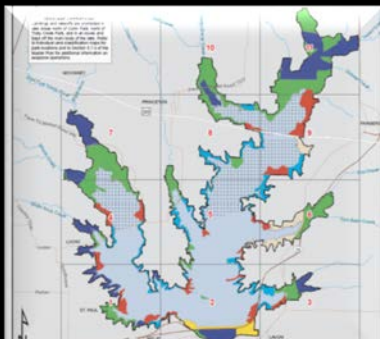
CALVIN C. HUDSON II  
Colonel, EN  
Commanding



# LAVON LAKE MASTER PLAN DRAFT

EAST FORK OF TRINITY RIVER  
COLLIN COUNTY, TEXAS

SEPTEMBER 2016



US Army Corps of Engineers



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## PREFACE

The Lavon Lake Master Plan (hereafter Plan) is a vital tool produced and used by the U.S. Army Corps of Engineers (USACE) to guide the responsible stewardship of USACE-administered resources for the benefit of present and future generations. The Plan provides direction for appropriate management, use, development, enhancement, protection, and conservation of the natural, cultural, and man-made resources at Lavon Lake. The original Plan for Lavon Lake was approved in February 1953, updated in 1961, and revised in May 1972 (Design Memorandum No 13). The 1972 version is the most recent Plan at the time of this revision and was intended to serve as a guide for the orderly and coordinated development and management of all land and water resources of the project. These earlier documents presented data on existing conditions, anticipated recreational use, types of facilities needed to service the anticipated use, and an estimate of future requirements.

Lavon Lake is located completely within Collin County, Texas which, according to the 2010 Census, experienced a 59 percent (%) growth in population from 2000 to 2010. Collin County and adjacent Denton and Rockwall Counties were in the top seven fastest growing counties in Texas reported by the 2010 Census. This rapid urbanization and population growth in the Dallas-Fort Worth metropolitan area, and especially Collin County, has resulted in changes to land use in the region and around Lavon Lake. Changes in outdoor recreation trends, increasing fragmentation of wildlife habitat, ever increasing demand for more infrastructure to support population growth, as well as current legislative requirements demand a fresh look at the management of federal land at Lavon Lake. By definition, the Plan does not address the technical aspects of water management for flood risk management or water conservation purposes, but seeks to provide a land management plan that balances the stewardship of natural resources and provision of high quality recreation opportunities with these primary project purposes.

The USACE vision for the future management of the natural resources and recreation program at Lavon Lake is set forth as follows:

*The land, water, and recreational resources of Lavon Lake will be managed to protect, conserve, and sustain natural and cultural resources, especially environmentally sensitive resources, and provide outdoor recreation opportunities that complement overall project purposes for the benefit of present and future generations.*

The Plan presents an inventory and analysis of land resources; resource management objectives; land use classifications; a resource use plan for each land use classification; current and projected park facility needs; an analysis of existing and anticipated resource use; and anticipated influences on overall project operation and management.

An Environmental Assessment (EA) of alternative management scenarios set forth in the Plan has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality; and USACE regulations, including Engineer Regulation 200-2-2: Procedures for Implementing NEPA. The EA can be found in its entirety in Appendix B.

The EA evaluated and analyzed two alternatives as follows: the implementation of the proposed Plan, and a No Action Alternative (continued use of the 1972 Master Plan). The EA also analyzed the potential impact these two alternatives would have on the natural, cultural, and human environments. Because the Plan is conceptual, any action proposed in the plan that would result in significant disturbance to natural resources or result in significant public interest would require additional NEPA documentation at the time the action takes place.

Preparation of the Plan was a cooperative effort involving USACE; federal, state, and local government agencies; non-government organizations; and members of the general public. Listening sessions and scoping comments from government officials and the general public were important for identifying issues that needed to be addressed in the Plan. Details regarding the public involvement efforts for the Plan are provided in Chapter 7.

# **LAVON LAKE MASTER PLAN**

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# CHAPTER 1 - INTRODUCTION

## 1.1 OVERVIEW

Lavon Lake is a multipurpose water resources project constructed and operated by the U.S. Army Corps of Engineers (USACE). The lake and associated federal lands are located entirely within Collin County, Texas at river mile 55.9 on the East Fork of the Trinity River. The Lavon Lake dam extends in an east-west direction for a distance of approximately five miles and is situated two miles east of Wylie, Texas and 22 miles northeast of the city of Dallas, Texas (Figure 1.1). The dam and associated infrastructure, as well as all lands acquired for the Lavon Lake project, are federally owned and are administered by the USACE.

The Master Plan (Plan) is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years. The focus of this Plan is to guide the stewardship of natural and cultural resources, and the provision of outdoor recreation facilities and opportunities on federal land associated with Lavon Lake. The Plan does not address the flood risk management or water conservation purposes of Lavon Lake (see the USACE Water Control Manual for Lavon Lake for a description of these project purposes). The original Master Plan for Lavon Lake was written in the mid 1950's with the most recent revision prepared in May 1972 and entitled *Trinity River Basin, Texas – Design Memorandum No 13, (Revised May 1972) Updated Master Plan for Lavon Lake Modification – East Fork Trinity River, Texas*. In 1999, USACE discontinued use of the Design Memorandum (DM) system as a means of organizing the many phases of civil works projects. Therefore, the term “Design Memorandum” is not used in the title of this Master Plan revision. A list of DMs previously published for the Lavon Lake project is provided in Appendix C. A list of acronyms used in this Plan is provided in Appendix K.

## 1.2 PROJECT AUTHORIZATION

The following paragraphs provide a summary of key legislation authorizing the construction of Lavon Dam and Lake as well as stewardship of project lands and the provision of outdoor recreation facilities and programs.

House Document No. 403, 77th Congress, outlined a comprehensive plan of improvement of the Trinity River and Tributaries. The plan included eight reservoirs, including Lavon Dam and Lake, and various channel improvement projects within the upper Trinity River watershed. Congressional authority for the construction of Lavon Dam and Lake was granted in the River and Harbor Act approved 2 March 1945 (Public Law 14, 79th Congress, First Session). The July 24, 1946 River and Harbor Act (Public Law 525, 79th Congress, Second Session, Sec. 2) modified the authorization to provide for conservation storage. Subsequent to these authorizations, the initial Lavon Lake Project was constructed in March 1954.

Within 10 years of completion of the initial project, the need for increased flood protection and water conservation resulted in congressional authorization for the modification of Lavon Dam and Lake. This was set forth in the Flood Control Act of 1962, approved October 23, 1962 (Public Law 87-874, 87<sup>th</sup> Congress, Second Session, House Document No. 554).

Authority to initiate advanced planning was included in the Public Works Appropriation Act of 1964, approved December 31, 1963 (Public Law 88-257) and in Advice of Allotment C-87, dated January 13, 1964. Following several years of planning, design, and land acquisition, construction of the Lavon Lake Modification was initiated in May 1970 and completed in December 1975.

The authority to conduct land stewardship management activities, including vegetation management for conservation purposes, is set forth in Public Law 86-717, The Forest Cover Act, which is focused solely on the conservation and management of USACE-administered federal lands. The conservation of Fish and Wildlife Resources is authorized in accordance with the provisions of the Fish and Wildlife Coordination Act, Public Law 85-264. Land stewardship at USACE projects is further supported by Section 101 of the National Environmental Policy Act of 1969 (NEPA).

Section 4 of the Flood Control Act approved 22 December 1944, (Public Law 534, 78th Congress, Second Session), as amended, authorized the development of reservoir areas under the Department of the Army for recreational purposes.

### **1.3 PROJECT PURPOSE**

Lavon Lake is a multipurpose water resources project having the following authorized purposes:

- Flood Risk Management
- Water Conservation

Lavon Lake is also managed to provide public outdoor recreation opportunities and for environmental stewardship of natural and cultural resources.

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

In accordance with Engineering Regulation (ER) 1130-2-550, Change 07, dated 30 Jan 2013 and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 Jan 2013, master plans are required for most USACE water resources development projects having a federally-owned land base. This revision of the Lavon Lake Master Plan is intended to bring the Plan up to date to reflect changes in outdoor recreation trends as well as ecological and socio-demographic changes that are currently impacting the lake and those anticipated to occur within the planning period of 2016-2041, a 25-year period.



The 1972 Plan was sufficient for prior land use planning and management until recently, as rapid urbanization and suburbanization, demand for water, and changing trends in outdoor recreation began to impact the Collin County area and the North Central Texas region in general. These escalating pressures and changes highlight the need to engage the public and important stakeholders, including elected officials, to revise land classifications, adopt new resource management objectives, and project recreation facility needs into the foreseeable future. To accomplish this, a full revision of the 1972 Plan is required and is set forth in this Plan.

The revised Plan focuses on overall goals and objectives and not on details of design, routine management, and administration. These are addressed in the Lavon Lake Operational Management Plan (OMP). The OMP is a task oriented plan which must implement and be compatible with the Master Plan. The Plan does not address the specifics of regional water quality, shoreline management with respect to allowable vegetation modification by adjacent landowners, or water level management. In addition, the operation and maintenance of project operations facilities such as the dam and appurtenant structures is not included in the Plan.

## **1.5 PROJECT AND WATERSHED OVERVIEW**

Lavon Lake was originally constructed in 1953-54 and was modified and enlarged in 1974-75. The modification and enlargement of Lavon Lake required acquisition of additional lands bringing the total fee simple land base to 37,515 acres. In addition to these lands, a total of 849 acres of flowage easement was also acquired. Flowage easements grant to the Federal government the right to periodically inundate the land during flood management operations. When the pool elevation is at the normal or conservation pool elevation of 492.0 National Geodetic Vertical Datum (NGVD), the lake has a surface area of 21,400 acres. Approximately 16,115 acres of USACE-administered land lies above the normal pool from elevation 492.0 NGVD to approximately 508.0 NGVD. During times of flooding, water is stored in Lavon Lake between elevation 492.0 and 508.0 NGVD. The spillway crest, when all flood gates are closed is 503.5 NGVD. The Federal property boundary line is approximately 155 miles long and at elevation 492.0 NGVD, the shoreline is approximately 121 miles long.

The release of stored flood water is controlled by USACE until the normal or conservation pool elevation of 492.0 NGVD is achieved. Water stored below elevation 492.0 NGVD is managed for water supply purposes in accordance with contractual agreements between USACE and the North Texas Municipal Water District (NTMWD). NTMWD withdraws water from the lake through three separate water intake structures located along the southeast shoreline of the lake. To supplement water supply, the NTMWD has the capability to pump water into Lavon Lake from Jim Chapman Lake (Cooper Dam) and Lake Texoma. Recently, invasive zebra mussels were found in Lake Texoma thus preventing the direct pumping of Lake Texoma water into Lavon Lake. In addition to the water management responsibilities of USACE and NTMWD, the City of Garland withdraws water from Lavon Lake through an intake channel near Little Ridge

Park. The water withdrawn by the City of Garland is used as cooling water for a steam electric plant and is returned to the lake.

The Plan classifies all USACE-managed lands lying above elevation 492.0 NGVD as follows:

- Project Operations.....508 Acres
- High Density Recreation .....2,007 Acres
- Environmentally Sensitive Areas..... 4,319 Acres
- Multiple Resource Management - Low Density Recreation.....2,468 Acres
- Multiple Resource Management - Wildlife Management.....6,480 Acres
- Multiple Resource Management – Vegetation Management.....824 Acres

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

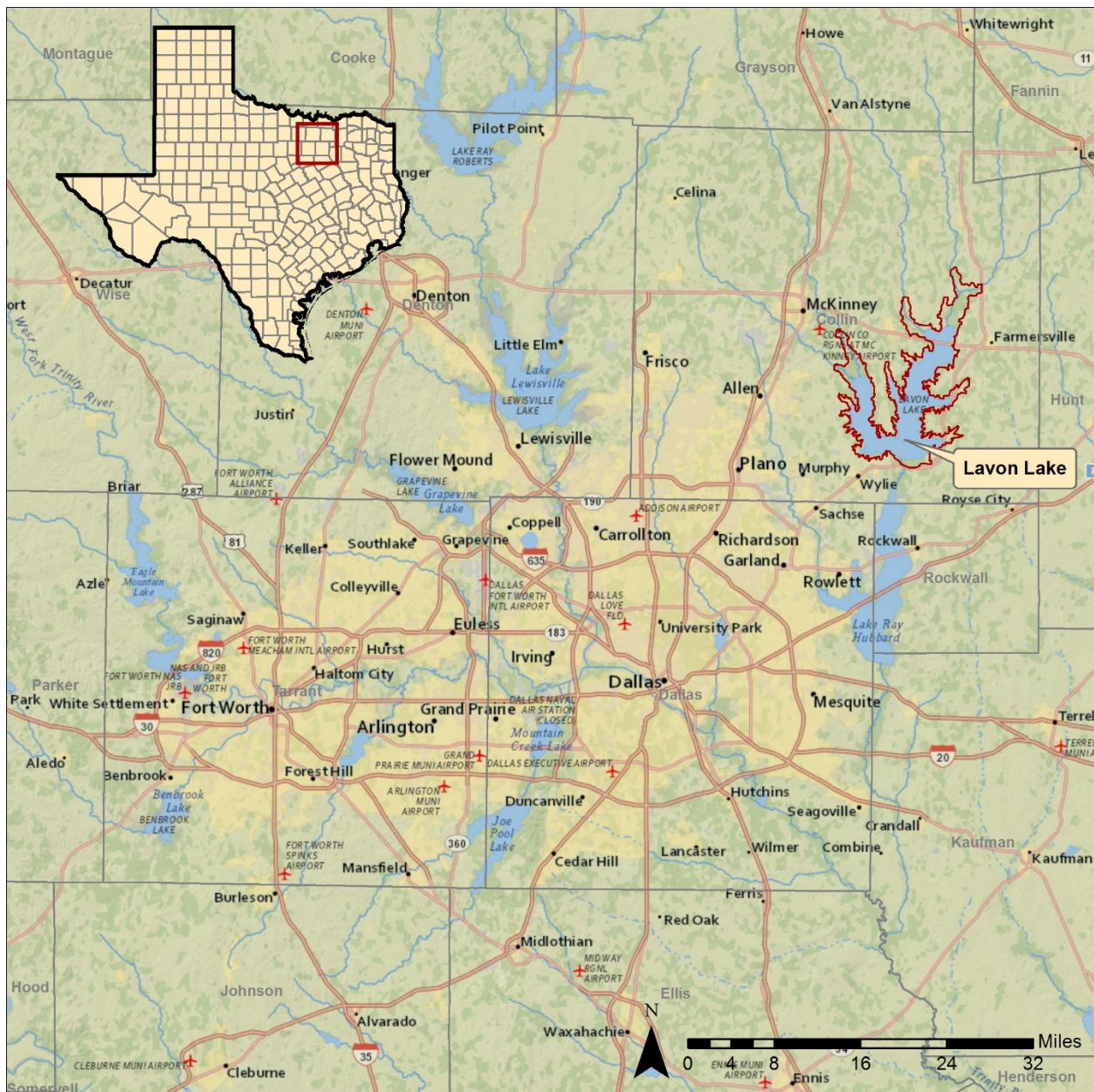
Two marinas operate on the lake under a concession lease with USACE. One of the marinas also operates Collin Park for day use and camping. USACE operates all other parks. The majority of USACE park operations and maintenance activities, including mowing, cleaning, building repairs, road repairs, utility repairs, trash removal and related tasks are accomplished through service contracts.

Lavon Lake is part of the Upper Trinity River watershed in the north central Texas region and lies completely within Collin County, Texas. The dam is located on the East Fork of the Trinity River approximately 2 miles east of Wylie, Texas. Figure 1.1 illustrates the location of Lavon Lake with respect to neighboring municipalities and major roadways associated with the lake. Figure 1.2 illustrates the location of Lavon Lake within the 16-County North Central Texas Council of Governments (NCTCOG) region.

The East Fork of the Trinity River originates in the southern part of Grayson County near Dorchester, Texas in north central Texas. The East Fork flows about 110 miles in a southerly direction until it merges with the Trinity River below Dallas. The East Fork joins the main stem at approximately river mile 460 of the Trinity River near Rosser, Texas.

The East Fork Watershed lies between 32 degrees (°) 30 minutes (') and 33° 32' north latitude and between 96° 13' and 96° 47' west longitude. The watershed is generally located north and east of Dallas, Texas and includes a portion of the Dallas metropolitan area, and the cities of Garland, McKinney, Plano, Richardson, and Mesquite. The watershed has a length of about 78 miles along the major axis of its valley and a maximum width of about 30 miles. The East Fork watershed has a drainage area of 1,314 square miles, including 770 square miles above Lavon Lake. Portions of the watershed lie within Collin, Dallas, Fannin, Grayson, Hunt, Kaufman, and Rockwall Counties.

The East Fork watershed has a multiple stream drainage pattern. Sister Grove, Pilot Grove, and Indian Creeks are major left bank tributaries, and Wilson Creek and Honey Creek are major right bank tributaries that are all located upstream of Lavon Dam. Major downstream right bank tributaries are Muddy Creek, Rowlett Creek and Duck Creek. There are no major left bank tributaries downstream of Lavon Dam. Lake Ray Hubbard, a water supply reservoir owned and operated by the city of Dallas is located only a few miles downstream from the dam at Lavon Lake.



**Figure 1.1** Lavon Lake Vicinity Map

## **1.6 DESCRIPTION OF RESERVOIR**

Lavon Lake is located in the Upper Trinity River watershed in North Central Texas. The lake and all associated Federal land are located wholly within Collin County. Administratively, Lavon Lake is one of seven lakes in the USACE Trinity Regional Project with headquarters at Lewisville Lake in Denton County. USACE maintains an office at Lavon Lake near the west end of the dam. Downstream of the dam is the forested floodplain of the East Fork of the Trinity River which is part of the headwaters of Lake Ray Hubbard, a reservoir owned and operated by the City of Dallas, and located approximately three miles south of Lavon Lake Dam.

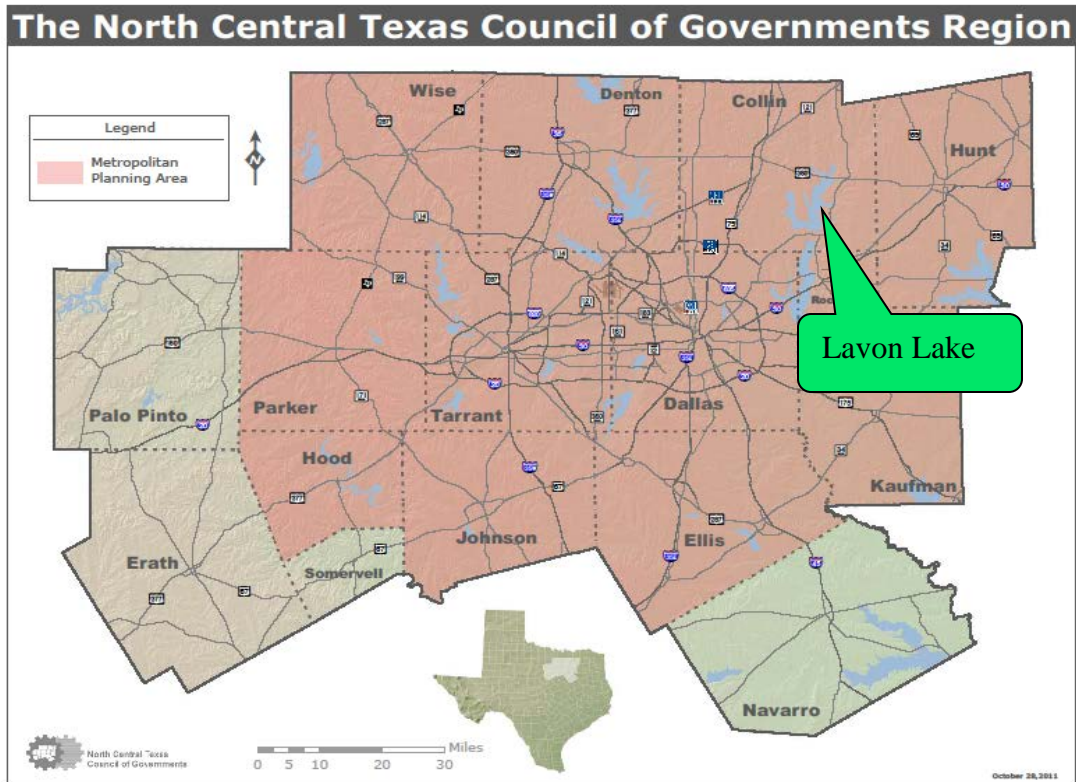
The topography of Lavon Lake varies from gently rolling in the upper portion of the lake to relatively flat in the lower lake area. With the exception of the forested floodplains along Pilot Grove Creek, Indian Creek, Sister Grove Creek, Ticky Creek, the East Fork of the Trinity River and Wilson Creek, most of the land surrounding Lavon Lake was cleared for agricultural purposes decades ago. The main body of the lake consists of two major arms, a western arm created by the East Fork of the Trinity River and an eastern arm created by Pilot Grove and Sister Grove Creeks. The eastern arm is the larger and is approximately 12 miles long north to south and 4.75 miles wide east to west.

Soils in the Lavon Lake area can be generally characterized as heavy clays and clay loams in the Houston Black and Trinity-Frio associations. Widespread farming activity in the watershed has resulted in moderately higher deposition of sediment in Lavon Lake than was estimated during project planning. Sediment laden runoff into Lavon Lake can result in moderately turbid water for extended periods. In spite of this runoff, the water quality in Lavon Lake for domestic water supply purposes remains good.

As designed, pool elevations of Lavon Lake can vary significantly. Extended periods of drought have resulted in elevations below 480.0 NGVD while flood conditions have raised the elevation above 500.0 NGVD, with the record elevation being 504.93 NGVD set on May 3, 1990. Pertinent pool elevations and storage capacities are provided in Table 1.1.

Management of the recreation and natural resources program at Lavon Lake must take into account the effects of planned operational characteristics of the project, especially the significant pool elevation fluctuations.





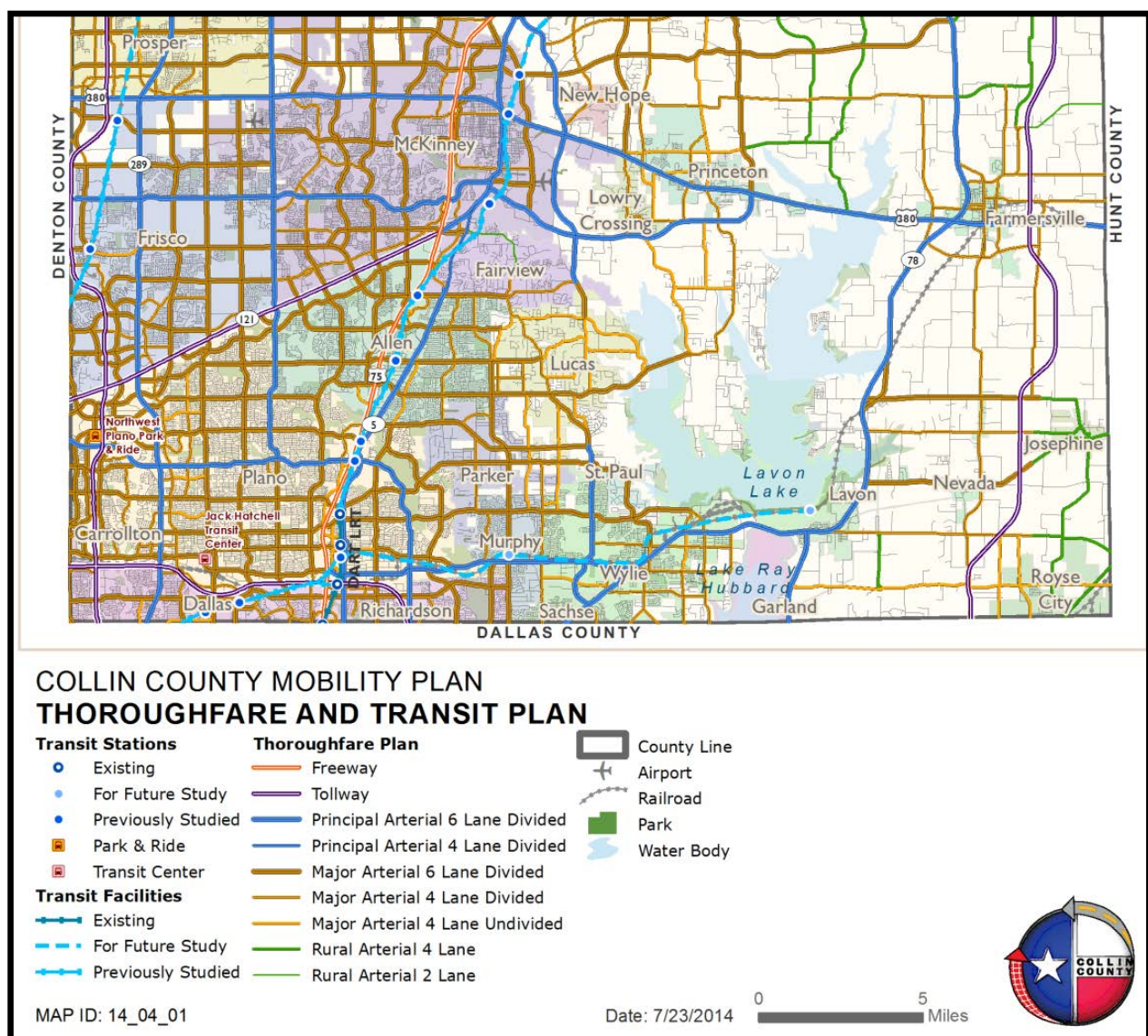
**Figure 1.2** Regional Map: 16-County NCTCOG

## 1.7 PROJECT ACCESS

Lavon Lake is located in southeastern Collin County, Texas. The dam is approximately two miles east of the central business district of Wylie, Texas and approximately 22 miles northeast of the central business district of Dallas, Texas. State Highway 78 is the primary public road providing access to the area near the dam and along the east side of the lake. The west side of the lake is served by several county and municipal roadways including Parker Road and East Lucas Road. The central portion of the lake is served primarily by Farm to Market (FM) 982 and the northern sector of the lake is served by U.S. Highway 380 and FM 559. A vicinity map is provided in Figure 1.1.

Significant local road expansion/construction projects are either planned or anticipated to take place during the planning horizon of this Plan. The majority of these road projects include U.S. or State Highways and Farm to Market (FM) roads maintained by the Texas Department of Transportation (TxDOT), county roads maintained by Collin County, or municipal roads maintained by the cities of Wylie, St. Paul, Lucas, Lowry Crossing, Princeton, Farmersville or Lavon. A portion of a map depicting the 2014 Collin County Mobility Plan – Thoroughfare and Transit Plan is provided in Figure 1.3.

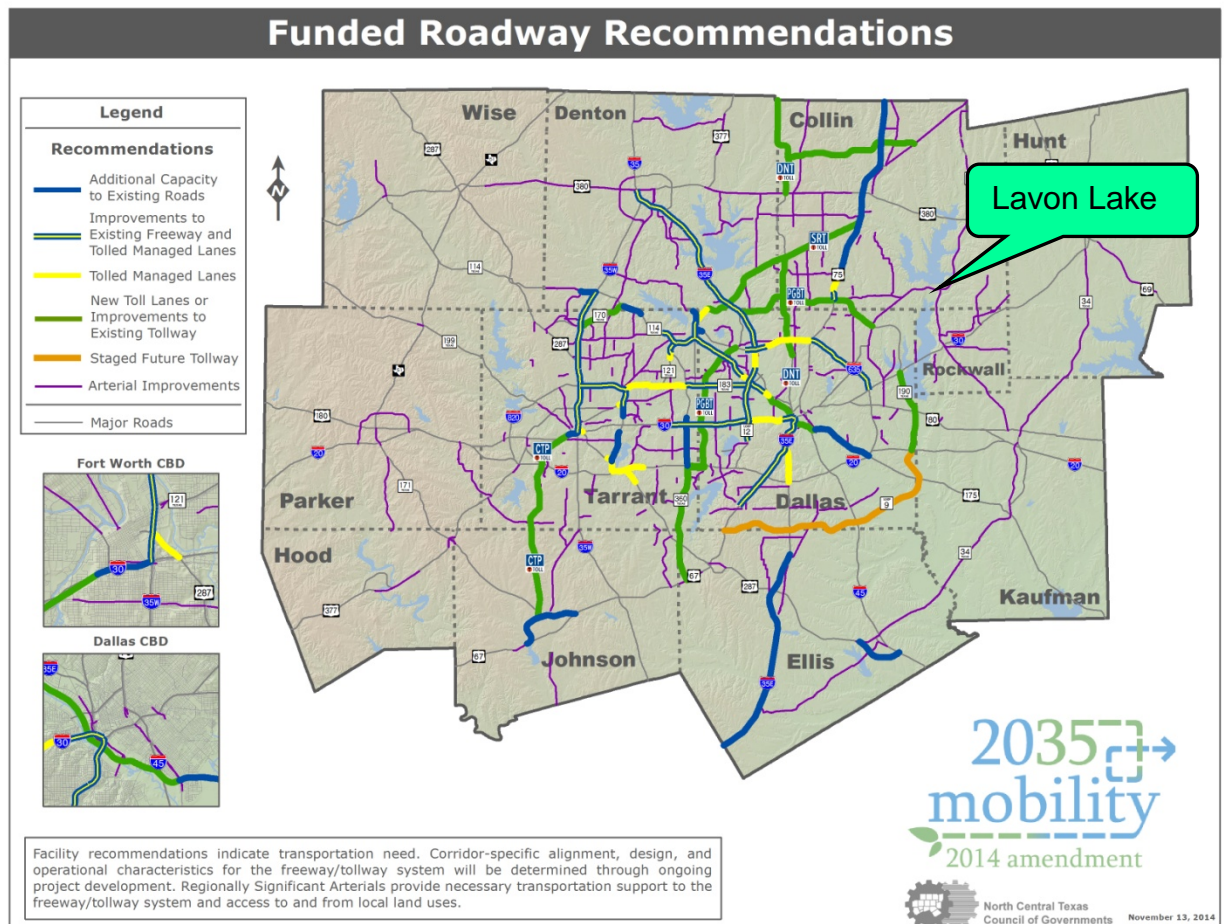
As shown in Figure 1.3, most of the principal roadways mentioned above are proposed to be widened in the coming years to accommodate the projected significant growth in the Collin County population. In addition to the Collin County Mobility Plan, the 2035 Metropolitan Transportation Plan (MTP) published by the NCTCOG addresses the major, controlled access, regional arterial freeways and tollways constructed and operated by TxDOT or the North Texas Tollway Authority (NTTA). The MTP includes planned and envisioned roadways near Lavon Lake, but none that would directly impact USACE- managed lands or water surface. However, any major freeway or tollway constructed near Lavon Lake would carry with it the effects of increased residential and commercial development. Refer to Figure 1.4 for a map showing major arterial roads that are funded for construction and/or expansion in the 2014 amendment to the MTP.



**Figure 1.3** Portion of Collin County 2014 Mobility Plan Affecting Lavon Lake



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



**Figure 1.4** NCTCOG 2035 Mobility, Metropolitan Transportation Plan

### 1.7.1 Lavon Lake Bridge Study

In 2007, Collin County voters approved funding for a preliminary route study to find an optimum alignment for a bridge across Lavon Lake. After conducting public meetings on the topic, the Collin County Commissioners Court voted on October 11, 2010, to reject the Lavon Lake bridge study and update the county Thoroughfare Plan by removing any proposed new bridges that would directly affect USACE-managed lands and water surface.

## 1.8 PRIOR DESIGN MEMORANDA

Thirty-seven separate DM's were prepared from 1961 thru 1972 setting forth design criteria for all aspects of the project including the prime flood risk management facilities, real estate acquisition, road and utility relocations, reservoir clearing, and the master plan for recreation development and land management. A complete listing of the DMs is provided in Appendix C.

## 1.9 PERTINENT PROJECT INFORMATION

The Lavon Lake Dam consists of a rolled fill, earth embankment and a gated concrete spillway with low flow sluices. The total length of the dam is 19,493 feet which includes the 586-foot spillway. The top of the embankment is 81 feet above the streambed. The upstream slopes are protected with 24-inch riprap placed on nine inches of granular bedding from elevation 462.0 NGVD to the crest, at elevation 514.0 feet NGVD. An additional layer of 24 inches of graded riprap was placed between elevations 482.0 and 501.0 feet NGVD during the modification. The downstream slopes were mulched and seeded at the time and continue to be grass-lined.

**Table 1.1** Pertinent Project Features

Feature	Elevation (ft. NGVD)	Area (acres)	Capacity (acre-feet)
Top of dam	514.0		
Maximum design water surface	509.0		
Upper guide contour	508.0	32,700	888,100
Spillway crest (top of flood control pool)	503.5	29,450	748,200
Five-year flood line	496.0	24,100	547,400
Top of conservation storage	492.0	21,400	456,500
Five-year drawdown	486.0	18,000	339,200
Ten-year drawdown	482.0	16,000	271,400
Streambed	433.0		
Shoreline at conservation level – approximately 121 miles			

Source: Updated Master Plan for Lavon Lake Modification, East Fork Trinity River, Texas, Trinity River Basin, Texas, Design Memorandum No 13 (Revised May 1972), U. S. Army Engineer District, Fort Worth Corps of Engineers, Fort Worth, TX May 1972; Volumetric and Sedimentation Survey of Lavon Lake, June-July 2011 Survey, Texas Water Development Board, January 2013; Texas Water Development Board 2011 Survey

The Texas Water Development Board (TWDB) conducted a Volumetric Survey of Lavon Lake in June/July 2011 to determine the amount of sedimentation that has occurred in the lake since 1975. The findings from that TWDB survey indicate that Lavon Lake had a volume of 409,360 acre-feet and encompasses 20,559 acres at conservation pool of 492.0 feet above mean sea level. The study indicates that Lavon Lake has lost 47,140 acre-feet of storage or 10.3% capacity and a 3.9% decrease in surface area.

The spillway is equipped with twelve 40-foot X 28-foot tainter gates. Five low-flow, 36-inch sluices are located in the five center piers of the spillway. Each of these sluices consists of a 36-inch conduit controlled by a 36-inch service gate. Each conduit is capable of releasing 220 cubic feet per second (cfs) into the stilling basin.

When water is released through the tainter gates it cascades into the stilling basin before flowing down the East Fork of the Trinity River. The stilling basin is 568 feet wide and 125 feet long with training walls on either side. The reinforced training walls are 47 feet high. The floor of the stilling basin is at elevation 415.0 feet NGVD and is five feet thick concrete. There are two rows of eight-foot high baffle blocks and an end sill seven feet in height to dissipate the energy of the discharge. The first row has 47 baffle blocks, while the second row has 46 that are staggered from the first row. Pertinent features of the project are shown in Table 1.1.

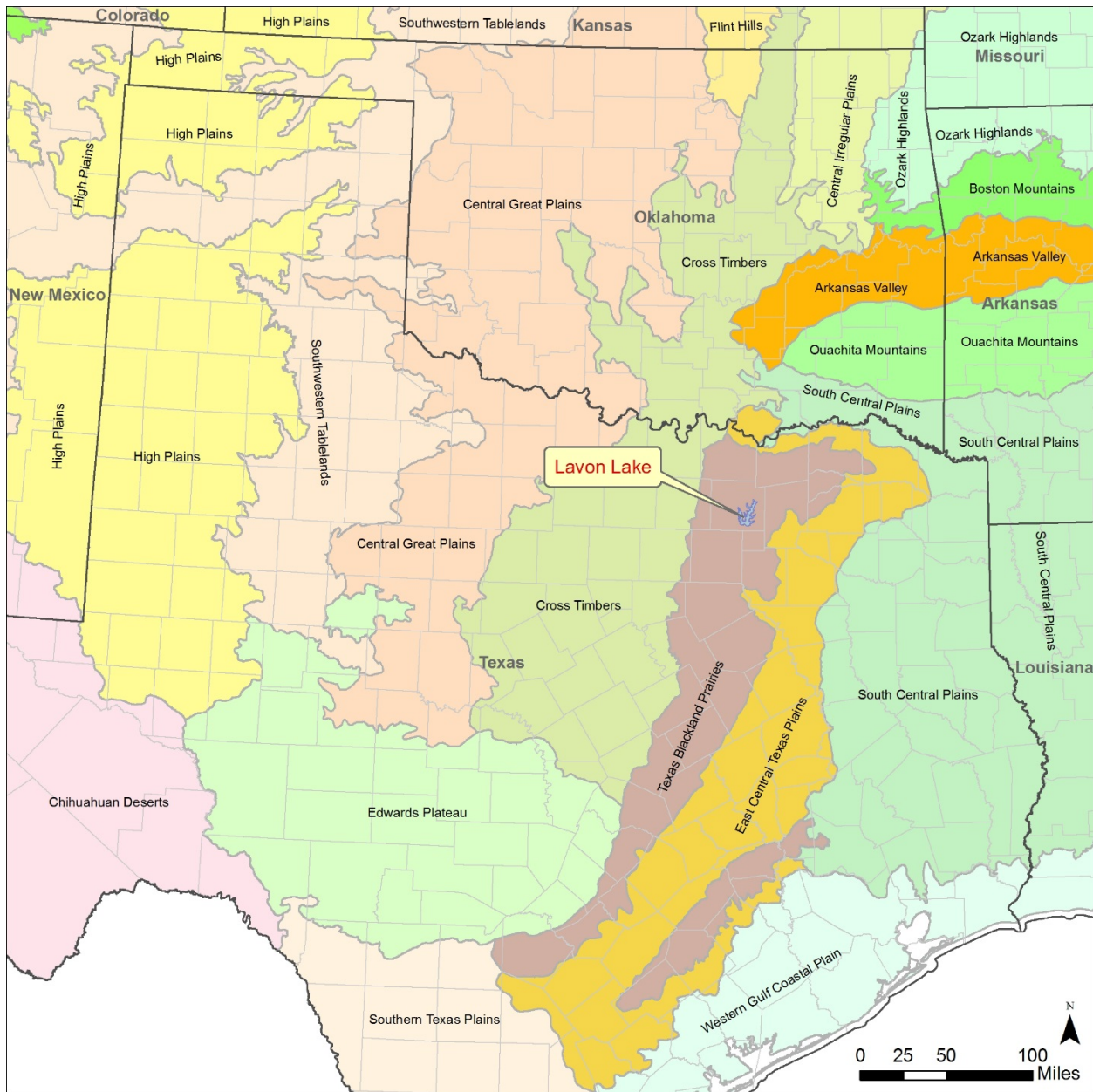
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## **CHAPTER 2 - PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT**

### **2.1 PHYSIOGRAPHIC REGION**

#### **2.1.1 Ecoregion Overview**

Lavon Lake, as well as all of Collin County, is located in the Texas Blackland Prairies ecological region (ecoregion). Refer to Figure 2.1 for a map of the Ecoregions of Texas. The Texas Blackland Prairies Region (TBPR) form a disjunct ecoregion, distinguished from surrounding regions by fine-textured, clayey soils and predominantly prairie potential natural vegetation. The predominance of vertisols in this area is related to soil formation in Cretaceous shale, chalk, and marl parent materials. Unlike tallgrass prairie soils that are mostly mollisols in states to the north, this region contains vertisols, alfisols, and mollisols. Dominant grasses included little bluestem, big bluestem, yellow Indiangrass, and switchgrass. The region now contains a higher percentage of cropland than adjacent regions; pasture and forage production for livestock is common. Large areas of the region are being converted to urban and industrial uses.



**Figure 2.1** Level III Ecoregions of Texas (Source: Environmental Protection Agency)

### 2.1.2 Climate

The climate of Collin County is warm temperate, subtropical, and humid with hot summers and mild winters. Occasional extreme temperatures occur in winter and summer months but are of short duration. The average low and high temperatures range from 36° Fahrenheit (F) in January to 96°F in July. The lowest minimum recorded temperature is 1°F in 1989 and the highest maximum 112°F in 1980. The average frost free period is 287 days but this can vary significantly from year to year. The average first freeze occurs in mid-November and the average last freeze occurs in late March. Annual precipitation within the county averages 33.7 inches per year and is fairly evenly



distributed throughout the year with the highest rainfall typically occurring in April and May. Snow seldom falls and is an insignificant source of moisture. Relative humidity ranges from 38% to 93% with the driest period around late July and the most humid period in early May. The prevailing surface winds are southeasterly with strong winds from the north-northwest occurring frequently in winter months. In a typical year, wind speeds vary from zero to 17 miles per hour (mph) and rarely exceed 25 mph.

The topic of worldwide climate change, including the causes and extent, continues to be studied by the scientific community and world governments. In the United States, two Executive Orders, EO 13514 and EO 13653, as well as the President's Climate Action Plan (CAP) set forth requirements to be met by Federal agencies. These requirements range from preparing general preparedness plans to meeting specific goals to conserve energy and reduce greenhouse gas emissions. USACE has prepared an Adaptation Plan in response to the Executive Orders and CAP. The Adaptation Plan includes the following USACE policy statement:

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

### 2.1.3 Geology

Lavon Lake is underlain by an eastward and southeastward-dipping series of Upper Cretaceous marine sedimentary rocks, overlain locally by Pleistocene fluvial terrace deposits of recent floodplain alluvium. Change in the strike of beds from north to east across Collin County may be in response to deposition of Cretaceous units over now buried, plunging folds of the Ouachita or Arbuckle mountain systems.

Shoreline geology of Lavon Lake consists primarily of fluvial terrace deposits, gravel, sand, and silt. Alluvium floodplain and channel deposits of sand, silt, clay, and gravel are located in stream channels flowing into Lake Lavon. Small areas near the confluence of these stream channels and the lake show deposits of Wolfe City Sand. Between one and four miles east of the lake and south of Elm Creek/Tom Bean Creek the geology is predominately Pecan Gap Chalk with small pockets of Marlbrook Marl.

### 2.1.4 Topography

The topography of the area varies from gently rolling in the upper portion of the watershed to generally flat in the lower portion. The gently undulating slightly rolling upland areas have historically been intensely cultivated. The project area lies within the West Gulf Coastal Plains section of the Coastal Plains physiographic province. The floodplain of the East Fork, Trinity River, has an average width of two miles and is confined between valley walls that rise fairly steeply to terrace flats and rolling uplands.

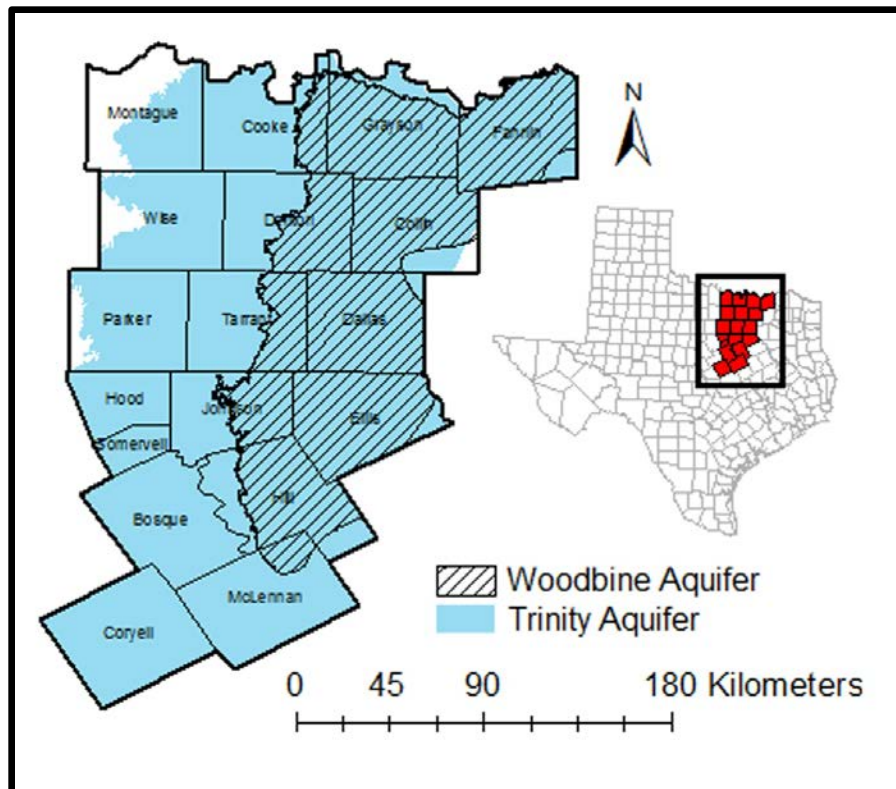
The main body of the impounded water at elevation 492.0 (top of conservation pool storage) has a maximum length of 12 miles and a maximum width of 4.75 miles. The impounded water at elevation 492.0 inundates approximately 21,400 acres and has a shoreline of approximately 121 miles. Maximum depth at conservation pool is approximately 45 feet and the average depth is 18 feet. The water level fluctuates about 7.1 feet annually. The elevation of the terrain at Lavon Lake ranges from 430 feet at the bottom of the inundated East Fork river channel, to approximately 675 feet NGVD in the surrounding hill tops.

#### 2.1.5 Hydrology and Ground Water

A basic description of surface water hydrology and the Lavon Lake watershed is provided in Chapter 1, Section 1.5, Project and Watershed Overview. In addition to this overview, it is notable that in the watershed above Lavon Lake, the Natural Resources Conservation Service of the U.S. Department of Agriculture (NRCS) has constructed at least 149 water retention structures. These structures retard runoff from approximately 242 square miles. The combined detention capacity of these structures is 69,170 acre-feet, but this storage capacity has a limited effect on the inflow to Lavon Lake during major floods. There are no major flood retention reservoirs in the Trinity River watershed above Lavon Lake. As noted previously, the City of Dallas operates Forney Dam and Lake Ray Hubbard approximately three miles downstream from Lavon Lake Dam.

Groundwater in the immediate Lavon Lake area and throughout most of Collin County is present in two aquifers, the Trinity (subcrop) Aquifer, considered to be a major aquifer by the state of Texas and the more shallow Woodbine (subcrop) Aquifer, considered to be a minor aquifer. Administratively, these aquifers are included in the Groundwater Management Area (GMA) 8 as designated by the TWDB. There are 12 Groundwater Management Districts within GMA 8, including the North Texas Groundwater Conservation District which takes in Cooke, Denton and Collin Counties.

Both the Trinity and the Woodbine aquifers serve a very densely populated area and have been heavily used over the past several decades by numerous municipalities, and other public water supply providers. Some of the largest aquifer level declines in Texas have occurred in the Trinity Aquifer in a broad corridor that encompasses and parallels Interstate Highway 35. These declines have ranged from 350 feet to more than 1000 feet. The decline has slowed in recent years due to increasing reliance on surface water for municipal purposes. Refer to Figure 2.2 for a map of the Trinity Aquifer in the areas where declines have been significant. All recreational areas operated by USACE and others at Lavon Lake are connected to municipal or other public water supply providers.



**Figure 2.2** Zone of Historically Heavy Water Use – Trinity and Woodbine Aquifers

### 2.1.6 Soils

Six soil associations have been identified and mapped within Collin County. Soils of the Houston Black-Austin association occur primarily on rocks of the Austin group. These deep clayey soils are found on gently sloping to sloping uplands over argillaceous marl and chalk. The Houston Black-Houston soils are associated with the Ozan and Marlbrook formations. These deep clayey soils occur on gently sloping to sloping uplands over calcareous clays and minor limestone units. Soils formed on the Pleistocene fluvial terrace deposits belong to the Houston Black-Burleson association. These deep, clayey soils occur on nearly level to gently sloping stream terraces.

The deep clayey and loamy soils of the nearly level floodplains belong to the Trinity-Frio Association and are developed on recent alluvium. The eroded, deep, clayey soils of the Ferris-Houston Association occur on sloping to strongly sloping uplands. These soils were developed on Pecan Gap Chalk and Wolfe City Formation, consisting of fine grained calcareous sand, silt, and chalky limestone. The Wilson-Burleson soils are associated with the Eagle Ford formation. These deep, loamy and clayey soils occur on nearly level to gently sloping uplands and are underlain by gypsum bearing shale.

These soil types are representative of the Texas Blackland Prairie Ecoregion tallgrass prairie community of soils associated with floodplains, stream terraces, and uplands along this portion of the Trinity River floodplain. This community is characterized by deeper soils underlain at rather shallow depths by dense, hard, clayey material. This “claypan” restricts air and water movements, as well as root penetration.

The flood plain areas with slopes of less than one percent consist of Frio and Trinity soils. These are deep, calcareous, and clayey with high fertility and water holding capacity. These clayey soils have a high shrink/swell capacity and develop large cracks during dry weather.

The upland areas are gently sloping to rolling and consist of Houston clay, Altoga silt clay, Burleson clay, and Lewisville silt clay. These soils are deep and calcareous with moderately high water holding capacity. Soil texture ranges from clay to silt clay loam. The clayey soils shrink and crack during dry periods. Moderate to severe sheet and gully erosion is present on areas where vegetation has been removed. Detailed information and maps on all soil types surrounding Lavon Lake is available on websites maintained by the NRCS.

## **2.2 ECOREGION AND NATURAL RESOURCE ANALYSIS**

In preparation for revision of the Lavon Lake Master Plan, USACE requested the assistance of the U.S. Fish & Wildlife Service (USFWS) to describe existing wildlife habitat conditions on project lands. A team of USFWS and USACE biologists conducted field work from July 12-28, 2010 and the report was completed later that year. The fieldwork consisted of identifying major habitat types on project lands and collecting data on 154 sample points randomly selected throughout the major habitat types. Developed recreation areas and the main body of the lake were excluded from the study. Data collection was done using the Habitat Evaluation Procedures (HEP) developed by USFWS. Identified habitat types included bottomland hardwood (9,490 acres), herbaceous wetlands (526 acres) and grassland (6,771 acres). The report is attached to this Plan as Appendix D.

The Texas Conservation Action Plan (TCAP) 2012 and the accompanying Texas Blackland Prairies Ecoregion Handbook (Handbook), published by Texas Parks and Wildlife Department (TPWD) in August 2012, were used extensively in the preparation of this Plan. The TCAP and Handbook were invaluable in identifying Species of Greatest Conservation Need (SGCN), rare plant communities, regional conservation issues and a suite of conservation actions needed to reduce negative effects on SGCN and rare plant communities. The 2011 TPWD list of SGCN, as well as the rare species list for Collin County, is provided at Appendix F. The TCAP and Handbook were especially valuable in preparing the Land Classifications and Resource Objectives in this Plan. The following paragraphs provide a general description of the natural and cultural resources located on Federal land at Lavon Lake.

### 2.2.1 Vegetation

The ecoregion that spans the entire vicinity of Lavon Lake is the TBPR. This prairie community forms a belt across Texas and was dominated by tallgrass prairies on uplands prior to the now established row crop agriculture and suburban development. The intense suburban and agricultural development has almost completely annihilated all vestiges of tallgrass prairie. As noted in the TCAP, less than 5,000 acres of scattered patches of Texas Blackland Prairie remain out of the 12 million acres that once existed. Intact Texas Blackland Prairie remains predominantly as a treeless rolling prairie of bunch and short grasses; however, hardwoods such as elm species (*Ulmus spp.*), hackberry (*Celtis occidentalis*), pecan (*Carya illinoensis*) and oak species (*Quercus spp.*) occur along streams and bottomlands. Groundcover consists of such native grasses as buffalograss (*Bouteloua dactyloides*), various bluestems and grama combined with various forbs and vines.

The TBPR ecoregion is perhaps the most critically threatened in the state. It lies along one of the most development-intensive and populated areas in Texas – the Interstate Highway 35 corridor which stretches through Dallas, Waco, Temple, Austin (eastern portions), San Marcos, New Braunfels, and San Antonio. Gently rolling to mostly flat, this region is easily developed and has few barriers to development like the adjacent ecoregions which require clearing, leveling, and geotechnical work. Historically, the region was a vast tallgrass prairie of little bluestem, big bluestem, yellow Indiangrass, tall dropseed, eastern gamagrass and many forbs, such as asters, clovers, and black-eyed susan which supported wide-ranging abundant herds of bison and pronghorn, greater prairie chickens, and even ocelot. Almost the entire prairie has now been converted to other uses.

Collin County lies in the Texan biotic province, a transitional zone between the forested Austroriparian province to the east and the grassland provinces (Kansan and Balconian) to the west. While the region exhibits a combination of eastern forest and western prairie flora and fauna, the bottomlands are primarily Austroriparian species. Stream bottoms were often wooded with bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), hackberry, elm, ash (*Fraxinus spp.*), eastern cottonwood (*Populus deltoides*), and pecan. There are, however, hardwoods such as elm, hackberry, pecan, oak, and Bois d'Arc (*Maclura pomifera*) occurring along streams. Brushy species such as honey mesquite (*Prosopis glandulosa*) and eastern redcedar (*Juniperus virginiana*) have invaded many portions of the grasslands as a result of the minimization of natural and manmade fires.

Within the TBPR, the TCAP lists several rare plant communities. Refer to Table 2.1 for a listing of these rare plant communities. Determining the presence or absence and extent of these communities requires careful field investigations that will be accomplished at Lavon Lake as time and funding permits. A few relic patches of tallgrass prairie as well as a few acres of Southern Elm – Chinquapin Oak Forest and Bur Oak – Shumard Oak Bottomland Forest are known to exist at Lavon Lake and efforts to restore and expand these areas are included in the resource objectives described in this Plan. Crosscutting this prairie were dense meandering bands of

riparian hardwoods (primarily bur oak, Shumard oak, sugar hackberry, elm, ash, eastern cottonwood, and pecan) along broad floodplains. A map depicting the Texas Blackland Prairies Ecoregion is provided at Figure 2.1. Photo 2.1, taken in July 2015 is provided as an example of the rare vertisol blackland prairie known to exist in small pockets at Lavon Lake.

**Table 2.1** Texas Blackland Prairies Ecoregion Rare Plant Communities

Common Name	State Rank
Bur Oak - Shumard Oak <i>Mixed Bottomland Forest</i>	S3? - Vulnerable (“?” denotes Inexact Rank)
Eastern Gamagrass – Switchgrass <i>Floodplain Herbaceous Vegetation</i>	S1 - Critically Imperiled
Eastern Gamagrass – Switchgrass – Yellow Indiangrass - Michaelmas daisy <i>Herbaceous Vegetation</i>	S1 – Critically Imperiled
Silveus Dropseed – Longspike Tridens <i>Herbaceous Vegetation</i>	S1S2 – Critically Imperiled and Imperiled
Silveus Dropseed – Mead’s Sedge	S1 – Critically Imperiled
Southern Elm – Chinquapin Oak <i>Forest</i>	S1S2? – Critically Imperiled and Imperiled (Inexact Rank)
Upper West Gulf Coastal Plain Dry <i>Calcareous (Blackland) Prairie</i>	S1S2 – Critically Imperiled and Imperiled
<i>Vertisol Blackland Prairie w</i>	S1S2 – Critically Imperiled and Imperiled





**Photo 2.1** Native Vertisol Blackland Prairie, East Fork Park

The current dominant canopy species along creeks in the project area include pecan, black willow (*Salix nigra*), cedar elm (*Ulmus crassifolia*), and eastern cottonwood. The dominant sapling/shrub species within both areas include young tree species, buttonbush (*Cephalanthus occidentalis*), flameleaf sumac (*Rhus lanceolata*), and roughleaf dogwood (*Cornus drummondii*). Finally, herbaceous species near the aquatic resources were dominated by wild rye (*Elymus spp.*), coralberry (*Symphoricarpos orbiculatus*), smartweed, (*Polygonum spp.*), cocklebur (*Xanthium strumarium*), inland seaoats (*Chasmanthium latifolium*), cattail (*Typha latifolia*), and sedge (*Carex spp.*). The herbaceous species within the upland areas are dominated by giant ragweed (*Ambrosia trifida*), Bermuda grass (*Cynodon dactylon*), and perennial ryegrass (*Lolium perenne*). However, there are still remnants of native prairie that support little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), tall dropseed (*Sporobolus compositus*), goldenrod (*Solidago sp.*), and cut-leaf daisy (*Erigeron compositus*). Invasive species such as broomweed (*Sporobolus compositus*), King Ranch bluestem (*Bothriochloa ischaemum var. songarica*), and Johnsongrass (*Sorghum halepense*) are now common in many portions of the grasslands. A complete listing of vegetative species that occur or potentially occur at Lavon Lake is beyond the scope of this Plan but can be found in numerous reference books and websites.



### 2.2.2 Wetlands

In accordance with national USACE policy, wetlands at operational projects are inventoried using the protocol established by USFWS in their *Classification of Wetlands and Deepwater Habitats of the United States*. The current USACE inventory for Lavon Lake indicates there are 526 acres of emergent wetlands located in shallow shoreline areas in the upper reaches of the main tributaries. The National Wetland Inventory (NWI) maps prepared by the USFWS and available in the Wetland Mapper tool on the USFWS website, show these and more emergent wetlands, as well as a significant acreage of forest/shrubland and freshwater pond wetlands in the upper reaches of the main tributaries to Lavon Lake. However, as explained by the USFWS regarding use of the NWI map data, the data represents reconnaissance level mapping using high altitude imagery. The actual presence and boundaries of wetlands shown on NWI maps requires verification through detailed, on-the-ground inspection. During preparation of the 2010 Habitat Evaluation Report (See Appendix D), on-site inspection of USACE lands indicated that most of the wetlands described using the Wetland Mapper tool do not exist on the ground. Most of the “freshwater pond” and “forested” wetlands shown by the Wetland Mapper tool are actually open water of the lake or tracts of bottomland hardwood forest. USACE is aware that the acreage of NWI wetlands at Lavon Lake exceeds, to some extent, the 526 acres of known wetlands, and as time and funding permits, USACE intends to verify the NWI data to determine the full extent of wetlands at Lavon Lake.

### 2.2.3 Fish and Wildlife Resources

A variety of mammals are known to inhabit the project area and/or surrounding land. These include opossum (*Didelphis virginiana*), cave myotis (*Myotis velifer*), beaver (*Castor canadensis*), nutria (*Myocastor coypus*), plains pocket gopher (*Geomys bursarius*), eastern flying squirrel (*Glaucomys volans*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), California jackrabbit (*Lepus californicus*), eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), mink (*Mustela vison*), spotted skunk (*Spilogale putorius*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Many of these species have been able to tolerate urbanization, while species that formerly inhabited the region such as black bear (*Ursus americanus*), gray and red wolves (*Canis lupus* and *Canis rufus*, respectively), mountain lion (*Felis concolor*), river otter (*Lutra canadensis*), and bison (*Bos bison*) were extirpated from the area due to hunting, trapping, and/or behavioral intolerance to human activity.

The situation is similar for birds, reptiles, and amphibians. The project area is used by both resident and migratory wildlife species that are tolerant of human activity. Resident passerines use the wooded areas along the forks, main stem and tributaries of the East Fork of the Trinity River for nesting, foraging and as a dispersion corridor. The more heavily impacted woodlands upstream and downstream of the project area are most likely used by a variety of migratory and resident passerine, owl, and hawk species which may disperse from the less impacted project area. Some common

resident bird species that may be observed in the study area are sparrows (various species), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*), blue jay (*Cyanocitta cristata*), common grackle (*Quiscalus quiscula*), scissor-tailed flycatcher (*Tyrannus forficatus*), barred owl (*Strix varia*), common crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), Carolina chickadee (*Poecile carolinensis*), and red-tailed hawk (*Buteo jamaicensis*). The species more intolerant to human activity have declined, while the more tolerant species have flourished. Common reptile species documented near the project area include lizards and various snakes, such as the copperhead (*Agkistodon contortrix*), cottonmouth (*Agkistodon piscivorus*), bullsnake (*Pituophis melanoleucus sayi*), and diamondback rattlesnake (*Crotalus atrox*) while amphibians seen occasionally include turtles and frogs.

The common fish species known to be in Lavon Lake and its tributaries include various species of bass (*Micropterus spp.*), bluegill (*Lepomis macrochirus*), gar (*Atractosteus spatula*), sunfish (Family Centrarchidae), shad (*Dorsoma spp.*), white crappie (*Pomoxis annularis*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*) as well as freshwater drum, carp and suckers. Freshwater mussels common to the Upper Trinity drainage are giant floater (*Pyganodon grandis*), Texas liliput (*Toxolasma texasiensis*), southern mapleleaf (*Quadrula apiculata*), and pink papershell (*Potamilus ohioensis*). Comprehensive listings of fish and wildlife species that occur or potentially occur in the region surrounding Lavon Lake can be found at websites maintained by TPWD or USFWS.

#### 2.2.4 Threatened and Endangered Species

In accordance with the Trust Resources Report generated by the U.S. Fish and Wildlife Service (USFWS) web-based Information for Planning and Conservation tool, there are two federally-listed endangered species and two threatened species that potentially occur at Lavon Lake. The four species, all birds, are listed in Table 2.2. The Trust Resources Report, attached in Appendix E, also lists several “Birds of Conservation Concern”. The Bald Eagle has the potential to occur at Lavon Lake and was formerly listed by the USFWS as an endangered or threatened species. Although recently delisted, the Bald Eagle is provided specific protections under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c).

Designated critical habitat is not present for any of the federally-listed threatened or endangered species within the project area. Additionally, none of the federally-listed species have been observed during on-site investigations. The whooping crane and interior least tern are known to migrate through, but not nest at Lavon Lake. However, the bald eagle has been known to nest on the East Fork of the Trinity River downstream of Lavon Lake and at nearby lakes in the region such as Bardwell Lake and Benbrook Lake.

In addition to the federally-listed species for Lavon Lake, TPWD maintains lists of rare species, by county, and lists of Species of Greatest Conservation Need (SGCN) by

ecoregion. The lists for Collin County and the Texas Blackland Prairie Ecoregion are available at Appendix F. The SGCN list also provides general habitat requirements for each of the species on the list. Included in the list, the white-faced ibis and wood stork are migratory birds that breed along the Texas coast, and there is a likelihood of both species being present at Lavon Lake during migration. Habitat preferred by other state listed species such as the Texas horned lizard and the timber/canebrake rattlesnake was not observed within the project area. However, habitat suitable for the timber rattlesnake is present on project lands and the species could be present. Many of the other species on the list, particularly migratory songbirds, are known to utilize habitat at Lavon Lake on a regular basis and are considered in management plans.

**Table 2.2** Federally-listed Endangered and Threatened Species with Potential to Occur at Lavon Lake.

Common Name	Scientific Name	Federal Status	State Status
Piping Plover	<i>Charadrius melodus</i>	LT	T
Whooping Crane	<i>Grus americana</i>	LE	E
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E
Red Knot*	<i>Calidris canufus rufa</i>	LT	NL

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LE, LT – Federally Listed Endangered/Threatened

E, T, NL - State Listed Endangered/Threatened/Not Listed

\*Listed for Wind Projects Only

### 2.2.5 Invasive Species

Several non-native invasive species have been documented at Lavon Lake. Zebra mussels (*Dreissena polymorpha*) have garnered the most visibility given Lavon Lake's importance as a water supply and outdoor recreation asset. Zebra mussels can have a detrimental effect on water control structures, raw water facilities and the general health and productivity of the aquatic environment. A reproducing zebra mussel population has been documented in one of the tributaries (Sister Grove Creek) that feed into Lavon Lake and isolated adult individuals have been found on recreational vessels over the last few years. Control attempts to eradicate zebra mussels in Sister Grove Creek exhibited limited success as live but stressed individuals remained post treatment. No reproducing population has been documented within Lavon Lake but given the proximity of established zebra mussel populations and a robust recreation footprint facilitating boat traffic, the risk of establishment remains high for the foreseeable future.

Feral hogs (*Sus scrofa*) continue to have a presence at differing levels throughout the year given food availability and the abundance of cover afforded by bottomland hardwoods around Lavon Lake. Signs of land degradation, conversion of the understory plant community and accelerated soil instability have all been documented and are assumed to continue in natural resource and park areas around

the lake. Lavon Lake does have an active hunting program with feral hogs being one of the animals allowed for harvesting.

Other nuisance species that impact the health and productivity of the natural resources at Lavon Lake include exotic Johnsongrass (*Sorghum halapense*) and native eastern redcedar (*Juniperus virginiana*). Both species are prolific and can out-compete more desirable native species further degrading prairie components that were historically the dominant vegetation type in the Blackland prairies. The resource objectives in Chapter 3 include a requirement for equestrian users and grazing lessees to use certified weed-free hay and animal feed to prevent the spread of exotic weeds. Additionally, when livestock are introduced into a grazing lease area, the animals shall be held in a confined area to allow previously ingested material to pass prior to the animals being released onto other USACE land.

The Emerald Ash borer (EAB) (*Agilus planipennis*) is another invasive species of concern that has not been detected in the area, but has slowly moved east across North America and has been detected near the east Texas border. The EAB is native to Asia and was first recorded in North America in 2002. EAB specifically utilizes true ash species to complete its lifecycle. Female emerald ash borers lay their eggs on the surface of ash trees, and when the eggs hatch the larvae burrow into the tree, feeding and developing into adult beetles. At maturity, the beetle leaves the host tree and the cycle is repeated. This feeding activity kills the tree within a few years. Lavon Lake has considerable acreage where green ash (*Fraxinus pennsylvanica*) is a dominant or co-dominant species. All stands of green ash commonly found in the upper Trinity River watershed would be in jeopardy if EAB spreads to the area.

#### 2.2.6 Visual and Open Space Qualities

Lavon Lake proper and surrounding federal lands offer public, open space values and scenic vistas that are unique in Collin County. The aesthetic qualities inherent in Lavon Lake are recognized by the NCTCOG in their North Texas 2050 vision document and in the Collin County Parks and Open Space Program Strategic Plan. The NCTCOG vision document stresses that “business as usual” with regard to a rapidly expanding population and the continuation of low density housing developments within the 16-county NCTCOG area, which includes Collin County and adjacent Denton, Dallas, Rockwall and Hunt counties will result in a lower quality of life for the regions citizens. The “business as usual” future would result in the loss of approximately 900,000 acres of agricultural land as well as substantial acreage of natural habitat and would add significantly to traffic congestion. The NCTCOG vision document recommends the adoption of several policies that would work toward a better quality of life for the region. One of the policy areas that relates directly to Lavon Lake is focused on natural areas and includes the following statement:

*“The purpose of this policy area is to preserve and protect open spaces, public parks, greenways, lake shores, significant views, stands of trees, and floodplains. The development that occurs near these natural features*

*is planned with these important environmental features in mind. Retaining and managing the natural assets that are at the heart of these areas is the goal.”*

The Collin County Parks and Open Space Strategic Plan stresses the importance of parks and open space and the need for more land dedicated to these purposes going into the future. The following is a quote from the Strategic Plan that relates directly to Lavon Lake:

*“...the parks and open space system should reflect sustainable financial, cultural, and environmental objectives that promote the conservation of natural and human resources for current and future citizens”*

Lavon Lake already plays a pivotal role in availability of parks and open space in Collin County. Protecting the public open space values afforded by the lake is strongly supported by public comment and is set forth as a key objective in Chapter 3 of this Plan.

#### 2.2.7 Mineral and Timber Resources

The Texas Railroad Commission database shows very little mineral extraction activity in Collin County and virtually no activity in the immediate area of Lavon Lake. A few dry holes are shown several miles north and east of the lake. This is in sharp contrast to the significant oil and gas drilling and production activity approximately 25 miles west of Lavon Lake in the natural gas rich Barnett Shale area of Denton County. Most of the minerals underlying Federal land at Lavon Lake are privately owned with the exception of the immediate area underlying the Lavon Lake Dam and a few other isolated tracts. In general terms, during the land acquisition process for the Lavon Lake project, the mineral estate underlying the dam was purchased by the Federal government as a precautionary measure to protect the integrity of the dam structure. Should oil and gas exploration ever occur within this Federally-owned mineral estate, the leasing of the minerals would be administered by the Bureau of Land Management, U.S. Department of the Interior. Any leasing of the minerals would be subject to stipulations imposed by USACE.

Currently, with few exceptions, the stipulations used in the USACE, Fort Worth District, do not allow surface occupancy of Federal lands for the extraction of Federally-owned minerals. Exploration and extraction of privately owned minerals may, in some cases, be allowed to occur on Federal lands at Lavon Lake in so far as the integrity of the dam and related facilities are not at risk and every precaution is taken to reduce the risk of pollution and other environmental damage to the lands and waters of the lake.

The bottomland forests of the main tributaries of Lavon Lake have high value as wildlife habitat but do not have significant value as commercial timber. This is due in part to the location being approximately 100 miles west of any appreciable timber

resources that support a viable forest products industry, and secondarily to the lack of tree species and sizes having commercial timber value.

### 2.2.8 Sedimentation and Shoreline Erosion

During the planning of the original Lavon Dam the Department of Agriculture estimated that the annual rate of sediment deposition in the lake would be 1.23 acre-feet per square mile of drainage area. At this rate, the average annual deposition would be 956 acre-feet. Based on this estimate a total of 47,800 acre-feet of storage space was provided in Lavon Lake to accommodate sediment deposition for a period of 50 years.

In November 1959, six years after the dam was completed, a sediment survey was completed revealing a deposition rate of 1.92 acre-feet per square mile of drainage area and an average annual deposition rate of about 1,415 acre-feet. In October 1965, a second sediment survey was completed at Lavon Lake. This survey revealed an even greater sediment deposition rate of 2.03 acre-feet per square mile of drainage area and an average annual deposition rate of about 1,496 acre-feet.

The 1959 and 1965 sediment surveys were conducted when the top of conservation pool was at elevation 472.0 feet NGVD and the top of flood control was at elevation 490.0 feet NGVD. The results of both surveys show that the rate of sedimentation is higher than initially estimated. The high rate of sedimentation may be due in part to the amount of clay in the watershed and the relatively high percentage of land in the watershed that is in agricultural production. The NRCS water retention structures in the watershed undoubtedly retained some sediment over the years but the tendency of colloidal suspended clay to stay in suspension for extended periods of time has probably contributed to the higher than anticipated accumulation of sediment in Lavon Lake.

In May 1970, the top of conservation pool at Lavon Dam was raised from elevation 472.0 feet to 492.0 feet NGVD. The estimated 100-year sediment load was increased to 92,600 acre-feet below elevation 492.0 feet NGVD. In July of 2011 the TWDB conducted a volumetric and sedimentation survey of Lake Lavon. Data gathered during this survey indicate that from the 1970 plan to the 2011 survey, the conservation storage capacity (492.0 feet NGVD) shrank from 456,500 acre feet to 409,360 acre feet, or a net storage capacity loss of 47,140 acre feet due to sedimentation.

Shoreline erosion at Lavon Lake can be severe during times of high pool elevations. During the record flood pool elevations of 1990-91 and 2015, significant shoreline erosion occurred in many of the designated recreation areas. Damage to park facilities and roads required extensive repair. Shorelines exposed to significant wind and wave action required protection in the form of riprap and other treatments.

### 2.2.9 Water Quality

The USACE, U.S. Geological Survey (USGS), and NTMWD conduct water quality testing at Lavon Lake. The most routine testing is conducted by the NTMWD which takes monthly samples at approximately 17 locations. Table 2.3 provides the 17 sample locations and notes those sites where fecal coliform (F) and taste and odor (T&O) are analyzed. Table 2.4 provides the chemical and biological parameters of the testing. Table 2.5 provides an April 2012 water analysis report for raw and treated water withdrawn from Lavon Lake by NTMWD. The April 2012 time period was selected because the lake elevation was close to the conservation pool elevation during that period.

**Table 2.3** Water Quality Sample Locations - NTMWD for Taste, Odor, and Fecal Coliform

Site No. & Location	Finding	Site No. & Location	Finding
1 – Highway 380		2 – Elm Creek Park	T&O
6 – Pilot Grove Arm	T&O	7 – Raw Water #1	T&O
8 - Raw Water #2	T&O	9 – Brockdale Park	F, T&O
10 – Highway 3286/546	F, T&O	11 – Wilson Creek Cove	F
12 – East Fork	F	13 – West Arm #1	F
14 – West Arm #2	F	15 – East Arm #1	-
16 – East Arm #2	-	17 – Raw Water #3	F, T&O
(T&O) – Taste and Odor ; (F) Fecal Coliform			

**Table 2.4** Chemical and Biological Parameters Sampled by NTMWD

Dissolved Oxygen (DO)	Total Dissolved Solids (TDS)
Water temperature	Cholorphyll-A
Conductivity	Chlorides
Secchi (Turbidity)	Ortho-Phosphate (OPO4)
pH	Total Phosphorus
Total Kjeldhal Nitrogen	Total Suspended Solids (TSS)
Ammonia (NH3)	Volatile Suspended Solids (VSS)
Nitrite (NO2)	Total Organic Carbon (TOC)
Nitrate (NO3)	Phyto count
Sulfate (SO4)	

In summary, water quality at Lavon Lake can be characterized as generally good. Water quality is not static and can change over time as a result of changes in the landscape and human activity within the watershed. Lavon Lake, with a drainage area of approximately 770 square miles, receives significant runoff from agricultural row crop production and suburban land. Water testing over the years has indicated elevated

levels of nitrate at times which may result in algal blooms in the lake. Common sources of nitrate loading include runoff of applied fertilizer from agricultural fields. Having a well vegetated buffer along the shoreline of the lake can have a positive impact on nutrient loading by absorbing nutrients before they reach the water body. However, the primary source of nutrient loading is from activities taking place throughout the watershed in areas remote from USACE managed lands. Any attempt to reduce nutrient loading from the watershed would require the cooperation of many governmental entities and private landowners.

As with many reservoirs in Texas, warm summer temperatures can cause lake stratification resulting in very low levels of dissolved oxygen in deeper areas of the lake. This causes displacement of fish and other aquatic organisms to less deep parts of the lake where dissolved oxygen levels remain at sufficient levels.



**Table 2.5** Water Quality Analysis – Raw and Treated Water Withdrawn from Lavon Lake

North Texas Municipal Water District  
Water Analysis  
Apr-2012

Mineral Analysis	Raw (mg/L)	Treated (mg/L)	Standards			
			EPA Primary (mg/L)	EPA Secondary (mg/L)	TCEQ Primary (mg/L)	TCEQ Secondary (mg/L)
Residue on Evaporation	232	258		500		1000
Silica (SiO <sub>2</sub> )	3.11	2.90				
Iron (Fe)	0.685	<0.200		0.3		0.3
Calcium (Ca)	52.1	53.8				
Magnesium (Mg)	3.69	3.51				
Sodium (Na)	22.4	32.6				
Potassium (K)	5.23	5.16				
Bicarbonates (HCO <sub>3</sub> )	117	105				
Carbonates (CO <sub>3</sub> )	0	0				
Hydroxides (OH)	0	0				
Sulfate (SO <sub>4</sub> )	38.6	69.0		250		
Nitrite (NO <sub>2</sub> )	0.0509	<0.0200	1		1	
Nitrate (NO <sub>3</sub> )	0.999	1.06	10		10	
Chloride (Cl)	20.1	28.4		250		300
Fluoride (F)	0.284	0.608	4.0	2.0		2.0
Phosphates (PO <sub>4</sub> )	0.0720	0.0110				

	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )
Total Alkalinity	117	105				
Phenolphthalein Alkalinity	0	0				
Noncarbonate Hardness	19.3	43.3				
Total Hardness	136	148				
Langelier Index	-	[+ 0.150]				

**Trace Element Analysis**

	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Arsenic (As)	<0.00500	<0.00500	0.01		0.01	
Barium (Ba)	0.0528	0.0432	2		2	
Cadmium (Cd)	<0.00100	<0.00100	0.005		0.005	
Chromium (Cr)	<0.00500	<0.00500	0.1		0.1	
Copper (Cu)	0.0267	0.186	1.3		1.3	1.0
Iron (Fe)	0.685	<0.200		0.3		
Lead (Pb)	<0.00100	<0.00100	0.15		0.15	
Manganese (Mn)	0.0232	<0.00100		0.05		0.05
Mercury (Hg)	<0.000100	<0.000100	0.002		0.002	
Nickel (Ni)	0.00399	0.00547				
Selenium (Se)	0.00106	<0.00100	0.05		0.05	
Silver (Ag)	<0.00100	<0.00100		0.10		0.1
Zinc (Zn)	0.00651	<0.00500		5		5

**Other Analysis**

Chlorine Residual (mg/L)	-	3.23*	4.0		4.0	
Total coliform ( Present / Absent )	-	A	A		A	
pH (Standard Units) @ 25°C	8.07*	7.75*		6.5 - 8.5		>7.0
Specific Conductance (Umhos)	369	443				
Turbidity (NTU)	15.0	0.0999*	0.3		0.3	
Threshold Odor Number	EARTHY	ND				3

### 2.2.10 Air Quality

In 2012, the US Environmental Protection Agency (EPA) designated ten counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant and Wise Counties) in North Central Texas as nonattainment for the pollutant ozone in accordance with the 1997 eight-hour ozone National Ambient Air Quality Standards (NAAQS). These standards are designed to protect human and environmental health, and ground-level ozone is monitored and targeted for reductions due to its potentially harmful effects. Four main sources of ozone-causing emissions include on-road mobile sources like cars and trucks, Non-road mobile sources like construction equipment, point sources like electric generating utilities and industrial boilers, and area sources like solvent use and agriculture.

Development of an air quality plan, known as the State Implementation Plan (SIP), is required for all nonattainment areas in order to demonstrate how ozone will be reduced to levels compliant with the NAAQS. The SIP for the Dallas-Fort Worth nonattainment area includes programs to get older cars off the road, technologies to clean up vehicles already on the road, and education programs so that citizens can do their part in improving air quality in North Texas. For more information about what individuals and businesses can do to clean the air, visit <http://airnorthtexas.org>.

In conducting routine operations and maintenance activities at Lavon Lake, USACE will comply with all federal, state and local laws governing air quality and will implement best management practices to protect air quality. Prescribed fire is a useful land management tool for improving native prairie and certain forested areas and will be conducted in accordance with the Texas Administrative Code, Section 111.211(1). Statutory requirements governing prescribed fire and other types of outdoor burning are explained in the Texas Commission on Environmental Quality (TCEQ) publication "Outdoor Burning in Texas" available on the TCEQ website. USACE guidance for wildland fire management is set forth in Engineer Pamphlet, EP 1130-2-540.

## **2.3 SOCIAL AND CULTURAL RESOURCES AND ANALYSIS**

### 2.3.1 Prehistoric

The earliest well-documented evidence of human occupation in North Central Texas dates to about 12,000 years before present (B.P.). Prehistory is divided generally into three broad time periods: Paleo-Indian (12,000-8,500 B.P.), Archaic (8,500-1,250 B.P.), and Late Prehistoric (1,250-300 B.P.).

Evidence for Paleo-Indian period occupation is relatively rare in the Lavon Lake area, and is known primarily from distinctive projectile point styles dating to this time period found in surface collections or in mixed multi-component sites. It is likely that intact Paleo-Indian camp sites may be buried deeply beneath Holocene floodplain alluvium, as was the case with the Aubrey Clovis site on the Elm Fork Trinity River. Evidence suggests that the region was occupied by small groups of highly mobile

hunter-gatherers that traveled over very large territories. Traditionally thought of as big-game hunters of mammoth and bison, more recent evidence indicates Paleo-Indians exploited a much broader range of animal and plant resources.

The Archaic period is divided into Early (8,500-6,000 B.P.), Middle (6,000-3,500 B.P.), and Late (3,500-1,250 B.P.) sub periods. During this long time period, a generalized hunting and gathering subsistence strategy is indicated. Trends through time suggest increasing population density and decreasing group mobility within smaller territories. Sites with Late Archaic components are well represented in the Lavon Lake area and in North Central Texas generally. The large circular depressions known as “Wylie pit features” were first identified at Lavon Lake and had long been attributed to the subsequent Late Prehistoric period. However, more recent investigations of two such features elsewhere in the Trinity River drainage showed that their original construction dated to the Late Archaic. A similar Late Archaic age is assumed for the initial construction of these features at Lavon Lake.

The Late Prehistoric Period (1,250-300 B.P.) is marked by the presence of the bow and arrow and pottery. During the early portion of this time span, subsistence strategies remained similar to those of the preceding Late Archaic. By around 800 B.P., there is limited evidence for maize horticulture and more sedentary occupations in some North Central Texas sites. After around 600 B.P., there is widespread evidence for an increase in bison hunting. Pottery from Lavon Lake sites includes plain and decorated grog-tempered specimens in the Caddo ceramic tradition. It is unclear whether this pottery was made locally or represents trade with East Texas Caddo groups. Plain, shell-tempered pottery is also found at Lavon Lake sites and is thought to show connections with southern plains groups to the north and west. This shell-tempered pottery is generally thought to date to the late portion of the Late Prehistoric period (after ca. 600 B.P.) when bison hunting became more important.

### 2.3.2 Historic

Local tradition holds that Native Americans of the Caddo Nation inhabited the Lavon Lake area prior to the arrival of the first white settlers in the early 1840s. The majority of these early settlers were farmers operating small family farms growing mainly wheat and corn. When Collin County was created out of Fannin County in 1846, the estimated population was only 150. The population grew slowly between the 1840s and 1870s. The arrival of the railroads in the early 1870s allowed farmers access to markets and led to a major increase in the number of farms. Cotton farming became an important agricultural activity in the Blackland Prairie region and tenant farming was a major social institution. No historic period resources were recorded by the surveys conducted prior to the initial construction or the subsequent pool raise of Lavon Lake. Most of the historic resources at Lavon Lake are expected to be the archeological remains of house sites and farmsteads dating from the late 19<sup>th</sup> century through the mid-20<sup>th</sup> century.

### 2.3.3 Previous Investigations at Lavon Lake

The initial archeological investigations at Lavon Lake were conducted between 1948 and 1950 by the River Basin Surveys. During that period, 25 sites were recorded, two sites were tested, and one site (the Hogge Bridge Site) was excavated extensively. Plans to enlarge the lake led to another survey in 1964 by the Texas Archeological Salvage Project, during which 12 new sites were recorded and 17 known sites were revisited. In 1969, four sites affected by the lake's enlargement were tested, one of which (the Sister Grove Creek Site) was excavated in 1974 by Southern Methodist University. Limited survey work since then has added to the number of known archeological sites.

### 2.3.4 Recorded Cultural Resources

Currently, 47 archeological sites have been recorded at Lavon Lake. One of these sites (Sister Grove Creek) is listed on the National Register of Historic Places (NRHP). The remaining 46 sites have not yet been evaluated for NRHP eligibility. Only about 300 acres of Lavon Lake property have been inventoried to current survey standards. The surveys of the 1970s and earlier were not systematic and are not considered adequate by current standards.

### 2.3.5 Long-term Objectives for Cultural Resources

As funding allows, a Cultural Resources Management Plan (CRMP) shall be developed and incorporated into the OMP in accordance with EP 1130-2-540. The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Lavon Lake. Completion of a full inventory of cultural resources at Lavon Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA). All currently known and newly recorded sites must be evaluated to determine their eligibility for the NRHP. In accordance with Section 106 of the NHPA, any proposed ground-disturbing activities or projects, such as those described in this master plan or as may be proposed in the future by others for right-of-way easements, will require cultural resource surveys to locate and evaluate historic and prehistoric resources. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated. All future cultural resource investigations at Lavon Lake must be coordinated with the State Historic Preservation Officer and federally-recognized Tribes to insure compliance with the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.

### 2.3.6 Current Demographic and Economic Trends and Analysis

The primary zone of interest for the socio-economic analysis of Lavon Lake consists of Collin, Dallas, Denton, Fannin, Grayson, Hunt, and Rockwall Counties in Texas. The reservoir lies completely within Collin County, which is a suburban city located north of Dallas, and at the far northeastern corner of the Dallas-Fort Worth metropolitan area. The remaining counties in the zone of interest are those that are adjacent to Collin County.

### 2.3.7 Population

The total population for the zone of interest in 2014 was 4,490,830, as shown in Table 2.6. Of those 4.5 million people residing in the zone of interest, the majority (approximately 56%) of the population resides in Dallas County. Collin County is the second most populated county in the zone of interest with approximately 20% of the zone of interest's population, followed by Denton County with 17%. Fannin, Grayson, Hunt, and Rockwall Counties comprise less than 3% each of the zone of interest's population.

The population in the zone of interest makes up approximately 17% of the total population of Texas. From 2014 to 2040, the population in the zone of interest is expected to increase to approximately 6.3 million from 4.5 million, an annual growth rate of 1.3% per year. By comparison, the population of Texas is projected to increase at an annual rate of 1.2% per year, and the national growth rate is expected to be 0.7% per year between 2014 and 2040. During this timeframe, Collin County and Rockwall Counties are the only two in the zone of interest with a projected annual growth rate higher than the state of Texas, with a projected growth rate of 2% each.

**Table 2.6** 2000 and 2014 Population Estimates and 2040 Projections

<b>Geographical Area</b>	<b>2000 Population Estimate</b>	<b>2014 Population Estimate</b>	<b>2040 Population Projection</b>
Texas	20,851,820	26,956,958	36,550,595
Collin County	491,675	885,241	1,496,177
Dallas County	2,218,899	2,518,638	3,086,679
Denton County	432,976	753,363	1,242,750
Fannin County	31,242	33,752	39,458
Grayson County	110,595	123,534	142,177
Hunt County	76,596	88,493	119,853
Rockwall County	43,080	87,809	146,334
<b>Zone of Interest Total</b>	<b>3,405,063</b>	<b>4,490,830</b>	<b>6,273,428</b>

Source: U.S. Bureau of the Census, American Fact Finder (2000, 2014 Estimate); Texas State Data Center, The University of Texas at San Antonio (2040 Projections)

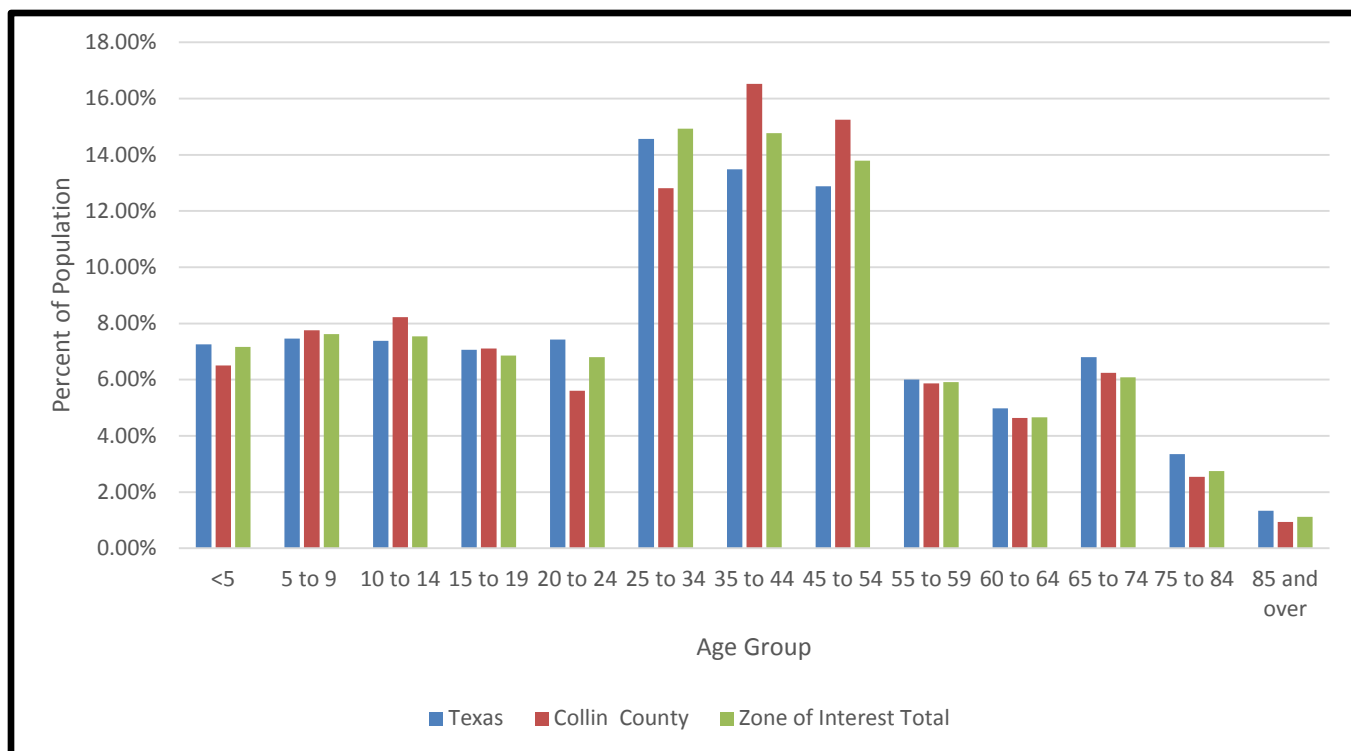
The distribution of the population among gender, as shown in Table 2.7 is approximately 49.2% male and 50.8% female in the zone of interest, which is very similar to the overall gender distribution in Texas. The female population is slightly higher than the male population in all counties in the zone of interest with the exception of Fannin County, which is 53.0% male and 47.0% female.

**Table 2.7** 2014 Percent of Population Estimate by Gender

Geographical Area	Male	Female
Texas	13,382,386	13,574,572
Collin County	434,591	450,650
Dallas County	1,241,277	1,277,361
Denton County	370,582	382,781
Fannin County	17,889	15,863
Grayson County	60,296	63,238
Hunt County	43,718	44,775
Rockwall County	43,019	44,790
Zone of Interest Total	2,211,372	2,279,458

Source: U.S. Bureau of the Census, Population  
Division (2014 Estimate)

Figure 2.3 and Table 2.8 show the population by age group. As shown in the figure, the distribution by age group is similar among the counties, zone of interest, and the state overall in terms of percentage of the population. The largest age groups in the zone of interest are the 25 to 34 group and the 35 to 44 group, with each making up approximately 15% of the zone of interest population. Collin County, in which the lake lies, has a slightly larger population of residents ages 35 to 54 than both the zone of interest and the state of Texas, and a slighter smaller population of individuals ages 20 to 34.



**Figure 2.3** 2014 Percent of Population by Age Group

**Table 2.8** 2014 Population Estimate by Age Group

Age Group	Geographic Area								
	Texas	Collin County	Dallas County	Denton County	Fannin County	Grayson County	Hunt County	Rockwall County	Zone of Interest Total
<5	1,956,213	57,527	194,213	49,834	1,782	7,593	5,444	5,391	321,784
5 to 9	2,010,846	68,612	194,473	56,158	1,979	8,422	5,845	6,761	342,250
10 to 14	1,990,571	72,840	183,886	57,724	2,086	8,327	6,110	7,673	338,646
15 to 19	1,905,104	62,899	168,704	53,240	1,941	8,211	6,317	6,842	308,154
20 to 24	2,000,562	49,630	182,493	52,175	2,227	7,948	6,197	4,599	305,269
25 to 34	3,925,657	113,402	404,529	113,334	4,048	14,570	10,695	9,802	670,380
35 to 44	3,634,885	146,292	356,239	118,833	4,131	14,186	10,409	13,240	663,330
45 to 54	3,471,743	135,009	327,975	109,529	4,711	16,725	12,430	13,102	619,481
55 to 59	1,619,276	51,894	146,496	43,666	2,362	9,002	6,220	5,619	265,259
60 to 64	1,343,020	41,090	115,790	33,164	2,138	7,580	5,237	4,405	209,404
65 to 74	1,833,501	55,264	144,639	43,208	3,696	12,102	8,071	6,332	273,312
75 to 84	904,078	22,523	69,013	16,324	1,941	6,422	4,109	2,851	123,183
85+	361,502	8,259	30,188	6,174	710	2,446	1,409	1,192	50,378

Source: U.S. Bureau of the Census, American Fact Finder (2014 Estimate)

Population by race and Hispanic origin is displayed in Table 2.9 The zone of interest population is 45% White, 16% Black, 29% Hispanic, 7% Asian, and 2% two or more races. The other race categories account for less than 2% each of the population. By

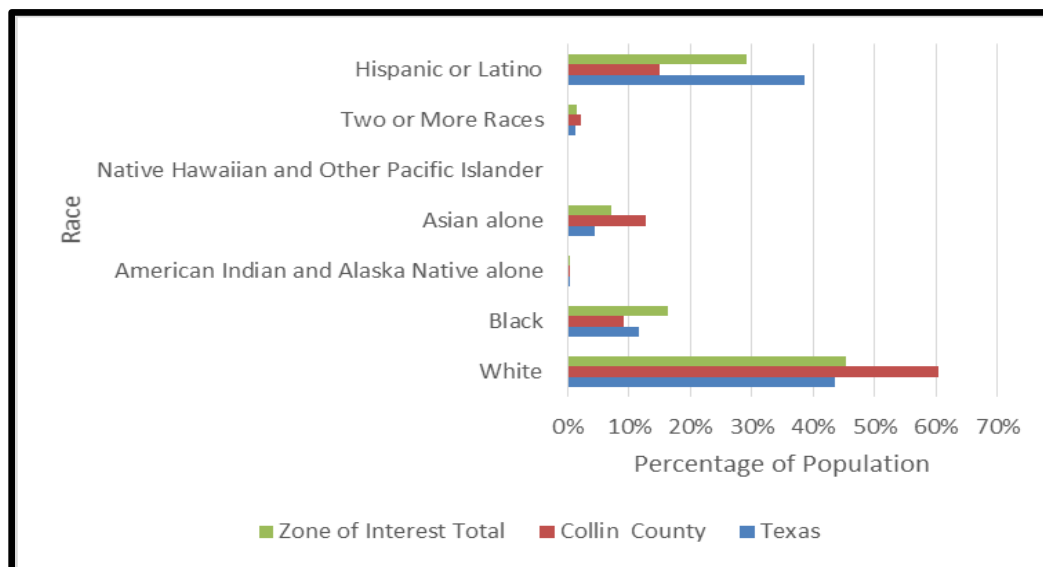


comparison, the Hispanic population in Texas is nearly 10% higher than the zone of interest at 38%. When comparing Collin County to the zone of interest, the White population is 15% higher, the Black population is 7% lower, the Asian population is 6% higher, and the Hispanic population is 14% lower. These contrasts can be observed in

**Table 2.9** 2014 Population Estimate by Race/Hispanic Origin

Area	White	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Two or More Races	Hispanic
Texas	11,735,074	3,161,811	88,539	1,177,410	21,807	360,977	10,411,340
Collin County	534,565	81,151	3,668	112,930	554	18,735	133,638
Dallas County	782,674	560,538	7,406	145,333	1,045	32,166	989,476
Denton County	465,191	68,643	3,466	57,091	557	15,053	143,362
Fannin County	26,811	2,266	311	173	8	634	3,549
Grayson County	94,847	7,289	1,732	1,350	53	2,705	15,558
Hunt County	64,955	7,085	573	1,187	116	1,360	13,217
Rockwall County	63,710	5,049	389	2,355	61	1,353	14,892
<b>Zone of Interest Total</b>	<b>2,032,753</b>	<b>732,021</b>	<b>17,545</b>	<b>320,419</b>	<b>2,394</b>	<b>72,006</b>	<b>1,313,692</b>

Source: U.S. Bureau of the Census, Population Division (2014 Estimate)

**Figure 2.4** Population Estimate by Race/Hispanic Origin

### 2.3.8 Education and Employment

Table 2.10 displays the highest level of education attained by the population ages 25 and over in both Texas and the zone of interest. In the zone of interest, 8% of the population has less than a 9<sup>th</sup> grade education; 8% has between a 9<sup>th</sup> and 12<sup>th</sup> grade education; 22% has a high school diploma or equivalent; 21% has some college and no degree; 6% has an Associate's degree; 23% has a Bachelor's degree; and 12% has a graduate or professional degree. These percentages are similar to those for the state of Texas, though the zone of interest has a slightly larger population that has received a higher level education (i.e., Bachelor's, graduate, or professional degree). In Texas, 9% of the population has less than a 9<sup>th</sup> grade education; another 9% has between a 9<sup>th</sup> and 12<sup>th</sup> grade education; 25% has at least a high school diploma or equivalent; 23% has some college; 6% has an Associate's degree; 18% has a Bachelor's degree; and 9% has a graduate or professional degree. Collin County has the largest population of persons ages 25 and over that has received at least Bachelor's degree at 32%.

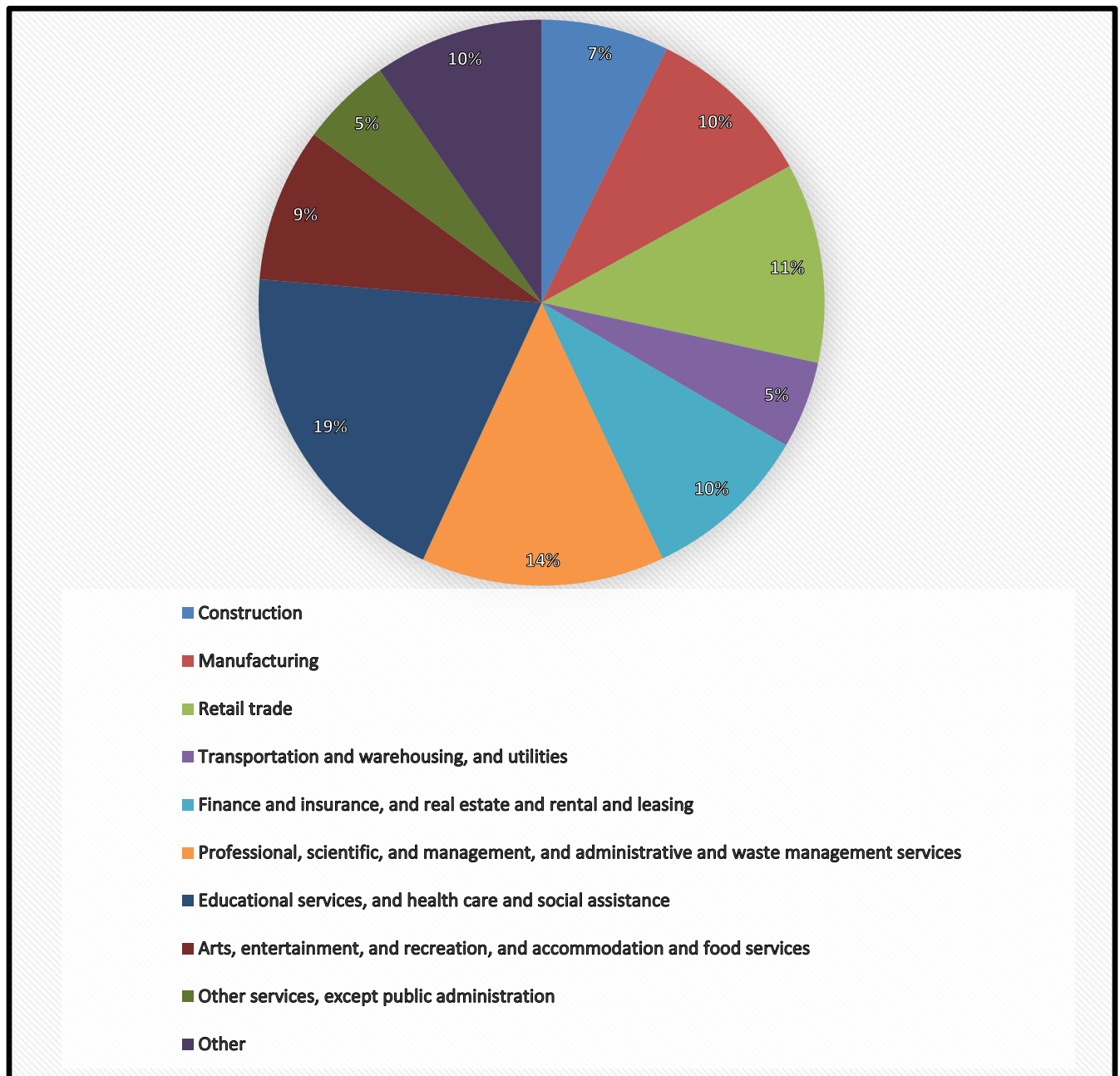
**Table 2.10** 2014 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older

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
Texas	16,426,730	1,519,482	1,505,854	4,145,289	3,726,610	1,079,891	2,948,330	1,501,274
Collin County	539,347	17,434	17,977	84,066	112,979	40,314	173,951	92,626
Dallas County	1,541,324	175,753	168,456	357,261	311,877	85,131	285,669	157,177
Denton County	448,049	16,588	19,475	85,093	108,036	35,347	126,892	56,618
Fannin County	23,574	1,510	2,761	8,179	5,897	1,551	2,416	1,260
Grayson County	81,569	3,879	6,965	25,524	22,025	6,717	10,821	5,638
Hunt County	57,178	3,364	6,358	19,714	14,064	3,708	6,498	3,472
Rockwall County	53,527	1,985	2,457	11,703	13,579	4,142	13,514	6,147
<b>Zone of Interest Total</b>	<b>2,744,568</b>	<b>220,513</b>	<b>224,449</b>	<b>591,540</b>	<b>588,457</b>	<b>176,910</b>	<b>619,761</b>	<b>322,938</b>

Source: U.S. Bureau of the Census, American Fact Finder (2014 Estimate)

Employment by sector is presented in Figure 2.5. The largest percentage in the zone of interest is employed in the Educational services, and health care and social assistance sector, at 19%, followed by 14% in the Professional, scientific, and

management, and administrative and waste management services, 11% in Retail trade, 10% in both Manufacturing and in Finance and insurance, and real estate and rental and leasing, 9% in Arts, entertainment, and recreation, and accommodation and food services, 7% in Construction, 5% in Transportation and warehousing, and utilities, and 5% in Other services, except public administration. The remainder of the employment sectors comprise less than 5% each of the zone of interest's labor force.



**Figure 2.5** Annual Average Employment by Sector

The civilian labor force in the zone of interest accounts for approximately 17.8% of the civilian labor force of the state of Texas. The 2014 unemployment rate for the zone of interest, at 7.6%, was comparable to the unemployment rate of the state of Texas, which was 7.7%, as shown in Table 2.11. The unemployment rates in Dallas, Fannin, Grayson, and Hunt Counties were higher than that of the state, while the unemployment rates in Collin, Denton, and Rockwall Counties were lower.

**Table 2.11** Labor Force, Employment and Unemployment Rates, 2014 Annual Averages

<b>Geographic Area</b>	<b>Civilian Labor Force</b>	<b>Number Employed</b>	<b>Number Unemployed</b>	<b>Unemployment Rate</b>
Texas	12,791,590	11,809,010	982,580	7.7%
Collin County	454,649	429,486	25,163	5.5%
Dallas County	1,269,810	1,161,634	108,176	8.5%
Denton County	398,807	373,978	24,829	6.2%
Fannin County	14,384	13,197	1,187	8.3%
Grayson County	58,610	53,283	5,327	9.1%
Hunt County	40,580	35,749	4,831	11.9%
Rockwall County	42,976	40,068	2,908	6.8%
<b>Zone of Interest Total</b>	<b>2,279,816</b>	<b>2,107,395</b>	<b>172,421</b>	<b>7.6%</b>

Source: U.S. Bureau of the Census, American Fact Finder (2014 Estimate)

### 2.3.9 Households, Income, and Poverty

The number of households and average household sizes as of the 2010 census are displayed in Table 2.12. There were approximately 8.9 million households in the state of Texas, with an average household size of 2.75. There are approximately 1.5 million households in the zone of interest with an average household size of 2.76 persons.

As shown in Table 2.13, the median household income varies greatly within the zone of interest. The median household incomes in Dallas, Fannin, Grayson, and Hunt Counties are slightly lower than the median household income of the state, but substantially higher than the state in Collin, Denton, and Rockwall Counties. Collin County has the second highest median household income, at \$84,233, when compared with the other counties within the zone of interest. Per capita income in the zone of interest is \$30,605, which is greater than that of Texas at \$26,513. Per capita incomes in the zone of interest range from \$20,784 in Fannin County to \$38,575 in Collin County.

**Table 2.12** 2010 Households and Household Size

Area	Total Households	Average Household Size
Texas	8,922,933	2.75
Collin County	283,759	2.74
Dallas County	855,960	2.73
Denton County	240,289	2.71
Fannin County	12,149	2.53
Grayson County	46,905	2.53
Hunt County	32,076	2.63
Rockwall County	26,448	2.94
<b>Zone of Interest Total</b>	<b>1,497,586</b>	<b>2.76</b>

Source: U.S. Bureau of the Census, American Fact Finder (2010 Estimate)

**Table 2.13** 2014 Median and Per Capita Income

Geographic Area	Median Household Income	Per Capita Income
Texas	\$52,576	\$26,513
Collin County	\$84,233	\$38,575
Dallas County	\$49,925	\$27,195
Denton County	\$74,662	\$34,528
Fannin County	\$44,432	\$20,784
Grayson County	\$47,631	\$24,614
Hunt County	\$44,898	\$22,446
Rockwall County	\$86,597	\$34,850
<b>Zone of Interest Total</b>	<b>N/A</b>	<b>\$30,605</b>

Source: U.S. Bureau of the Census, American Fact Finder (2014 Estimate)

As shown in Table 2.14, there are less persons in the zone of interest whose incomes in 2014 were below the poverty level in the last 12 months (15.0%) as compared to the state of Texas (17.7%). Hunt County and Dallas Counties have the most persons below the poverty level at 19.6% and 19.3% respectively, followed by Fannin County (17.7%), Grayson County (15.8%), Denton County (8.9%), Collin County (7.9%), and Rockwall County (6.3%). The number of families whose incomes in 2014 were below the poverty level follows basically the same pattern as the number of persons below the poverty level; however, the number of families below the poverty level is less overall than the number of persons.

**Table 2.14** Percent of Families and People Whose Income in the Past 12 Months is Below the Poverty Level (2014)

Geographic Area	All Persons	All Families
Texas	17.7%	13.7%
Collin County	7.9%	5.8%
Dallas County	19.3%	15.9%
Denton County	8.9%	5.8%
Fannin County	17.7%	13.1%
Grayson County	15.8%	11.6%
Hunt County	19.6%	14.8%
Rockwall County	6.3%	5.3%
<b>Zone of Interest Total</b>	<b>15.0%</b>	<b>N/A</b>

Source: U.S. Bureau of the Census, American Fact Finder (2014 Estimate)

## 2.4 RECREATION FACILITIES, ACTIVITIES AND NEEDS

### 2.4.1 Zones of Influence

The primary area having a significant influence on the public use and management of Lavon Lake includes all of Collin County and portions of the adjoining counties of Dallas, Denton, Grayson, Fannin, Hunt and Rockwall.

### 2.4.2 Visitation Profile

The majority of visitors to Lavon Lake come from within a 100-mile radius of the lake area. Lavon Lake visitors are a diverse group ranging from campers who utilize the campgrounds around the lake, full time and part time residents of housing developments that border the lake, hunters who utilize the lands managed for wildlife, day users who picnic in the private and federally operated parks, fisherman, recreational boaters, marina customers, pedestrian, equestrian and bicycle trail users, and many other user groups.

The peak visitation months on Lavon Lake are April through September, when 88% of visits occur. July is the highest visitation month and accounts for 18 to 20% of the annual total. Approximately 90% of visits to recreation areas occur in USACE-managed recreation areas. The remaining visitation takes place on USACE lands that have been leased to marina operators and to Collin County. Lavon Lake experiences an unknown amount of dispersed recreation visits from adjacent landowners walking on to USACE lands, hunters and fisherman parking at undesignated/unmonitored access points, and trail users parking at trailheads that are not monitored. One indication of dispersed use is the number of USACE-issued hunting permits for Lavon Lake. In the hunting seasons of 2012-2014 annual hunting permits issued by USACE ranged from 1,700 to 2,000. Permits are valid for the entire hunting season and many hunters make



several trips during the season. At the national level, USACE is currently preparing computerized visitation models/programs that will estimate the level of dispersed visitation at all USACE lakes. Table 2.15 provides the Fiscal Year 2012 report on the number of total recreation visits to each designated high density use recreation area at Lavon Lake. More recent data is unavailable as a result of a nationwide revision of the procedures for collecting and reporting visitation data.

**Table 2.15** Fiscal Year 2012 Visitation (total number of visits) for the 16 Designated Recreation Areas and Stilling Basin Access Point at Lavon Lake

<b>Recreation Area</b>	<b>Total Visits</b>
Avalon Park	30,113
Bratonia Park	8,741
Brockdale Park	29,606
Caddo Park (temp closed)	0
Clear Lake Park	38,065
Collin Park	168,149
East Fork Park	124,456
Elm Creek Park	11,239
Highland Park	21,029
Lakeland Park	13,259
Lavonia Park	50,155
Little Ridge Park	15,971
Mallard Park	52,511
Pebble Beach Park	9,937
Stilling Basin Access	102,641
Ticky Creek Park	27,788
Twin Groves Park	5,986
<b>Total Visits</b>	<b>709,646</b>

#### 2.4.3 Recreation Analysis

Recreational use at Lavon Lake continues to evolve, but day use activities including primarily swimming, picnicking, fishing, and boating, as well as overnight camping, are the principal activities pursued by most visitors. As of the date of this Plan, the most recent summer where the lake elevation was close to the normal or conservation pool elevation was 2012. Using 2012 data generated by the National Recreation Reservation Service (NRRS), there were 11,346 camping permits issued at Lavon Lake that year. For the three campgrounds participating in the NRRS (Clear Lake Park, East Fork Park, and Lavonia Park), the campers making those reservations originated from nearby counties as shown in Table 2.16. For Lavonia and East Fork Parks, campers are originating primarily from cities to the south and west including Wylie, Plano, Richardson, McKinney, Garland and Dallas (not in order). For Clear Lake Park campers originate

primarily from Princeton and McKinney. No data is available that would show where day use visitation is coming from but USACE believes it is safe to assume that, like campers, more than 90% of day users at Lavon Lake are originating from the cities listed above.

**Table 2.16** County of Origin for Registered Campers in 2012 (Percent of total registered campers within each listed park)

	Collin County	Dallas County	Rockwall County
Clear Lake Park	71%	20%	2%
East Fork Park	47%	35%	9%
Lavonia Park	49%	26%	10%

While visitation in designated recreation areas remains strong, there is an unknown, but considerably high level of recreation use originating from the many subdivisions that share a common boundary with USACE lands. Adjacent landowners are allowed pedestrian access to the shoreline throughout most of the lake area with the exception of developed parks and prohibited access areas, such as near the dam or water intake structures. This easy access to the shoreline results in dispersed recreation use, such as bank fishing, hiking and nature study.

The Texas Outdoor Recreation Plan – 2012 (TORP), published by the TPWD, was referred to extensively in the preparation of the Plan. The TORP was developed using results from web surveys to garner public input on the outdoor recreational needs of Texans. The surveys resulted in more than 4,000 public comments. Additionally, TPWD utilized the results from a Hispanic Focus Group for State Parks as well as survey results from the 2009 National Survey on Recreation and the Environment (NSRE) conducted by the U.S. Forest Service (USFS). The TORP, coupled with the results of public meetings and recreation area surveys conducted by USACE, were especially useful in identifying outdoor recreation trends and in setting management objectives for the recreation management program at Lavon Lake. The TORP clearly shows that Lavon Lake is the largest and most important outdoor recreation venue in Collin County, Texas. Table 2.17, taken from the TORP, shows the number of conservation- recreation acres available in the ten most populated counties in Texas. Of the 27,309 acres shown for Collin County, approximately 16,000 of those acres are USACE lands at Lavon Lake that lie above the normal pool of the lake.

**Table 2.17** Available Public Outdoor Recreation Acres Per Capita for the Ten Most Populated Counties in Texas.

<b>Ten Most Populace Counties by Recreation-Conservation Acres Per Capita</b>					
<b>County Name</b>	<b>County Acres</b>	<b>County Populatio</b>	<b>Recreation-Conservation Acres</b>	<b>Per Capita Acres</b>	<b>2010 Population Rank</b>
Harris	1,133,239	4,092,45	66,646	0.02	1
Dallas	578,268	2,368,13	33,420	0.01	2
Tarrant	573,242	1,809,03	28,008	0.02	3
Bexar	801,952	1,714,77	27,960	0.02	4
Travis	653,260	1,024,26	66,083	0.06	5
El Paso	646,607	800,647	30,585	0.04	6
Collin	565,441	782,341	27,309	0.03	7
Hidalgo	1,015,707	774,769	32,136	0.04	8
Denton	611,467	662,614	39,156	0.06	9
Fort Bend	564,888	585,375	14,102	0.02	10

Source: 2012 Texas Outdoor Recreation Plan

While traditional camping, picnicking and power boating at Lavon Lake continue to be very popular, the TORP reveals that Texas residents have a strong desire for a broad array of passive use recreation activities that have potential for expansion on federal lands at Lavon Lake. Public comment received on the preparation of this Plan indicates a strong interest in equestrian, biking, and hiking trails. Information from the TORP provided in Table 2.18 verifies that hiking and biking trails are in the top five recreation facilities that Texas citizens stated they need now in local parks. Although equestrian trails are not in the top five facilities, the interest in equestrian trails at Lavon Lake is high and has been growing since 1989 when construction was initiated on the 25.5-mile Trinity Trail. A copy of the TORP is available on the TPWD website at <http://tpwd.texas.gov>.

**Table 2.18** Top Five Recreation Facilities Needed by Texas Citizens – TORP 2012

<b>Top 5 Facilities Needed Now In Local Parks by Texas Citizens</b>	
Unpaved trails for walking and hiking	43.6%
Natural park area/open space	31.8%
Mountain bike trails	31.4%
Paved trails for walking, hiking, biking, skating	30.1%
Wildlife/nature observation sites	27.8%

Outdoor recreation at Lavon Lake generally falls within two broad categories of land or water-based recreation. Management objectives for each type vary depending on the location and the intensity of use. Recreation management objectives are provided in this Plan which project future direction and actions necessary to meet the public's needs for land and/or water based recreation.

Land-based recreation opportunities, activities, areas and facilities that typically occur on, or adjacent to, USACE land and water include, but are not limited to, camping, hiking, swimming, hunting, fishing, horseback riding, picnicking, geocaching, wildlife/bird viewing, and sightseeing. Land-based recreation areas include campgrounds, day-use areas, overlooks, trails and wildlife management areas. Facility types typically found within these recreation areas include campsites, picnic sites, restrooms, shower facilities, boat ramps and courtesy docks. These recreation areas are managed by several entities including USACE, county government, and private/commercial concessionaires. Refer to Table 2.19 for a listing of designated recreation areas located on USACE lands at Lavon Lake.

**Table 2.19** Designated High Density Recreation Areas at Lavon Lake

Park Name	Acres Above Normal Pool	Type of Use	Boat Ramp	Operator	Number of Campsites Or Picnic Sites
Avalon	60	Day Use	Yes-4 Lane	USACE	56 Picnic Sites
Bratonia	138	Day Use	Yes-2 Lane	USACE & Lessee	NA
Brockdale	114	Day Use	Yes-4 Lane	USACE & Lessee	NA
Caddo	515	Day Use	Yes-4 Lane	USACE	13 Picnic Sites
Clear Lake	88	Camping	Yes-8 Lane	USACE	23 Camp Sites; 18 Picnic Sites
Collin	160	Camping	Yes	Lessee	61 Camp Sites
East Fork	102	Camping and Day Use	Yes- 8 Lane	USACE & Lessee	62 Camp Sites; 27 Picnic Sites
Elm Creek	189	Day Use	Yes- 2 Lane	USACE	NA
Highland	131	Day Use	Yes- 4 Lane	USACE	NA
Lakeland	105	Camping	Yes- 4 Lane	USACE	32 Camp Sites (Tent)
Lavonia	126	Camping and Day Use	Yes- 8 Lane	USACE	53 Camp Sites; 51 Picnic Sites
Little Ridge	45	Day Use	Yes- 4 Lane	USACE	28 Picnic Sites
Mallard	81	Day Use	Yes- 4 Lane	USACE	10 Picnic Sites
Pebble Beach	35	Day Use	Yes- 4 Lane	USACE	21 Picnic Sites
Ticky Creek	38	Day Use	Yes- 4 Lane	USACE	16 Picnic Sites
Twin Groves	115	Day Use	Yes- 4 Lane	USACE	NA

In accordance with the NSRE, some of the popular recreation activities at Lavon Lake are, on a national basis, either static or declining in participation. For example, camping activity, power boating, hunting and fishing have experienced small to moderate declines in recent years. In contrast to these declines, significant increases in hiking, walking, sightseeing, wildlife viewing and canoeing/kayaking have occurred in recent years. The USACE *Visitation Estimation and Reporting System* (VERS) is currently being updated and until the update is complete, data that could be compared to the trend information reported in the TORP will not be available. Refer to Table 2.20 and Table 2.21 for the percent of U.S. population participating in several recreation activities that are common at Lavon Lake.

**Table 2.20** Percent of Population Participating in Recreational Boating in the U.S.

<b>Percent of Population Participating in Recreational Boating in the U.S.</b>				
	<b>1982-1983</b>	<b>1994-1995</b>	<b>1999-2001</b>	<b>2005-2009</b>
Boating	28.0%	37.8%	36.3%	35.6%
Canoeing/Kayaking	8.0%	9.5%	11.5%	12.4%

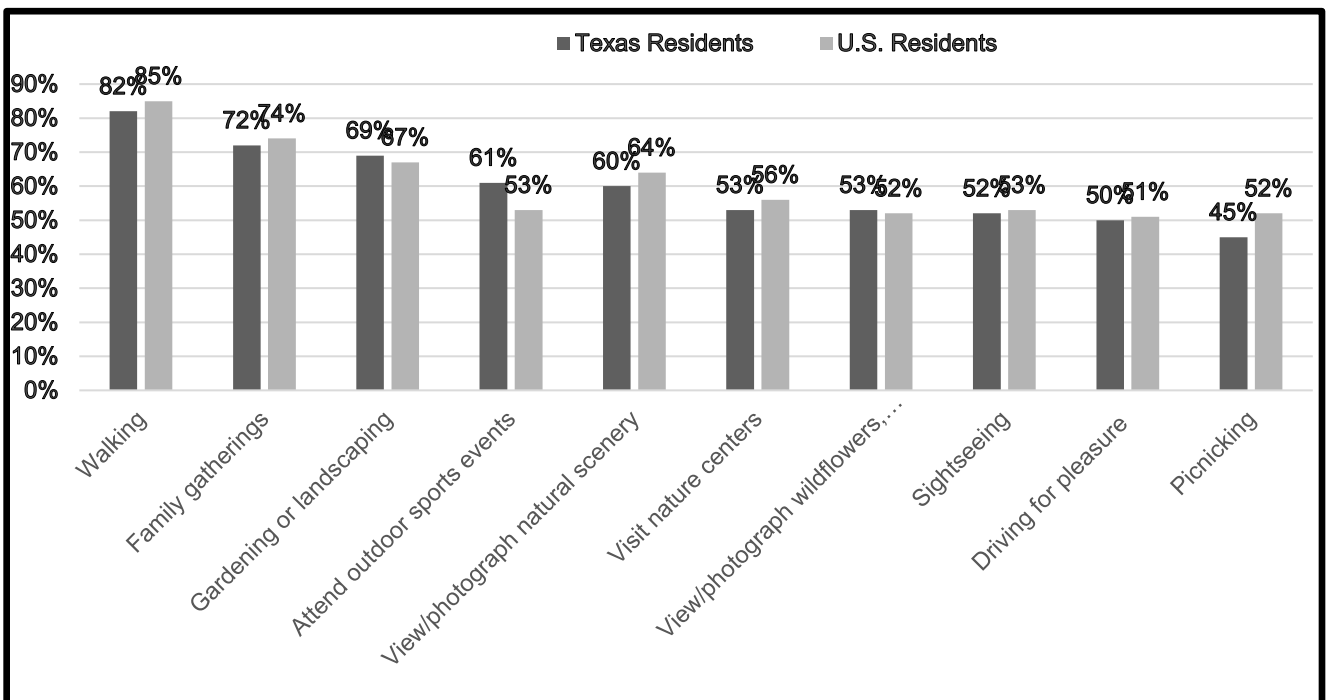
Source: (Cordell & Green, National Survey on Recreation and the Environment, Texas Reports 1994-95, 2000-01 and 2006-09, 2009; TORP - 2012

**Table 2.21** Participation in Hunting, Fishing, and Wildlife Watching in Texas.

<b>Participation in Hunting, Fishing and Wildlife Watching in Texas (Residents and Non-Residents, 16 years and older)</b>				
<b>Texas</b>	<b>Fishing</b>	<b>Hunting</b>	<b>Wildlife Watching</b>	<b>Total Participants (Fishing + Hunting + Wildlife Watching)</b>
1996 Survey	2.5 million	829 thousand	3.6 million	4.7 million
2001 Survey	2.4 million	1.2 million	3.2 million	4.9 million
2006 Survey	2.5 million	1.1 million	4.2 million	6.0 million

Source: 1996, 2001, 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation for Texas, USFWS; TORP 2012

Figure 2.6 below depicts participation rates in the top 10 outdoor recreation activities by Texas citizens compared to the nation at large. As can be seen, walking and family gatherings are the top rated activities for both US and Texas residents.



**Figure 2.6** Participation Rates of Texas Residents (2006-2009) versus U.S. Residents (2005-2009) in the Top 10 Outdoor Recreation Activities (Source: NSRE; TORP 2012)

Given the growing Hispanic population in Texas and other states, outdoor recreation providers have conducted surveys to determine the level of participation by Hispanic citizens in various outdoor recreation activities. Although the Hispanic population in Collin County is smaller on a percentage basis compared to other Texas counties, USACE is aware that use of recreation facilities at Lavon Lake by Hispanic families is a significant factor to be considered in setting recreation management objectives. Refer to Table 2.22 for a comparison of the participation rates of White/Non-Hispanics versus Hispanics in 10 outdoor recreation activities in Texas.

**Table 2.22** Comparison of Participation Rates of White/Non Hispanics versus Hispanics in the Top 10 Outdoor Recreation Activities in Texas

<b>Comparison of Top 10 Outdoor Recreation Activities, White/Non-Hispanics and Hispanics in Texas, 2006-2009</b>		
	<b>% Texans Participating 2006-2009</b>	
	White/Non-Hispanics	Hispanics
Walking for Pleasure	81.1%	83.4%
Family Gatherings	66.6%	75.8%
Gardening or Landscaping	66.3%	76.3%
Attend Outdoor Sports Events Outdoors	57.3%	68.4%
View/Photograph Natural Scenery	63.3%	57.2%
Visit Outdoor Nature Centers	49.8%	58.4%
View/Photograph Wildflowers	59.3%	49.0%
Sightseeing	54.1%	49.6%
Driving for Pleasure	53.6%	49.4%
Picnicking	43.4%	47.7%

Source: TORP 2012

Management of the water surface for recreational purposes rests primarily with USACE, but close coordination is maintained with TPWD and Collin County Sheriff's office with respect to enforcement of rules and regulations that apply to boating. Marina concessionaires are also important stakeholders in water-based recreation management. Water-based outdoor recreation includes, but is not limited to fishing, boating, swimming, water skiing, scuba diving, seaplane operations, and kayaking. This Plan includes a Water Surface Classification Plan that establishes areas where boating may be restricted or prohibited. The objective of the water surface classification plan is to ensure public safety and protect natural resources while providing recreational opportunities on the water.

Recreational carrying capacity is considered by USACE to ensure that visitors have a high quality and safe recreational experience, and that natural resources are not irreparably damaged. An example of a carrying capacity consideration at Lavon Lake is the management of public hunting on USACE lands wherein hunting activity may be restricted by species or by area, depending on population and/or habitat conditions.



#### 2.4.4. Recreational Boating Capacity Study

In 2002, the Fort Worth District adopted a policy governing water-related recreation development that has the potential to affect the degree of boating traffic on the water surface of all Fort Worth District lakes. In brief terms, the policy established a target capacity of 22 surface acres of boatable water surface for each boat on the water during peak use periods. Using the number of boat ramp parking spaces, wet storage slips and dry stacked storage slips as a basis for calculating potential boating activity, USACE can determine whether any proposed additions of parking spaces or storage slips has the potential to exceed the target capacity. USACE has determined that the number of existing parking spaces and slips at Lavon Lake as of the date of this Plan has the potential to exceed the target capacity and may have already exceeded the target. In view of this potential, USACE would require a comprehensive water-related recreation use study prior to making a decision to approve or deny a proposal for additional slips or boat ramp parking spaces at Lavon Lake. The policy allows limited flexibility in decision making.

## **2.5 REAL ESTATE**

Land acquisition for Lavon Lake took place under two acquisition policies, the pre-1953 policy for the original construction, and the post 1971 policy for the Lavon Lake modification. Prior to 1953 land acquisition by USACE was largely determined on a case-by-case basis. However, in general terms the policy was to obtain fee title to lands up to the full flood pool elevation level of the reservoir. Additional lands needed for operations or for other authorized purposes, such as recreation or fish and wildlife were also acquired in fee. In 1971 the implementation of the joint policy (applied to both USACE and the Department of Interior) was revised so that the guidelines for taking lands for fee acquisition would be a 300 foot block-out of the conservation pool or 3 to 5 feet of freeboard above the full pool level, whichever resulted in the acquisition of more land.

The area acquired in fee simple title at Lavon Lake was 37,387 acres, which includes land for construction of the dam and for the operation and maintenance of the project and public use areas. Land for the operation of Lavon Lake was acquired in fee simple to contour elevation 508.0 feet NGVD or to a point 300 feet horizontally from the top of the flood control pool, elevation 503.5 feet, whichever was greater. However, within residential subdivided areas the fee simple acquisition line was generally based on lot lines encompassing the upper guide contour of elevation 508.0 feet without regard to the 300-foot criteria.

Significant suburban expansion near Lavon Lake, coupled with the road and utility network that was relocated and/or constructed at the time of project construction has resulted in the following active real estate outgrants at Lavon Lake: 52 easements, 6 licenses, and 12 consents to easement. There also exists a small number of utility lines that cross USACE land and that existed prior to Federal land acquisition. In those

cases, the lands were acquired subject to existing easements and are therefore not listed in the totals given above.

Flowage easements were acquired from properties located in the upper reaches of the reservoir that would be subject to induced backwater flooding. Backwater curves that show the location of inundation can be found in the Design Memorandum No. 1A (Hydrology), dated June 1965. The total area on which flowage easement was acquired is 849 acres.

## **2.6 PERTINENT PUBLIC LAWS**

Numerous public laws apply directly or indirectly to the management of Federal land at Lavon Lake. Listed below are several key public laws that are most frequently referenced in planning and operational documents. Refer to Appendix J for a more comprehensive listing.

- Public Law 78-534, Flood Control Act of 1944. - Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- Public Law 85-624, Fish and Wildlife Coordination Act 1958. - This act as amended in 1965 sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- Public Law 86-717, Forest Conservation. - This act provides for the protection of forest and other vegetative cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.
- Public Law 89-72, Federal Water Project Recreation Act of 1965. - This act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at Federal reservoir projects shall be borne by a non-Federal public body. A HQUSACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). – NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a “continuing policy of the Federal Government... to use all practicable

means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. It is Section 102 that requires consideration of environmental impacts associated with Federal actions. Section 101 of NEPA requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony.

Specifically, Section 101 of the National Environmental Policy Act declares:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
  - Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
  - Attain the widest range of beneficial uses of the environment without degradation risk to health or safety or other undesirable and unintended consequences;
  - Preserve important historic, cultural, and natural aspects of our national heritage and maintain wherever possible an environment which supports diversity and variety of individual choice;
  - Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities: and
  - Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.
- 
- PL 89-665, National Historic Preservation Act of 1966 (NHPA) (15 October 1966), establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
  - PL 101-601, Native American Graves Protection and Repatriation Act (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

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## CHAPTER 3 – MANAGEMENT GOALS AND RESOURCE OBJECTIVES

### 3.1 INTRODUCTION

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

### 3.2 MANAGEMENT GOALS

- **GOAL A.** Provide the best management practices to respond to regional needs, resource capabilities and capacities, and expressed public interests consistent with authorized project purposes.
- **GOAL B.** Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.
- **GOAL C.** Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining project natural resources.
- **GOAL D.** Recognize the unique qualities, characteristics, and potentials of the project.
- **GOAL E.** Provide consistency and compatibility with national objectives and other State and regional goals and programs.

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

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

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

### **3.3 RESOURCE OBJECTIVES**

Resource objectives are defined as clearly written statements that respond to identified issues and that specify measurable and attainable activities for resource development and/or management of the lands and waters under USACE jurisdiction. The objectives stated in this master plan support the Plan's goals, USACE Environmental Operating Principles, and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and they take public input into consideration. Recreational and natural resources carrying capacities are also addressed in the Resource Objectives. Regional and State planning documents including TPWD's TCAP and TORP, NCTCOG's North Texas – 2050 publication; and the Collin County Parks and Open Space Strategic Plan were considered in developing these objectives. Planning documents from adjacent municipalities were also reviewed.

The objectives in this Plan are intended to provide project benefits, meet public needs, and foster environmental sustainability for Lavon Lake to the greatest extent possible. They include recreational objectives; natural resource management objectives; visitor information; education, and outreach objectives; general management objectives; and cultural objectives.

**Table 3.1** Recreational Objectives

Recreational Objectives	Goals				
	A	B	C	D	E
Evaluate the demand for improved recreation facilities and increased public access on USACE-managed public lands and water for recreational activities (i.e. camping, walking, hiking, biking, boating, hunting, fishing, wildlife viewing, etc.) and facilities (i.e. campsites, picnic facilities, overlooks, all types of trails, boat ramps, courtesy docks, interpretive signs/exhibits, and parking lots).	*		*		
Improve and modernize day use and campground facilities through addition and repair of amenities, including, but not limited to: road improvements, sewer hook ups, increased electrical service, concrete or asphalt recreational vehicle pads, wireless internet access, amphitheaters, restrooms, trails, pavilions, and improved park entrances.	*		*		
Monitor public use levels (with a special focus on boating congestion and marina capacity) and evaluate potential impacts from overuse and crowding. Take action to prevent/remediate overuse, conflict, and public safety concerns.	*		*		
Evaluate recreational use zoning and regulations for designated quiet water or no-wake areas with emphasis on natural resource protection, quality recreational opportunities, and public safety concerns.	*				
Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans.		*	*		*
Increase universally accessible facilities on Lavon Lake.	*		*		*
Evaluate established permits/outgrants to determine impacts on public lands and waters. Sustain the Shoreline Management Program in order to balance private shoreline uses (such as mowing or vegetation removal requests along the Federal property boundary, or paths to the shoreline) with habitat management and impacts to the general public.	*		*		
Consider flood/conservation pool to address potential impact to recreational facilities (i.e. campsites, boat ramps, courtesy docks, etc.).	*	*	*	*	
Ensure consistency with USACE Recreation Strategic Plan.					*



Recreational Objectives	Goals				
	A	B	C	D	E
Monitor the TCAP, the TORP, Collin County Parks and Open Space Strategic Plan, relevant NCTCOG plans, and adjacent municipality plans to insure that USACE is responsive to outdoor recreation trends, public needs and resource protection within a regional framework. All plans by others will be evaluated in light of USACE policy and operational aspects of Lavon Lake.					*

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



**Photo 3.1** Resource Objectives include evaluation of recreational use of the water surface to increase visitor enjoyment and safety (USACE )



**Photo 3.2** Increased trail opportunities is a Resource Objective at Lavon Lake (USACE)

**Table 3.2** Natural Resource Management Objectives

Natural Resource Management Objectives	GOALS:				
	A	B	C	D	E
Consider flood/conservation pool levels to ensure that natural resources are managed in ways that are compatible with primary project purposes of flood risk management and water supply.	*	*		*	
Work with partners to maintain fisheries habitat in the form of aquatic vegetation, littoral area, and coarse substrate.	*	*			*
Ensure project lands are managed with preservation and conservation of natural habitat and open space as primary objectives in order to maintain the largest contiguous tract of public open space in Collin County with natural connectivity to Lake Ray Hubbard immediately to the south.	*			*	
Actively manage and conserve fish and wildlife resources, especially special status species, by implementing ecosystem management principles. Key among these principles is the use of native species adapted to the Texas Blackland Prairie Ecological Region in restoration and mitigation plans.	*	*		*	*
Consider watershed approach during decision-making process.					*
Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats.		*			*
Employ best management practices to reduce non-point source pollution that may originate from recreation areas.	*	*			*
Minimize activities which disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Continually evaluate erosion control and sedimentation issues at Lavon Lake and develop alternatives to resolve the issues.	*	*			*
Stop unauthorized uses of public lands such as off-road vehicle use, trash dumping, unauthorized fires, fireworks, poaching, clearing of vegetation, agricultural trespass, timber theft, unauthorized trails and paths, and placement of advertising signs that create negative environmental impacts.	*	*	*	*	*

Natural Resource Management Objectives	GOALS:				
	A	B	C	D	E
Monitor lands and waters for invasive, non-native and aggressively spreading native species and take action to prevent and/or reduce the spread of these species. The most prevalent aggressively spreading native species at Lavon is eastern redcedar. The most prevalent invasive plant species are Johnsongrass and King Ranch bluestem. Potential invasive species of great concern are the zebra mussel and Emerald Ash borer. Implement prescribed fire as a management tool to control the spread of eastern redcedar and other noxious plants including Johnsongrass and King Ranch bluestem and to promote the vigor of native prairie grasses and forbs. Require equestrian users and grazing lessees to utilize certified weed-free hay and animal feeds to prevent the spread of exotic plants. Install signage at boat ramps to warn boaters about the potential for invasive species to be spread by boats that are used on multiple lakes.	*	*		*	*
Sustain the Lavon Lake public hunting program as a habitat and species management tool that maintains sustainable game populations, reduces invasive species such as feral hogs, improves habitat conditions and carrying capacity, maintains project lands and waters as a wildlife travel corridor and resting location, and considers proximity and density of adjacent development.	*	*	*	*	*
Designate utility corridors to address the increased residential development around the lake and interconnection to utilities in Collin County and the surrounding counties. The intent of the utility corridors is to limit natural habitat fragmentation by creating corridors for use by multiple utilities.	*	*		*	*
Protect and/or restore important native habitats such as Texas Blackland Prairies, bottomland hardwoods, riparian zones, and wetlands, where they occur, or historically occurred on project lands. Special emphasis should be taken to protect and/or restore special or rare plant communities, to include actions that promote butterfly and/or pollinator habitat, migratory bird habitat, and habitat for birds listed by USFWS as Birds of Conservation Concerns. Some of these habitats may be designated as Environmentally Sensitive Areas.	*	*	*	*	*

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



**Photo 3.3** The Loggerhead Shrike is listed by TPWD as a Species of Greatest Conservation Need. Resource Objectives call for actions that promote habitat for species like the loggerhead shrike at Lavon Lake. (Photo courtesy of Dan Tallman's Bird Blog)



**Photo 3.4** Eradicating large fields of invasive Johnsongrass is a Resource Objective for Lavon Lake. (USACE photo)





**Photo 3.5** Mature Shumard oak – bur oak forest in the floodplain of the East Fork of the Trinity River. A Resource Objective calls for protection of this habitat at Lavon Lake. (USACE photo)

**Table 3.3** Visitor Information, Education, and Outreach Objectives

Visitor Information, Education and Outreach Objectives	Goal				
	A	B	C	D	E
Provide more opportunities for communication with agencies, special interest groups, and the general public (i.e. comment cards, updates to City Managers, web page).	*			*	*
Implement more educational, interpretive, and outreach programs at the lake office and around the lake. Topics to include: history, lake operations (flood risk management and water supply), water safety, recreation, nature, cultural resources, ecology, and USACE missions.	*	*	*	*	*
Establish a network among local, state, and federal agencies in order to exchange lake-related information for public education and management purposes.	*			*	*
Use signage and interpretive programs to reduce litter and non-point source pollution	*	*			*

Visitor Information, Education and Outreach Objectives	Goal				
	A	B	C	D	E
Increase public awareness of special use permits or other authorizations required for special activities, organized special events, and commercial activities on public lands and waters of the lake.	*	*	*		
Capture trends concerning boating accidents and other incidents on public lands and waters and coordinate data collection with other public safety officials.	*		*	*	*
Promote USACE Water Safety message.	*		*	*	*
Educate adjacent landowners on shoreline management policies and permit processes in order to reduce encroachment actions.	*	*	*	*	*

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



**Photo 3.6** Increased water safety outreach programs is a Resource Objective for Lavon Lake.

**Table 3.4** General Management Objectives

General Management Objectives	Goal				
	A	B	C	D	E
Resurvey and maintain the public lands boundary line to ensure it is clearly marked and recognizable in all areas to reduce habitat degradation and encroachment actions.	*	*		*	
Secure sustainable funding for the shoreline management program.	*	*	*	*	*
Ensure consistency with USACE Campaign Plan (national level), IPlan (regional level), OPlan (District level).					*
Reference Recreation Infrastructure Investment Strategy (RIIS) if funding levels change in future years.					*
Ensure green design, construction, and operation practices, such as the Leadership in Energy and Environmental Design (LEED) criteria for government facilities, are considered as well as applicable Executive orders.					*
Carefully manage non-recreation outgrants such as utility and road easements in accordance with national guidance set forth in ER-1130-2-550 and applicable chapters in ER 405-1-12. Designate and manage utility corridors as a management tool to reduce habitat fragmentation.	*	*			*
Manage project lands and recreational programs to advance broad national climate change mitigation goals, including but not limited to climate change resilience and carbon sequestration, as set forth in Executive Order 13653, Executive Order 13693 and related USACE policy.					*

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





**Photo 3.7** Establishment of strategic utility corridors is a Resource Objective for Lavon Lake (USACE Photo)

**Table 3.5** Cultural Resources Management Objectives

Cultural Resources Management Objectives	Goal				
	A	B	C	D	E
Monitor and better coordinate lake development and the protection of cultural resources with State Historic Preservation Offices and federally recognized Tribes.	*	*		*	*
Complete an inventory of cultural resources.	*	*		*	*
Increase public awareness and education of regional history.		*		*	*
Ensure historical preservation is fully integrated into the Lavon Lake Master Plan and future planning decision making process (Section 106 and 110 of the National Historic Preservation Act; the Archeological Resources Protection Act; and the Native American Graves Protection and Repatriation Act on public lands surrounding the lake).		*		*	*
Stop unauthorized use of public lands as it pertains to the illegal excavation and removal of cultural resources.		*		*	*

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

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

### **4.1 LAND ALLOCATION**

All project lands at USACE water resource development projects are allocated by USACE into one of four categories in accordance with the congressionally authorized purpose for which the project lands were acquired. There are four possible categories of allocation identified in USACE regulations including Operations, Recreation, Fish and Wildlife, and Mitigation. At Lavon Lake, the only land allocation category that applies is Operations, which is defined as those lands that are required to operate the project for the primary authorized purpose of flood control. The remaining allocations of Recreation, Fish and Wildlife, and Mitigation would apply only if lands had been acquired specifically for these purposes.

USACE recognizes that some lands were acquired that lie above the elevation required for operation of the project for flood control. These lands are located in recreation areas, but under the rules in place at the time of acquisition, these lands are not considered “separable” lands in that the acquisition of separable lands normally requires a cost sharing sponsor, a non-federal operator, or were acquired by separate congressional authorization. The entire fee simple federal estate at Lavon Lake is 37,515 acres, all of which is allocated to Operations.

### **4.2 LAND CLASSIFICATION**

#### **4.2.1 General**

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

#### **4.2.2 Prior Land Classifications**

Previous versions of the Lavon Lake Master Plan included land classification criteria that were similar to the current criteria. These prior land classifications were based more on projected need than on actual experience which resulted in some areas being classified for a type of use that has not, or is not likely to occur. Additionally, in the 40+ years since the previous Master Plan was published, wildlife habitat values, surrounding land use, and regional recreation trends have changed significantly giving rise to the need for revised classifications. Refer to Table 8.1 in Chapter 8 for a summary of land classification changes from the prior classifications to the current classifications.

#### 4.2.3 Current Land Classifications

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

- Project Operations
- High Density Recreation
- Mitigation
- Environmentally Sensitive Areas
- Multiple Resource Management Lands
- Water Surface

The land and water surface classifications for Lavon Lake were established after taking into account public comments, input from key stakeholders including elected officials, city and county governments, and lessees operating on USACE land. Additionally, public comment, wildlife habitat values, and the trends analysis provided in TPWD's TORP and TCAP were also used in decision making. Maps showing the various land classifications can be found in Appendix A. Each of the land classifications, including the acreage and description of allowable uses is described in the following paragraphs.

#### 4.2.4 Project Operations

This classification includes the lands managed for operation of the dam, project office, and maintenance yards, all of which must be maintained to carry out the authorized purpose of flood control. In addition to the operational activities taking place on these lands, limited recreational use may be allowed for activities such as public fishing access in the stilling basin area. Regardless of any limited recreation use allowed on these lands, the primary classification of Project Operations will take precedent over other uses. There are 508 acres of Project Operations land specifically managed for this purpose.

#### 4.2.5 High Density Recreation

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

*“The primary rationale for any future recreation development must be dependent on the project’s natural or other resources. This dependency is typically reflected in facilities that accommodate or support water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps, and comprehensive*

*resort facilities. Examples that do not rely on the project's natural or other resources include theme parks or ride-type attractions, sports or concert stadiums, and standalone facilities such as restaurants, bars, motels, hotels, non-transient trailers, and golf courses. Normally, the recreation facilities that are dependent on the project's natural or other resources, and accommodate or support water-based activities, overnight use, and day use, are approved first as primary facilities followed by those facilities that support them. Any support facilities (e.g., playgrounds, multipurpose sports fields, overnight facilities, restaurants, camp stores, bait shops, comfort stations, and boat repair facilities) must also enhance the recreation experience, be dependent on the resource-based facilities, be secondary to the original intent of the recreation development..."*

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

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

At Lavon Lake, prior land classifications included an excessive number of areas under the high density recreation classification. Several of these areas were never developed and/or were determined by the study team to be unsuitable for development resulting in a change to another, more suitable land classification. At Lavon Lake there are 2,007 acres classified as High Density Recreation land. Refer to Table 2.19 for a listing of the current High Density Recreation Areas at Lavon Lake. Each of the High Density Recreation areas is described briefly in Chapter 5 of this Plan.

#### 4.2.6 Mitigation

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

#### 4.2.7 Environmentally Sensitive Areas

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. Ten distinct parcels have been classified as Environmentally Sensitive Areas (ESA) at Lavon Lake primarily for the protection of sensitive habitats. The habitats were evaluated in the 2010 habitat study conducted jointly by USACE and USFWS and some are listed as "Rare Communities" in the TPWD TCAP for the Texas Blackland Prairies Ecoregion. Each of these areas is discussed in Chapter 5 of this Plan. There are 4,319 acres classified as ESA at Lavon Lake.

#### 4.2.8 Multiple Resource Management Lands

This classification is divided into four sub-classifications identified as: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. A given tract of land may be classified using one or more of these sub-classifications but the primary sub classification should reflect the dominant use of the land. Typically, Multiple Resource Management Lands support only passive, non-intrusive uses with very limited facilities or infrastructure. Where needed, some areas may require basic facilities that include, but are not limited to minimal parking space, a small boat ramp, and/or primitive sanitary facilities. There are 9,768 acres of land under this classification at Lavon Lake. The following paragraphs list each of the sub-classifications, and the number of acres and primary uses of each.

- Low Density Recreation: These are lands that may support passive public recreational use (e.g., fishing, hunting, wildlife viewing, natural surface trails, hiking, etc.). Under prior land classifications, several relatively large tracts were classified for low density recreation, but during the study process to develop this Plan, these larger tracts were reclassified under the sub-classification of Wildlife Management. Low Density Recreation lands are typically narrow strips of land lying between the shoreline at the conservation pool elevation and the USACE property boundary line, and are often located adjacent to private residential areas. The narrow configuration and location next to residential areas make these areas unsuitable for other uses such as High Density Recreation, Vegetation or Wildlife Management. These areas are often used by adjacent landowners for the passive recreation activities listed above. There are 2,468 acres under this classification at Lavon Lake.
- Wildlife Management: This land classification applies to those lands managed primarily for the conservation of fish and wildlife habitat. These lands generally include comparatively large contiguous parcels, most of which are located within the flood pool of the lake. Passive recreation uses such as natural surface trails, fishing, hunting, and wildlife observation are compatible with this classification unless restrictions are necessary to protect sensitive species or to promote public safety. There are 6,480 acres of land included in this classification at Lavon Lake.
- Vegetative Management: These are lands designated for stewardship of forest, prairie, and other native vegetative cover. At Lavon Lake, several parcels of native prairie grassland, or that have high potential to be restored to native prairie, are included in this classification. Passive recreation activities previously described may be allowed in these areas. There are 824 acres included in this classification at Lavon Lake.
- Future/Inactive Recreation Areas: By definition, these are areas with site characteristics compatible with potential future high density recreation

development, or existing HDR areas that are currently closed. No such areas are designated at Lavon Lake.

#### 4.2.9 Water Surface

USACE regulations specify four possible sub-categories of water surface classification. These classifications are intended to promote public safety, protect resources, or protect project operational features such as the dam and spillway. These areas are typically marked by USACE or lessees with navigational or informational buoys or signs, or are denoted on public maps and brochures. The four sub-categories of water surface classification include:

- Restricted: These areas are restricted to the extent that public access is not allowed for reasons of public safety, and for project operations and security purposes. The areas include water surface in front of the tainter gates, major water supply intakes, swimming beaches and the water release area associated with the City of Garland power plant. Approximately 63 acres of water surface are classified as Restricted at Lavon Lake. These areas are depicted on the land classification maps in Appendix A.
- Designated No-Wake: There are 16 boat ramps and 2 marina areas totaling 42 acres at Lavon Lake where no-wake restrictions are in place for reasons of public safety and protection of property.
- Fish and Wildlife Sanctuary: These areas are managed with annual or seasonal boating access restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Coordination with TPWD during preparation of the Master Plan resulted in a determination that no permanent fish and wildlife sanctuary is needed at Lavon Lake. See Chapter 5 for additional discussion on this topic.
- Open Recreation: This classification encompasses the majority of the lake water surface and is open to general recreational boating. Boaters are advised through maps and brochures, or signs at boat ramps and marinas, that navigational hazards may be present at any time and at any location in these areas. Operation of a boat in these areas is at the owner's risk. Specific navigational hazards may or may not be marked with a buoy. Approximately 21,295 acres of water surface at Lavon Lake are classified as Open Recreation.

Table 4.1 provides a summary of land classifications at Lavon Lake. Acreages were calculated using historical and GIS data. A map representing these areas can be found in Appendix A.

**Table 4.1** Acreage by Land Use Classification

<b>Classification</b>	<b>Acres</b>
Project Operations	508
High Density Recreation	2,007
Environmentally Sensitive Areas	4,319
Multiple Resource Managed Lands: Low Density Recreation	2,468
Multiple Resource Managed Lands: Wildlife Management	6,480
Multiple Resource Managed Lands: Vegetative Management	824
Multiple Resource Managed Lands: Future/Inactive Recreation Areas	0
Water Surface: Restricted	63
Water Surface: Designated No-wake	42
Water Surface: Open Recreation	21,295

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

### 4.3 PROJECT EASEMENT LANDS

These are lands on which easement interests were acquired. Fee title was not acquired on these lands but the easement interests convey to the Federal government certain rights to use and/or restrict the use of the land for specific purposes. Easement lands are typically classified as Operations Easement, Flowage Easement, and/or Conservation Easement. At Lavon Lake the only easement lands are those lands where a flowage easement was acquired. A flowage easement, in general, grants to the government the perpetual right to temporarily flood/inundate private land during flood risk management operations and to prohibit activities on the flowage easement that would interfere with flood risk management operations such as placement of fill material or construction of habitable structures. There are 849 acres of Flowage Easement lands at Lavon Lake.



## CHAPTER 5 – RESOURCE PLAN

### 5.1 RESOURCE PLAN OVERVIEW

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

Management of all lands, recreation facilities and related infrastructure must take into consideration the effects of pool fluctuations associated with authorized flood risk management and water conservation purposes. Management actions are dependent on congressional appropriations, the financial capability of lessees and other key stakeholders, and the contributions of labor and other resources by volunteers. The land classifications and applicable management goals for each classification for Lavon Lake include the following:

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

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

### 5.2 PROJECT OPERATIONS.

This land is associated with the dam and spillway structures that are operated and maintained for the purpose of fulfilling the flood risk management mission of Lavon Lake. There are 508 acres of lands under this classification all of which are managed by USACE. Lands in these areas will be managed to ensure continued operation of the lake and structures. Recreation, Environmental Stewardship, and other missions will be secondary to continued security and operation of the facilities. Public access to this land is restricted with the exception of the public fishing platform and parking area located on the west side of the spillway.

The public comment period for the Plan resulted in requests to allow pedestrian and bicycle traffic on the road that traverses the top of the dam. This concept is also

presented in the Collin County Regional Trails Master Plan (CCRTMP) where a trail route across the dam is identified as a “spine” trail corridor. This crossing is viewed by some as a critical link connecting various trails in the northeast Dallas metropolitan area to the Northeast Texas Trail, which currently spans 130 miles from Farmersville, Texas to New Boston, Texas. While such use is allowed on dams at some lakes, public safety and security concerns indicate that major modifications to Lavon Dam would be needed for such use to be accommodated. Pedestrian access across the tainter gate structure is currently prohibited by USACE for security reasons. This dictates that some other means of access would be needed for pedestrian traffic to cross the downstream channel below the spillway, then traverse north toward the dam where a ramp on the downstream slope of the dam would be required to provide pedestrian access to the top of the dam. USACE currently has no plans to pursue the creation of such public access.

A possible alternative to pedestrian access along the top of the dam would be construction of a trail originating in Little Avalon Park, the small day use area off of County Road 384 due south of the USACE project office, then following the path of an abandoned railroad until it crosses the East Fork of the Trinity River a short distance north of Highway 78. The abandoned railroad bridge crossing of the East Fork would require major repair to make it safe for pedestrian traffic. From the abandoned railroad bridge the trail could follow one of several optional routes in an easterly direction until it reaches the east end of Lavon Dam where it could connect to other trails that may or may not be located on USACE land. This route is also identified in the CCRTMP as a major spine corridor. Pursuing this option will almost certainly require multiple partners/sponsors.

In addition to the hike/bike trail, public and agency comment during preparation of this Plan, recommended a kayak/canoe launching location in the area below Lavon Dam. Having a convenient launching facility at this location would facilitate creation of a paddle trail on the East Fork of the Trinity River leading from Lavon Dam to the upper end of Lake Ray Hubbard only a few mile downstream from Lavon Dam. USACE supports this recommendation and is prepared to work with interested partners to create this kayak/canoe access point.

Regardless of any authorized public recreational use of lands that are classified as Project Operations, these uses are subservient to the operation and maintenance requirements of Lavon Dam, spillway and associated lands and infrastructure.



**Photo 5.1** Lavon Dam Tainter Gates during a Major Release of Stored Floodwater (USACE photo)

### **5.3 HIGH DENSITY RECREATION**

Lands classified for High Density Recreation (HDR) are currently developed for intensive recreational activities. Lavon Lake has 16 distinct parcels included in this classification with each area having a unique name. A summary table of these 16 areas is provided at Table 2.19 in Chapter 2. These areas are generally referred to as “Parks”. The off-road bicycle trails area that is leased to Collin County is referred to by Collin County as Sister Grove Park, but under the USACE land classification system this area is classified as a Low Density Recreation area. Depending on available space, funding, and public demand, lands classified for HDR may support additional outdoor recreation development in the future. These areas include access points, day use areas, and campgrounds. Commercial concession areas such as marinas and comprehensive resorts also fall into this classification. These areas have been developed to support concentrated visitation to the extent that an atmosphere of open space compatible with the natural resources of Lavon Lake is maintained.

Four areas are partially or fully leased to non-federal partners referred to as grantees; the USACE operates and manages all park areas that are not leased to others. Each grantee is responsible for the operation and maintenance of their leased area; USACE does not provide direct maintenance within any of the leased locations, but may occasionally lend support where appropriate. The USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all leased and USACE-operated HDR areas. USACE works with partners to ensure that recreation areas are managed and operated in accordance with the objectives

prescribed in Chapter 3. A description of each HDR area, including existing and proposed facilities, is provided below:

#### 5.3.1 Avalon Park

Operated by USACE, Avalon Park encompasses 60 acres and is the largest day use facility on Lavon Lake. The park currently provides 56 day use sites, a swim beach, two group pavilions, two restrooms, and a four-lane boat ramp with a courtesy dock. Use fees for boat launching, day use, and pavilion rentals are collected at the park entrance station. This day use area is heavily utilized during the summer season, but is currently closed from October through March each year. Avalon Park is heavily visited by fishermen, both from shore and by boat. Objectives for this park include extending the boat ramp, replacement and maintenance of existing roads, expansion of available parking areas alongside the roads in the picnic area, replacement of existing restrooms, and providing better access to the swim beach from the east. Additionally, an automated pay station should be considered for this park and the gate attendant pad should be covered and converted to a volunteer site. The CCRTMP proposes a hardened surface trail that would traverse through Avalon Park and East Fork Park. This trail would connect neighborhoods but would require careful planning to ensure compatibility with existing park operations.

Little Avalon Park is a small, seven-acre extension of Avalon Park and serves as a small day use park. The park has 12 picnic sites, a restroom and a small group pavilion. The area is tightly bounded by a creek and Lavon dam to the north and by a road to the south, distinctly limiting expansion opportunities, but the eastern end of the park could be converted to a trailhead to support hiking and biking to the east. Improvements in the park should focus on development of the trailhead, repair and maintenance of existing roads, installation of a group fire ring at the pavilion, and repair or replacement of the existing restroom.

#### 5.3.2 East Fork Park

Operated by USACE & a lessee, East Fork Park encompasses 102 acres and is a heavily used combination day use and camping park. The campground is split into three areas – a tent loop, recreation vehicle (RV) equestrian loop, and the primary RV loop. Twelve primitive tent sites complete the tent loop. The RV equestrian loop contains 11 equestrian sites with water, electricity, and a small corral at each site. The equestrian sites are directly linked to the southernmost end of the Trinity Trail which traverses the western reaches of the lake from East Fork Park to just north of Highland Park. The primary RV loop currently provides 50 RV campsites with water and electricity. The park also contains a group pavilion shelter which includes seven additional RV sites with water and electricity; these sites are rented as part of the pavilion and cannot be reserved separately. Day use facilities include a playground, swim beach, 34 picnic sites, and two boat ramps. Use fees for boat launching, day use, camping, and pavilion rentals are collected at the entrance station. East Fork Harbor Marina currently leases a portion of East Fork Park and offers approximately 135 boat slips. Future improvements envisioned for East Fork Park include repair of the retaining wall, replacement of the sewage system and restrooms, replacement of aging

roadways, replacement of the playground, construction of additional parking for the playground, installation of Wi-Fi, and extension of boat ramps to accommodate low water conditions.

#### 5.3.3 Collin Park

Operated by a lessee, Collin Park encompasses 160 acres and is leased to a private entity for operation as a commercial concession providing services to the public. The park serves as a combination day use and camping park and offers two full service marinas with approximately 700 boat slips. Collin Park provides 56 full service RV campsites with sewer hookups and five campsites with only water and electricity. Day use amenities include 13 picnic sites, a playground, two sand volleyball courts, a swim beach, and two boat ramps. Use fees for boat launching, day use, camping, and pavilion rentals are collected at the entrance station. Collin Park Marina offers a concessionaire-operated restaurant, store, gas dock, dry dock, and boat rental facility. The Trinity Trail crosses through the park, making the park an unofficial trailhead, but the lack of dedicated facilities for parking equestrian trailers limits use as a trailhead. The addition of hardened abutments for the boat ramp courtesy docks is proposed to better protect the ramp during prolonged weather events. Future development within Collin Park includes removing or replacing the playground equipment, upgrading all campsites to 50 amp service, repairing or replacing all restrooms, removing or replacing dilapidated facilities and buildings, and repairing or replacing existing day use facilities such as barbeque grills, picnic tables and benches, and pavilion roofs.

#### 5.3.4 Brockdale Park

Operated by USACE and lessee, Brockdale Park encompasses 114 acres and includes a USACE-operated access point with boat ramp and parking lot. The area is frequented by fishermen and hunters as one of the primary launch points for access to the northwestern reaches of the lake. Brockdale Park also contains an area leased to the non-profit Blackland Prairie Raptor Center (BPRC) which is the only raptor rehabilitation center capable of flight therapy and rehabilitation for raptors in North Texas. The leased area includes a pavilion, nine picnic sites, restroom and an amphitheater. The Brockdale Park Equestrian Trailhead is in the western part of the park which is traversed by the Trinity Trail and includes a large equestrian trailhead with a restroom, parking area, small group pavilion, and round riding pen. The trailhead is popular because it is relatively secluded and provides good access north and south on the trail. Use fees are not collected at this park. The City of Lucas has expressed interest in leasing a portion of Brockdale Park that includes the boat ramp complex and additional acreage for covered picnic sites. During the public comment period, the city stated their intent to support the continued use of the Trinity Trail, the work of the BPRC, improvement of wildlife habitat, and the current passive use nature of Brockdale Park. The CCRTMP proposes a soft surface multiuse trail that would traverse through the park and connect neighborhoods within the City of Lucas to the north and south. USACE policy is to actively seek leasing partners to pursue initiatives that better serve the public on USACE lands. Future USACE initiatives for Brockdale Park include fencing along the project boundary line to provide improved security for the park.

#### 5.3.5 Highland Park

Operated by USACE, Highland Park encompasses 131 acres and is one of the most popular hunting and fishing access points on Lavon Lake. The park features a restroom, boat ramp, and access to the Trinity Trail. The Highland Park Equestrian Trailhead is a large, fenced gravel lot at the southern end of the park and includes a small group pavilion and a restroom; it is the northernmost trailhead for the Trinity Trail and is very popular with riders. Use fees are not collected at this park. As with Brockdale Park, the City of Lucas has expressed interest in a potential lease of Highland Park. Future improvements needed in the park, whether leased to the City or remaining under direct USACE management, include repairs to roads and parking lot, security lights at the restroom and boat ramp, and repairing or replacing the restroom. Electrical service to the trailhead is needed and would likely be installed by Collin County acting through the Trinity Trails Preservation Association. The CCRTMP proposes a soft surface trail traversing through Highland Park to connect neighborhoods within the City of Lucas.

#### 5.3.6 Bratonia Park

Operated by USACE and lessee, Bratonia Park encompasses 138 acres and is a popular launching point for duck hunters and fishermen using the western arm of Lavon Lake. The park has a boat ramp, parking lot, and two vault toilets. Use fees are not collected at this park. The boat ramp is constructed of concrete to a higher elevation than many other Lavon ramps, making it one of the last to go underwater during high water events. Prior to the pool raise in the 1970's, the park was part of a private hunting and fishing club. The dikes of the club's ponds still remain and are heavily used by waterfowl hunters. The park's southern reaches are leased to the Richardson Radio Control Club and include their remote control airplane landing strip and associated out buildings. The primary visitors to this park are hunters, fishermen, and flyers. Future improvements in the park include repair of park roads and parking areas, and repair or replacement of the existing restrooms.

#### 5.3.7 Clearlake Park

Operated by USACE, Clearlake Park encompasses 88 acres and is a combination day use and camping park on the central peninsula of Lavon Lake. The park features the lake's largest pavilion area, two large boat ramps with courtesy docks, 23 camping sites with 30-amp service and sewer hookups, 18 picnic sites, a fishing pier, and a playground. Use fees for boat launching, day use, camping, and pavilion rentals are collected at the entrance station. The campground and part of the day use facilities close seasonally from 1 October to 31 March each year due to reduced visitation. The fishing pier is popular when the lake elevation is high enough. A small, active, cemetery that pre-dates Federal acquisition is located within the park. USACE intends to allow continued access to the cemetery.

During the master plan process, the land classification of Clearlake Island was changed from High Density Recreation to Low Density Recreation because the island is not developed and the water level at conservation pool does not allow vehicle access. Future plans for the park include moving the pavilion to the northern day use area, repair or replacement of restrooms in the northern day use area and relocating the displaced day use sites to an area along the south boat ramp access road and adjoining parking lots. A second camping loop is proposed near the current pavilion location by extending the current camping loop to the west of the pavilion area, ensuring that the park has a minimum of 50 full-service RV sites with 50-amp electrical and sewer hookups. Further improvements in the park include repair of failing roads, extension of boat ramps to accommodate low water conditions, repaving the boat ramp parking lots, upgrading the wiring to 50-amp service throughout the park, repairing or replacing the restrooms, and installation of Wi-Fi.

#### 5.3.8 Ticky Creek Park

Operated by USACE, Ticky Creek Park encompasses 38 acres and is a very busy day use area. The area contains a four-lane boat ramp, courtesy dock, 16 picnic sites, two restrooms and a large swim beach. Use fees are not charged in this park. The day use portion of the park is closed from October through May but the boat ramp remains open and accessible year round. The area is used heavily by families for swimming, fishing, picnicking, and boating access. The swim beach is not protected from wave action and southerly winds tend to create large swells at the beach. Future improvements in the park include construction of a wave break near the swim beach to mitigate damage to the swim beach and to decrease shoreline erosion within the park boundaries. Other needed improvements include the addition of hardened abutments for the boat ramp courtesy dock to increase stability during prolonged high water events. Plans for this day use area also include repair and replacement of the western restroom and improvement of the existing roads and parking lots.

#### 5.3.9 Twin Groves Park

Operated by USACE, Twin Groves Park covers 115 acres and is a small access point for the northeast portions of the lake. The park features two restrooms, a two-lane boat ramp, and two large parking lots. Use fees are not charged in this park. The boat ramp is unusable to larger deep draft vessels due to the shallow and flat nature of the lake bottom. The relative flatness of the Sister Grove Creek floodplain creates consistent shallows and provides some of the best duck hunting and catfishing areas on the lake making the park a favorite launch point for sportsmen. Aside from duck hunting and fishing seasons, this park receives little visitation. Objectives for this area include repair and upgrade of the road system and repair or replacement of the restrooms as a single building with separated services. The CCRTMP proposes a hardened surface trail that would traverse through the park connecting neighborhoods in the vicinity of Princeton and nearby unincorporated areas.

#### 5.3.10 Caddo Park

Operated by USACE, Caddo Park encompasses 515 acres and was originally designed as a park with special access features for persons with disabilities. The park

includes three fishing ponds, 13 picnic sites, two restrooms, and a four-lane boat ramp. Use fees are not charged in this park. The park closes seasonally from 1 October to 31 March. Future improvements for the park include repair and rehabilitation of the walkway and fishing ponds to current universal accessibility standards, expansion of wildlife viewing opportunities, replacement and maintenance of the roads, repair or replacement of the restrooms, connection to City of Farmersville water system, and connection to the City of Farmersville trail network. USACE policy would support leasing this park to the City of Farmersville should the City ever express interest in a lease arrangement.

#### 5.3.11 Elm Creek Park

Operated by USACE, Elm Creek Park encompasses 189 acres and serves as a small access point. The park contains a small, two-lane boat ramp, adjacent parking lot, and restroom facilities. Use fees are not charged in this park. The park is a popular access point for fishing and hunting the northeastern reaches of Lavon Lake. Future plans for the park include repair and improvement of roads, replacement or repair of the restroom facilities, planting additional trees and woody shrubs to facilitate transition from improved park areas to more natural adjacent habitat, and improvement of the boundary fencing.

#### 5.3.12 Lakeland Park

Operated by USACE, Lakeland Park encompasses 105 acres and serves as a small, primitive camping park. The park contains 32 campsites, a large group pavilion, several large parking lots, two restrooms, and a four-lane boat ramp. The boat ramp is subject to sedimentation and requires routine maintenance. Use fees are charged for use of the pavilion but are not charged for camping in the park. While traditionally underutilized compared to the developed campgrounds on the lake, Lakeland Park is the only free camping on the lake, has a strong following, and is popular with the surrounding communities of Copeville, Nevada, Josephine, and Farmersville. Future plans call for converting the northern parking lot to additional primitive camping spaces, improving the roads, improving the boundary fence, constructing a covered gate attendant site, repairing or replacing the pavilion roof and pavilion restroom.

#### 5.3.13 Pebble Beach Park

Operated by USACE, Pebble Beach Park encompasses 35 acres and serves as a large day use park on the eastern shore of the lake. The park contains 21 picnic sites, a four-lane boat ramp, parking lots, a restroom, and a swim beach. The boat ramp is subject to sedimentation and requires routine maintenance. Use fees are not charged in this park. Future plans for the park are to maintain the roads, increase the number of picnic sites, install a centralized parking lot, and repair or replace the existing restrooms. Consideration will be given to adding a fishing pier and small restroom near the existing swim beach

#### 5.3.14 Little Ridge Park

Operated by USACE, Little Ridge Park encompasses 45 acres and is a heavily used day use park popular with fishermen and families. The park contains 28 picnic



sites, a large four-lane boat ramp, parking lots, and two restrooms. Use fees are not charged in this park. Proximity to the Garland Power and Light power plant creates fishing opportunities not available elsewhere on the lake due to the warm water discharge channel from the power plant. Additionally, a pre-pool-raise boat ramp becomes accessible during extended low water conditions, making it one of the only boat launches operable at both low and high water. The day use portion of the park is well used and is popular with larger groups because the tables are spaced far enough apart to accommodate multiple families. Future plans for the park include repair or replacement of the restrooms, maintenance of the existing infrastructure, extension of the main boat ramp to a lower elevation, installation of a fishing pier on the south side of the park, and hardened abutments for the boat ramp courtesy dock to prevent wave damage.

#### 5.3.15 Mallard Park

Operated by USACE, Mallard Park is an 81 acre day use facility on the southeastern most arm of the lake. The park features ten picnic sites, a four-lane boat ramp with a courtesy dock, and a swim beach. Use fees are not charged at this park. Mallard Park is a popular launch point for fishermen and is especially popular with families during summer holidays. Mallard's swim beach is the largest designated beach on the lake. The day use portion of the park is closed seasonally from 1 October to 31 March, but the boat ramp and associated parking remain open for use year round. Significant improvements are planned for the park including the following:

- Increase the number of picnic sites and parking area in the park and expand the day use area to the southwest and also northeast toward the boat ramp parking lot
- Additional day use sites and increased parking area upslope to the southeast of the existing park road
- Reroute the entry road to prevent a straight line approach to the boat ramp;
- Install an automated fee collection station
- Replace both restrooms
- Repave park roads
- Harden abutments of the boat ramp courtesy dock to reduce damage from wave action.

#### 5.3.16 Lavonia Park

Operated by USACE, Lavonia Park encompasses 126 acres and serves as a combination day use and camping park. The park has 38 full service RV sites with water and sewer hookups, five tent sites, two four-lane boat ramps, a playground, an amphitheater, several parking lots, 4 restrooms, and a camper service building. Use fees for boat launching, day use, and camping are collected at the entrance station. Lavonia Park has significant future potential, but will need major renovation to achieve this potential. Future modifications and renovations include the following:

- Convert the existing day use loop to additional RV sites
- Construct a dedicated tent camping loop between A loop and the boat ramp road

- Add a third leg of RV sites in the large field between the upper and lower A loop legs
- Move the existing day use sites to the south boat ramp and include a group pavilion
- Convert B loop from RV camping to a dedicated volunteer village complete with wash facilities, a camper service building, storage area/building, and a small group pavilion. Similar facilities at other lakes have proven invaluable in attracting and retaining talented volunteers
- Modify the park entrance so access to the south boat ramp is inside the park and behind the gatehouse
- Additional improvements should focus on leveling the RV sites and building necessary retaining walls, installing hardened impact pads, remove amphitheater, repair and replacement of existing roads, upgrading the electrical system to 50-amp service, repair or replacement of the bathrooms, and installation of Wi-Fi
- Extension of boat ramps to accommodate low water conditions.

#### 5.4 ENVIRONMENTALLY SENSITIVE AREAS

Eleven distinct parcels totaling 4,319 acres are designated as Environmentally Sensitive Areas (ESA). Each of these areas was designated taking into consideration habitat values listed in the 2010 habitat evaluation report (see Appendix D), institutional knowledge of project lands, and expressed public interest. The rationale for these ESA designations is based primarily on high wildlife habitat value and the need to protect these and similar areas as described in planning documents published by TPWD, NCTCOG and Collin County Parks and Open Space Program. The habitat evaluation report in Appendix D shows that habitat values of the riparian woodland and bottomland hardwood ESAs range from poor for wood ducks to excellent for the Carolina chickadee. In general, the primary factors that prevent the forested ESAs from achieving an overall average score of excellence include:

- The dominant overstory trees are too young and/or small to meet the needs of cavity nesting species such as the barred owl, wood ducks, and downy woodpecker
- The absence or scarcity of hard mast producing trees such as oaks and pecans that serve as a winter food source for numerous species

These limiting factors will be overcome as the woodlands age and supplemental plantings are completed. Each of the ESAs is described in the following paragraphs.

- ESA 1 – East Fork Park Vertisol Blackland Prairie. This 55-acre blackland prairie site has a good mix of native grasses including Indiangrass, little bluestem, and the official state grass of Texas, sideoats grama. There has been no significant disturbance to the site since USACE acquired the land in the early 1950's. Prior to that, the area was likely used for livestock grazing but appears to have been spared the plow. Future management of this area will focus on improving the

existing native grass and forb mix through the use of prescription burning, supplemental seeding, and control of aggressive competition from species such as eastern redcedar, and Johnsongrass. Public use of the area is currently limited to equestrian and hiking activity on the Trinity Trail and bank fishing throughout the area. A day use trailhead to the Trinity Trail is located within this area with parking and restroom facilities. Future use of this area includes continued operation of the Trinity Trail and trailhead and pedestrian access for bank fishing and nature study. Natural surface interpretive trails would be appropriate within the area as a compliment to East Fork Park. As an ESA, future use of this area for high density recreation uses, such as expansion of the camping or picnicking facilities in East Fork Park, or utility line outgrants will not be permitted.

- ESA 2 – West Shore Blackland Prairie. This 308-acre ESA encompasses all USACE land lying between Collin Park and Brockdale Park. This area is a blackland prairie site with interspersed gallery woodlands following intermittent streams. The Trinity Trail traverses this entire area with the higher elevations along the trail offering excellent panoramic vistas of Lavon Lake. Future public use includes the Trinity Trail as well as a proposed soft surface trail described in the CCRTMP. Management of this area includes prairie management techniques to include prescription burning, supplemental seeding, removal of encroaching eastern redcedar, and maintenance of the property boundary line.
- ESA 3 – Brockdale Park Riparian Area. This riparian area of approximately 129 acres has a common boundary with the west boundary line of Brockdale Park but no part of this ESA is located within Brockdale Park. At lower elevations, this area supports impressive stands of mature cedar elm, hackberry and pecan. Higher elevations are prairie sites that are negatively affected by dense stands of eastern redcedar. Future management of this area calls for improvement of the riparian woodlands by thinning some of the thick early successional stands of hackberry and cedar elm, supplemental plantings of Shumard oak, bur oak, black walnut and pecan, and improvement of upland prairie sites by removal of some but not all redcedar, prescription burning, and supplemental planting of native grasses and forbs. Maintaining a boundary fence is a high priority to prevent unauthorized vehicular access and acts of trespass. Public use of this area currently includes an approximate two-mile segment of the Trinity Trail. The area is bordered by approximately 12-15 residential properties and is likely used by these neighbors for hiking and pedestrian access to the lake. Future public use includes continuation of existing uses and possible addition of interpretive trails that may originate in Brockdale Park, portions of which are currently managed through a lease arrangement between USACE and the non-profit Blackland Prairie Raptor Center.
- ESA 4 – White Rock Creek Riparian Hardwoods. This riparian area of approximately 224 acres supports excellent mature stands of Shumard oak, bur

oak, black walnut, and sycamore along the banks of White Rock Creek and several minor tributaries. Going upslope from the creek, the flood plain supports thickets of cedar elm, eastern redcedar, honey locust and hackberry. Moving upslope out of the floodplain and along the USACE boundary are prairie grasses that are heavily impacted by aggressive eastern redcedar. Management of the area calls for improving the riparian woodlands by thinning early successional stands of cedar elm and hackberry, removal of some but not all honey locust and eastern redcedar, and supplemental plantings of beneficial mast producing hardwoods. The upland prairie along the boundary provides an excellent buffer between adjacent private lands and the riparian zone. The prairie will be improved by prescription burning, removal of aggressive eastern redcedar and supplemental seeding of grasses and forbs. Current public use of this area includes an approximate 2 mile segment of the Trinity Trail and bank fishing. The area is bordered by numerous residential properties on private land. Future public use of the area includes continued use of the Trinity Trail and bank fishing. No other uses are anticipated.

- ESA 5 – Wilson Creek Riparian Area. This 236 acre area takes in the highest quality riparian hardwoods along Wilson Creek as well as the majority of USACE land lying west of a major utility line easement granted to the North Texas Municipal Water District (NTMWD) that runs in a northeast-southwest direction. The area is bordered on the north and south by the USACE boundary line and on the west by another utility line easement granted to the NTMWD. This beautiful area includes groves of mature Shumard oak, bur oak, pecan and sycamore. One exceptional grove includes a Texas state champion sycamore tree. Future management includes improvement of the riparian woodlands through selective thinning and supplemental tree and shrub plantings. Most of the USACE land lying south of the main channel of Wilson Creek is within the floodplain of Wilson Creek and appears to have been used for row crop agriculture prior to federal ownership and is dominated by early successional riparian hardwoods including cedar elm, hackberry and honey locust. This area will be improved through selective thinning and supplemental plantings of desirable trees and shrubs. The large regional wastewater treatment plant operated by NTMWD is located on private land a short distance south of the ESA. The effluent discharge point for this plant is on Wilson Creek located on USACE land downstream from the ESA. Current public use of the ESA and adjoining USACE land includes a loop segment of the Trinity Trail, bank fishing and hunting. Hunting is managed through a USACE permit system. These uses are compatible with the ESA designation and will continue in the future.
- ESA 6 – East Fork of the Trinity River Bottomland Hardwoods. This 568 acre area encompasses all USACE land lying north of FM 546. The area has excellent bottomland hardwoods in close proximity to the river channel but much of the area was farmed prior to federal ownership and is in an early successional state with thick stands of young cedar elm, hackberry, and honeylocust covering large areas. Future management efforts will be directed at restoring bottomland

hardwoods throughout the area. In select areas with appropriate topography and hydrology, construction and/or restoration of wetlands will be considered. Public use of this area currently includes hunting and fishing in the river channel. Canoeing and kayaking in the river channel also takes place. Future recreation use includes all current uses and the potential establishment of natural surface, multiuse hike/bike/equestrian trails.



**Photo 5.2** Mature Bur Oak - Shumard Oak Forest, East Fork of Trinity River (USACE Photo)

- ESA 7 – County Road 437 Riparian Area. This comparatively small area of 47 acres supports mature pecans and oaks along the banks of an unnamed tributary. The higher elevations of this area support prairie grasses that are negatively affected by encroaching eastern redcedar. Future management of the area includes improvement of the riparian hardwoods through thinning and supplemental planting. The prairie grasses will be improved by removing some, but not all encroaching eastern redcedar and other species such as mesquite and honey locust. Recreation use currently includes hiking and nature study by adjacent landowners. Future recreation use includes all current uses and could also include establishment of a natural surface, multiuse trail that could connect to USACE land to the south of this area.
- ESA 8 – Sister Grove Creek Riparian Area. This area of approximately 226 acres supports excellent bottomland hardwoods in close proximity to the main creek

channel. The boundaries of this area are indefinite but include all mature bottomland hardwoods on both sides of the main channel of Sister Grove Creek. Adjacent USACE lands were farmed extensively prior to federal ownership and exhibit characteristics of early successional bottomland hardwoods such as thick stands of honey locust, cedar elm and hackberry. Future management of this area includes expansion of the area on both sides of the creek channel by thinning and supplemental tree planting. Current recreational use of the area includes hunting and bank fishing. Future recreational use includes all existing uses as well as possible establishment of natural surface multiuse hike/bike/equestrian trails. The Collin County Regional Trails Master Plan identifies Sister Grove Creek as a possible location for a 26-mile paddle trail originating in Twin Groves Park and traversing north through open water of the lake and into the stream channel of Sister Grove Creek. The paddle trail would continue up Sister Grove Creek through USACE land and extending up the creek to FM 2862 just east of the city of Anna. This paddle trail would be appropriate within the ESA.

- ESA 9 – Pilot Grove Creek Bottomland Hardwoods. This comparatively large area of 1,829 acres encompasses several large stands of high quality bottomland hardwoods along Pilot Grove and Indian Creeks. Some stands have a Chinquapin Oak – Slippery Elm component that is listed by TPWD as a rare vegetative community. Future management of this area includes improvement of the bottomland hardwood forest through thinning and supplemental tree and shrub plantings. The bottomland hardwood forest will be expanded into nearby areas that were extensively farmed prior to federal ownership. Depending on topography and hydrology, some of the nearby USACE lands may present opportunities for wetland development or restoration. All agricultural leasing for grazing or hay production will cease. Current recreational use includes primarily hunting and bank fishing. Future recreational use includes existing uses as well as the potential addition of natural surface hike/bike/equestrian trails. Having relatively good public road access at several locations, portions of this ESA have potential for use as a regional nature center that could be used by schools and other organizations for environmental education and enjoyment.





**Photo 5.3** Slippery Elm – Chinquapin Oak Forest, Pilot Grove Creek (USACE)



**Photo 5.4** American Elderberry shrub in ESA 8 – Pilot Grove Creek Bottomlands (USACE)



- ESA 10 – Price and George Creeks Riparian Area. This area of approximately 247 acres supports high quality riparian woodlands along the main channels of Price and George Creeks as well as prairie grasses in upland areas along the USACE boundary line. Future management of this area includes improvement of the riparian hardwoods through selective thinning and supplemental planting. Prairie areas should be improved through prescription burning and removal of some, but not all, eastern redcedar and other aggressive woody species. Current recreational use includes primarily hunting. Future recreational use includes existing uses and may include natural surface, multiuse hike/bike/equestrian trails.
- ESA 11 – Bottomland Hardwood Forest below Dam. This area of approximately 450 acres encompasses high quality bottomland hardwood forest. Although the hydrology of the area has been altered by the presence of Lavon Dam, the release of flood waters from the lake will occasionally flood portions of the area thus mimicking historic, pre-dam, flooding to a limited extent. Future management of this area includes improvement of the bottomland hardwoods through thinning and supplemental tree and shrub planting. Current recreational use is primarily bank fishing along the discharge channel and the original channel of the East Fork of the Trinity River. Future recreational use includes existing use, and may include a natural surface, multiuse hike/bike/equestrian trail as described in Section 5.2 of this Plan. Interpretive nature trails would also be compatible within this area.



**Photo 5.5** Mature Shumard Oaks in ESA 8 – Pilot Grove Creek (USACE)



## **5.5 MULTIPLE RESOURCE MANAGEMENT LANDS**

Multiple Resource Management Lands (MRML) are, as the name implies, lands that serve multiple purposes, but that are sub-classified and manage for a predominant use. The following paragraphs describe the various sub-classifications of MRML at Lavon Lake, the number of acres in each sub-classification, and the management plan for these lands.

### **5.5.1 MRML - Low Density Recreation**

There are 2,468 acres of MRML – Low Density Recreation at Lavon Lake. These lands are generally narrow parcels of land that are adjacent to private residential developments. Ecologically, most of these lands are blackland prairie sites ranging in value from poor to excellent. Many of the areas have been negatively affected by Johnsongrass, eastern redcedar and other aggressive woody species. Small riparian corridors on some areas support good quality riparian hardwood trees and shrubs. Future management of these lands calls for maintaining a healthy, ecologically adapted vegetative cover to reduce erosion and improve aesthetics. Prevention of unauthorized use such as trespass or encroachments is an important management objective for all USACE lands, but is especially important for those lands in close proximity to private development. Management objectives call for restoration of native prairie conditions where practical. These lands are typically open to the public, including adjacent landowners, for pedestrian traffic and are frequently used by adjacent landowners for access to the shoreline near their homes.

Currently, portions of these Low Density Recreation areas are leased to Collin County for the Trinity Trail and Sister Grove Park, an area where trails are maintained for hiking and off-road bicycling. Both areas are currently maintained by volunteers. The general public may use these lands for bank fishing, hiking, and for access to the shoreline. Hunting may be allowed in designated hunting areas. Future recreational uses include existing uses and may include additional designated natural surface hike/bike/equestrian trails. The CCRTMP describes several trails and trail corridors that would affect MRML – Low Density Recreation. The placement of public trails in areas near residential properties will require public involvement prior to trail design.

### **5.5.2 MRML - Wildlife Management**

There are 6,480 acres of MRML – Wildlife Management at Lavon Lake. These lands are generally medium to large parcels that are located in the upper reaches of the major tributaries to Lavon Lake as well as a few other smaller parcels. Typically, these areas are adjacent to, or completely surround, one of the ten designated Environmentally Sensitive Areas. Future management of these lands calls for managing the habitat to support native, ecologically adapted vegetation which in turn supports native wildlife species. Specific management techniques including, but not limited to placement of nesting structures; construction of water features or brush piles; fencing; special plantings necessary to support the needs of SGCN; use of erosion control

blankets that do not pose entrapment hazards to wildlife; elimination of open-top vertical pipes that pose an entrapment hazard to wildlife; minimize nighttime lighting and only use down-shielded lighting to prevent disorientation of night-migrating birds; follow USFWS guidelines for building glass to prevent bird collisions; preserve and restore wildlife habitat in high density recreation areas; ensure that mowing practices provide standing tallgrass over winter to provide essential cover for wintering birds; and report state-listed species and rare vegetative communities to the Texas Natural Resources Diversity Database. Where beneficial to long term ecological management goals, agricultural leases for grazing or hay production may be employed. In general, any grazing lease would be limited to stocker calf operations and short rotation grazing with lease periods of three to five years.

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

Current public use of these lands includes hiking and horseback riding on existing trails, bank fishing, canoeing and kayaking, and hunting. Future public use includes all existing uses and may include development of nature/wildlife viewing opportunities and expansion of trail opportunities where feasible. The CCRTMP describes several trails and trail corridors that would affect several areas classified as MRML – Wildlife Management. Some MRML – Wildlife Management may support the establishment of nature centers or environmental learning areas.

### 5.5.3 MRML - Vegetative Management

There are 824 acres of MRML – Vegetation Management at Lavon Lake. These lands include two parcels on the east side of the lake that are large enough to support intensive prairie restoration efforts. These lands are generally on upland sites with blackland soil types that will, with proper management, support native prairie. Future management calls for prescription burning, fencing, removal of female eastern redcedar and some but not all male eastern redcedar as well as other aggressive woody species such as mesquite and honey locust, and supplemental seeding of desirable native grasses and forbs. In some locations, eradication of invasive Johnsongrass, Bermudagrass and King Ranch bluestem may require the use of herbicides. Short rotation grazing leases or hay production leases may be employed where deemed beneficial to the establishment of healthy native prairie.

Current recreational use of these lands includes bank fishing and pedestrian access by adjoining landowners. Hunting is currently allowed on the northern parcel that

is located adjacent to and south of Highway 380. Future uses include all existing uses with the possibility of creating multiuse trail opportunities.



**Photo 5.6** Prescription Burning to Improve Native Prairie Grassland  
(USACE photo)

## **5.6 WATER SURFACE**

In accordance with national USACE policy set forth in EP 1130-2-550, the water surface of the lake at the conservation pool elevation may be classified using the following four classifications:

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

At the conservation pool elevation of 492' NGVD, Lavon Lake has a water surface of 21,400 acres. The following water surface classifications are designated at Lavon Lake.

### **5.6.1 Restricted**

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety and security purposes. The Restricted water surface at Lavon Lake includes a designated strip of water surface along the north side of the Tainter Gate structure of Lavon Dam and small restricted areas near the three NTMWD water intake structures, the RWPS1, and the intake and

discharge channel for the Garland Power Station. Designated swimming beaches are also classified as Restricted water surface. The total acreage of Restricted water surface is approximately 63 acres. These areas are normally marked with standard United States Coast Guard (USCG) regulatory buoys stating that boats are excluded from the area. In some instances, physical barriers may be in place on the water.

#### 5.6.2 Designated No-Wake

Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve visitor safety near key recreational water access areas such as boat ramps, swim beaches and marinas. Designated No-Wake areas at Lavon Lake include approximately five acres at the entry point for each of the two existing marinas, and an area of approximately two acres at each of the 16 public boat ramps on Lavon Lake. These areas are typically marked with standard USCG regulatory buoys.

#### 5.6.3 Open Recreation

Open Recreation includes all water surface areas available for year round or seasonal water-based recreational use. With the exception of the Restricted and Designated No-Wake areas described in the above paragraphs, the remaining water surface of approximately 21,295 acres of Lavon Lake water surface is designated as Open Recreation. Large segments of the Open Recreation water surface were not cleared of standing timber during the construction phase of the project. An approximate location of the uncleared areas is shown on the land classification maps in Appendix A. These uncleared areas are not physically marked on the water surface and are a navigational hazard that requires boaters to be attentive and use caution when boating in these areas. Signs at boat ramps warn boaters that navigation hazards including, but not limited to standing dead timber, shallow water, and floating debris may be present at any time and location and it is incumbent on boat operators to exercise caution.

#### 5.6.4 Fish and Wildlife Sanctuary

This water surface classification applies to areas with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. Coordination with TPWD during preparation of the Master Plan resulted in a determination that no permanent fish and wildlife sanctuary is needed at Lavon Lake. This determination was based on several factors including the current “no hunting” restriction that applies to a large portion of the Lavon Lake water surface, the existence of many privately owned ponds and small lakes throughout the region surrounding Lavon Lake that provide sanctuary areas for waterfowl and shorebirds, and the fact that annual waterfowl counts conducted by TPWD for the past several years have indicated healthy waterfowl populations. Should it become necessary to designate sanctuary areas in the future, such designation can be accomplished as needed on an annual basis taking into account habitat conditions, public use levels, and changing fish & wildlife populations.

Future management of the water surface includes the maintenance of warning, information, and regulatory buoys as well as routine water safety patrols during peak use periods. Depending on available funding and appropriate lake conditions, USACE intends to conduct a water-oriented recreation use study to determine the level and type

of boating traffic occurring on the lake. The outcome of such a study may include changes in water surface zoning.

#### **5.7.4 Recreational Seaplane Operations**

Many USACE-administered reservoirs, including Lavon Lake, have areas where recreational seaplane operations are allowed. Areas where recreational landings and takeoffs are prohibited are determined by USACE through a public process separate from the Master Plan process and the information is furnished to the Federal Aviation Administration for publication as a Notice to Airmen. Appendix G is a USACE, Fort Worth District, publication listing District-wide prohibitions and restrictions as well as a description of areas at each lake where recreational seaplane landings and takeoffs are prohibited. Once a seaplane has landed it is considered a vessel and may taxi in locations where boating traffic is allowed.

### **5.7 PROJECT EASEMENT LANDS**

Future management of the 849 acres of Flowage Easement Lands at Lavon Lake includes routine inspection of these areas to ensure that the Government's rights specified in the easement deeds are protected. In almost all cases, the Government acquired the right to prevent placement of fill material or habitable structures on the easement area. Placement of any structure that may interfere with USACE flood risk management and water conservation missions may also be prohibited.

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## CHAPTER 6 – SPECIAL TOPICS

### 6.1 INTRODUCTION

The purpose of this chapter is to set forth topics of special interest that are important to the overall future management of Lavon Lake. These topics generally involve multiple land classifications and resource management objectives. Some of these topics are the subject of high public and/or stakeholder interest that warrants in-depth coverage.

According to the U.S. Census Bureau, during the period 2010 – 2014 the population of Texas grew by 7.2% compared to 3.3% for the entire United States. During the same period, the population of Collin County grew at a rate of 13.2%, adding approximately 103,000 new residents in only four years. Collin County is also one of the wealthiest counties in the U.S. with per capita income approximately 25% above the national average. Within the zone of influence for this Plan, the adjoining counties of Denton and Rockwall have population growth rates that are approximately equal to that of Collin County whereas adjacent Dallas County is slightly below the statewide average. Counties to the north and east of Lavon Lake include Fannin, Grayson and Hunt Counties where population growth is well below the statewide average, especially in Fannin County where population growth was – 0.5% for the four year period. Because Lavon Lake is located completely within Collin County, the focus of this section is on the effect of population growth in the immediate area surrounding the lake.

The Collin County government website (<http://collincountytx.gov>) provides many county statistics including the following summary statements:

- One of the fastest growing counties in Texas and the U.S.
- The sixth most populace county in Texas
- Among counties with more than a half million people, the highest sustained growth rate since the 2000 Census, at 73.9%

According to the website, 80 people move to Collin County each day. The county's population stood at 885,000 in mid-2014 and is projected to reach 1.2 million by 2030. Where and how this growth occurs will have a major effect on the future of Lavon Lake. In the NCTCOG's 2010 publication, *North Texas 2050*, five regional growth scenarios are described with both undesirable and desirable outcomes. The five scenarios included: Business as Usual; Connected Centers; Return on Investment; Diverse, Distinct Communities; and Green Region. In general, undesirable outcomes would result from the "Business as Usual" scenario where future development occurs somewhat randomly with little focus on infill, efficient mobility, maintenance of existing communities, or protection of natural assets and open space. The remaining four scenarios each provide desirable outcomes including, but not limited to maximizing return on investment in existing infrastructure, easy and efficient mobility including light

rail and trail networks, and protection of natural assets and open space. Stakeholder sessions conducted by NCTCOG indicate strong public support for a preferred future that is better than “Business as Usual”.

Public and stakeholder input during preparation of this plan echoes input gathered by NCTCOG for their North Texas 2050 vision document. The majority of comments from individuals, agencies and municipalities support protection of open space values and passive use activities. There appears to be a general consensus that exponential growth will continue near Lavon Lake and protection of the public lands and resources offered by the lake must be given high priority. Although USACE management actions at Lavon Lake cannot directly influence regional growth patterns, future management by USACE can support and augment desirable growth patterns. Examples include the classification of appropriate USACE lands as ESAs, and implementation of resource objectives that promote boundary line maintenance and connection of communities with hike and bike trails (trails are specifically addressed in paragraph 6.4 of this chapter). Other examples include designation of utility corridors to allow major, cross country utilities to cross USACE lands where no viable route on non-USACE land exists. Utility corridors preserve habitat and open space by concentrating utilities in areas where negative effects are minimized. Utility Corridors are discussed in section 6.2 of this Plan.

Further supporting protection of natural resources are national USACE policies in ER and EP 1130-2-550 that provide significant protections against inappropriate use of USACE lands. Most importantly, Chapter 17 of the above ER sets forth a non-recreation outgrant policy that places strict limitations on road, utility line, or municipal infrastructure easements or leases and requires compensatory and non-compensatory mitigation for negative impacts resulting from easements that cannot be avoided. Additionally, Chapter 16 of the above ER sets forth a recreation outgrant policy that restricts recreation development on USACE lands to those activities that are dependent on a project’s natural resources and typically include water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps and comprehensive resorts. Examples of activities that are not dependent on a project’s natural resources include, theme parks or ride-type attractions, sports or concert stadiums, and stand-alone facilities such as restaurants, bars, motels, hotels, and golf courses.

In summary, rapid population growth is likely to continue in the region and will bring with it increased demand for recreational access and facilities, as well as pressure to cross USACE lands with utility and road easements. By following the land classifications and resource objectives in this plan, complying with national USACE policy with respect to outgrants, and maintaining constant communication with the public and key stakeholders, USACE is well positioned to ensure that the natural resources and public outdoor recreation opportunities at Lavon Lake are protected for present and future generations.



## 6.2 UTILITY CORRIDORS

USACE policy encourages the establishment of designated corridors on project lands, where feasible, to serve as the preferred location for future outgrants such as easements for roads or utility lines. After obtaining public input and examining the location of existing roads and utility lines on project lands, USACE determined that only utility corridors would be designated at Lavon Lake. Because USACE policy in EP 1130-2-550, Chapter 17, states that project lands will generally be available only for roads that are considered regional arteries or freeways, and all current regional and county mobility plans include no proposals for regional arterials crossing USACE land at Lavon Lake, there is no need for designation of roadway corridors. Regional and county mobility plans call for widening of some existing roadways across USACE lands and these will be addressed on a case-by-case basis.

The following eleven utility corridors have been designated across USACE land at Lavon Lake with each corridor incorporating and/or running parallel to an existing easement. Several of the corridors have sub-corridors and each serves to cross a tributary to Lavon Lake. These corridors are shown on map number LA15MP-OU-01 provided in Appendix A. Future use of these corridors, where the corridor is limited to an existing easement, would in most cases require prior approval of those entities that have legal rights to the easement.

- Corridor 1. This corridor includes the existing right-of-way of an overhead electrical transmission line plus an additional 50-foot wide strip parallel to the west boundary of the existing right-of-way. The corridor generally runs from the southeast boundary line of USACE Tract 4520 to the west boundary line of USACE Tract 4516.
- Corridors 2a & 2b. This corridor includes the existing right-of-way of East Lucas Road (FM 3286) where the road crosses the White Rock Creek and the East Fork of the Trinity River arms of Lavon Lake, plus an additional 50-foot wide strip of USACE land running parallel to both the north and south right-of-way boundaries of the road.
- Corridor 3. This corridor includes the existing right-of-way of FM 546 as well as the existing right-of-way of an overhead electrical transmission line running parallel to the south side of FM 546. The corridor also includes an additional 25-foot wide strip of USACE land running parallel with the north right-of-way line of FM 546.

The segment of this corridor lying north of FM 546 lies within ESA 6 but the 25-foot wide strip has been previously disturbed and would serve well as a corridor.

- Corridor 4. This corridor includes the existing right-of-way for FM 982 where it crosses Ticky Creek plus an additional 50-foot wide strip of USACE land adjacent to the south and north right-of-way line of FM 982.

- Corridor 5. This corridor crosses Sister Grove Creek on both sides of FM 1377 with the downstream side taking in the existing right-of-way for FM 1377 and the existing 50-foot wide easement for an overhead transmission line easement owned and operated by Texas-New Mexico Power Company. The upstream side takes in the existing right-of-way for FM 1377 as well as a second 50-foot wide existing easement for an overhead transmission line operated by Texas-New Mexico Power Company. The full extent of the corridor includes the two existing transmission line easements as well as all land lying between the two overhead transmission line easements. This corridor is located within an ESA but the area included in the corridor has been previously disturbed by construction of FM 1377 and the two transmission lines.
- Corridor 6, 7 & 8. These corridors are clustered near the Highway 380 bridge crossing of Lavon Lake and are described as follows:
  - Corridor 6. Includes the existing right-of-way for Highway 380 where it crosses the Pilot Grove arm of Lavon Lake plus an additional 100 feet-wide strip running parallel with the south right-of-way boundary. On the north side of Highway 380, Corridor 6 includes all land up to the existing fence fronting Twin Groves and Caddo Parks.
  - Corridor 7. Includes the existing right-of-way of County Road 559. Most of this corridor consists of a bridge over open water. Future use of this corridor will be limited to utility lines that could be attached to the bridge and can be placed within the existing right-of-way boundaries.
  - Corridor 8. Includes the existing right-of-way for an above ground electric transmission line that runs from the south boundary line of USACE tract 2816 to the west boundary line of USACE tracts 2827 and 2828. Use of this corridor is limited to the existing transmission line right-of-way plus an additional 50 feet running parallel to both sides of the existing easement.
- Corridor 9. Includes the existing right-of-way for FM 2756 and the existing right-of-way for an overhead transmission line running parallel to the south right-of-way line of FM 2756 to include the narrow strip of USACE land lying between FM 2756 and the overhead transmission line. This corridor passes through ESA 7. Use of the previously disturbed easements will not adversely affect the ESA.
- Corridor 10a & 10b. These are two distinct and separate corridor alignments that cross the Tom Bean Creek arm of Lavon Lake. This corridor includes the following:
  - The existing right-of-way for Highway 78
  - The existing right-of-way for an underground pipeline.

Future use of this corridor is limited to the existing rights-of-way described above as well as an additional 50 feet running parallel to both sides of each right-of-way.

- Corridor 11a & 11b. This corridor includes two distinct strips of USACE land that cross the George Creek arm of Lavon Lake described as follows:
  - The existing right-of-way for Highway 78
  - The existing right-of-way for an electric transmission line.

Future use of this corridor is limited to the existing rights-of-way described above as well as an additional 50 feet running parallel to both sides of the Highway 78 and the electrical transmission line.

In summary, the following best management practices shall be applied in the future use of the eleven corridors, three of which have parts (a) and (b), described above:

- Use existing easements before using additional space.
- Efficient use of the designated corridor space to allow the maximum number of utilities possible to occupy the space. Reduced cost is not a reason to occupy more space. A typical drawing depicting how utility lines can be placed efficiently within a corridor is provided in Appendix A following the map of corridor locations.
- In accordance with USACE policy at Chapter 17 of EP 1130-2-550, Non-Recreation Outgrant Policy, avoid placement of utility lines on USACE land unless there is no reasonable alternative route.
- Underground utilities shall be installed by boring at all creek crossings, and where feasible, across the full extent of designated corridors. Bore pits shall be a minimum of 100 feet from the centerline of creeks and, depending on site conditions, may need to be placed farther than 100 feet.
- Overhead electric and communication lines must meet minimum sag height requirements to be specified by USACE.
- Natural resources damaged or destroyed within corridors shall be mitigated per USACE requirements.
- Current and future identified cultural resources will be protected.

### **6.3 PUBLIC HUNTING PROGRAM**

Currently, approximately 16,253 acres of USACE land and water surface at Lavon Lake is open to public hunting with certain restrictions. Population growth around the lake, coupled with a general scarcity of public land available for hunting within the seven county zone of influence, has resulted in significant public interest in hunting opportunities at Lavon Lake. Other public lands available within the zone of influence include USACE land and water surface at nearby Lewisville Lake, Ray Roberts Lake and Lake Texoma (operated by USACE Tulsa District), as well as the Caddo Unit of the

Lyndon B. Johnson National Grasslands managed by the U.S. Forest Service. All of these areas have a steady following of hunters.

The hunting program at Lavon Lake has evolved over the years to a system that requires hunters to obtain a no-cost annual permit from USACE. USACE has authority to charge an administrative fee for issuing permits and may charge a fee in the future. To obtain a permit, hunters must have a hunter safety certificate from the State of Texas or another state with equivalent hunter safety education requirements. When permits are issued, hunters are provided maps and other information showing where hunting is allowed and describing applicable restrictions. Returning hunters must complete an on-line hunter survey from the previous year in order to obtain a new permit. The program is adjusted annually based on wildlife populations, habitat conditions, changes in state wildlife regulations, and the proximity of new residential development near USACE land. The number of permits issued in recent years has varied from 1,222 in 2012 to 1,360 in 2014. Based on surveys completed and returned to USACE by hunters, waterfowl hunting is by far the most popular type of hunting taking place at Lavon Lake.

Topics of high interest for the foreseeable future include the following:

- TPWD recently established an open season for whitetail deer in Collin County with the restriction that only archery equipment, including crossbows, may be used. There is high interest among Lavon Lake hunters in this topic. Given the limited land base with suitable deer habitat, population surveys will be needed prior to allowing deer to be hunted. USACE will cooperate with TPWD to conduct the necessary population surveys. If a sustainable population is found to exist, USACE will determine to what extent deer hunting can be allowed. Other USACE lakes with a limited land base have found it necessary to implement a lottery system to ensure that deer populations are sustainable and hunters can enjoy a safe and rewarding hunting experience. Similar measures may be necessary at Lavon Lake.
- Hunting of feral hogs is popular at Lavon Lake and is allowed in certain management units. Because feral hogs are considered a nuisance invasive species, this hunting will be encouraged for the foreseeable future.
- Currently, equestrian, hiking and off-road biking trails traverse hunting areas in two locations, one is the Trinity Trail near Wilson Creek and the other is the off-road bicycle trails in Sister Grove Park. The Trinity Trail and Sister Grove Park are both outgranted to Collin County. Trails that traverse hunting areas are not uncommon on public lands. USACE, as well as USFWS, and USFS maintain such trails. Although USACE has never recorded an incident involving trail users and hunters, the possibility exists and requires all users to be aware of necessary safety precautions. When hunters are issued a permit at Lavon Lake, they are provided written advisory information that hunters are not the only users of USACE lands. Other users may include agricultural lessees, trail users, bird watchers and others which requires that hunters exercise caution.

Administration of the hunting program requires a significant investment in labor and materials in the form of maps, signs, and access gates. Future efforts may include establishment of designated parking areas on USACE property. As stated in the resource objectives in this plan, public hunting opportunities will continue to be made available to the extent that funding and personnel are available, and residential development along the boundary line will allow. Where feasible, volunteers will be utilized to reduce costs.

## **6.4 TRAILS**

Pedestrian, bicycle, and equestrian trails are popular at Lavon Lake and public comment during preparation of this Plan supports development of new trails and expansion of existing trails. Adding to this support are national and regional trends identified in the 2012 TORP that trail use is one of the fastest, if not the fastest, growing form of outdoor recreation in the United States. Trails that may affect USACE land are also described in the 2012 CCRTMP, which was produced through a multi-jurisdictional planning effort. The goal of the CCRTMP is to provide coordination and connectivity between cities within the County for future trail development. The CCRTMP addresses, to some extent, all of the public comments related to trails that were received by USACE during the preparation of this Plan. While USACE lands are often appropriate for trail development, even moderate flood events can cause trails to be closed for weeks until flood waters can be released, the area dries out, and flood debris is removed from the trails. Major flood events can cause trails to be closed for several months. In spite of these operational realities, there can be long periods of time when trails are fully functional and offer very rewarding outdoor recreation opportunities. Future management and development of trails will be possible only through partnerships and volunteer efforts. Typical trail management efforts involve repair of eroded trail sections, trimming trees and shrubs for trail clearance, mowing, posting of signs to require use of certified weed-free hay by equestrian users and maintenance of directional signs.

Trail development experience at Lavon Lake and other USACE lakes in the region including Ray Roberts, Lewisville, Grapevine, Benbrook and Joe Pool lakes indicates that trails fall within two broad categories described as low intensity trails and high intensity trails. A description of each category, and how each category fits within the land classifications at Lavon Lake is described in the following paragraphs.

### **6.4.1 Low Intensity Trails**

Low intensity trails are generally defined as soft surface trails and typically have a natural earth surface with the exception of trail sections that may need reinforcement such as steep slopes, sensitive soils, or wet locations. Minor use of natural reinforcement materials such as wood chips, gravel, or crushed granite is acceptable to control erosion or improve trail safety. Use of geotextiles, boardwalks, or comparable materials is acceptable at stream crossings or in wetlands. Use of professionally designed bridges, subject to USACE approval and of an appropriate scale, is

acceptable at stream crossings. With careful planning to protect sensitive resources and to ensure operational security, low intensity trails are appropriate in all land classifications. However, trailheads, which normally require a vehicle parking area, should not be located in ESAs.

#### 6.4.2 High Intensity Trails

High intensity trails are generally defined as trails with a hardened surface such as concrete, asphalt, soil cement, or extensive use of crushed stone or gravel. These trails are intended for high traffic locations and are generally appropriate only in areas classified for High Density Recreation. However, if a community expresses a need for a high intensity trail to connect to other nearby communities, with careful planning the trail may be located in areas classified as Multiple Resource Use Lands – Low Density Recreation.

#### 6.4.3 Existing and Future Trail Placement at Lavon Lake

Existing trails at Lavon Lake include the Trinity Trail, a pedestrian and equestrian trail operated under an MOU with Collin County and maintained by volunteers, and off-road bicycle trails in Sister Grove Park, leased to Collin County and maintained by volunteers. These existing trails are noted in the CCRTMP. Based on public comments received during preparation of this Plan, and trail concepts described in the CCRTMP, the following future trail scenarios appear suitable for future consideration.

- Expansion of the Trinity Trail. This would very likely require a substantial bridge over Wilson Creek at the current northern terminus of the trail. If Wilson Creek can be crossed, the trail, as described in the CCRTMP could traverse north along the west side of the East Fork of the Trinity River until it exits USACE land and proceeds further north. Currently, no bridge crossing of the East Fork is proposed.
- High Intensity/Hardened Surfaced Trails. The CCRTMP shows several of these trails proposed for placement on USACE land. The City of Wylie has proposed a trail that would traverse along the shoreline in East Fork and Avalon Parks before turning south and exiting USACE land at SH 78. Another trail would traverse down both sides of Wilson Creek. The trail on the north side of Wilson Creek would turn north and traverse up the west side of the East Fork of the Trinity River before exiting USACE land. A high intensity trail is also proposed in the Princeton area. This trail originates on USACE land at the intersection of CR 462 and 458 where it traverses south along the USACE boundary line going through Twin Groves Park, across Highway 380, and continuing south along the shoreline to the southern tip of the former Cedar Grove Park (now a wildlife management area). At the Highway 380 crossing, the trail would also turn east across Lavon Lake, presumably on the Highway 380 bridge if and when the bridge is widened to 4 lanes. A short segment of high intensity trail is also shown originating on USACE land where Highway 78 crosses Tom Bean Creek. The trail then traverses northeast along the USACE boundary until it exits USACE

land. Some of these high intensity trails would traverse through Environmentally Sensitive Areas where only low intensity trails would be appropriate. In general, high intensity trails are not appropriate on lands classified for low intensity recreation. However, USACE will consider trail proposals where the trails are critical for linking communities.

- **Low Intensity/Soft Surface Trails.** The City of Lucas has proposed two trails, the first beginning near Osage Lane and traversing north through Brockdale Park to FM 3286. The second trail begins on the east side of the FM 3286 bridge and traverses north to the north end of Highland Park. This trail would parallel portions of the Trinity Trail near Brockdale Park.
- **An off-road bicycle trail in the southern sector of Lavon Lake.** The off-road bicycle trail in Sister Grove Park is very popular, but some users expressed a desire for a second trail location further south. A potential location exists within an old borrow pit located on the downstream side of Lavon Dam. Should a hike-bike trail be developed within the trail corridor below Lavon Dam (described below under Trail Corridors and in paragraph 5.2 of this Plan), an off-road bicycle “loop” trail could be created that would traverse through the old borrow pit area.
- **Trail Corridors.** In addition to the planned or proposed trails described above, the CCRTMP also describes several “spine” trail corridors that cross USACE lands. A full description and map of each corridor is provided in the CCRTMP which is posted on the Collin County website. For convenience, each spine corridor is briefly described as follows:
  - A corridor originating in Clear Lake Park and proceeding north along the shoreline and along Ticky Creek where it exits USACE land and continues on private land. After crossing Highway 380, the corridor rejoins USACE land along Sister Grove Creek near FM 1377 and then continues north along Sister Grove Creek before exiting USACE land.
  - Two separate corridors that proceed from Princeton and Farmersville and traverse in a northerly direction on USACE land following Pilot Grove Creek and Indian Creek until exiting USACE land. These two corridors connect on USACE land.
  - A corridor originating near the west end of Lavon Dam and proceeding east across Lavon Dam then northeast along the shoreline and across the Highway 78 bridge before exiting USACE land. The corridor then rejoins USACE land at the Highway 78 Bridge where it crosses Elm Creek, then proceeds northeast along Elm Creek before exiting USACE land. Under current USACE policy, this corridor cannot be approved as described in Chapter 5, Paragraph 5.2 of this Plan.

- A corridor that originates near the west end of Lavon Dam then proceeds south and east on USACE land parallel to Highway 78 before exiting USACE land in the city of Lavon.



**Photo 6.1** Trail Riders on the Trinity Trail in the Prairies North of Collin Park

## **6.5 BOUNDARY LINE MANAGEMENT**

With more than 155 miles of boundary line and the potential for new residential areas and expansion of existing residential areas along the boundary line, maintenance of the boundary line will be given high priority to prevent trespass and to inform the public of the location of USACE lands. Boundary line management may include construction of a fence or other vehicle barrier on the boundary, replacing corner markers, clearing a minimal line of sight between property corners, placement of signs along the boundary, and routine inspection by USACE park rangers. Adjacent landowners may apply for written permission to reduce the hazard of wildfire by mowing and removing underbrush along the boundary fronting their property. Permission for such mowing is generally granted only if a Zone 1 defensible space, as defined by national Firewise criteria, cannot be created on the landowner's property. Specific details regarding shoreline use permits for mowing and underbrushing activities are set forth in the Shoreline Management Policy Statement for Lavon Lake.



## **6.6 BOATING CAPACITY STUDY**

USACE monitors the recreational use of the water surface at all USACE-operated lakes to ensure safe and enjoyable conditions for lake visitors. To ensure that boating activity is safe and enjoyable, USACE, Fort Worth District, prepared a Water-Related Development Policy (WRDP) that, under certain conditions at any given lake, requires a boating capacity study. The policy sets a target of 22 acres of boatable water surface per boat on peak use days and assumes, based on findings from a comprehensive study at Lewisville Lake, that for every ten wet slips in a marina, and for every parking spot at boat ramps, one boat will be on the water on peak use days. Lavon Lake currently has approximately 725 wet slips at marinas, 1,335 parking spaces at boat ramps, and approximately 17,434 boatable acres. Using these numbers, Lavon Lake has the potential to have approximately 1,437 boats on the water during peak use periods resulting in one boat for every 12 acres of boatable water surface. This is only a potential level of use, but because the potential is high, the WRDP would require a comprehensive boating capacity study before any additional wet slips or boat ramp parking spaces are authorized over current authorizations. A comprehensive study would involve on-the-water boat counts on several peak use days, as well as surveys to determine how boaters, elected officials, law enforcement officials and adjacent landowners perceive the level of boating traffic.

## **6.7 MARINA POTENTIAL ON EAST SIDE OF LAVON LAKE**

The possible future need for a marina on the east side of Lavon Lake did not surface during public meetings or public comments, but USACE believes that if and when residential development increases on the east side of the lake there will eventually be public interest in having a marina on the east side. If a boating capacity study is conducted before interest in an east side marina occurs, the study should address the marina topic. If the study concludes that an additional marina is needed, and would not cause the target capacity to be exceeded, a suitable location would have to be determined.

## **6.8 NEW USACE PROJECT OFFICE AND VISITOR INFORMATION CENTER**

The current project office consists of the original office constructed in the early 1950's with additional space added through the years. The current visitor information center is small, office space is inadequate, and the only meeting room is not conveniently located. The current layout of visitor parking is awkward and small. A new office and visitor information center with adequate office space, meeting facilities, and visitor parking is needed and will be planned and constructed depending on available funding.

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## **CHAPTER 7 - PUBLIC AND AGENCY COORDINATION**

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

USACE policy guidance in ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013 requires thorough public involvement and agency coordination throughout the master plan revision process including any associated environmental assessment process. Public involvement is especially important at Lavon Lake to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs in a region that is experiencing exceptionally rapid population growth. The following milestones provide a brief look at the overall process of revising the Lavon Lake Master Plan.

- January 2010 – USACE holds internal meetings to initiate master plan revision process.
- Summer of 2010 – USACE and USFWS conduct wildlife habitat evaluation field work on all Lavon Lake project lands.
- February - March 2011 – USFWS completes habitat evaluation report (attached as Appendix D) with mapping assistance from USACE
- 2011-2013 – Preliminary work continues (team assembled, gather data, research files). Lake Manager and project staff continue meeting with key stakeholders to personally inform them of the master plan process.
- January - December 2014 – Draft document preparation begins. Public Involvement plan is drafted
- January 2015 – Initial stakeholder and public meetings announced to take place on February 24, 2015. Meeting was delayed until March 10 due to winter storm
- April - Dec 2015 – Public comment analyzed. Draft master plan prepared
- May 2016 – Public meeting held on 5 May 2016 to announce the availability of the draft Master Plan and accompanying EA

### **7.2 INITIAL STAKEHOLDER AND PUBLIC MEETINGS**

The initial stakeholder and public meetings were held on March 10, 2015, at the City of Wylie Recreation Center, 300 Country Club Road, Wylie, Texas. The stakeholder meeting was held at 3:00 pm for the convenience of elected officials, city and county employees, agency personnel, and lessees operating on USACE land, and was attended by 30 individuals. The following entities were represented at the stakeholder meeting:

- Cities: Lucas, McKinney, Saint Paul, Wylie
- Collin County

- Agencies: Texas Parks and Wildlife Department; Texas Department of Transportation; Texas Historical Commission; North Texas Municipal Water District; Garland Power & Light
- Lessees: East Fork Marina; Blackland Prairie Raptor Center
- Volunteers: Trinity Trails Preservation Association; Dallas Off-Road Bicycle Association
- Media: Wylie News

Following the stakeholder meeting, an open public meeting was held at 5:30 pm and was attended by 93 individuals. At both meetings USACE presented a short slide presentation explaining the purpose of the Master Plan, the overall process involved in revising the plan, and how individuals can participate. Following the presentation, attendees were invited to visit one of three information tables to view maps and ask questions of USACE personnel. Attendees were provided comment sheets for written comment and were also invited to visit the USACE website where the slide presentation and additional comment sheets were posted. A 30-day comment period followed the public meeting and numerous comments were received. A summary of the comments received can be found in Appendix H of this plan.

Review of comments received led to additional personal contact with stakeholders and individuals. USACE planners contacted NCTCOG and Collin County personnel to discuss their respective mobility and transportation plans affecting Lavon Lake. USACE personnel also met with TPWD biologists on October 2, 2015, to discuss the status of waterfowl usage of Lavon Lake as well as the overall status of public hunting activity. A copy of TPWD's summary of topics discussed at the meeting is provided in Appendix I.



**Photo 7.1** Public meeting held March 10, 2015 to discuss proposed revision of Lavon Lake Master Plan

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

A public meeting was held to release the revised draft of the Lavon Lake Master Plan and Draft EA and FONSI for public and agency review on May 5, 2016 at the Hyatt Place Garland, 5101 North President George Bush Highway, Garland, Texas. USACE employees hosted the meeting, which was conducted in an open format. Participants were asked to sign in at a table where staff provided the participants with information regarding the structure of the meeting and comment forms. After signing in, participants were directed to be seated in the auditorium and a slide presentation was presented by the lake manager. At the conclusion of the presentation USACE representatives were available to answer questions and receive written comments at information tables. 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 at a later date
- Submitting a comment using electronic mail
- Submitting a comment and mailing it in on letterhead or choice of paper

In total, approximately 50 individuals, not including USACE personnel, attended the meeting for interest groups, partner agencies, other government agencies, and businesses. The public and agency comment period was open from May 6, 2016 to June 6, 2016 providing an opportunity for the public and agencies to comment on the Draft Master Plan, Environmental Assessment (EA) and Finding of No Significant Impact Statement (FONSI). A total of 22 written comments were received from governmental entities and 15 comments were received from the public at large. Comments received resulted in changes to management objectives and resource management plans and practices. Each comment and the USACE response is summarized in Appendix H of the Master Plan. Copies of letters received from governmental entities are included in the EA. Upon incorporation of public comment into the draft Master Plan and EA and FONSI, final versions will be prepared and signed by the District Engineer for implementation.

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## **CHAPTER 8 - SUMMARY OF RECOMMENDATIONS**

### **8.1 SUMMARY OVERVIEW**

The preparation of this Master Plan for Lavon Lake followed the new USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated 30 January 2013. Three major requirements set forth in the new guidance include the preparation of contemporary Resource Objectives, Classification of project lands using the newly approved classification standards, and the preparation of a Resource Plan describing in broad terms how the land in each of the land classifications will be managed into the foreseeable future. Additional important requirements include rigorous public involvement throughout the process, and consideration of regional recreation and natural resource management priorities identified by other federal, state, and municipal authorities. The study team endeavored to follow this guidance to prepare a Master Plan that will provide for enhanced recreational opportunities for the public, improve environmental quality, and foster a management philosophy conducive to existing and projected USACE staffing levels at Lavon Lake. Factors considered in the Plan development were identified through public involvement and review of statewide planning documents including TPWD's 2012 TORP (synonymous with SCORP) and the TCAP – Texas Blackland Prairies Ecoregion. Other important reference documents included the NCTCOG's Vision 2050 and Mobility 2035, Collin County's Parks and Open Space Strategic Plan and the Collin County Regional Trails Master Plan. This Master Plan will ensure the long term sustainability of the recreation and environmental stewardship program associated with Lavon Lake.

### **8.2 LAND RECLASSIFICATION PROPOSALS**

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to the new land classification standards. Public comment was solicited to assist in making these land reclassification decisions. Chapter 7 of this Plan describes the public involvement process and Appendix H provides a summary of public comments received. After analyzing public comment, USACE team members reclassified the Federal lands associated with Lavon Lake as described in Table 8.1.

**Table 8.1** Change in Land Classifications from Prior Classifications to New Classifications

Prior (1972) Land Classifications	Acres	New Land Classifications	Acres	Net Difference
Project Operations	131	Project Operations	508	377
Recreation – Intensive Use	2,971	High Density Recreation	2,007	(960)
Natural Area	527	Environmentally Sensitive Areas	4,319	3,792
Recreation – Low Density Use	6,403	Multiple Resource Management – Low Density Recreation	2,468	(3,935)
Wildlife Management	6,574	Multiple Resource Management – Wildlife Management	6,480	(98)
		Multiple Resource Management – Vegetation Management	824	824

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

**Table 8.2** Land Classification Changes and Justifications for New Land Classifications

Land Classification	Description of Changes	Justification
Project Operations	<p>The increase of Project Operations from 131 acres to 508 acres resulted from the following actions:</p> <ul style="list-style-type: none"> <li>• Conversion of former Intensive Use Recreation land near the USACE Office</li> <li>• Conversion of Low Density Use lands near the east end of the dam</li> <li>• Conversion of a narrow strip of Natural Area along the downstream toe of the dam.</li> </ul>	<p>All lands converted to Project Operations have historically been used primarily in support of critical operational requirements related to the primary missions of flood risk management and water conservation. The conversion of 377 acres to Project Operations will have no effect on current or projected public use.</p>
High Density Recreation	<p>Lands under the prior classification of Recreation-Intensive Use were converted to the new and similar classification of High Density Recreation but were reduced from 2,971 acres to 2,007 acres through the following changes:</p> <ul style="list-style-type: none"> <li>• Two park areas under the prior Recreation- Intensive Use</li> </ul>	<p>The four park areas that were converted to another, more appropriate classification had never been developed and are not suitable for future development. The small portions of parks were converted due to loss of acreage to shoreline erosion or, in the case of conversion to ESA, to recognize significant ecological value. The</p>



Land Classification	Description of Changes	Justification
	<p>classification were converted to Multiple Resource Management Lands (MRML) – Low Density Recreation.</p> <ul style="list-style-type: none"> <li>• Two park areas under the prior Recreation-Intensive Use classification were converted to MRML – Wildlife Management</li> <li>• Small portions of several areas under the prior Recreation-Intensive Use classification were converted to MRML-Low Density Recreation or Wildlife Management, or ESA.</li> </ul>	<p>conversion of these lands will have no effect on current or projected public use.</p>
Environmentally Sensitive Areas	<p>The classification of 4,319 acres as Environmentally Sensitive Areas resulted from the following land classification changes:</p> <ul style="list-style-type: none"> <li>• All lands under the prior classification of Natural Area were converted to ESA with the exception of a small portion converted to Project Operations and a small portion converted MRML – Wildlife Management.</li> <li>• Several parcels under the prior classification of Low Density Use were converted to ESA. These areas included lands along Wilson Creek, White Rock Creek, George Creek, and the rolling prairies between Collin Park and Brockdale Park</li> <li>• Large parcels of land under the prior classification of Operations – Wildlife were converted to ESA.</li> </ul>	<p>These classification changes were necessary for two reasons:</p> <ul style="list-style-type: none"> <li>• The simple change in nomenclature from Natural Area to ESA.</li> <li>• The need to recognize those areas having the highest ecological value. Included were areas of high value bottomland hardwood and riparian forest, and areas supporting high value native prairie. These conversions were supported by public comment and recommendations from the USFWS and TPWD. The conversion of these lands will have no effect on current or projected public use. Lands classified as ESA are given the highest order of protection among possible land classifications</li> </ul>

Land Classification	Description of Changes	Justification
MRML – Low Density Recreation	<p>The definition of the prior classification of Low Density Use is very comparable to the definition of the current classification of MRML – Low Density Recreation. Land classification changes resulted in a net reduction of these acres from 6,403 acres to the current 2,468 acres. This reduction resulted from the following changes:</p> <ul style="list-style-type: none"> <li>• Several parcels of land under the prior classification of Low Density Use were converted to ESA as describe under the ESA discussion in this table.</li> <li>• Several parcels were converted to MRML – Wildlife Management or Vegetation Management.</li> <li>• Several small portions of parks under the prior classification of Recreation – Intensive Use were converted to MRML – Low Density Recreation</li> </ul>	<p>The change from Low Density Use to ESA was necessary to recognize the high ecological and scenic values of the land in question and was supported by public comment and recommendations from USFWS and TPWD. The change to MRML – Wildlife or Vegetation Management was needed to better reflect historic management and how these lands will be managed in the future.</p> <p>The small portion of park areas converted to MRML – Low Density Recreation was necessary because these small parcels were never developed and are not suitable for future development due to limited size, exposure to shoreline erosion or low elevation resulting in frequent inundation. The conversion of these lands will have no effect on current or projected public use.</p>
MRML – Wildlife or Vegetation Management	<p>The classification of 6,480 acres to MRML – Wildlife Management and 824 acres to MRML – Vegetation Management resulted from the following changes:</p> <ul style="list-style-type: none"> <li>• Lands under the prior classification of Operations – Wildlife Management were converted to MRML – Wildlife Management or to ESA.</li> <li>• Several parcels of land under the prior classification of Operations – Low Density Use were converted to MRML – Wildlife Management or to MRML – Vegetation.</li> </ul>	<p>The change from the prior Operations – Wildlife Management classification to MRML – Wildlife Management was a simple change to the current nomenclature. The change to ESA was needed to reflect the high ecological value of the land in question.</p> <p>The change from the prior classification of Operations – Low Density Use to MRML – Wildlife or Vegetation Management was needed to better reflect historic management patterns and future management. The conversion of these lands will have no effect on current or projected public use.</p>

## **CHAPTER 9 - REFERENCES**

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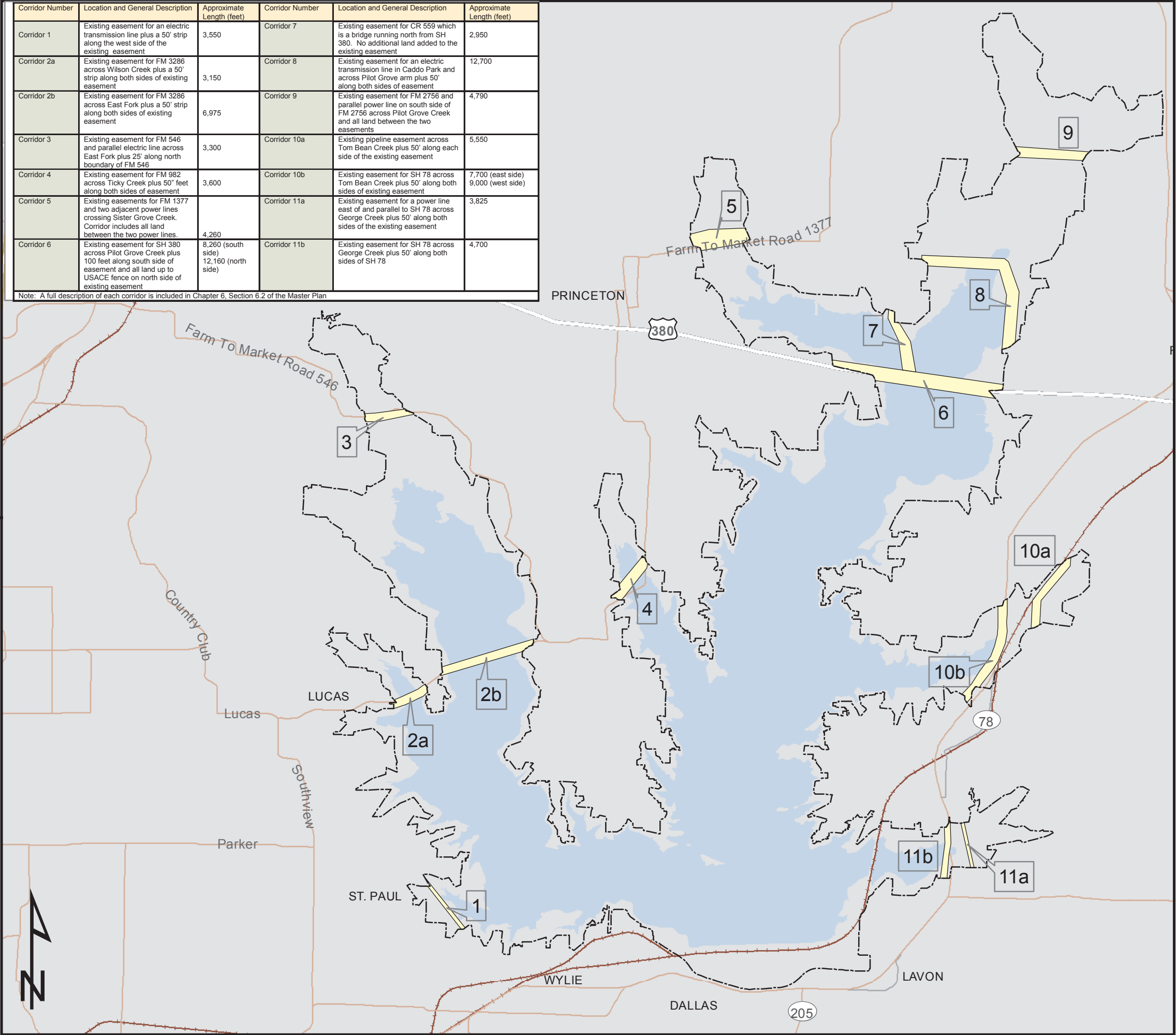
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## **Appendix A - Maps**



Corridor Number	Location and General Description	Approximate Length (feet)	Corridor Number	Location and General Description	Approximate Length (feet)
Corridor 1	Existing easement for an electric transmission line plus a 50' strip along the west side of the existing easement	3,550	Corridor 7	Existing easement for CR 559 which is a bridge running north from SH 380. No additional land added to the existing easement	2,950
Corridor 2a	Existing easement for FM 3286 across Wilson Creek plus a 50' strip along both sides of existing easement	3,150	Corridor 8	Existing easement for an electric transmission line in Caddo Park and across Pilot Grove arm plus 50' along both sides of easement	12,700
Corridor 2b	Existing easement for FM 3286 across East Fork plus a 50' strip along both sides of existing easement	6,975	Corridor 9	Existing easement for FM 2756 and parallel power line on south side of FM 2756 across Pilot Grove Creek and all land between the two easements	4,790
Corridor 3	Existing easement for FM 546 and parallel electric line across East Fork plus 25' along north boundary of FM 546	3,300	Corridor 10a	Existing pipeline easement across Tom Bean Creek plus 50' along each side of the existing easement	5,550
Corridor 4	Existing easement for FM 982 across Ticky Creek plus 50' feet along both sides of easement	3,600	Corridor 10b	Existing easement for SH 78 across Tom Bean Creek plus 50' along both sides of existing easement	7,700 (east side) 9,000 (west side)
Corridor 5	Existing easements for FM 1377 and two adjacent power lines crossing Sister Grove Creek. Corridor includes all land between the two power lines.	4,260	Corridor 11a	Existing easement for a power line east of and parallel to SH 78 across George Creek plus 50' along both sides of the existing easement	3,825
Corridor 6	Existing easement for SH 380 across Pilot Grove Creek plus 100 feet along south side of easement and all land up to USACE fence on north side of existing easement	8,260 (south side) 12,160 (north side)	Corridor 11b	Existing easement for SH 78 across George Creek plus 50' along both sides of SH 78	4,700

Note: A full description of each corridor is included in Chapter 6, Section 6.2 of the Master Plan



- PROJECT BOUNDARY
- UTILITY CORRIDOR



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

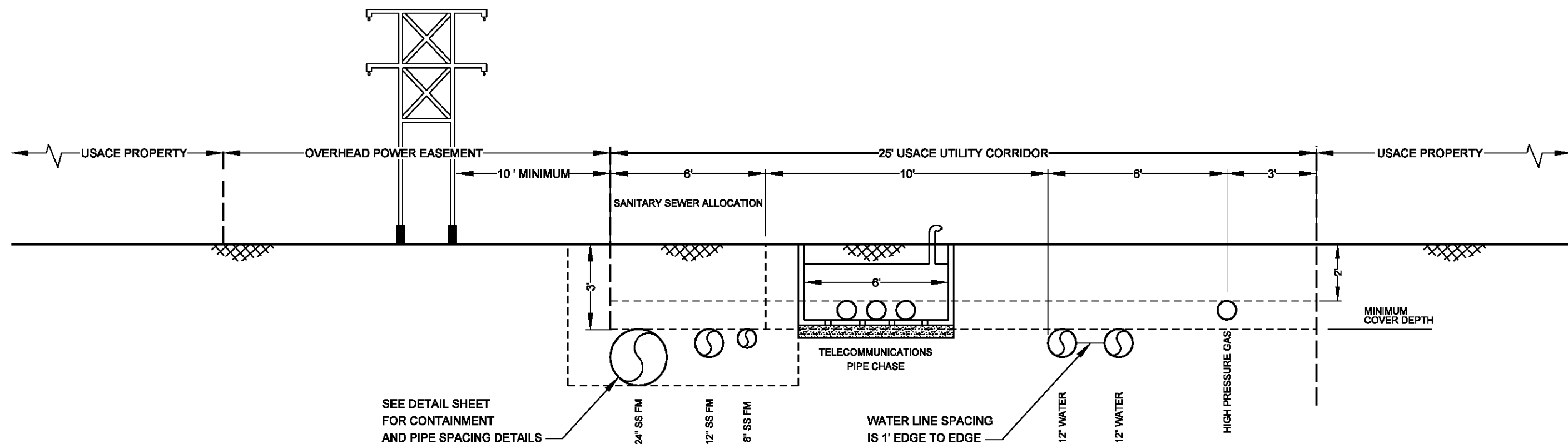
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE  
LAVON LAKE MASTER PLAN  
UITLITY CORRIDOR MAP



DATE:  
MAY 2016

MAP NO.  
LA15MP-OU-01



**NOTES:**

1. CONTAIN ALL WASTE WATER LINES: SEE DETAIL SHEET.
2. USE TRENCH BOXES <20' FROM POWER POLES.
3. SEWERS SHALL BE LOCATED NO CLOSER THAN 10' HORIZONTALLY TO POTABLE WATER LINES.
4. IN AREAS WITH HIGH-VALUE NATURAL RESOURCES AND NATURAL AESTHETICS, INCLUDING ENVIRONMENTALLY SENSITIVE AREAS, WILDLIFE MANAGEMENT AREAS AND RECREATION AREAS, THE USE OF SUBSURFACE BORING MAY BE REQUIRED TO AVOID DAMAGE TO THE RESOURCES.
5. THIS DESIGN OPTION IS FOR ADVISORY PURPOSES ONLY. APPLICANTS SHALL PROVIDE ENGINEERING DRAWINGS.

**OPTION 7: MULTIPLE FORCE MAINS  
AND MULTIPLE WATER LINES  
CROSS SECTIONAL VIEW**

**NOT TO SCALE**



U. S. ARMY CORPS OF ENGINEERS  
FORT WORTH DISTRICT

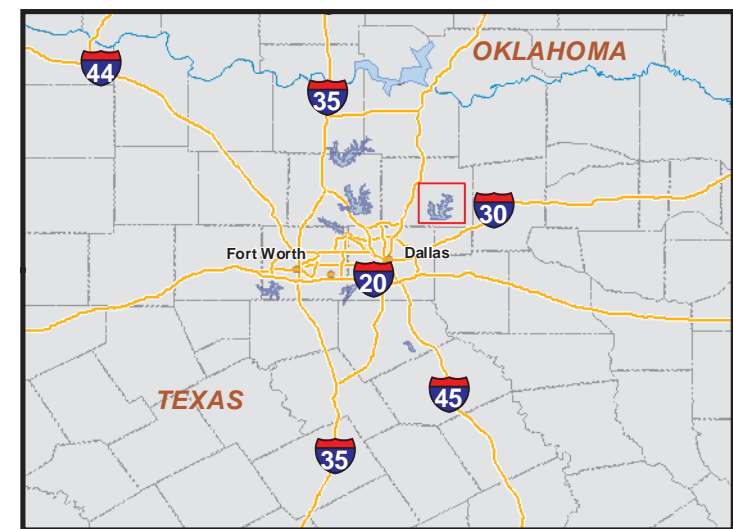
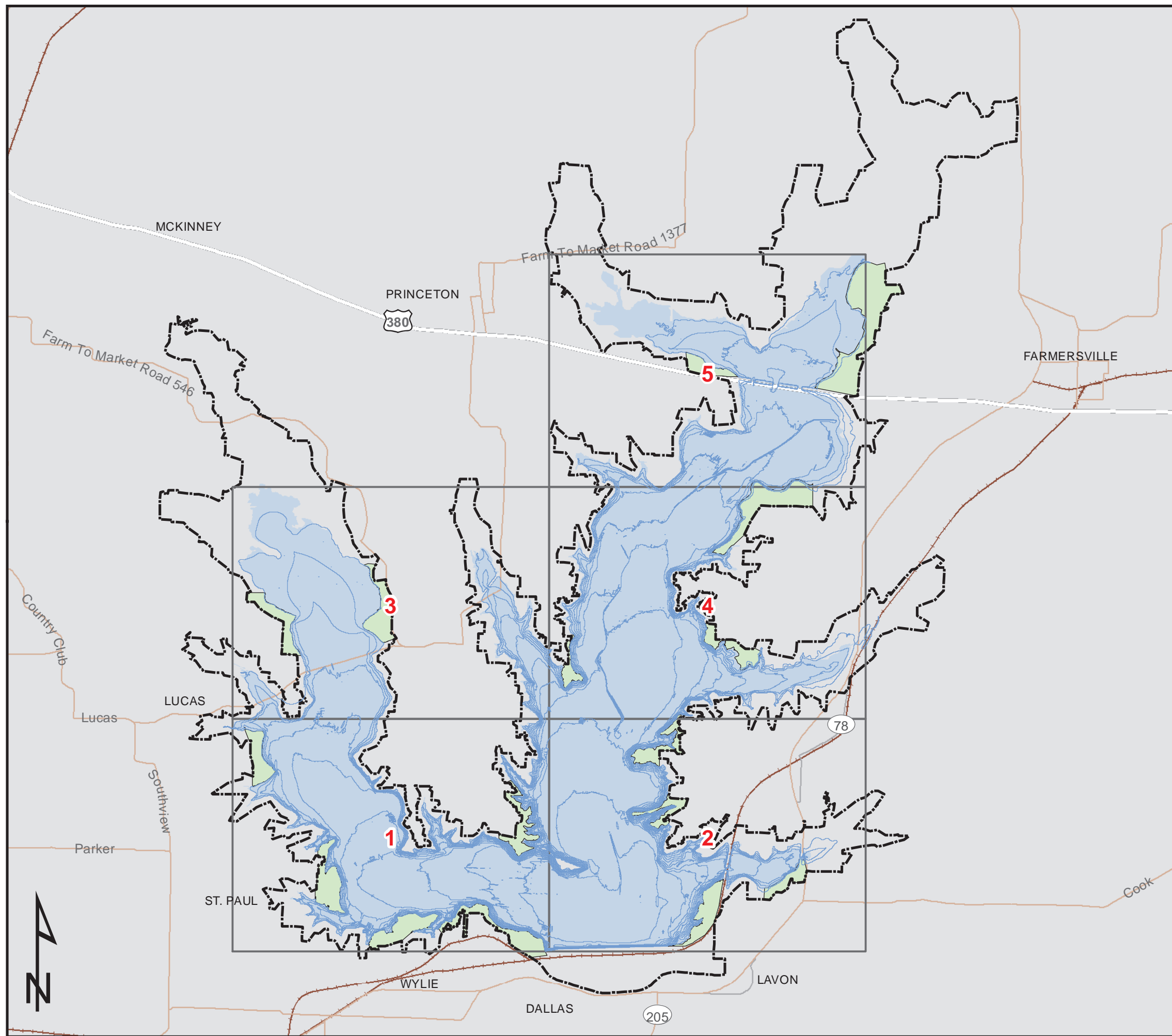
**USACE UTILITY CORRIDORS**




UTILITY EASEMENT  
INSTALLATION OPTIONS

JUNE 2003

OPTION 7





-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

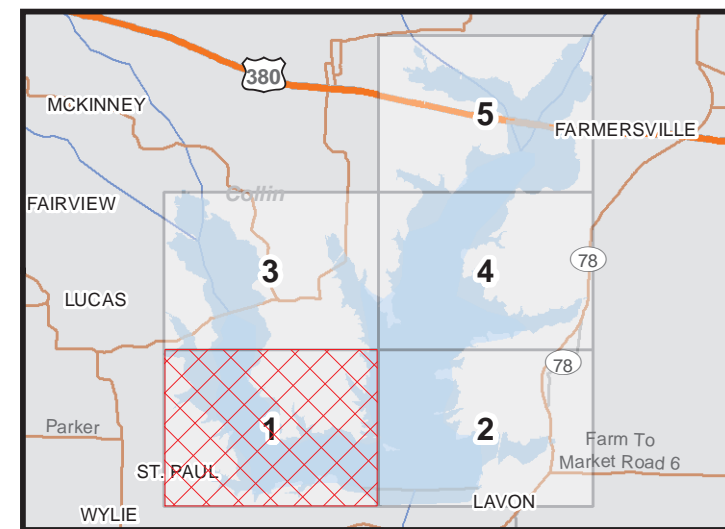
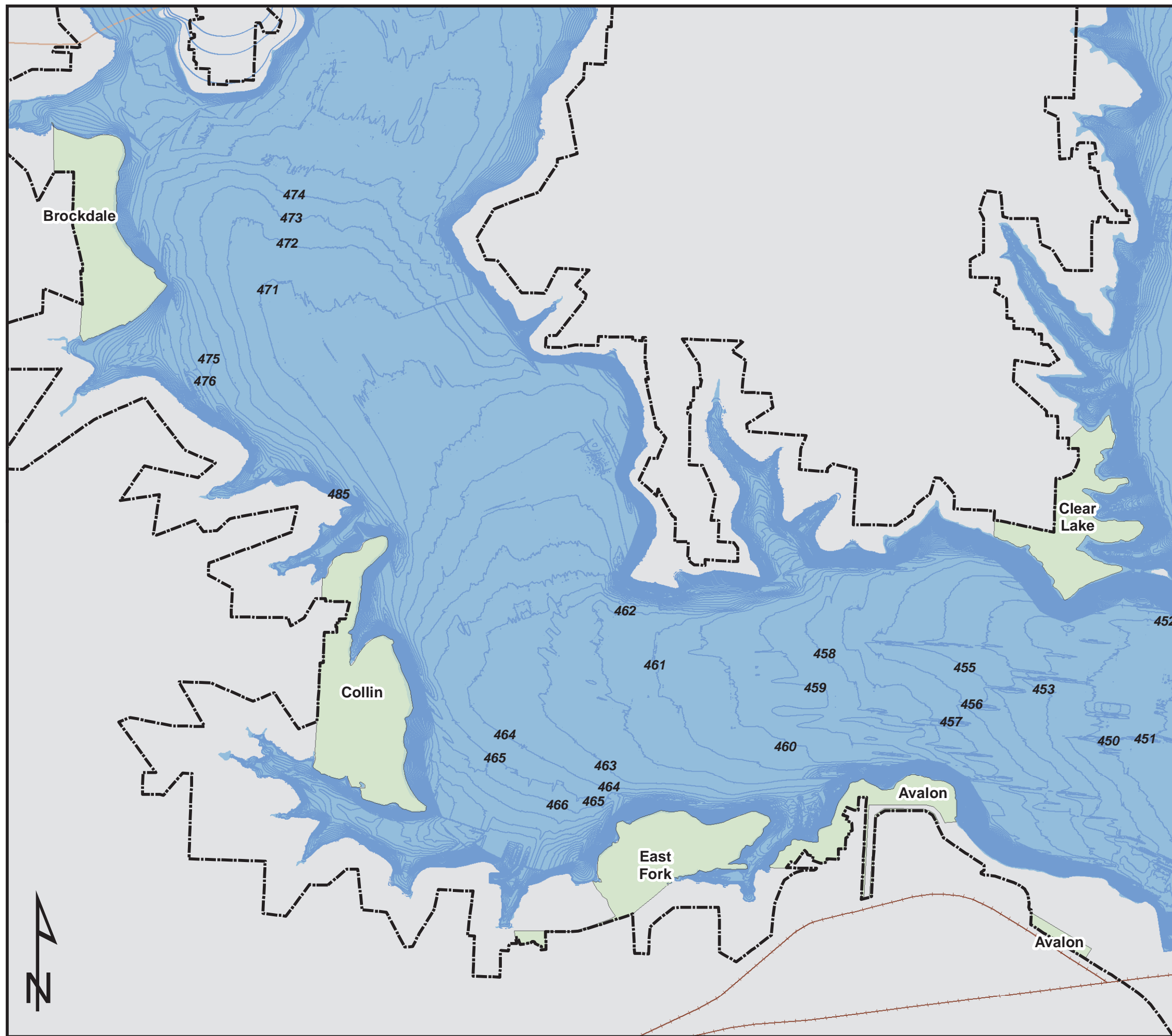
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS


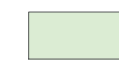

LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 00)

0 1 2 3  
MILES

DATE:  
MAY 2016

MAP NO.  
LA15MP-OD-00



-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

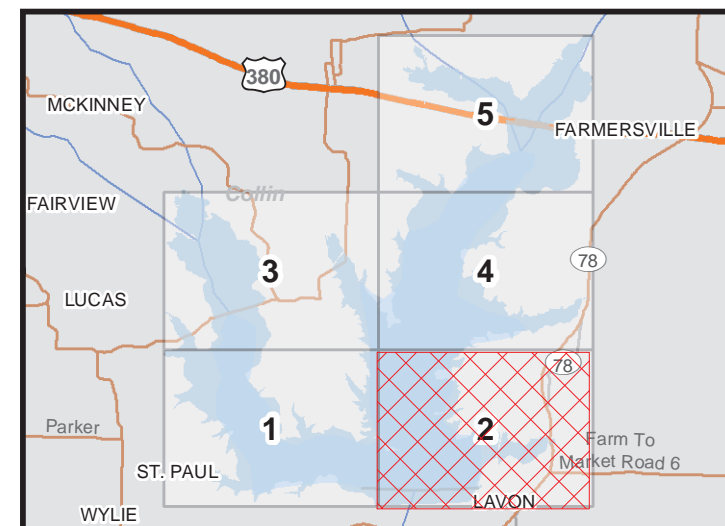
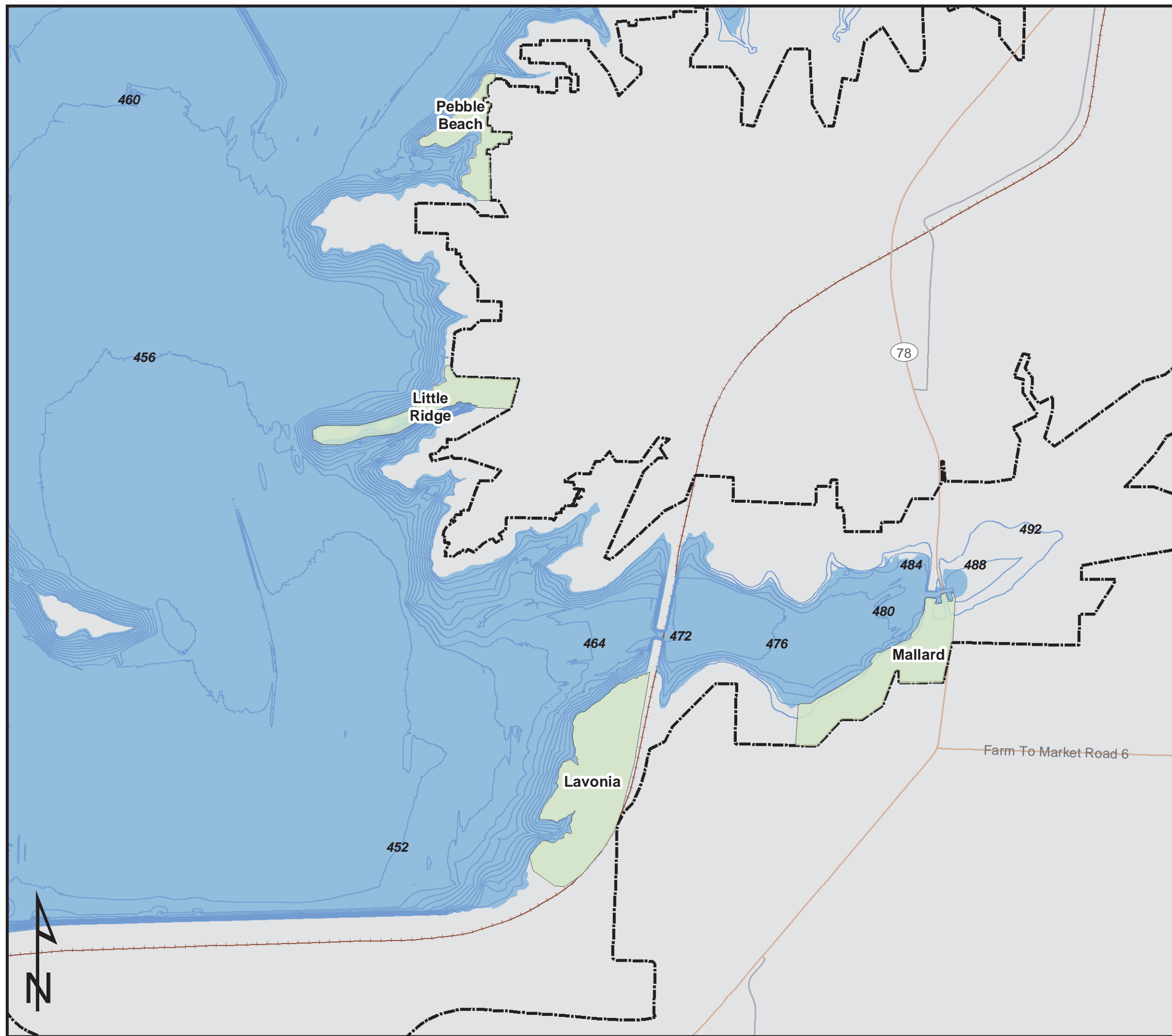
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS




LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 01)

0 1,700 3,400 5,100  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OD-01



-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

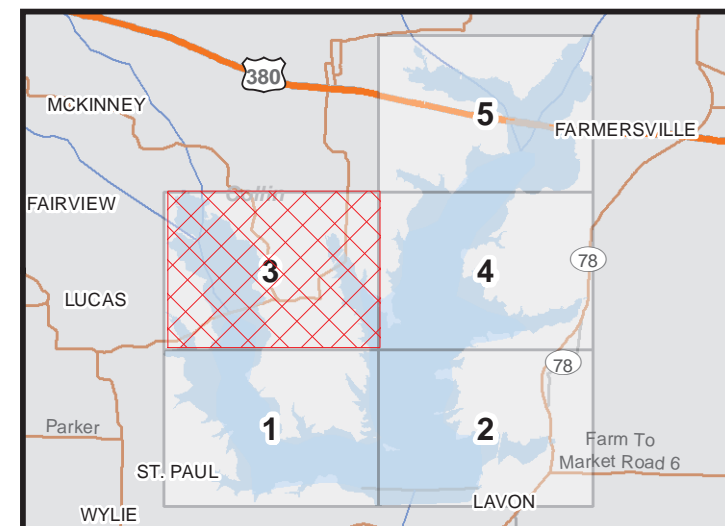
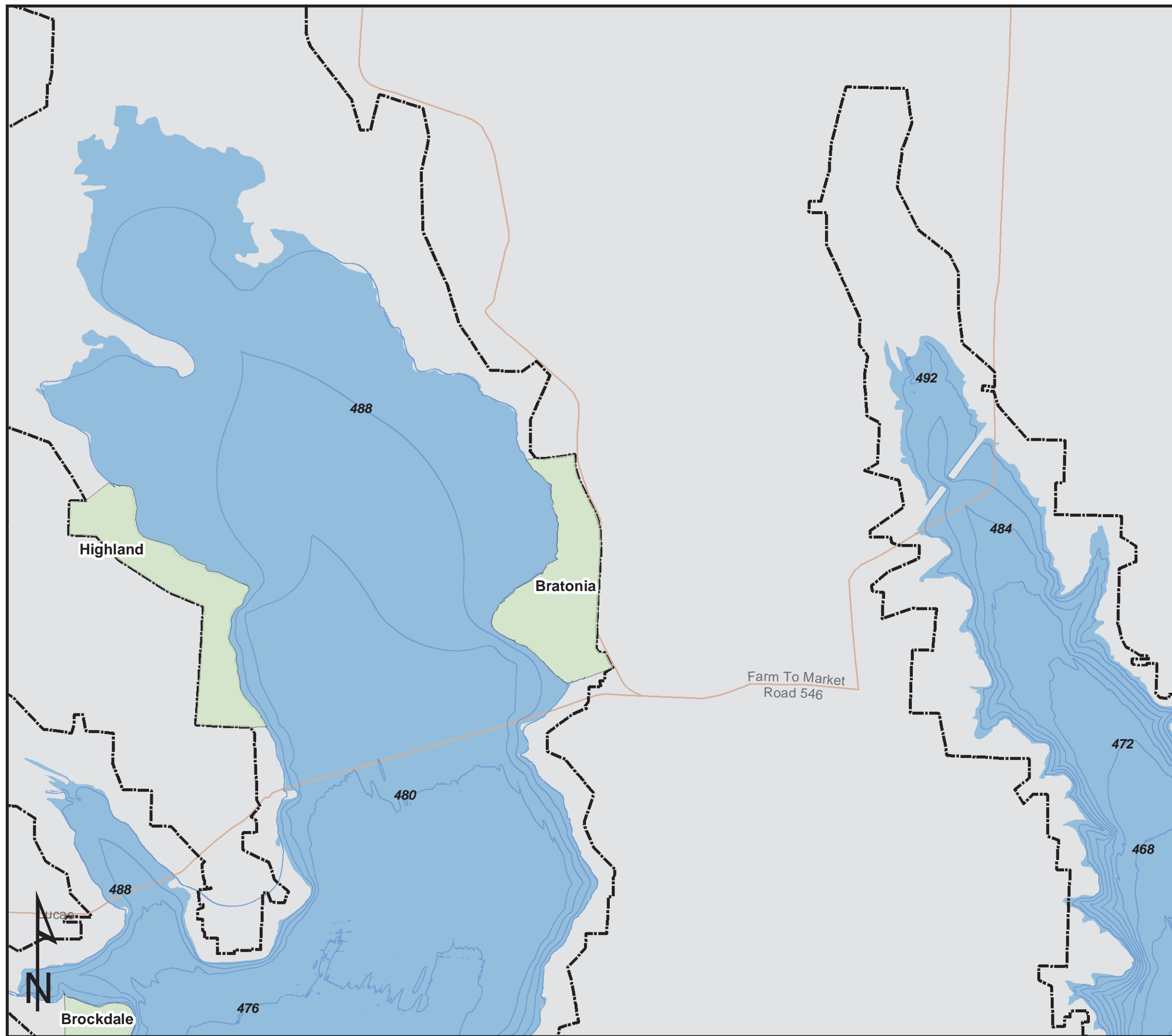
LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 02)




0 1,700 3,400 5,100  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OD-02





-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

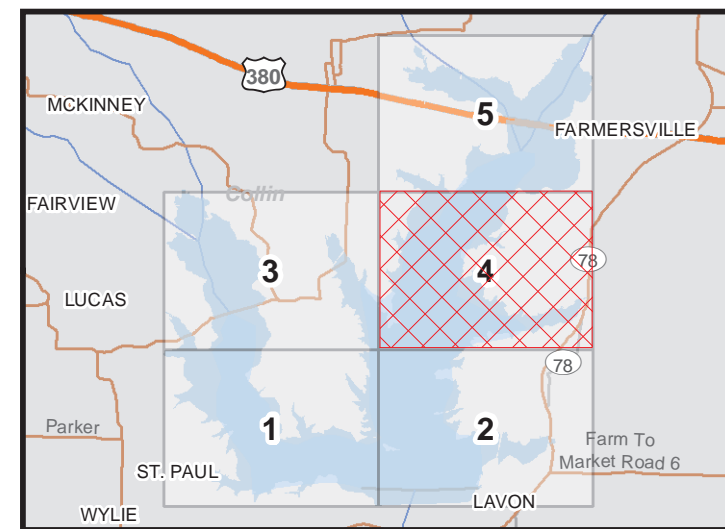
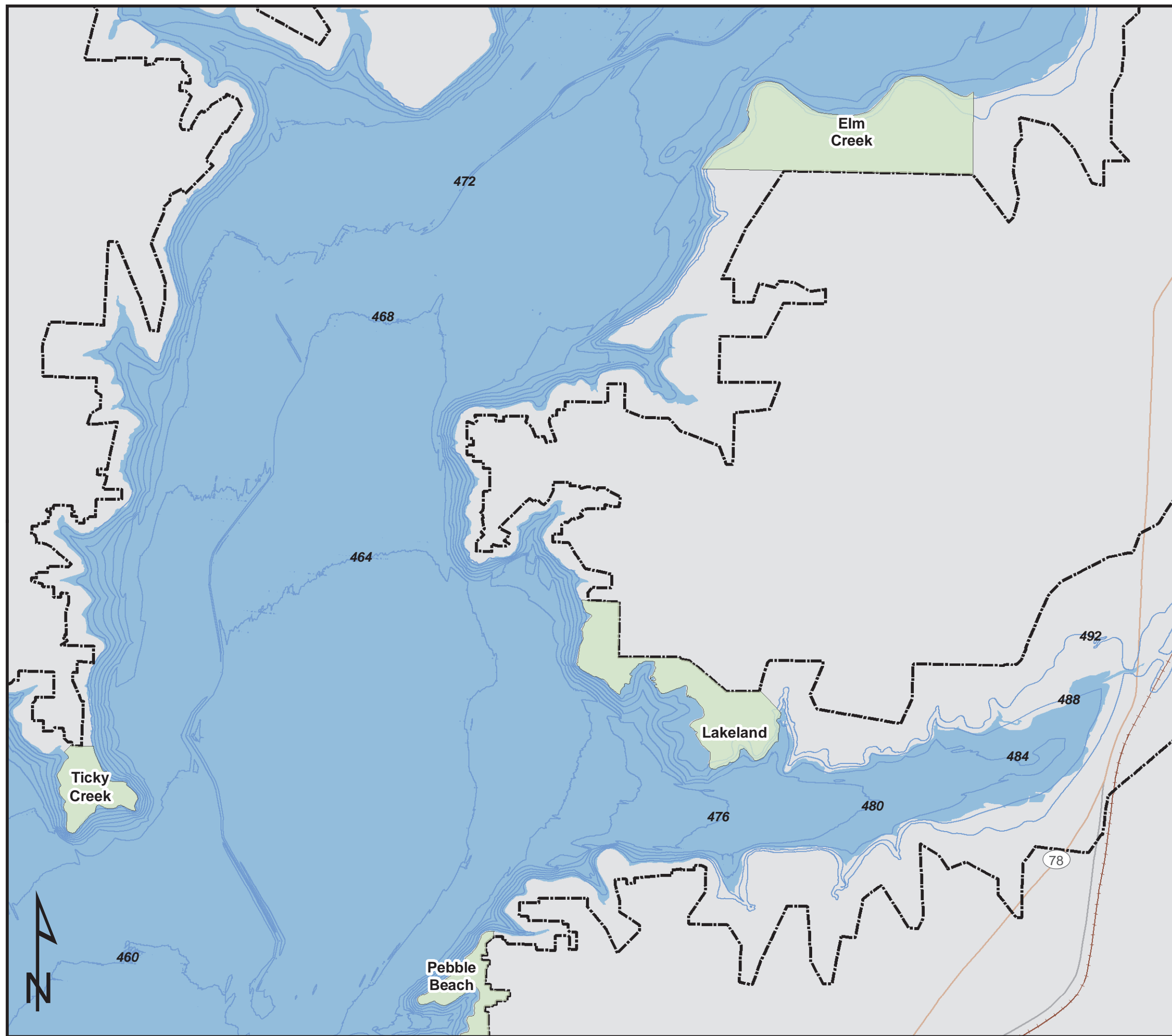
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS




LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 03)

0 1,700 3,400 5,100  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OD-03



-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

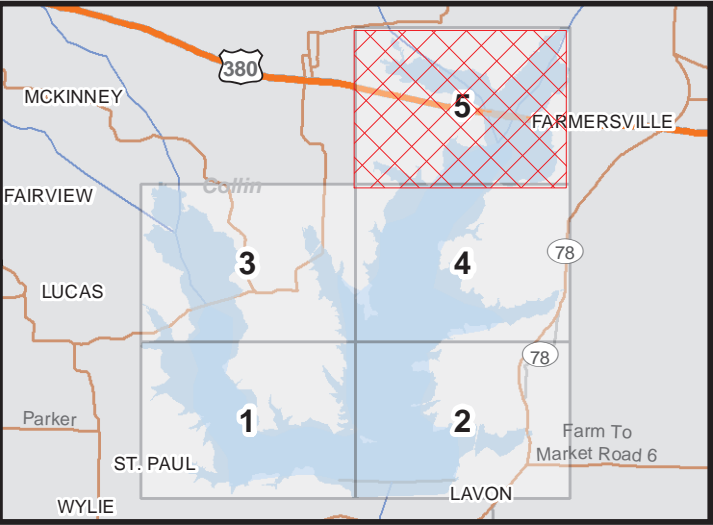
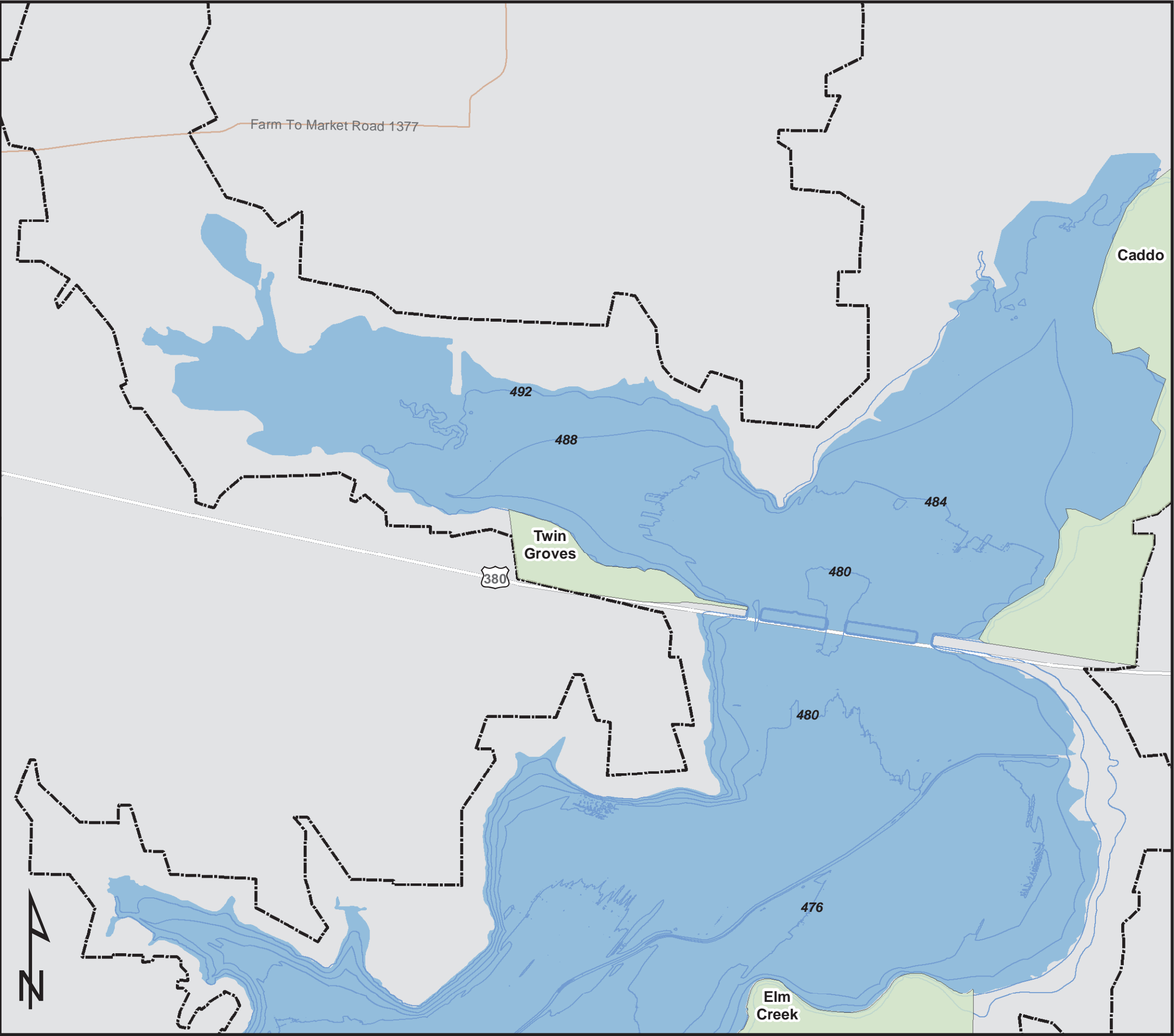
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS




LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 04)

0 1,700 3,400 5,100  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OD-04



-  FEE BOUNDARY
-  RECREATION AREA
-  DEPTH CONTOUR



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

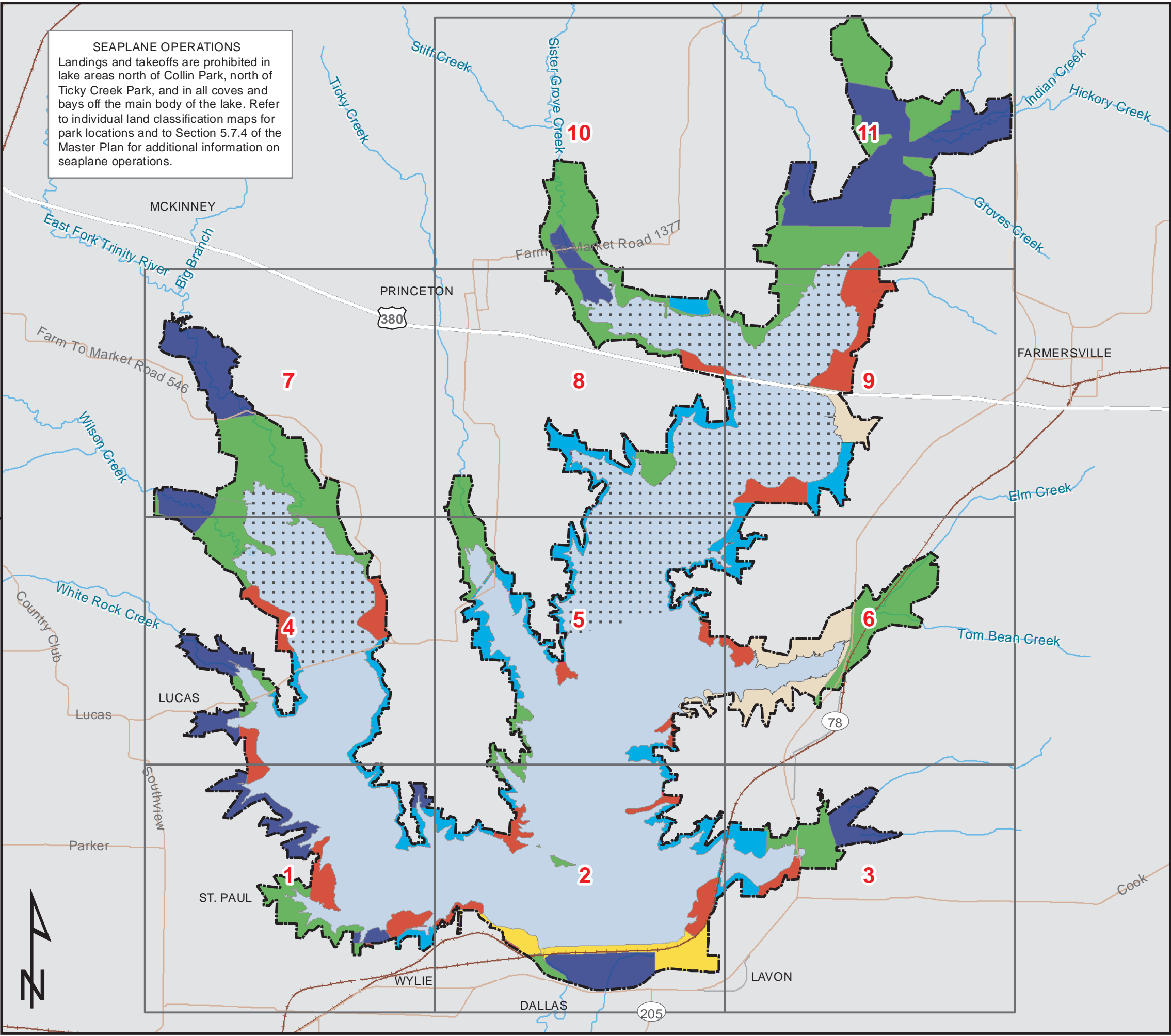
LAVON LAKE  
LAVON LAKE MASTER PLAN  
DEPTH CONTOUR INDEX (SHEET 05)



0 1,700 3,400 5,100  
FEET

DATE:  
MAY 2016








MAP NO.  
LA15MP-OD-05


**SEAPLANE OPERATIONS**  
Landings and takeoffs are prohibited in lake areas north of Collin Park, north of Ticky Creek Park, and in all coves and bays off the main body of the lake. Refer to individual land classification maps for park locations and to Section 5.7.4 of the Master Plan for additional information on seaplane operations.



 PROJECT BOUNDARY  
 UNCLEARED WATER SURFACE

**LAND CLASSIFICATION**

-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
-  WATER SURFACE



**U.S. ARMY CORPS OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

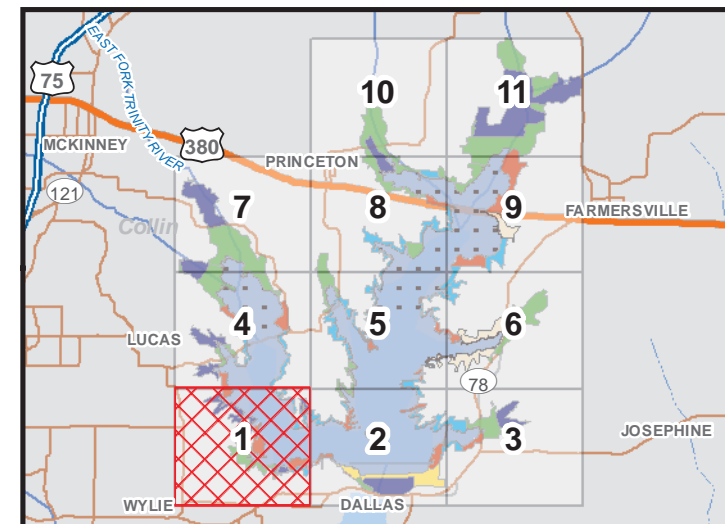
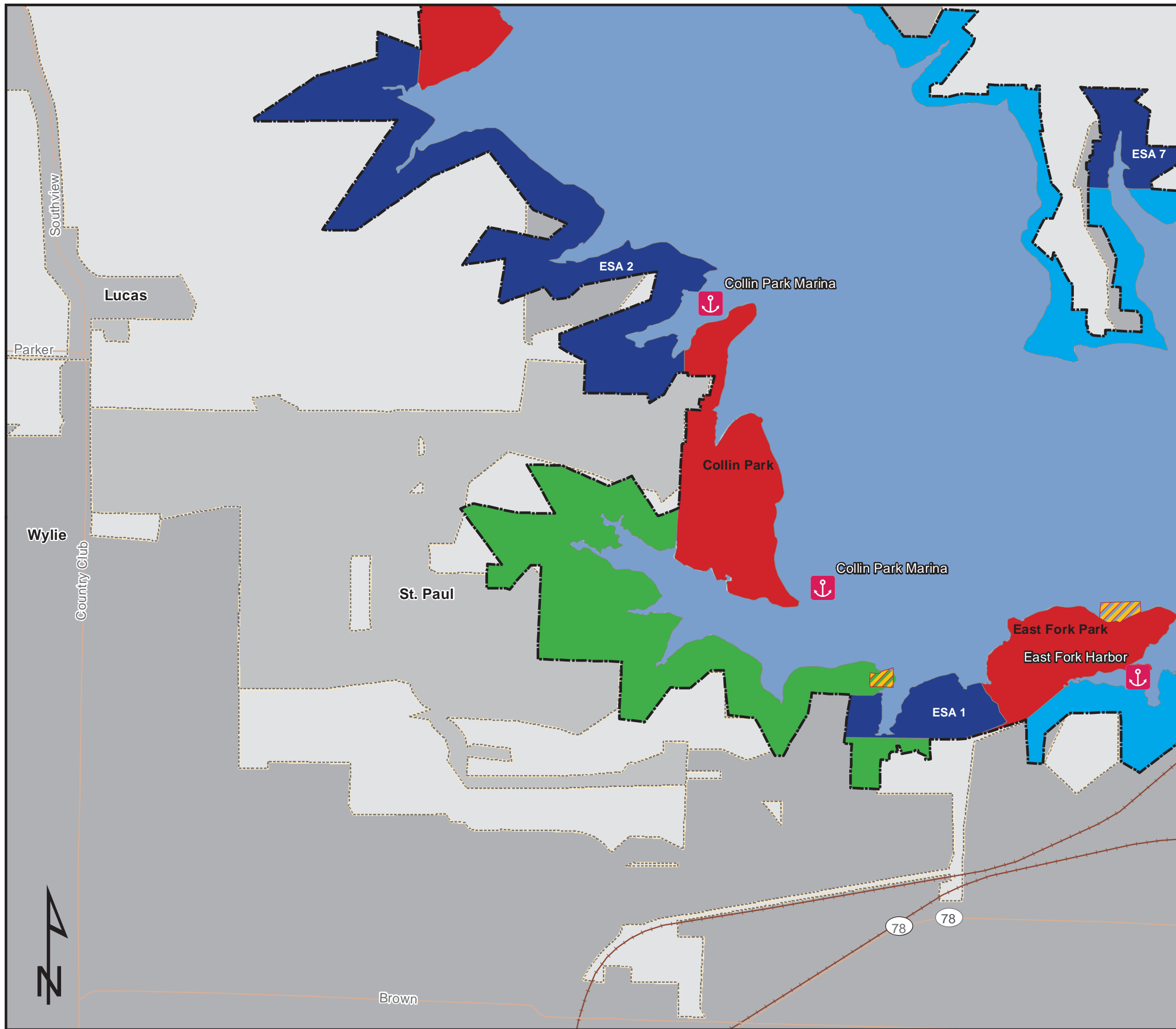
LAND CLASSIFICATION INDEX (SHEET 00)

0 1 2 3 MILES

DATE: MAY 2016

MAP NO. LA15MP-OC-00





-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

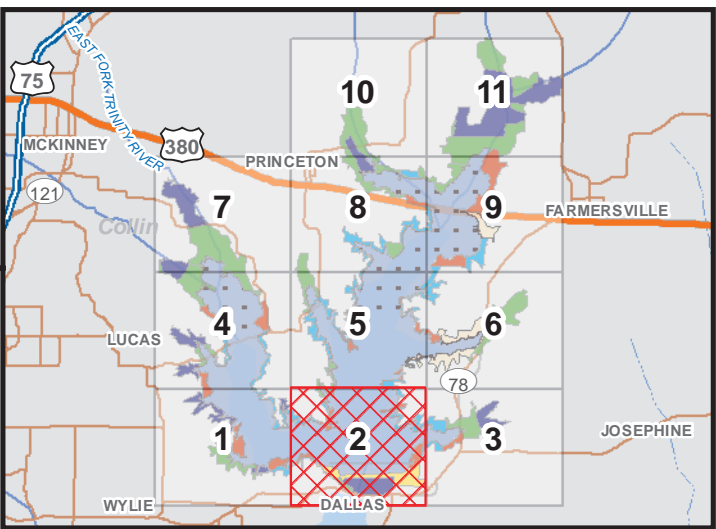
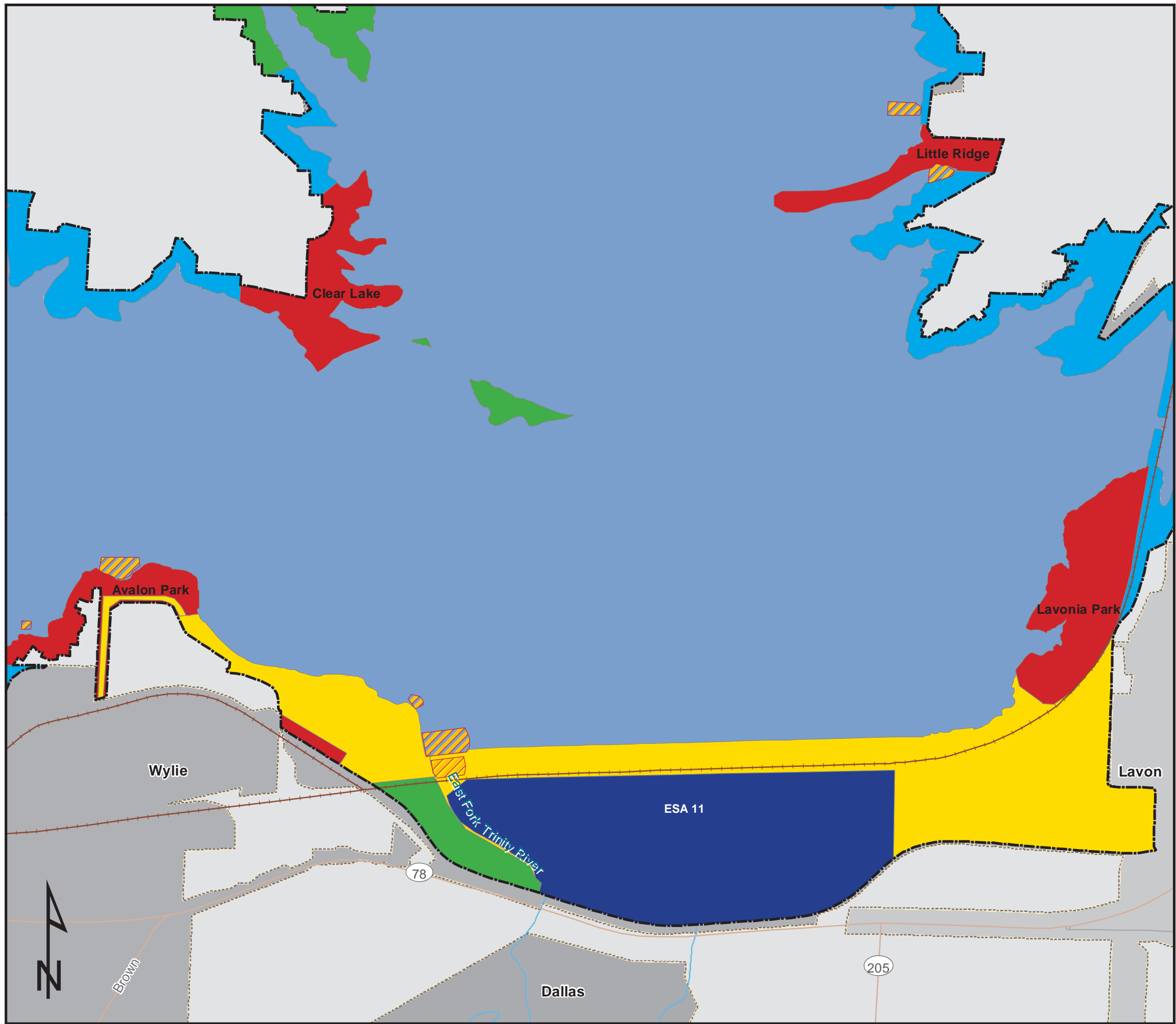
LAND CLASSIFICATION (SHEET 01)











0 1,500 3,000 4,500  
FEET


DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-01





-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

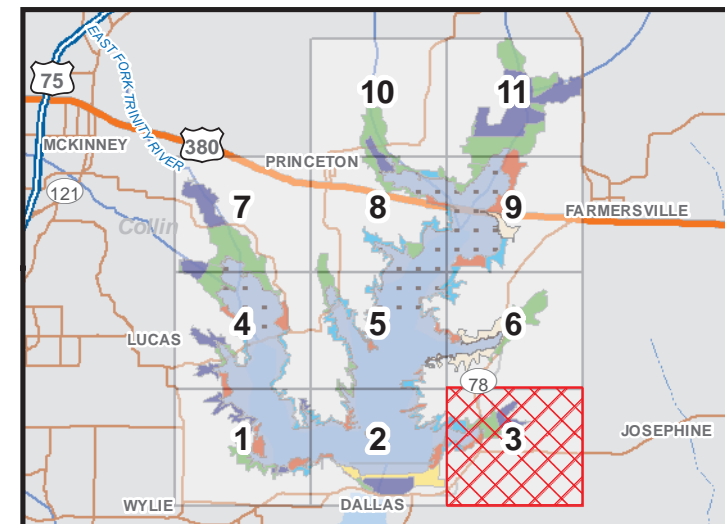
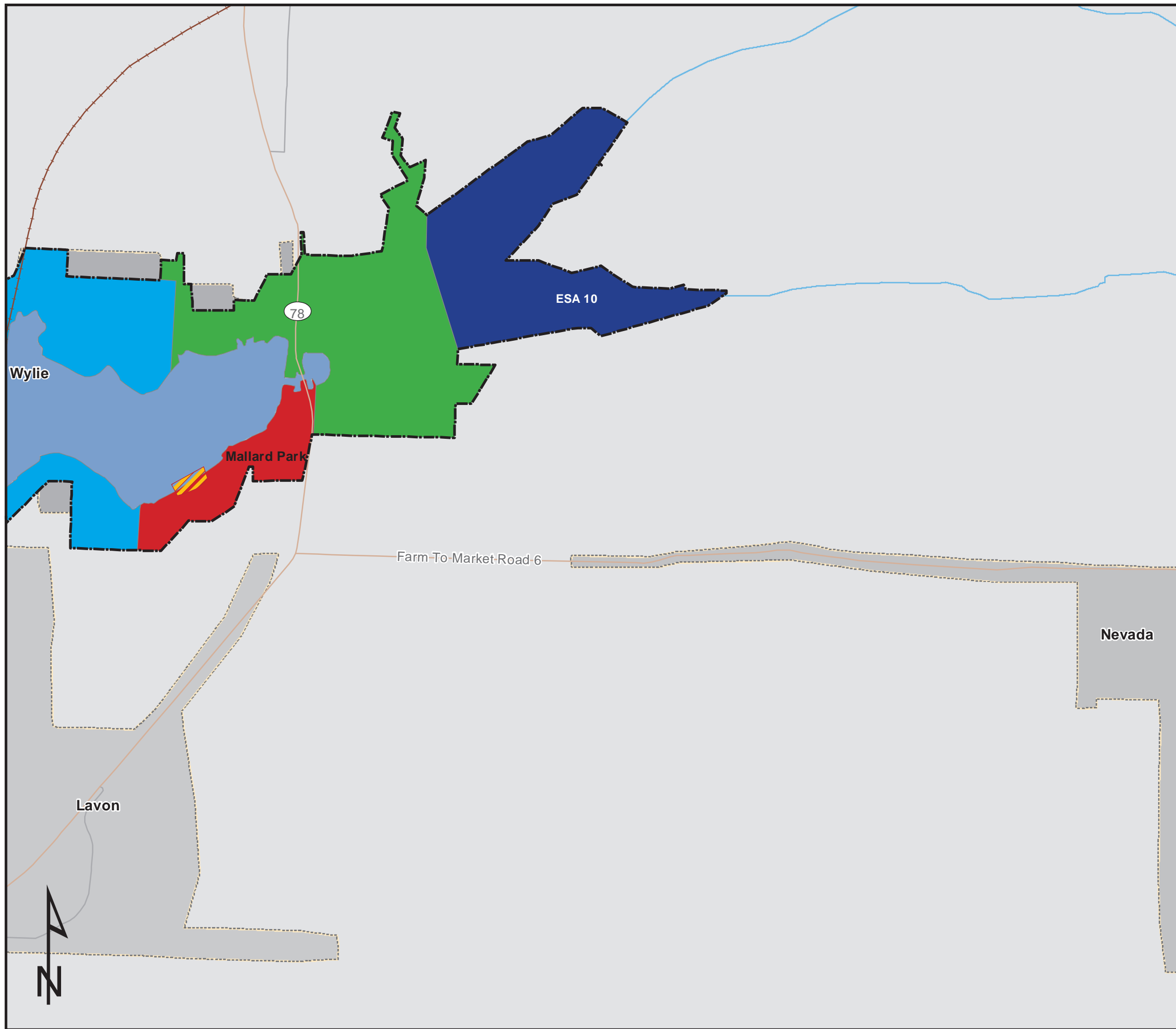
LAVON LAKE  
LAVON LAKE MASTER PLAN  
LAND CLASSIFICATION (SHEET 02)

0150030004500


FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-02



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

LAVON LAKE MASTER PLAN

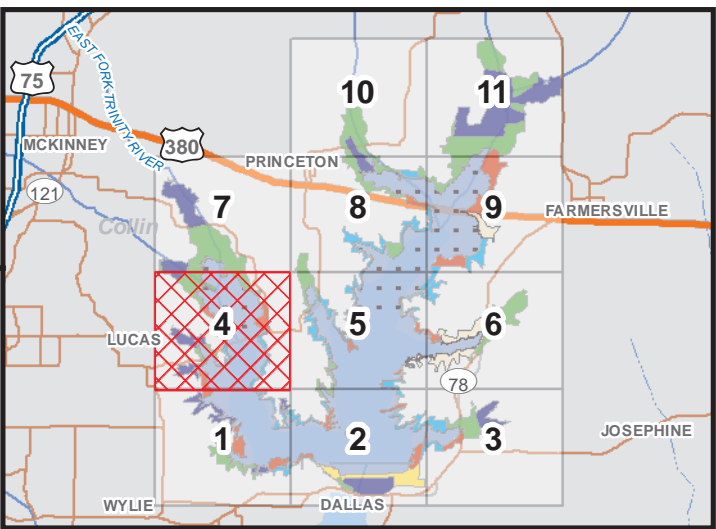
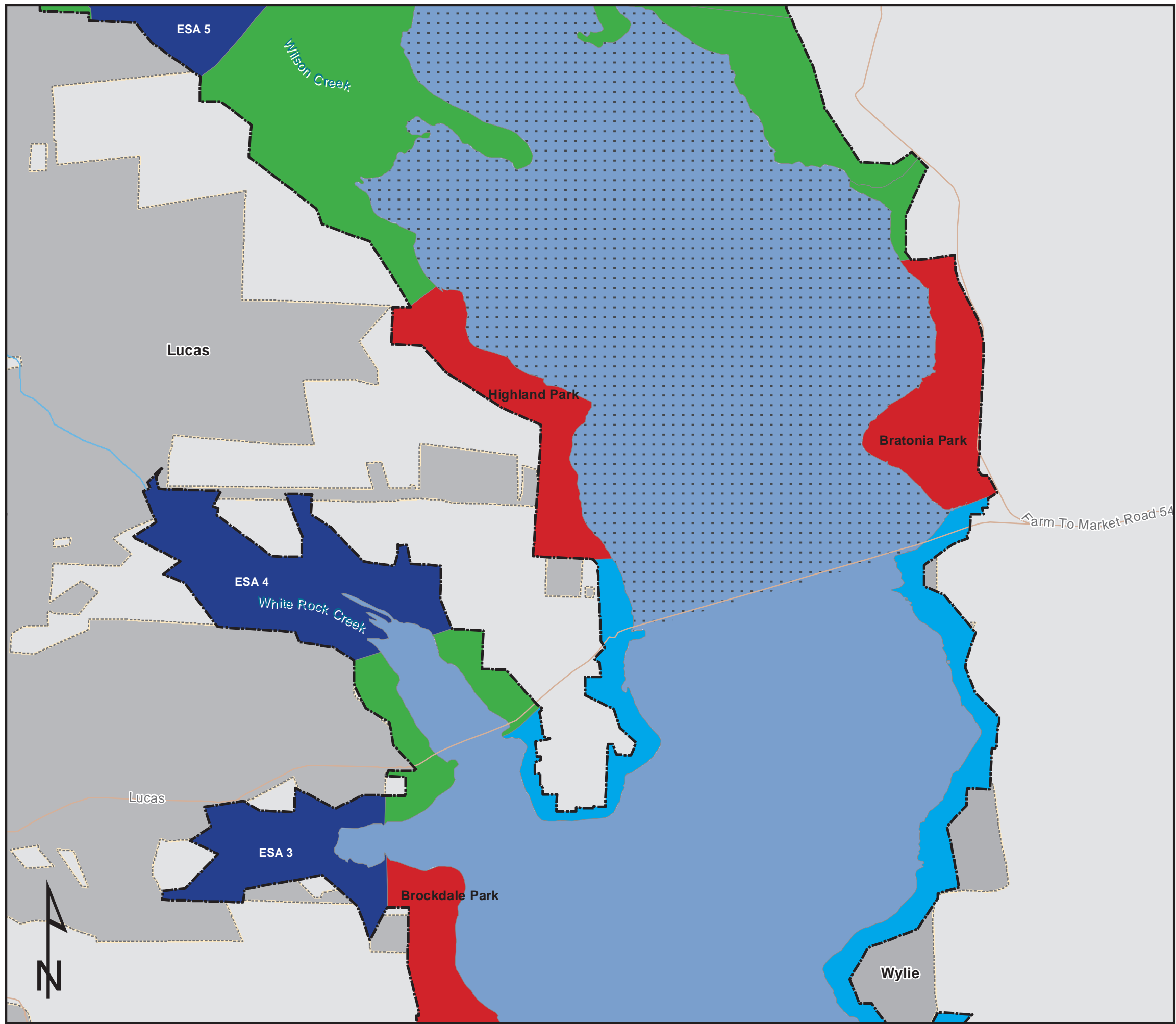
LAND CLASSIFICATION (SHEET 03)











01,5003,0004,500


FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-03



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

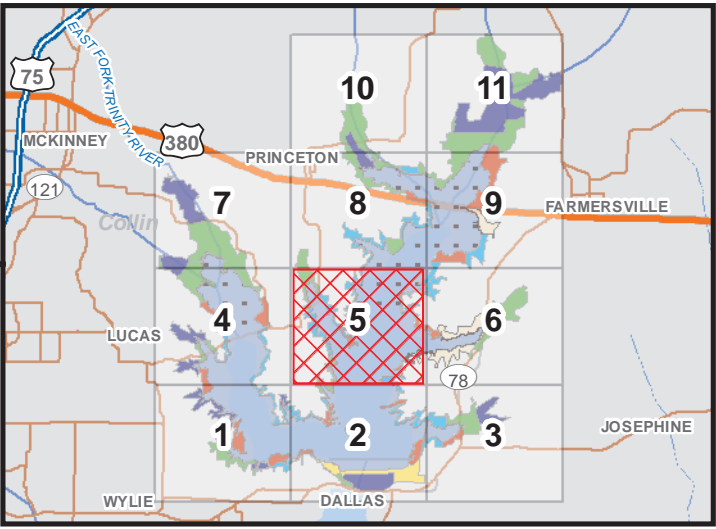
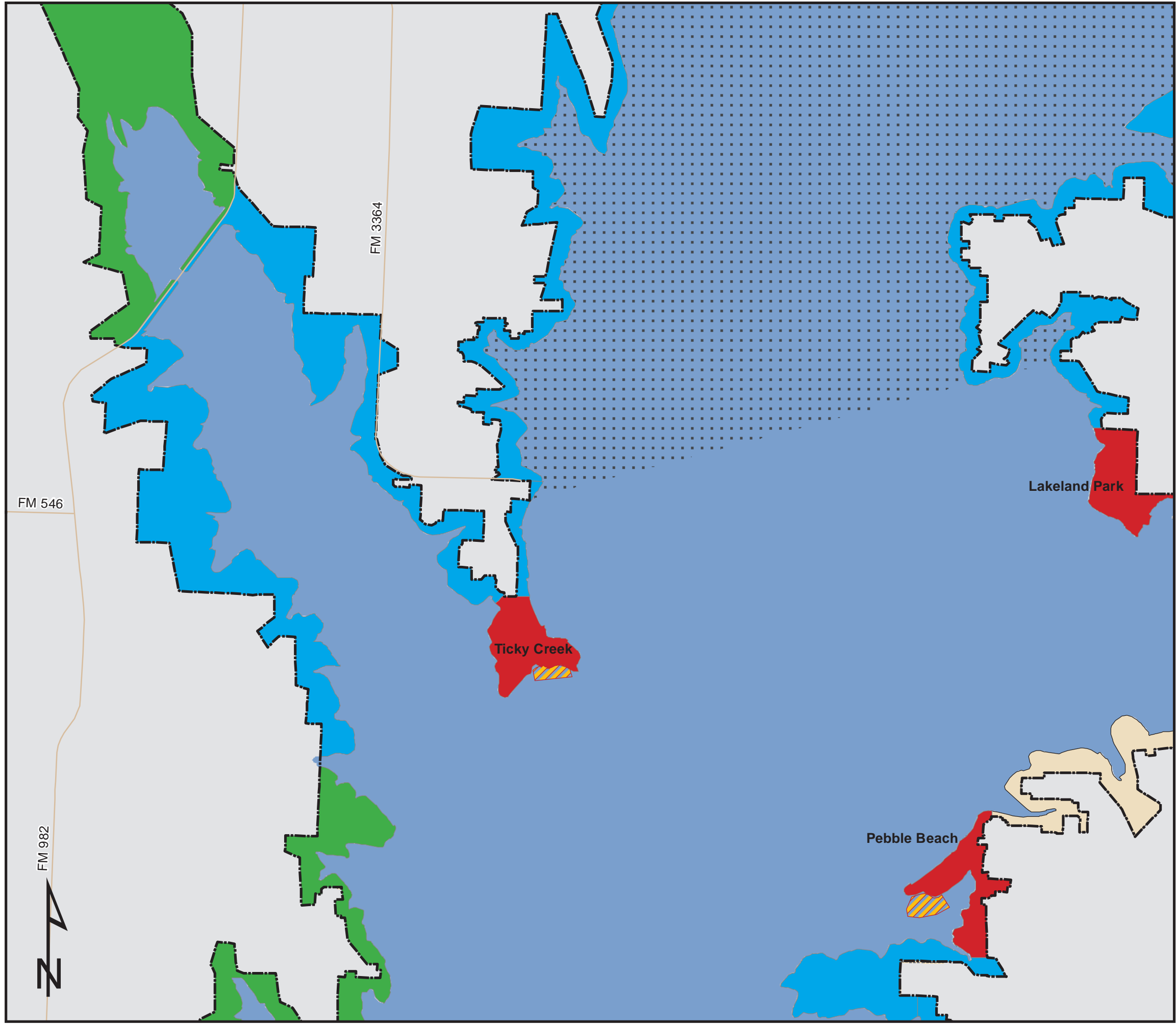
LAND CLASSIFICATION (SHEET 04)












01,5003,0004,500


FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-04



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



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

**FORT WORTH DISTRICT**

LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

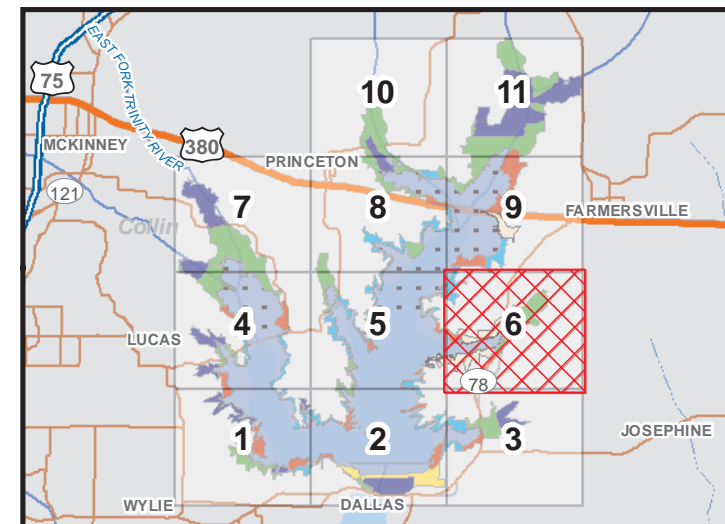
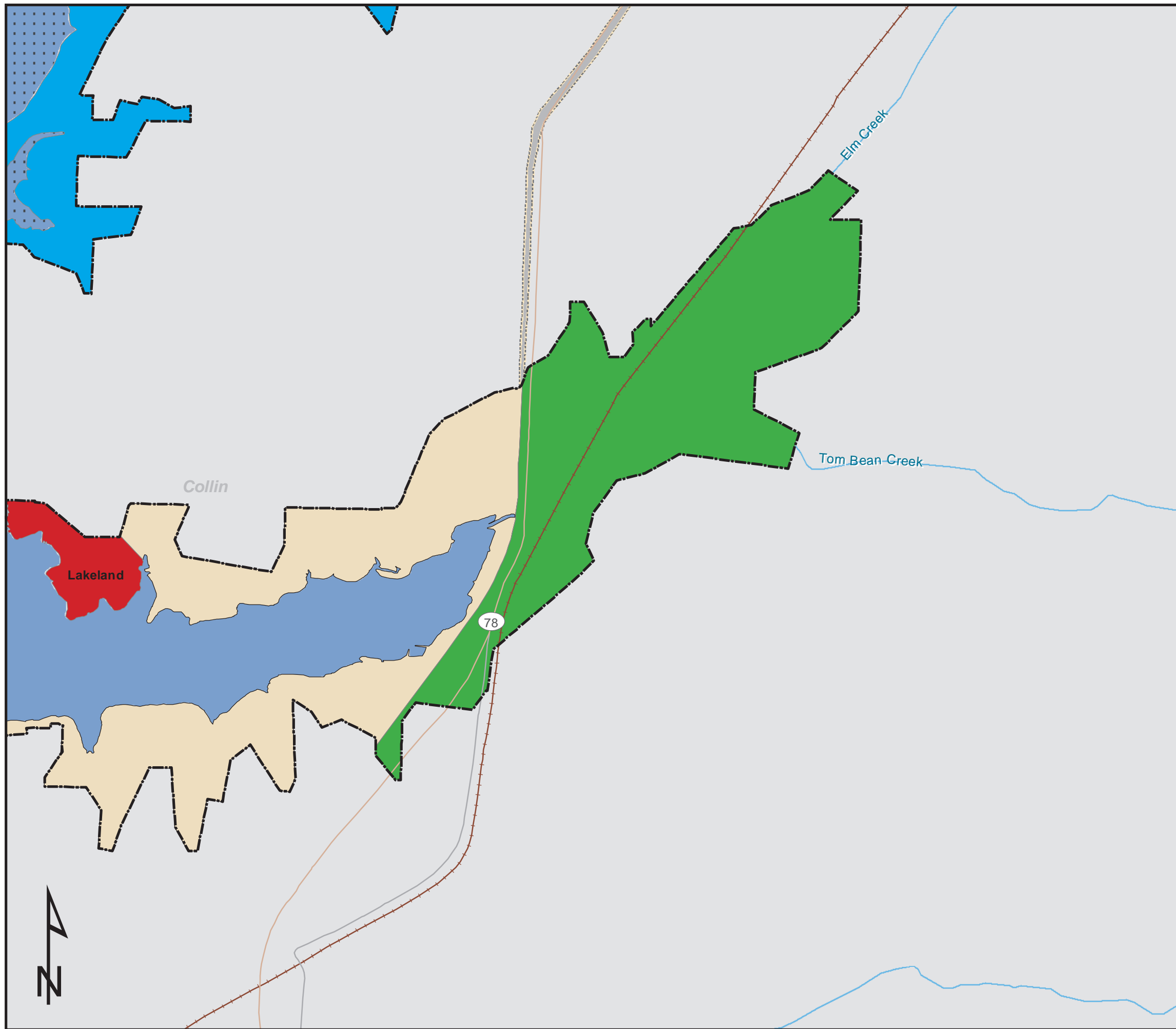
LAVON LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 05)

0 1,400 2,800 4,200  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-05



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE EAST FORK TRINITY RIVER, TEXAS

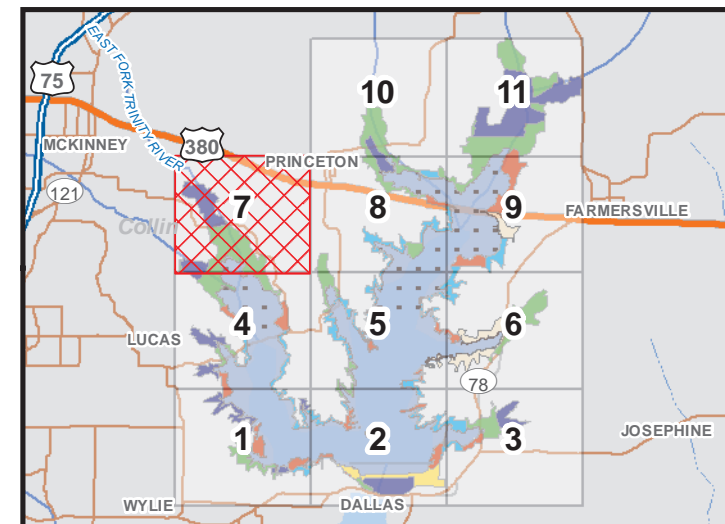
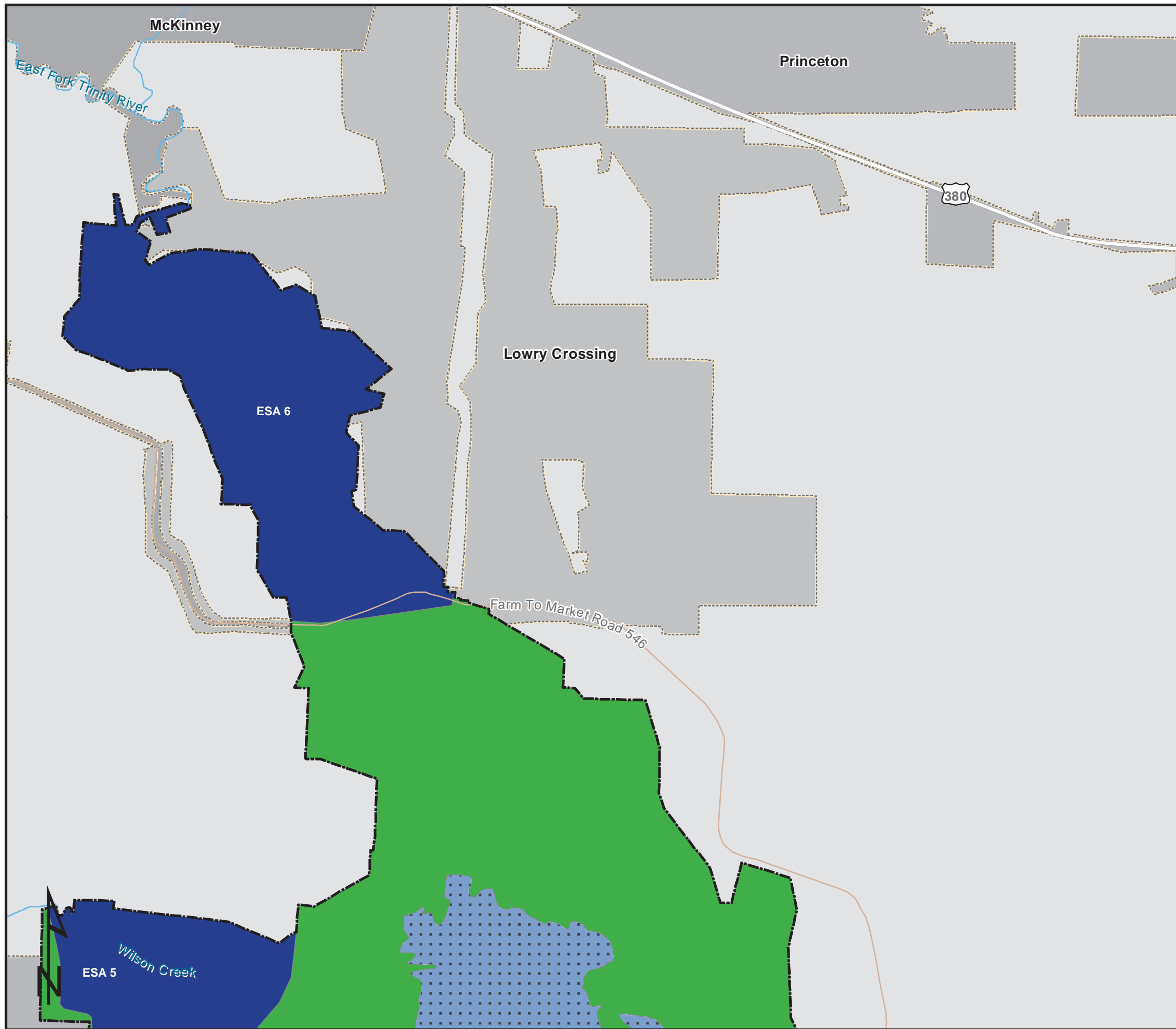
LAVON LAKE  
LAVON LAKE MASTER PLAN  
LAND CLASSIFICATION (SHEET 06)

0 1,600 3,200 4,800  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-06





-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

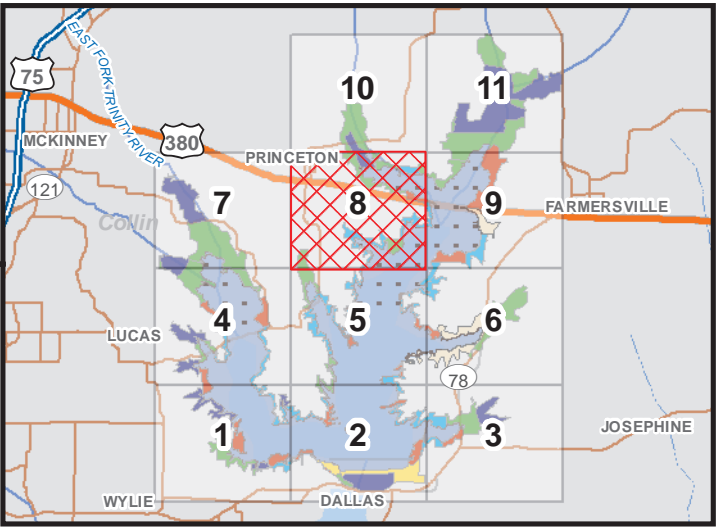
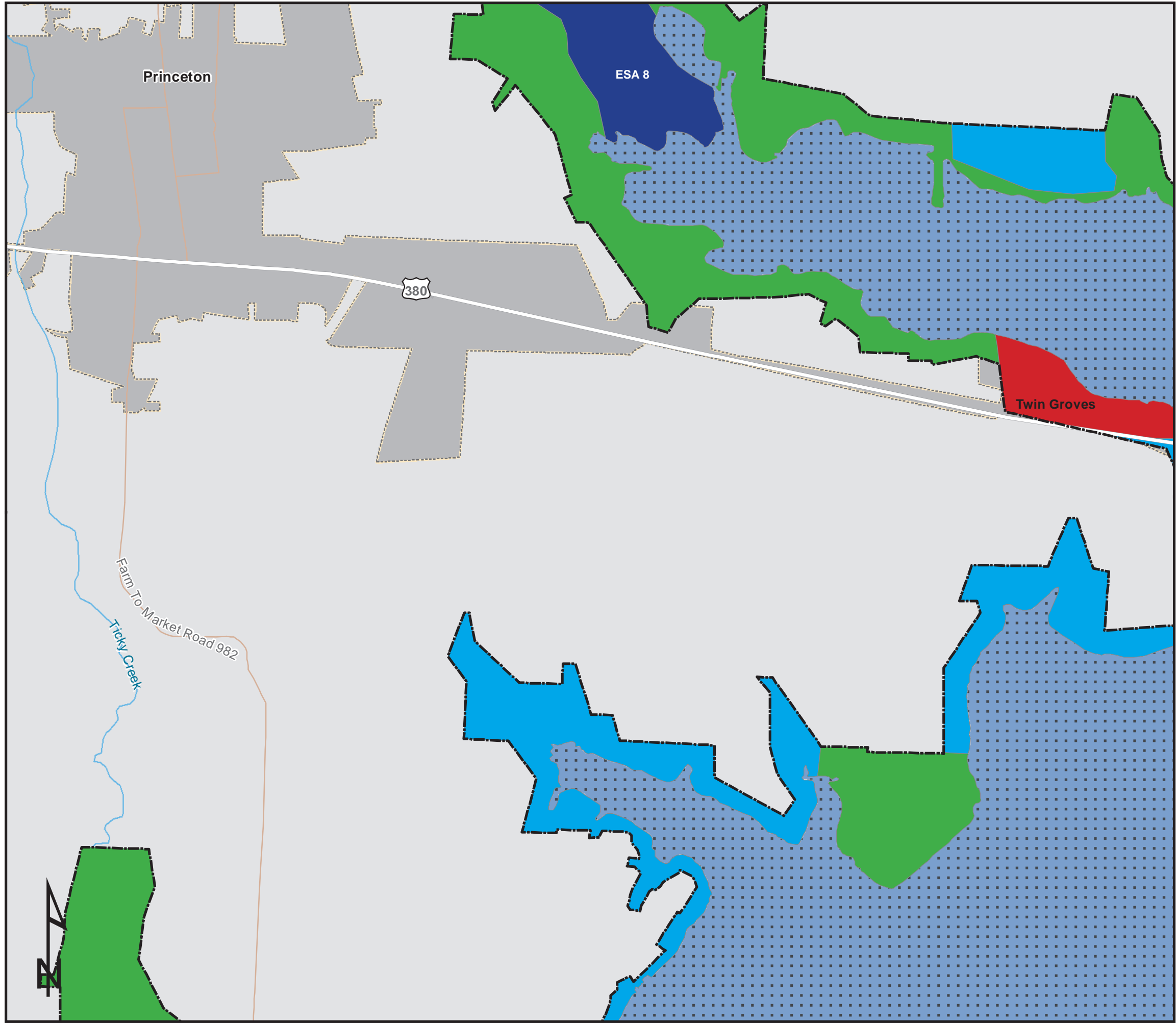
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS






LAVON LAKE  
LAVON LAKE MASTER PLAN  
LAND CLASSIFICATION (SHEET 07)


0 1,500 3,000 4,500  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-07



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

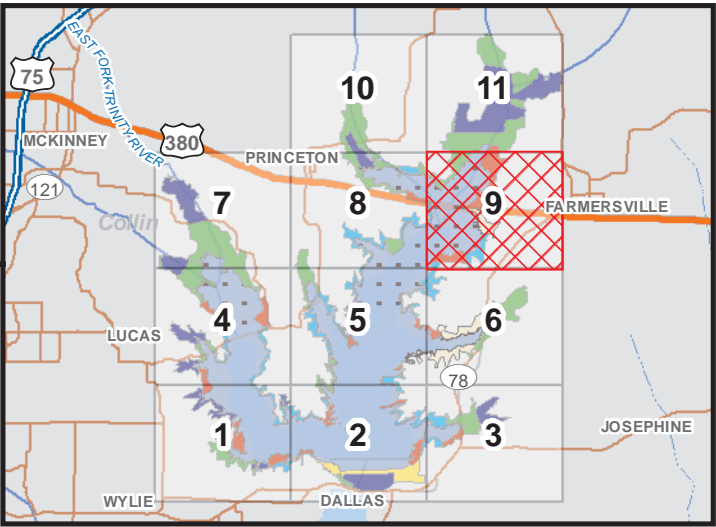
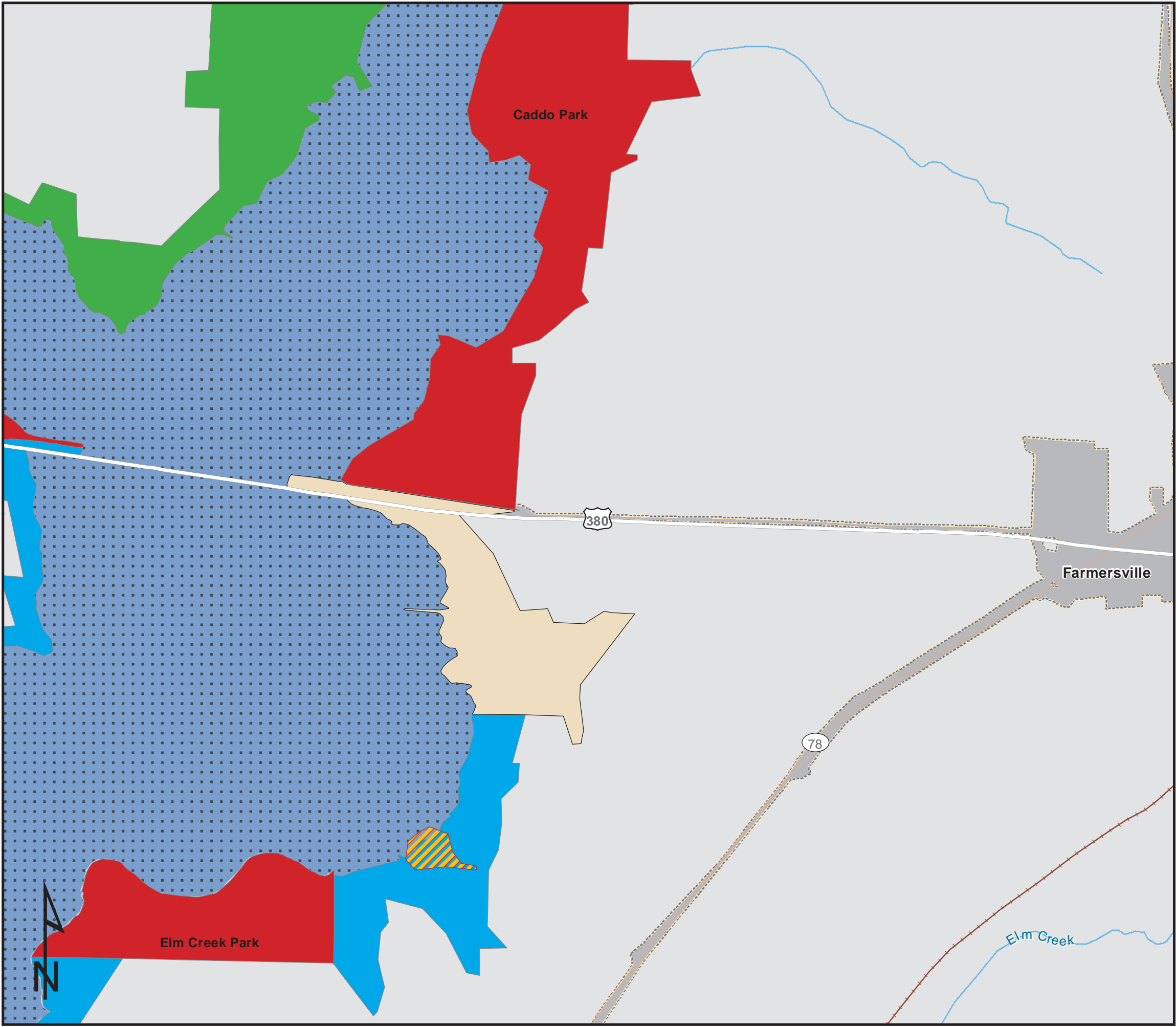
LAND CLASSIFICATION (SHEET 08)











01,5003,0004,500


FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-08



-  MARINA
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 09)

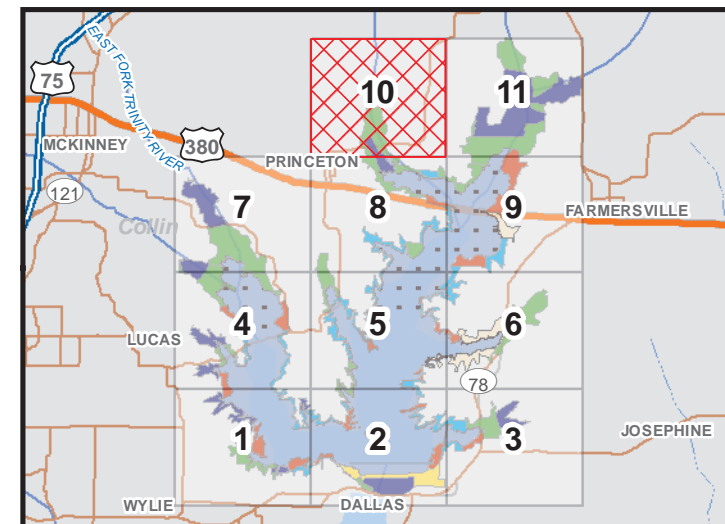
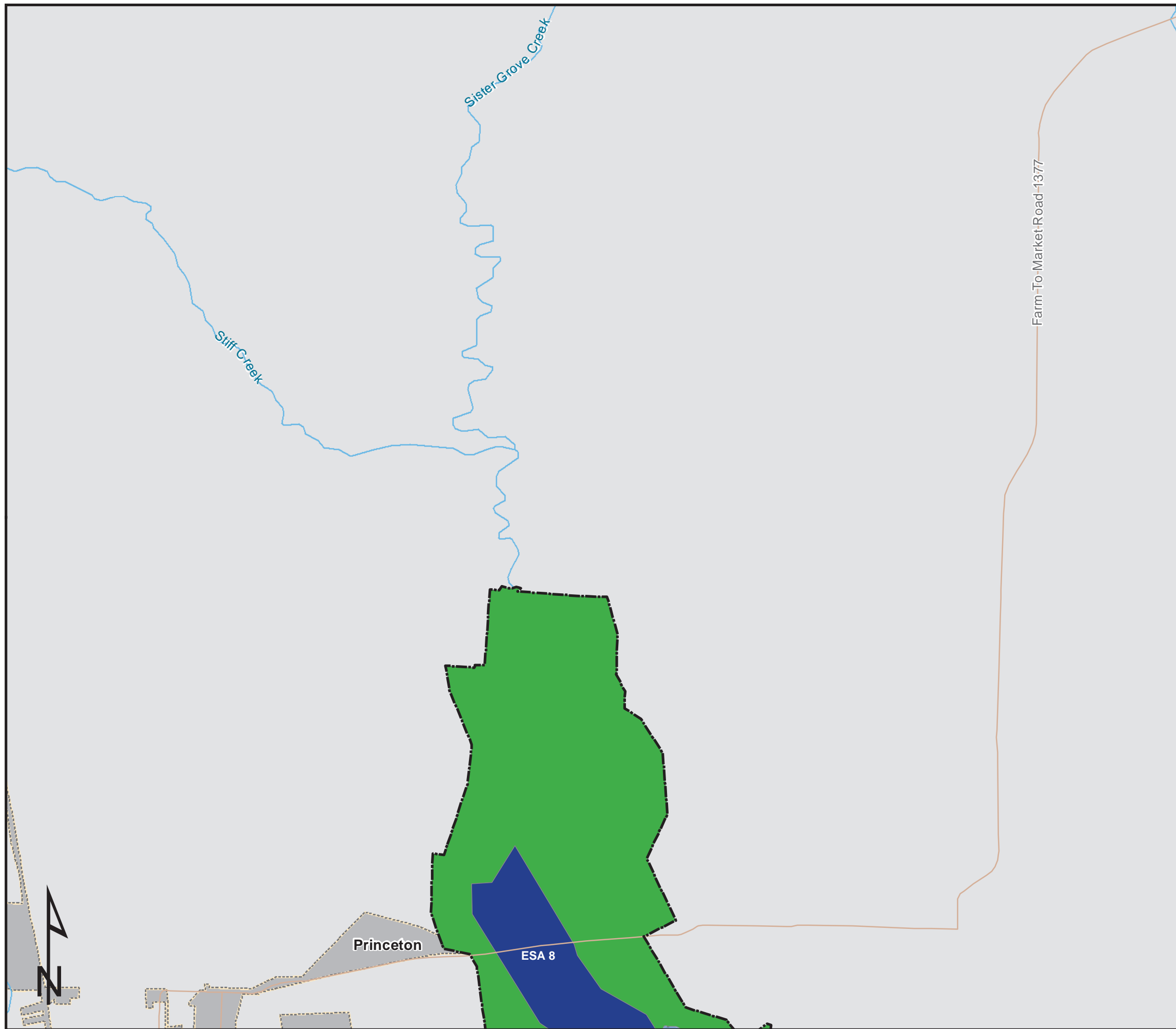
01,5003,0004,500

FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-09





-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

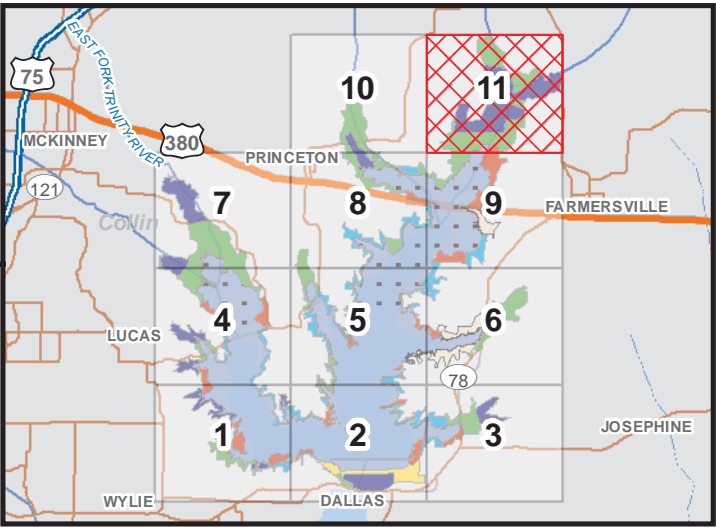
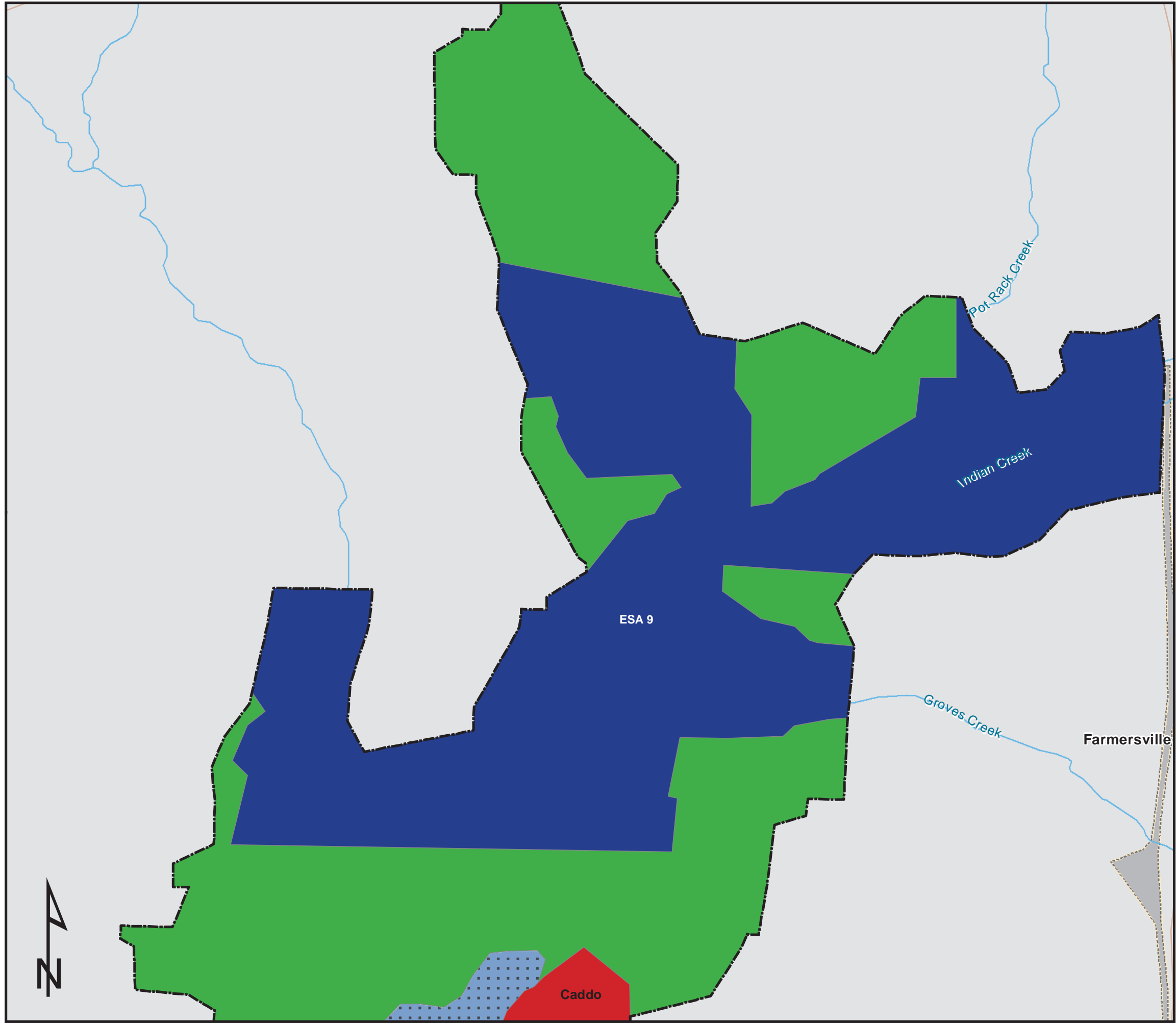
LAVON LAKE EAST FORK TRINITY RIVER, TEXAS









LAVON LAKE  
LAVON LAKE MASTER PLAN  
LAND CLASSIFICATION (SHEET 10)


0 1,500 3,000 4,500  
FEET

DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-10



-  MARINA
-  PROJECT BOUNDARY
-  UNCLEARED WATER SURFACE
- LAND CLASSIFICATION**
-  PROJECT OPERATIONS
-  HIGH DENSITY RECREATION
-  ENVIRONMENTALLY SENSITIVE AREA
-  LOW DENSITY RECREATION
-  VEGETATIVE MANAGEMENT
-  WILDLIFE MANAGEMENT
- WATER SURFACE**
-  OPEN RECREATION
-  RESTRICTED



**U.S. ARMY CORPS  
OF ENGINEERS**  
**FORT WORTH DISTRICT**

LAVON LAKE

EAST FORK TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 11)

01,5003,0004,500

FEET






DATE:  
MAY 2016

MAP NO.  
LA15MP-OC-11





ITEM	EXISTING
PICNIC SITE	12
GROUP PICNIC SHELTER	1
RESTROOM (VAULT)	1

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  GROUP PICNIC SHELTER
-  RESTROOM



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP  
(AVALON PARK - LITTLE AVALON)












DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-01





ITEM	EXISTING
ATTENDENT SITE	1
PICNIC SITE	55
GROUP PICNIC SHELTER	2
RESTROOM (WATERBORNE)	3
BOAT RAMP LANES	4
COURTESY DOCK	1
GATEHOUSE	1

-  FEE BOUNDARY
-  RECREATION AREA
-  ATTENDENT SITE
-  PICNIC SITE
-  GROUP PICNIC SHELTER
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK
-  GATEHOUSE



**U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT**

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (AVALON PARK)



0 170 340 680  
Feet

DATE:  
MAY 2016


MAP NO.  
LA15MP-OR-02





ITEM	EXISTING
CAMPSITE	79
ATTENDENT SITE	2
PICNIC SITE	32
GROUP PICNIC SHELTER	1
RESTROOM (WATERBORNE)	6
DUMP STATION	1
BOAT RAMP LANES	8
GATEHOUSE	1
COURTESY DOCK	2

- FEE BOUNDARY
- RECREATION AREA
- CAMPSITE
- ATTENDENT SITE
- PICNIC SITE
- GROUP PICNIC SHELTER
- RESTROOM
- BOAT RAMP
- COURTESY DOCK
- DUMP STATION
- GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS

FORT WORTH DISTRICT

LAVON LAKE

EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (EAST FORK PARK)

0195390780

Feet

DATE:

MAY 2016

MAP NO.

LA15MP-OR-03





ITEM	EXISTING
PICNIC SITE	13
GATEHOUSE	1
RESTROOM (WATERBORNE)	3
BOAT RAMP LANES	8

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  GROUP PICNIC SHELTER
-  RESTROOM
-  BOAT RAMP
-  GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP  
(COLLIN PARK - SOUTH)



0 220 440 880 Feet

DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-04





ITEM	EXISTING
CAMPSITE	65
GATEHOUSE	1
RESTROOM (WATERBORNE)	1
ATTENDENT SITE	1
DUMP STATION	1

- FEE BOUNDARY
- RECREATION AREA
- CAMPSITE
- ATTENDENT SITE
- RESTROOM
- DUMP STATION
- GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP  
(COLLIN PARK - NORTH)









DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-05





ITEM	EXISTING
PICNIC SITE	12
GROUP PICNIC SHELTER	1
RESTROOM (WATERBORNE)	1
BOAT RAMP LANES	4

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  GROUP PICNIC SHELTER
-  RESTROOM
-  BOAT RAMP



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (BROCKDALE PARK)







DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-06





ITEM	EXISTING
RESTROOM (WATERBORNE)	1
BOAT RAMP LANES	4

-  FEE BOUNDARY
-  RECREATION AREA
-  RESTROOM
-  BOAT RAMP



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (HIGHLAND PARK)







DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-07





ITEM	EXISTING
RESTROOM (VAULT)	2
BOAT RAMP LANES	2

-  FEE BOUNDARY
-  RECREATION AREA
-  RESTROOM
-  BOAT RAMP



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (BRATONIA PARK)



0 140 280 560  
Feet

DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-08





ITEM	EXISTING
CAMPSITE	23
ATTENDENT SITE	2
PICNIC SITE	18
GROUP PICNIC SHELTER	1
RESTROOM (VAULT)	4
BOAT RAMP LANES	8
COURTESY DOCK	1
GATEHOUSE	1

- FEE BOUNDARY
- RECREATION AREA
- CAMPSITE
- ATTENDENT SITE
- PICNIC SITE
- GROUP PICNIC SHELTER
- RESTROOM
- BOAT RAMP
- COURTESY DOCK
- GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (CLEAR LAKE PARK)



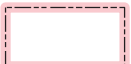






DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-09





ITEM	EXISTING
ATTENDENT SITE	1
PICNIC SITE	16
RESTROOM (VAULT)	2
BOAT RAMP LANES	4
COURTESY DOCK	1

-  FEE BOUNDARY
-  RECREATION AREA
-  ATTENDENT SITE
-  PICNIC SITE
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK



**U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT**

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (TICKY CREEK PARK)







DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-10





ITEM	EXISTING
RESTROOM (VAULT)	2
BOAT RAMP LANES	2

-  FEE BOUNDARY
-  RECREATION AREA
-  RESTROOM
-  BOAT RAMP



**U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT**

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (TWIN GROVES PARK)



0 140 280 560  
Feet







DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-11





ITEM	EXISTING
PICNIC SITE	13
RESTROOM (WATERBORNE)	2
BOAT RAMP LANES	4
COURTESY DOCK	1

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (CADDO PARK)



0 187.5 375 750  
Feet





DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-12





ITEM	EXISTING
RESTROOM (VAULT)	1
BOAT RAMP LANES	2

-  FEE BOUNDARY
-  RECREATION AREA
-  RESTROOM
-  BOAT RAMP



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (ELM CREEK PARK)



0 140 280 560  
Feet

DATE:  
MAY 2016


MAP NO.  
LA15MP-OR-13





ITEM	EXISTING
CAMPSITE	32
ATTENDENT SITE	1
GROUP PICNIC SHELTER	1
RESTROOM (WATERBORNE)	2
BOAT RAMP LANES	4

- FEE BOUNDARY
- RECREATION AREA
- CAMPSITE
- ATTENDENT SITE
- GROUP PICNIC SHELTER
- RESTROOM
- BOAT RAMP
- GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS

FORT WORTH DISTRICT

LAVON LAKE

EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (LAKELAND PARK)

N

0125250500

Feet

DATE:

MAY 2016

MAP NO.

LA15MP-OR-14





ITEM	EXISTING
PICNIC SITE	22
RESTROOM (WATERBORNE)	1
BOAT RAMP LANES	4

- FEE BOUNDARY
- RECREATION AREA
- PICNIC SITE
- RESTROOM
- BOAT RAMP



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (PEBBLE BEACH PARK)



DATE: MAY 2016	MAP NO. LA15MP-OR-15
-------------------	-------------------------





ITEM	EXISTING
PICNIC SITE	23
GROUP PICNIC SHELTER	1
RESTROOM (WATERBORNE)	2
BOAT RAMP LANES	4
COURTESY DOCK	1

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  GROUP PICNIC SHELTER
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK



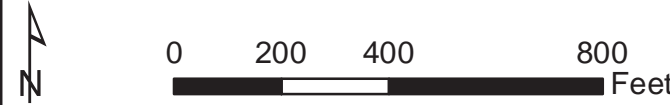
U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (LITTLE RIDGE PARK)









DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-16





ITEM	EXISTING
PICNIC SITE	10
RESTROOM (WATERBORNE)	2
BOAT RAMP LANES	4
COURTESY DOCK	1

-  FEE BOUNDARY
-  RECREATION AREA
-  PICNIC SITE
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (MALLARD PARK)



0 110 220 440  
Feet











DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-17





ITEM	EXISTING
CAMPSITE	53
ATTENDENT SITE	2
PICNIC SITE	51
RESTROOM (WATERBORNE)	5
DUMP STATION	1
BOAT RAMP LANES	8
COURTESY DOCK	2
GATEHOUSE	1

-  FEE BOUNDARY
-  RECREATION AREA
-  CAMPSITE
-  ATTENDENT SITE
-  PICNIC SITE
-  RESTROOM
-  BOAT RAMP
-  COURTESY DOCK
-  DUMP STATION
-  GATEHOUSE



U.S. ARMY CORPS  
OF ENGINEERS  
FORT WORTH DISTRICT

LAVON LAKE EAST FORK OF TRINITY RIVER, TEXAS

LAVON LAKE

LAVON LAKE MASTER PLAN

RECREATIONAL MAP (LAVONIA PARK)



DATE:  
MAY 2016

MAP NO.  
LA15MP-OR-18



## **Appendix B – Environmental Assessment**

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**FINAL**

# **Environmental Assessment for the Lavon Lake Master Plan**

East Fork of the Trinity River  
Collin County, Texas



August 2016



**US Army Corps  
of Engineers** ®  
Fort Worth District

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**FINAL FINDING OF NO SIGNIFICANT IMPACT  
ENVIRONMENTAL ASSESSMENT FOR THE  
LAVON LAKE MASTER PLAN  
COLLIN COUNTY, TEXAS**

In accordance with the National Environmental Policy Act of 1969, including guidelines in 33 Code of Federal Regulations (CFR), Part 230, the Fort Worth District and the Regional Planning and Environmental Center (RPEC) of the U.S. Army Corps of Engineers (USACE) have assessed the potential impacts that the alternative management scenarios set forth in the 2016 Lavon Lake Master Plan (2016 Master Plan) would have on the natural, cultural, and human environments.

The 2016 Master Plan is a revision of the 1972 Master Plan entitled *Trinity River Basin, Texas – Design Memorandum No 13, (Revised May 1972) Updated Master Plan for Lavon Lake Modification – East Fork of the Trinity River, Texas*. The 2016 Master Plan is the strategic land use management document that guides the comprehensive management and development actions related to all project recreational, natural, and cultural resources throughout the life of the water resource project. The 2016 Master Plan guides the execution of efficient and cost-effective management, development, and use of project lands. The 2016 Master Plan is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

The Environmental Assessment (EA) evaluated and analyzed two alternatives: a No Action Alternative (continued use of the 1972 Master Plan) and implementation of the 2016 Master Plan (Proposed Action). Under the No Action Alternative, the USACE would be taking no action, which means the Master Plan would not be revised. With this alternative, no new resource analysis, resource management objectives, revised land classifications, or resource plan would occur. Additionally, no utility corridors would be designated. The management of the lands and associated resources would continue as outlined in the 1972 Master Plan.

The purpose of the Proposed Action is to ensure that the conservation and sustainability of the land, water, and recreational resources on Lavon Lake are in compliance with applicable environmental laws and regulations and to maintain quality land for future public use. The need for the Proposed Action is to bring the 1972 Master Plan up to date and to reflect ecological, socio-political, and socio-demographic changes that are currently impacting Lavon Lake, as well as those changes anticipated to occur through 2040.

The Proposed Action includes a revised Master Plan, coordination with the public, and updates to comply with USACE regulations and guidance, and reflects changes in land management and land uses that have occurred since 1972. Land classifications were refined to meet authorized project purposes and current resource objectives that address a mix of natural resource and recreation management objectives that are compatible with regional goals. Required land and water surface



classification changes associated with the Proposed Action include five reclassifications to balance resource objectives:

Land Classification	Proposed Action Description	Justification
Project Operations	<p>The increase of Project Operations from 131 acres to 508 acres resulted from the following:</p> <ul style="list-style-type: none"> <li>• Conversion of former Recreation – Intensive Use lands near the USACE Office</li> <li>• Conversion of Low Density Recreation lands near the east end of the dam</li> <li>• Conversion of a narrow strip of Natural Area along the downstream toe of the dam</li> </ul>	<p>All lands converted to Project Operations have historically been used primarily in support of critical operational requirements related to the primary missions of flood risk management and water conservation. The conversion of 377 acres to Project Operations will have no effect on current or projected public use.</p>
High Density Recreation	<p>Lands under the prior classification of Recreation-Intensive Use were converted to the new and similar classification of High Density Recreation, but total land acreage was reduced from 2,971 acres to 2,007 acres through the following changes:</p> <ul style="list-style-type: none"> <li>• Two park areas under the prior Recreation – Intensive Use classification were converted to Multiple Resource Management Lands (MRML) – Low Density Recreation</li> <li>• Two park areas under the prior Recreation-Intensive Use classification were converted to MRML – Wildlife Management</li> <li>• Small portions of several areas under the prior Recreation-Intensive Use classification were converted to MRML – Low Density Recreation, Wildlife Management, or Environmentally Sensitive Areas</li> </ul>	<p>The four park areas that were converted to other, more appropriate classifications had never been developed and are not suitable for future development. Small portions of parks were converted due to shoreline erosion and the associated loss in acreage or, in the case of conversion to Environmentally Sensitive Areas, to recognize significant ecological value of the lands. The conversion of these lands will have no effect on current or projected public use.</p>
Environmentally Sensitive Areas	<p>The classification of 4,319 acres as Environmentally Sensitive Areas resulted from the following lands classification changes:</p> <ul style="list-style-type: none"> <li>• All lands under the prior classification of Natural Area were converted to Environmentally Sensitive Areas, with the exception of a small portion converted to Project Operations and a small portion converted to MRML – Wildlife Management</li> </ul>	<p>These classification changes were necessary for two reasons: (1) change in nomenclature from Natural Area to Environmentally Sensitive Areas and (2) recognition of areas with the highest ecological value. Included were areas of high-value bottomland hardwood forest, riparian forest, and native prairie. These conversions were supported by public comment and recommendations from the U.S. Fish and Wildlife Service</p>

Land Classification	Proposed Action Description	Justification
Environmentally Sensitive Areas, continued	<ul style="list-style-type: none"> <li>Several parcels under the prior classification of Low Density Use were converted to Environmentally Sensitive Areas, including lands along Wilson Creek, White Rock Creek, George Creek, and the rolling prairies between Collin Park and Brockdale Park</li> <li>Large parcels of lands under the prior classification of Operations – Wildlife were converted to Environmentally Sensitive Areas</li> </ul>	(USFWS) and Texas Parks and Wildlife Department (TPWD). The conversion of these lands will have no effect on current or projected public use. Lands classified as Environmentally Sensitive Areas are given the highest order of protection among the land classifications.
MRML – Low Density Recreation	<p>The definition of the prior classification of Low Density Use is comparable to the definition of the current classification of MRML – Low Density Recreation. Land classification changes resulted in a net reduction of these acres from 6,403 acres to the current 2,468 acres because:</p> <ul style="list-style-type: none"> <li>Several parcels of land under the prior classification of Low Density Use were converted to Environmentally Sensitive Areas</li> <li>Several parcels were converted to MRML – Wildlife Management or Vegetation Management</li> <li>Several small portions of parks under the prior classification of Recreation – Intensive Use were converted to MRML – Low Density Recreation</li> </ul>	<p>The change from Low Density Use to Environmentally Sensitive Areas was necessary to recognize the high ecological and scenic values of the lands in question and was supported by public comment and recommendations from USFWS and TPWD. The change to MRML – Wildlife or Vegetation Management was needed to better reflect historic management and how these lands will be managed in the future.</p> <p>The small portion of park areas converted to MRML – Low Density Recreation was necessary because these small parcels were never developed and are not suitable for future development due to limited size, exposure to shoreline erosion, or low elevation resulting in frequent inundation. The conversion of these lands will have no effect on current or projected public use.</p>
MRML – Wildlife or Vegetation Management	<p>The classification of 6,480 acres to MRML – Wildlife Management and 824 acres to MRML – Vegetation Management resulted from the following changes:</p> <ul style="list-style-type: none"> <li>Lands under the prior classification of Operations – Wildlife Management were converted to MRML – Wildlife Management or to Environmentally Sensitive Areas</li> <li>Several parcels of land under the prior classification of Operations – Low Density Use were converted to MRML – Wildlife Management or to MRML – Vegetation</li> </ul>	<p>The change from the prior Operations – Wildlife Management classification to MRML – Wildlife Management was a simple change to the current nomenclature. The change to Environmentally Sensitive Areas was needed to reflect the high ecological value of the land in question.</p> <p>The change from the prior classification of Operations – Low Density Use to MRML – Wildlife or Vegetation Management was needed to better reflect historic</p>

Land Classification	Proposed Action Description	Justification
MRML – Wildlife or Vegetation Management, continued		management patterns and future management. The conversion of these lands will have no effect on current or projected public use.
Water Surface	<p>The classification of 21,400 acres of water surface of the lake at the conservation pool elevation may result from the following four changes:</p> <ul style="list-style-type: none"> <li>• 63 acres of Restricted water surface at Lavon Lake including a designated strip of water surface along the northern side of the tainter gate structure of Lavon Dam, small restricted areas near the two North Texas Municipal Water District (NTMWD) water intake structures, the discharge channel for the Garland Power Station, and designated swimming beaches 42 acres of</li> <li>• 42 acres of Designated No-Wake areas including approximately 5 acres at the entry point for each of the two existing marinas and an area of approximately 2 acres at each of the 16 public boat ramps on the lake</li> <li>• 21,295 acres of Open Recreation including all water surface areas available for year-round or seasonal water-based recreational use, except for Restricted and Designated No-Wake areas</li> <li>• 0 acres of Fish and Wildlife Sanctuary</li> </ul>	<p>Restricted water surface areas are areas where recreational boating is prohibited or restricted for project operations, safety, and security purposes.</p> <p>Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps.</p> <p>USACE coordinated with TPWD during preparation of the 2016 Master Plan, and this coordination resulted in a determination that no permanent Fish and Wildlife Sanctuary is currently needed at Lavon Lake.</p>

The Proposed Action was chosen because it would meet regional goals associated with good stewardship of land and water resources, would meet regional recreation goals, and would allow for continued use and development of project lands without violating national policies or public laws. In addition to the five land reclassification actions described above, the Proposed Action includes the designation of 11 utility corridors strategically aligned with existing utility and road easements. The purpose of the utility corridors is to ensure that future utility lines are concentrated in select areas to conserve wildlife habitat and open space.

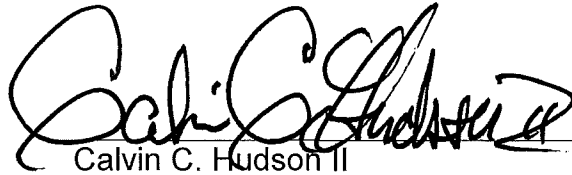
The EA and comments received from other agencies have been used to determine whether the Proposed Action requires the preparation of an Environmental Impact Statement (EIS). All environmental, social, and economic factors that are relevant to the recommended alternative were considered in this assessment. These



include, but are not limited to, climate and climate change, environmental justice, cultural resources, air quality, Prime Farmland, water quality, wetlands, fish and wildlife, invasive species, migratory birds, recreation, aesthetics, and threatened and endangered species.

It is my finding, based on the EA, that the revision of the 1972 Master Plan for Lavon Lake will have no significant adverse impact on 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.

20 Oct 16  
Date

  
Calvin C. Hudson II  
Colonel, U.S. Army  
District Commander

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## ENVIRONMENTAL ASSESSMENT ORGANIZATION

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

<i>SECTION 1</i>	<i>INTRODUCTION, PURPOSE, NEED, AND SCOPE</i> of the Proposed Action summarizes the purpose of and need for the Proposed Action, provides relevant background information, and describes the scope of the EA.
<i>SECTION 2</i>	<i>ALTERNATIVES INCLUDING THE PROPOSED ACTION</i> examines alternatives for implementing the Proposed Action and describes the recommended alternative.
<i>SECTION 3</i>	<i>AFFECTED ENVIRONMENT</i> describes the existing natural, cultural, and human environments.  <i>ENVIRONMENTAL CONSEQUENCES</i> identifies the potential effects of implementing the Proposed Action and alternatives.
<i>SECTION 4</i>	<i>CUMULATIVE IMPACTS</i> describes the impact on the environment that may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.
<i>SECTION 5</i>	<i>COMPLIANCE WITH ENVIRONMENTAL LAWS</i> provides a listing of environmental protection statutes and other environmental requirements.
<i>SECTION 6</i>	<i>IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES</i> identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented.
<i>SECTION 7</i>	<i>PUBLIC AND AGENCY COORDINATION</i> provides a listing of individuals and agencies consulted during preparation of the EA.
<i>SECTION 8</i>	<i>REFERENCES</i> provides bibliographical information for cited sources.
<i>SECTION 9</i>	<i>ACRONYMS/ABBREVIATIONS</i>
<i>SECTION 10</i>	<i>LIST OF PREPARERS</i> identifies persons who prepared the document and their areas of expertise.
<i>APPENDICES</i>	A     Public and Agency Coordination



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**FINAL ENVIRONMENTAL ASSESSMENT**  
**Master Plan Revision**  
**Lavon Lake**  
**East Fork of the Trinity River, Collin County, Texas**

## **SECTION 1: INTRODUCTION**

The U.S. Army Corps of Engineers (USACE) is proposing to implement the proposed land use reclassifications in the 2016 Lavon Lake Master Plan (2016 Master Plan). The 2016 Master Plan is a revision of the 1972 Master Plan entitled *Trinity River Basin, Texas – Design Memorandum No 13, (Revised May 1972) Updated Master Plan for Lavon Lake Modification – East Fork Trinity River, Texas*. The 2016 Master Plan is the strategic land use management document that guides the comprehensive management and development actions related to all project recreational, natural, and cultural resources throughout the life of the water resource project. The 2016 Master Plan guides the execution of efficient and cost-effective management, development, and use of project land. The 2016 Master Plan is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

Implementation of the 2016 Master Plan (Proposed Action) would create potential impacts on the natural, cultural, and human environments, and as such, this Environmental Assessment (EA) was prepared, in accordance with the National Environmental Policy Act (NEPA) of 1969, (Public Law [PL] 91-190), and 33 Code of Federal Regulations (CFR) 230.

### **1.1 PROJECT LOCATION AND SETTING**

Lavon Lake is a multipurpose water resources project constructed and operated by the USACE. The lake and associated land are located entirely within Collin County, Texas, at river mile 55.9 on the East Fork of the Trinity River. The Lavon Lake Dam extends in an east-west direction for a distance of approximately five miles and is situated two miles east of Wylie, Texas, and 22 miles northeast of the City of Dallas, Texas. The Lavon Lake Dam and associated infrastructure, as well as all land acquired for the Lavon Lake project, are Federally owned and are administered by the USACE. A Vicinity Map showing the location of Lavon Lake with respect to neighboring municipalities and major roadways associated with the lake can be found in Section 1.5 of the 2016 Master Plan.

The Lavon Lake Dam consists of a rolled-fill, earth embankment and a gated concrete spillway with low-flow sluices. The total length of the dam is 19,493 feet which includes the 586-foot spillway. The top of the embankment is 81 feet above the streambed. The upstream slopes are protected with 24-inch riprap placed on nine inches of granular bedding from elevation 462.0 to the crest, at elevation 514.0 feet National Geodetic Vertical Datum (NGVD). An additional layer of 24 inches of graded



riprap was placed between elevations 482.0 and 501.0 feet NGVD during a modification. The downstream slopes are grass-lined.

The spillway is equipped with twelve 40-foot by 28-foot tainter gates. Five low-flow, 36-inch sluices are located in the five center piers of the spillway. Each of these sluices consists of a 36-inch conduit controlled by a 36-inch service gate. Each conduit is capable of releasing 220 cubic feet per second (cfs) into the stilling basin. When water is released through the tainter gates it cascades into the stilling basin before flowing down the East Fork of the Trinity River. The stilling basin is 568 feet wide and 125 feet long with training walls on either side. The reinforced training walls are 47 feet high. The floor of the stilling basin is at elevation 415.0 feet NGVD and is five-foot-thick concrete. There are two rows of 8-foot-high baffle blocks and an end sill seven feet in height to dissipate the energy of the discharge. The first row has 47 baffle blocks, while the second row has 46 that are staggered from the first row.

## **1.2 PURPOSE OF AND NEED FOR THE ACTION**

The purpose of the Proposed Action is to ensure that the conservation and sustainability of the land, water, and recreational resources on Lavon Lake are in compliance with applicable environmental laws and regulations and to maintain quality land for future public use. The 2016 Master Plan is intended to serve as a comprehensive land and recreation management plan with an effective life of approximately 25 years.

The need for the Proposed Action is to bring the 1972 Master Plan up to date and to reflect ecological, socio-political, and socio-demographic changes that are currently impacting Lavon Lake, as well as those changes anticipated to occur through 2040. Lavon Lake is located completely within Collin County, Texas, which has experienced a 59 percent growth in population from 2000 to 2010 (U.S. Census Bureau 2015). This rapid population growth has resulted in changes to land use in the region and around Lavon Lake. Changes in outdoor recreation trends, increasing fragmentation of wildlife habitat, increasing demand for more infrastructure to support the population growth, and current legislative requirements necessitate a more current examination of the management of Federal land at Lavon Lake.

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

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

The USACE study team held a public meeting to explain the need for a revised Master Plan and to seek public input on decision making.

### **1.3 SCOPE OF THE ACTION**

This EA addresses the implementation of the 2016 Master Plan with special attention given to revised land classifications, new resource management objectives, a conceptual resource plan for each land classification category, and establishment of strategic utility corridors. This EA analyzes the potential impacts that implementing the 2016 Master Plan would have on the natural, cultural, and human environments.

The typical focus of NEPA compliance consists of environmental impact assessments for individual projects, rather than for long-range plans. However, application of NEPA to more strategic decisions not only meets the Council on Environmental Quality (CEQ) implementing regulations (CEQ 2005) and USACE regulations for implementing NEPA (USACE 1988), but also allows the USACE to consider the environmental consequences of its actions long before any physical activity is implemented. Multiple benefits can be derived from such early consideration. Effective and early NEPA integration with the master planning process can significantly increase the usefulness of the Master Plan to the decision maker.

NEPA documents prepared concurrently with an updated Master Plan can influence and modify strategic land use decisions, whereas NEPA documents prepared after a Master Plan has been updated would have little influence on strategic decisions already included in the plan. The intention of the revised land use classifications in the 2016 Master Plan is to develop land classifications, management goals, and management objectives that will guide the sustainable development of resources within the Lavon Lake Project. It is not feasible to define the exact nature of potential impacts for all potential actions prior to receiving specific project proposals. Therefore, environmental consequences may be less than or may exceed what is described in this EA. To ensure that future environmental consequences are identified and documented as accurately as possible, additional NEPA coordination will be conducted, as appropriate, for future projects that are the result of the implementation of the 2016 Master Plan.

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## SECTION 2: PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is necessary to revise the 1972 Master Plan so that it is compliant with USACE regulations and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends. As part of this process, which includes public outreach and comment, two alternatives were developed for evaluation, including a No Action Alternative. The alternatives were developed using land classifications that indicate the primary use for which project lands are managed. USACE regulations specify five possible categories of land classification: Project Operations, High Density Recreation, Mitigation, Environmentally Sensitive Areas, and Multiple Resource Managed Lands (MRML). MRML are divided into four subcategories: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. At Lavon Lake, each of these land classifications is applicable with the exception of the Mitigation classification and the MRML – Future/Inactive Recreation Area subcategory.

The action alternative evaluated in this EA is compared to the No Action, which serves as the baseline condition. USACE guidance recommends the establishment of resource goals and objectives for purposes of development, conservation, and management of natural, cultural, and man-made resources at a project. Goals describe the desired end state of overall management efforts, whereas objectives are concise statements describing measurable and attainable management activities that support the stated goals. Goals and objectives are guidelines for obtaining maximum public benefits while minimizing adverse impacts on the environment and are developed in accordance with 1) authorized project purposes, 2) applicable laws and regulations, 3) resource capabilities and suitabilities, 4) regional needs, 5) other governmental plans and programs, and 6) expressed public desires.

In the context of the 2016 Master Plan, goals express the overall desired end state of the Master Plan whereas objectives are specific task-oriented actions necessary to achieve the Master Plan goals. The objectives in the 2016 Master Plan are intended to provide project benefits, meet public needs, and foster environmental sustainability of Lavon Lake to the greatest extent possible. The goals for the 2016 Master Plan include the following:

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

Specific resource objectives to accomplish these goals can be found in Chapter 3.0 of the 2016 Master Plan.

The Proposed Action would meet regional goals associated with good stewardship of land and water resources, would meet regional recreation goals, would address identified recreational trends, and would allow for continued use and development of project lands without violating national policies or public laws.

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

Under the No Action Alternative, the USACE would not approve the adoption or implementation of the revised land use classifications, resource management objectives, or the conceptual resource plan in the 2016 Master Plan. Instead the USACE would continue to manage Lavon Lake's natural resources as set forth in the 1972 Master Plan. The 1972 Master Plan would continue to provide the only source of comprehensive management guidelines and philosophy. However, the 1972 Master Plan is out of date and does not reflect the current ecological, socio-political, or sociodemographic conditions of Lavon Lake or those that are anticipated to occur through 2040. The No Action Alternative, while it does not meet the purpose of or need for the Proposed Action, serves as a benchmark of existing conditions against which Federal actions can be evaluated, and as such, the No Action Alternative is included in this EA, as prescribed by CEQ regulations.

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

Under the Proposed Action, the USACE proposes to adopt and implement the 2016 Master Plan. The 2016 Master Plan would replace the 1972 Master Plan and provide an up-to-date management plan that follows current Federal laws and regulations while sustaining Lavon Lake's natural resources and providing recreational experiences for the next 25 years.

Lavon Lake was originally constructed in 1953-54 and was modified and enlarged in 1974-75. The modification and enlargement of Lavon Lake required acquisition of additional lands, which brought the total fee simple land base to 37,515 acres. In addition to these lands, a total of 849 acres of flowage easement was acquired. Flowage easements grant the Federal government the right to periodically inundate the land during flood management operations. When the pool elevation is at the normal or conservation pool elevation, which is 492.0 feet NGVD for Lavon Lake, the lake has a surface area of 21,400 acres. Approximately 16,115 acres of the USACE-administered land lies above the normal pool from elevation 492.0 feet NGVD to approximately 508.0 feet NGVD. During times of flooding, water is stored in Lavon Lake between the elevations of 492.0 feet and 508.0 feet NGVD. The spillway crest, when all flood gates are closed, is 503.5 feet NGVD. The Federal property boundary line is approximately 155 miles long at an elevation of 492.0 feet NGVD, while the shoreline is approximately 121 miles long.

The 2016 Master Plan proposes to classify all Federal land lying above elevation 492.0 feet NGVD and the existing water surface into management classification categories. These land classification categories would allow uses of Federal property that meet the definition of the assigned category and ensure the protection of natural resources and environmental stewardship while allowing maximum public enjoyment of the lake's resources.

The proposed land classification categories are defined as follows:

- Project Operations: Lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas used solely for the operation of Lavon Lake.
- High Density Recreation: Lands developed for the intensive recreational activities for the visiting public including day use and campgrounds. These areas could also be for commercial concessions and quasi-public development.
- Mitigation: Lands used only for mitigation purposes.
- Environmentally Sensitive Areas: Areas where scientific, ecological, cultural, or aesthetic features have been identified.
- MRML: Allows for the designation of a predominant use with the understanding that other compatible uses may also occur on these lands.
  - MRML Low Density Recreation: Lands with minimal development or infrastructure that support passive recreational use (primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
  - MRML Wildlife Management: Lands designated for stewardship of fish and wildlife resources.
  - MRML Vegetative Management: Lands designated for stewardship of forest, prairie, and other native vegetative cover.
  - MRML Future or Inactive Recreation Areas: Areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. These areas will be managed for multiple resources until there is an opportunity to develop or reopen these areas.
- Water Surface: Allows for surface water zones.
  - Restricted: Water areas restricted for Lavon Lake operations, safety, and security.
  - Designated No-Wake: Water areas to protect environmentally sensitive shoreline areas and recreational water access areas from disturbance and areas to protect public safety.
  - Fish and Wildlife Sanctuary: Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, or spawning.
  - Open Recreation: Water areas available for year-round or seasonal water-based recreational use.



Table 2-1 shows the proposed land classifications and acres proposed for each classification, Table 2-2 shows the water surface classifications, and Table 2-3 provides the justification for the proposed reclassification. USACE regulations define a utility corridor as a parcel of land with fixed boundaries that has been identified in the project Master Plan as being the preferred location for future outgrants (e.g., public utilities, pipelines, etc.) or proposed modifications to existing outgrants suitable to accommodate compatible types of outgrants (see Chapter 6.2 of the 2016 Master Plan for designated utility corridors).

**Table 2-1. Proposed Lavon Lake Management Classifications**

1972 Land Classifications	Acres	Proposed New Land Classifications	Acres*
Project Operations	131	Project Operations	508
Recreation – Intensive Use	2,987	High Density Recreation	2,007
Natural Area	527	Environmental Sensitive Areas	4,319
Recreation – Low Density Use	6,403	MRML – Low Density Recreation	2,468
Wildlife Management	6,578	MRML – Wildlife Management	6,480
		MRML – Vegetation Management	824

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

Source: USACE 2016

**Table 2-2. Proposed Lavon Lake Water Surface Classifications**

Classifications	Acres
Water Surface: Restricted	63
Water Surface: Designated No-wake	42
Water Surface: Open Recreation	21,295
Fish and Wildlife Sanctuary	0

**Table 2-3. Justification for the Proposed Reclassification**

Land Classification	Proposed Action Description	Justification
Project Operations	<p>The increase of Project Operations from 131 acres to 508 acres resulted from the following:</p> <ul style="list-style-type: none"> <li>• Conversion of former Recreation – Intensive Use lands near the USACE Office</li> <li>• Conversion of Low Density Recreation lands near the east end of the dam</li> <li>• Conversion of a narrow strip of Natural Area along the downstream toe of the dam</li> </ul>	<p>All lands converted to Project Operations have historically been used primarily in support of critical operational requirements related to the primary missions of flood risk management and water conservation. The conversion of 377 acres to Project Operations will have no effect on current or projected public use.</p>

Table 2-3, continued

Land Classification	Proposed Action Description	Justification
High Density Recreation	<p>Lands under the prior classification of Recreation-Intensive Use were converted to the new and similar classification of High Density Recreation, but total land acreage was reduced from 2,971 acres to 2,007 acres through the following changes:</p> <ul style="list-style-type: none"> <li>• Two park areas under the prior Recreation – Intensive Use classification were converted to Multiple Resource Management Lands (MRML) – Low Density Recreation</li> <li>• Two park areas under the prior Recreation-Intensive Use classification were converted to MRML – Wildlife Management</li> <li>• Small portions of several areas under the prior Recreation-Intensive Use classification were converted to MRML – Low Density Recreation, Wildlife Management, or Environmentally Sensitive Areas</li> </ul>	<p>The four park areas that were converted to other, more appropriate classifications had never been developed and are not suitable for future development. Small portions of parks were converted due to shoreline erosion and the associated loss in acreage or, in the case of conversion to Environmentally Sensitive Areas, to recognize significant ecological value of the lands. The conversion of these lands will have no effect on current or projected public use.</p>
Environmentally Sensitive Areas	<p>The classification of 4,319 acres as Environmentally Sensitive Areas resulted from the following lands classification changes:</p> <ul style="list-style-type: none"> <li>• All lands under the prior classification of Natural Area were converted to Environmentally Sensitive Areas, with the exception of a small portion converted to Project Operations and a small portion converted to MRML – Wildlife Management</li> <li>• Several parcels under the prior classification of Low Density Use were converted to Environmentally Sensitive Areas, including lands along Wilson Creek, White Rock Creek, George Creek, and the rolling prairies between Collin Park and Brockdale Park</li> <li>• Large parcels of lands under the prior classification of Operations – Wildlife were converted to Environmentally Sensitive Areas</li> </ul>	<p>These classification changes were necessary for two reasons: (1) change in nomenclature from Natural Area to Environmentally Sensitive Areas and (2) recognition of areas with the highest ecological value. Included were areas of high-value bottomland hardwood forest, riparian forest, and native prairie. These conversions were supported by public comment and recommendations from the U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD). The conversion of these lands will have no effect on current or projected public use. Lands classified as Environmentally Sensitive Areas are given the highest order of protection among the land classifications.</p>
MRML – Low Density Recreation	<p>The definition of the prior classification of Low Density Use is comparable to the definition of the current classification of MRML – Low Density Recreation. Land classification changes resulted in a net reduction of these acres from 6,403 acres</p>	<p>The change from Low Density Use to Environmentally Sensitive Areas was necessary to recognize the high ecological and scenic values of the lands in question and was supported by</p>

Table 2-3, continued

Land Classification	Proposed Action Description	Justification
MRML – Low Density Recreation, continued	<p>to the current 2,468 acres because:</p> <ul style="list-style-type: none"> <li>Several parcels of land under the prior classification of Low Density Use were converted to Environmentally Sensitive Areas</li> <li>Several parcels were converted to MRML – Wildlife Management or Vegetation Management</li> <li>Several small portions of parks under the prior classification of Recreation – Intensive Use were converted to MRML – Low Density Recreation</li> </ul>	<p>public comment and recommendations from USFWS and TPWD. The change to MRML – Wildlife or Vegetation Management was needed to better reflect historic management and how these lands will be managed in the future.</p> <p>The small portion of park areas converted to MRML – Low Density Recreation was necessary because these small parcels were never developed and are not suitable for future development due to limited size, exposure to shoreline erosion, or low elevation resulting in frequent inundation. The conversion of these lands will have no effect on current or projected public use.</p>
MRML – Wildlife or Vegetation Management	<p>The classification of 6,480 acres to MRML – Wildlife Management and 824 acres to MRML – Vegetation Management resulted from the following changes:</p> <ul style="list-style-type: none"> <li>Lands under the prior classification of Operations – Wildlife Management were converted to MRML – Wildlife Management or to Environmentally Sensitive Areas</li> <li>Several parcels of land under the prior classification of Operations – Low Density Use were converted to MRML – Wildlife Management or to MRML – Vegetation</li> </ul>	<p>The change from the prior Operations – Wildlife Management classification to MRML – Wildlife Management was a simple change to the current nomenclature. The change to Environmentally Sensitive Areas was needed to reflect the high ecological value of the land in question.</p> <p>The change from the prior classification of Operations – Low Density Use to MRML – Wildlife or Vegetation Management was needed to better reflect historic management patterns and future management. The conversion of these lands will have no effect on current or projected public use.</p>
Water Surface	<p>The classification of 21,400 acres of water surface of the lake at the conservation pool elevation may resulted from the following four changes:</p> <ul style="list-style-type: none"> <li>63 acres of Restricted water surface at Lavon Lake including a designated strip of water surface along the northern side of the tainter gate structure of Lavon Dam, small restricted areas near the two North Texas Municipal Water District (NTMWD) water intake structures,</li> </ul>	<p>Restricted water surface are areas where recreational boating is prohibited or restricted for project operations, safety, and security purposes.</p> <p>Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps.</p>



Table 2-3, continued

Land Classification	Proposed Action Description	Justification
Water Surface, continued	<p>the discharge channel for the Garland Power Station, and designated swimming beaches 42 acres of</p> <ul style="list-style-type: none"> <li>• 42 acres of Designated No-Wake areas including approximately 5 acres at the entry point for each of the two existing marinas and an area of approximately 2 acres at each of the 16 public boat ramps on the lake</li> <li>• 21,295 acres of Open Recreation including all water surface areas available for year-round or seasonal water-based recreational use, except for Restricted and Designated No-Wake areas</li> <li>• 0 acres of Fish and Wildlife Sanctuary</li> </ul>	USACE coordinated with TPWD during preparation of the 2016 Master Plan, and this coordination resulted in a determination that no permanent Fish and Wildlife Sanctuary is currently needed at Lavon Lake.

Source: USACE 2016

### Project Operations

These lands are associated with the dam and spillway structures that are operated and maintained for the purpose of fulfilling the flood risk management mission of Lavon Lake. In the 2016 Master Plan, there are 508 acres of lands under this classification all of which are managed by the USACE. The management plan for the land included in this classification is to continue providing physical security necessary to ensure continued operation of the critical operational structures. Public access to these lands is restricted with the exception of the public fishing platform and parking area located on the west side of the spillway.

### High Density Recreation

In the 2016 Master Plan, lands classified for High Density Recreation are currently developed for intensive recreational activities and encompass 2,007 acres. Lavon Lake has 16 distinct parcels included in this classification, with each area having a unique name. These areas are generally referred to as “parks”. The off-road bicycle trails area that is leased to Collin County is referred to by Collin County as Sister Grove Park, but under the USACE land classification system this area is classified as a Low Density Recreation area. Depending on available space, funding, and public demand, lands classified for High Density Recreation may support additional outdoor recreation development in the future. These areas include access points, day-use areas, and campgrounds. Commercial concession areas such as marinas and comprehensive resorts also fall into this classification. These areas have been developed to support concentrated visitation to the extent that an atmosphere of open space compatible with the natural resources of Lavon Lake is maintained.

Four High Density Recreation areas are partially or fully leased to non-Federal partners referred to as grantees; the USACE operates and manages all park areas that are not leased to others. Each grantee is responsible for the operation and maintenance of their leased area; the USACE does not provide direct maintenance within any of the leased locations, but may occasionally lend support where appropriate.

### Environmentally Sensitive Areas

Eleven distinct land parcels totaling 4,319 acres are designated as Environmentally Sensitive Areas in the 2016 Master Plan. Each of these areas was designated taking into consideration habitat values listed in the 2010 habitat evaluation report (see Appendix D of the 2016 Master Plan), institutional knowledge of project lands, and expressed public interest. The rationale for the Environmentally Sensitive Areas designations is based primarily on high wildlife habitat value and the need to protect these and similar areas as described in planning documents published by TPWD, North Central Texas Council of Governments (NCTCOG), and Collin County Parks and Open Space Program. The habitat evaluation report shows that habitat values of the riparian woodland and bottomland hardwood Environmentally Sensitive Areas range from poor for the wood duck (*Aix sponsa*) to excellent for the Carolina chickadee (*Poecile carolinensis*). In general, the primary factors that prevent the forested Environmentally Sensitive Areas from achieving an overall average score of excellent include the following:

- The dominant overstory trees are too young and/or small to meet the needs of cavity nesting species such as the barred owl (*Strix varia*), wood duck, and downy woodpecker (*Picoides pubescens*)
- The absence or scarcity of hard mast-producing trees, such as oaks (*Quercus* spp.) and pecans (*Carya* spp.) that serve as a winter food source for numerous species

These limiting factors will be overcome as the woodlands age and supplemental plantings are completed.

### MRML

MRML are, as the name implies, lands that serve multiple purposes, but that are sub-classified and managed for a predominant use. The following paragraphs describe the various sub-classifications of MRML at Lavon Lake, the number of acres in each sub-classification, and the management plan for these lands.

#### MRML – Low Density Recreation

These lands are generally narrow parcels of land that are adjacent to private residential developments. Ecologically, most of these lands are blackland prairie sites ranging in value from poor to excellent. Many of the areas have been negatively affected by Johnsongrass (*Sorghum halepense*), eastern redcedar (*Juniperus virginiana*), and other aggressive woody species. Small riparian corridors on some

areas support good quality riparian hardwood trees and shrubs. Future management of these lands calls for maintaining a healthy, ecologically adapted vegetative cover to reduce erosion and improve aesthetics. Prevention of unauthorized use, such as trespass or encroachments, is an important management objective for all USACE lands, but is especially important for those lands in proximity to private development. Management objectives call for restoration of native prairie conditions where practical.

These lands are typically open to the public, including adjacent landowners, for pedestrian traffic and are frequently used by adjacent landowners for access to the shoreline near their homes. Currently, portions of these Low Density Recreation areas are leased to Collin County for the Trinity Trail and Sister Grove Park, an area where trails are maintained for hiking and off-road bicycling. Both areas are currently maintained by volunteers. Adjacent landowners may apply for a permit to mow a meandering path to the shoreline, and if conditions warrant, may apply for a permit to mow a narrow strip along the USACE boundary line as a precaution against wildfire. The general public may use these lands for bank fishing, hiking, and for access to the shoreline. Hunting may be allowed in select areas that are a reasonable and safe distance from adjacent residential properties. Future uses may include additional designated natural surface hike/bike/equestrian trails. The Collin County Regional Trails Master Plan (CCRTMP) describes several trails and trail corridors that would affect MRML – Low Density Recreation. The placement of public trails in areas near residential properties will require public involvement prior to trail design. In the 2016 Master Plan, there are 2,468 acres of land designated as MRML – Low Density Recreation at Lavan Lake.

#### MRML – Wildlife Management

These lands are generally medium to large parcels that are located in the upper reaches of the major tributaries to Lavan Lake as well as a few other smaller parcels. Typically, these areas are adjacent to, or completely surround, one of the 11 designated Environmentally Sensitive Areas. Future management of these lands calls for managing the habitat to support native, ecologically adapted vegetation which in turn supports native wildlife species. Specific management techniques including, but not limited to placement of nesting structures, construction of water features or brush piles, fencing, and planting of specific food-producing plants may be necessary to support the needs of wildlife Species of Greatest Conservation Need (see Appendix D of the 2016 Master Plan for a listing of Species of Greatest Conservation Need). Migratory species, both game and non-game, will generally be given priority over non-migratory species when implementing wildlife management measures. Priority will also be given to the improvement or restoration of existing wetlands, or where topography, soil type, and hydrology are appropriate, the construction of wetlands. Where beneficial to long-term ecological management goals, agricultural leases for grazing or hay production may be employed. In general, any grazing lease would be limited to stocker calf operations and short rotation grazing with lease periods of three to five years.

Current public use of these lands includes hiking and horseback riding on existing trails, bank fishing, canoeing and kayaking, and hunting. Future public use



includes all existing uses and expansion of trail opportunities where feasible. The CCRTMP describes several trails and trail corridors that would affect several areas classified as MRML – Wildlife Management. Some MRML – Wildlife Management may support the establishment of nature centers or environmental learning areas. In the 2016 Master Plan, there are 6,480 acres of land designated as MRML – Wildlife Management at Lavon Lake.

### MRML – Vegetative Management

These lands include two parcels on the eastern side of the lake that are large enough to support intensive prairie restoration efforts. These lands are generally on upland sites with blackland soil types that will, with proper management, support native prairie. Future management calls for prescription burning, fencing, removal of some but not all aggressive woody species such as eastern redcedar, mesquite (*Prosopis* spp.) and honey locust (*Gleditsia triacanthos*) and supplemental seeding of desirable native grasses and forbs. In some locations, eradication of invasive Johnsongrass, Bermudagrass (*Cynodon dactylon*), and King Ranch bluestem (*Bothriochloa ischaemum*) may require the use of herbicides. Short rotation grazing leases or hay production leases may be employed where deemed beneficial to the establishment of healthy native prairie.

Current recreational use of these lands includes bank fishing and pedestrian access by adjoining landowners. Hunting is currently allowed on the northern parcel that is located adjacent to and south of Highway 380. Future uses include all existing uses with the possibility of creating multiuse trail opportunities. In the 2016 Master Plan, there are 824 acres of land designated as MRML – Vegetation Management at Lavon Lake.

### Water Surface

In accordance with the national USACE policy set forth in Engineer Pamphlet (EP) 1130-2-550, the water surface of the lake at the conservation pool elevation may be classified using the following four classifications:

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

At the conservation pool elevation of 492.0 feet NGVD, Lavon Lake has a water surface area of 21,400 acres. The following water surface classifications are designated at Lavon Lake:

#### *Restricted*

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety and security purposes. The

Restricted water surface at Lavon Lake includes a designated strip of water surface along the northern side of the tainter gate structure of Lavon Dam, small restricted areas near the two NTMWD water intake structures, and the discharge channel for the Garland Power Station. Designated swimming beaches are also classified as Restricted water surface. The total acreage of Restricted water surface is approximately 63 acres. These areas are normally marked with standard U.S. Coast Guard (USCG) regulatory buoys stating that boats are excluded from the area. In some instances, physical barriers may be in place on the water.

### *Designated No-Wake*

Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. Designated No-Wake areas at Lavon Lake include approximately five acres at the entry point for each of the two existing marinas, and an area of approximately two acres at each of the 16 public boat ramps on Lavon Lake. These areas are typically marked with standard USCG regulatory buoys.

### *Open Recreation*

Open Recreation includes all water surface areas available for year-round or seasonal water-based recreational use. With the exception of the Restricted and Designated No-Wake areas described in the above paragraphs, the remaining water surface of approximately 21,295 acres at Lavon Lake water surface is designated as Open Recreation.

### *Fish and Wildlife Sanctuary*

This water surface classification applies to areas with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, or spawning. Coordination with TPWD during preparation of the 2016 Master Plan resulted in a determination that no permanent fish and wildlife sanctuary is needed at Lavon Lake. This determination was based on several factors including the current “no hunting” restriction that applies to the majority of the Lavon Lake water surface, the existence of many privately owned ponds and small lakes throughout the region surrounding Lavon Lake that provide sanctuary areas for waterfowl and shorebirds, and the fact that annual waterfowl counts conducted by TPWD for the past several years have indicated healthy waterfowl populations. Should it become necessary to designate sanctuary areas in the future, such designation can be accomplished as needed on an annual basis taking into account habitat conditions, public use levels, and changing fish and wildlife populations.

Future management of the water surface includes the maintenance of warning, information, and regulatory buoys, as well as routine water safety patrols during peak use periods. Depending on available funding and appropriate lake conditions, USACE intends to conduct a water-oriented recreation use study to determine the level and type

of boating traffic occurring on the lake. The outcome of such a study may include changes in water surface zoning.

### Project Easement Lands

Project easement lands are lands on which easement interests were acquired. Fee title was not acquired on these lands, but the easement interests convey to the Federal government certain rights to use or restrict the use of the land for specific purposes. Easement lands are typically classified as Operations Easement, Flowage Easement, and/or Conservation Easement. At Lavon Lake the only easement lands are those lands where a flowage easement was acquired. A flowage easement, in general, grants to the government the perpetual right to temporarily flood or inundate private land during flood risk management operations and to prohibit activities on the flowage easement that would interfere with flood risk management operations, such as placement of fill material or construction of habitable structures. In the 2016 Master Plan, there are 849 acres of land designated as Flowage Easement lands at Lavon Lake.

### Utility Corridors

Recent USACE guidance in ER-1130-2-550, Chapter 17, encourages the establishment of designated utility corridors with defined boundaries on project lands as a means to consolidate the placement of utility lines in locations resulting in the least possible environmental impact. The Proposed Action establishes 11 corridors crossing the major arms of Lavon Lake (see Chapter 6.2 in the 2016 Master Plan). Each corridor incorporates and aligns with existing state highways and utility lines easements. Best Management Practices (BMPs) specify that future use of each corridor shall occur, where feasible, within existing, previously disturbed easements and secondarily within a narrow strip of land varying from 25 feet to 100 feet lying parallel to existing easements. Future underground utilities within each corridor shall be installed, where possible, by subsurface boring. The future use of any corridor will require mitigation for the loss of any natural resources in accordance with USACE stipulations.

Chapter 6.2 in the 2016 Master Plan provides a summary of corridor locations, lengths, and the acreage of project lands included in each corridor that is not already included within an existing easement. The total acreage for the 11 corridors is approximately 172 acres, of which approximately 110 acres is open water with the remaining 62 acres consisting of low-quality grassland and early successional woodland.

## **2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION**

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



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

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

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

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8[a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8[b]). As discussed in this section, the alternatives may create temporary (less than 1 year), short-term (up to 3 years), long-term (3 to 10 years), or permanent effects following the Master Plan revision.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term, and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

### **3.1 LAND USE**

The USACE lands above elevation 492.0 feet NGVD presently associated with Lavon Lake are listed in the 1972 Master Plan as follows:

- 131 acres of land managed as Project Operations
- 527 acres of land managed as Natural Areas
- 2,971 acres of land managed as Recreation – High Density
- 6,403 acres of land managed as Recreation – Low Density
- 6,578 acres of land managed as Wildlife Management

A total of 16 designated recreation areas and the Stilling Basin Access Point operate as High Density Use Recreation areas at Lavon Lake. These areas include Avalon Park, Bratonia Park, Brockdale Park, Caddo Park (temporarily closed), Clear Lake Park, Collin Park, East Fork Park, Elm Creek Park, Highland Park, Lakeland Park, Lavonia Park, Little Ridge Park, Mallard Park, Pebble Beach Park, Stilling Basin Access, Tickey Creek Park, and Twin Groves Park.

Two marinas also operate on the lake under a concession lease with the USACE. One of the marinas also operates Collin Park for day use and camping. The USACE operates all other parks. The majority of the USACE park operations and maintenance activities, including mowing, cleaning, building repairs, road repairs, utility repairs, trash removal, and related tasks are accomplished through service contracts.

Most of the Federal lands associated with Lavon Lake, as well as the majority of Collin County, were long ago converted from tall grass prairie and riparian woodlands to cultivation, pasture, and most recently residential development.

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

The No Action Alternative for Lavon Lake would mean the 1972 Master Plan would not be revised and no new resources analysis resource management objectives, utility corridors, or land use classifications would occur. The operation and maintenance of USACE lands at Lavon Lake would continue as outlined in the existing Master Plan. Although this alternative does not result in a Master Plan that meets current regulations and guidance, there would be no significant impacts on land uses on Project lands.

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

The objectives for revising the Lavon Lake Master Plan were to describe current and foreseeable land uses and management priorities taking into account expressed public opinion and USACE policy that have evolved to meet day-to-day operational needs. The changes required for the Proposed Action were developed to recognize and implement regional goals associated with good stewardship of land and water resources that would allow for continued use and development of project lands. Therefore, implementation of the Proposed Action would not result in significant impacts on land uses on Project lands.



## 3.2 WATER RESOURCES

### Surface Water

When the pool elevation is at the normal or conservation pool elevation of 492.0 feet NGVD, the lake has a surface area of 21,400 acres. Approximately 16,115 acres of USACE-administered land lies above the normal pool from elevation 492.0 feet NGVD to approximately 508.0 NGVD. During times of flooding, water is stored in Lavon Lake between elevation 492.0 feet and 508.0 feet NGVD. The Federal property boundary line is approximately 155 miles long and at elevation 492.0 feet NGVD the shoreline is approximately 121 miles long.

The release of stored flood water is controlled by the USACE until the normal or conservation pool elevation of 492.0 feet NGVD is achieved. Water stored below an elevation of 492.0 feet is managed for water supply purposes in accordance with contractual agreements between the USACE and the NTMWD. NTMWD withdraws water from the lake through three separate water intake structures located along the southwest shoreline of the lake. To supplement water supply, the NTMWD has the capability to pump water into Lavon Lake from Jim Chapman Lake (Cooper Dam) and Lake Texoma. Recently, invasive zebra mussels (*Dreissena polymorpha*) were found in Lake Texoma thus preventing the direct pumping of Lake Texoma water into Lavon Lake. In addition to the water management responsibilities of the USACE and NTMWD, the City of Garland withdraws water from Lavon Lake through an intake channel near Little Ridge Park. The water withdrawn by Garland is used as cooling water for a steam electric plant and is returned to the lake.

Lavon Lake is part of the Upper Trinity River watershed in the north-central Texas region. The dam is located on the East Fork of the Trinity River originating in the southern part of Grayson County near Dorchester, in north-central Texas. The East Fork flows about 110 miles in a southerly direction until it merges with the Trinity River below Dallas. The East Fork joins the main stem at approximately river mile 460 of the Trinity River near Rosser, Texas.

The watershed is generally located north and east of Dallas, Texas, and includes a portion of the Dallas metropolitan area, and the cities of Garland, McKinney, Plano, Richardson, and Mesquite. The watershed has a length of about 78 miles along the major axis of its valley and a maximum width of about 30 miles. The East Fork watershed has a drainage area of 1,314 square miles, including 770 square miles above Lavon Lake. Portions of the watershed lie within Collin, Dallas, Fannin, Grayson, Hunt, Kaufman, and Rockwall counties.

The East Fork watershed has a multiple stream drainage pattern. Sister Grove, Pilot Grove, and Indian Creeks are major left bank tributaries, and Wilson Creek and Honey Creek are major right bank tributaries that are all located upstream of Lavon Dam. Major downstream right bank tributaries are Muddy Creek, Rowlett Creek, and Duck Creek. There are no major left bank tributaries downstream of Lavon Dam. Lake

Ray Hubbard, a water supply reservoir owned and operated by the City of Dallas is located only a few miles downstream from the dam at Lavon Lake.

In addition, it is notable that in the watershed above Lavon Lake, the U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) has constructed at least 149 water retention structures. These structures retard runoff from approximately 242 square miles. The combined detention capacity of these structures is 69,170 acre-feet, but this storage capacity has a limited effect on the inflow to Lavon Lake during major floods. There are no major flood retention reservoirs in the Trinity River watershed above Lavon Lake.

### Hydrology and Groundwater

Groundwater in the immediate Lavon Lake area and throughout most of Collin County is present in two aquifers, the Trinity (subcrop) Aquifer, considered to be a major aquifer by the State of Texas, and the more shallow Woodbine (subcrop) Aquifer, considered to be a minor aquifer. Administratively, these aquifers are included in Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB). There are 12 Groundwater Management Districts within GMA 8, including the North Texas Groundwater Conservation District, which encompasses Cooke, Denton, and Collin counties.

Both the Trinity and the Woodbine aquifers serve a very densely populated area and have been heavily used over the past several decades by numerous municipalities, as well as other public water supply providers. Some of the largest aquifer level declines in Texas have occurred in the Trinity Aquifer in a broad corridor that encompasses and parallels Interstate Highway 35. These declines have ranged from 350 feet to more than 1,000 feet. The decline has slowed in recent years due to increasing reliance on surface water for municipal purposes. Refer to Figure 2-3 in the 2016 Master Plan for a map of the Trinity Aquifer in the areas where declines have been significant. All recreational areas operated by the USACE and others at Lavon Lake are connected to municipal or other public water supply providers.

### Water Quality

The USACE, U.S. Geological Survey (USGS), and NTMWD conduct water quality testing at Lavon Lake. The most routine testing is conducted by NTMWD, which takes monthly samples at approximately 17 locations. Table 3-1 provides the 17 sample locations and notes those sites where fecal coliform, taste, and odor are analyzed. Table 3-2 provides the chemical and biological parameters of the testing. Tables 3-3, 3-4, and 3-5 provide an April 2012 water analysis report for raw and treated water withdrawn from Lavon Lake by NTMWD. The April 2012 time period was selected because the lake elevation was close to the conservation pool elevation during that period.

**Table 3-1. NTMWD Water Quality Sample Locations for Taste, Ordo, and Fecal Coliform**

Site Number	Site Location	Parameter Sampled
1	Highway 380	-
2	Elm Creek Park	Taste and Odor
6	Pilot Grove Arm	Taste and Odor
7	Raw Water #1	Taste and Odor
8	Raw Water #2	Taste and Odor
	Brockdale Park	Taste, Odor, and Fecal Coliform
10	Highway 3286/546	Taste, Odor, and Fecal Coliform
11	Wilson Creek Cove	Fecal Coliform
12	East Fork	Fecal Coliform
13	West Arm #1	Fecal Coliform
14	West Arm #2	Fecal Coliform
15	East Arm #1	-
16	East Arm #3	-
17	Raw Water #3	Taste, Odor, and Fecal Coliform

**Table 3-2. Chemical Biological Parameters Sampled by NTMWD**

Parameter Sampled	
<ul style="list-style-type: none"> <li>• Dissolved Oxygen (DO)</li> <li>• Water Temperature</li> <li>• Conductivity</li> <li>• Turbidity</li> <li>• pH</li> <li>• Total Kjeldhal Nitrogen</li> <li>• Ammonia (NH<sub>3</sub>)</li> <li>• Nitrite (NO<sub>2</sub>)</li> <li>• Nitrate (NO<sub>3</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>• Sulfate (SO<sub>4</sub>)</li> <li>• Total Dissolved Solids (TDS)</li> <li>• Chlorophyll-A</li> <li>• Chlorides (Cl)</li> <li>• Ortho-Phosphate (PO<sub>4</sub>)</li> <li>• Total Suspended Solids (TSS)</li> <li>• Volatile Suspended Solids (VSS)</li> <li>• Total Organic Carbon (TOC)</li> <li>• Phyto Count</li> </ul>

**Table 3-3. NTMWD Water Quality Mineral and Alkalinity Analysis from April 2012 for Raw and Treated Water Withdrawn from Lavon Lake using U.S. Environmental Protection Agency (USEPA) and Texas Commission on Environmental Quality (TCEQ) Standards**

Mineral Analysis	Standards					
	Raw (mg/L)*	Treated (mg/L)	USEPA Primary (mg/L)	USEPA Secondary (mg/L)	TCEQ Primary (mg/L)	TCEQ Secondary (mg/L)
Residue on Evaporation	232	258		500		1000
Silica (SiO <sub>2</sub> )	3.11	2.90				
Iron (Fe)	0.685	<0.200		0.3		0.3
Calcium (Ca)	52.1	53.8				
Magnesium (Mg)	3.69	3.51				
Sodium (Na)	22.4	32.6				
Potassium (K)	5.23	5.16				
Bicarbonates (HCO <sub>3</sub> )	117	105				
Carbonates (CO <sub>3</sub> )	0	0				
Hydroxides (OH)	0	0				
SO <sub>4</sub>	38.6	69.0		250		

Table 3-3, continued

Mineral Analysis	Standards					
	Raw (mg/L)*	Treated (mg/L)	USEPA Primary (mg/L)	USEPA Secondary (mg/L)	TCEQ Primary (mg/L)	TCEQ Secondary (mg/L)
NO <sub>2</sub>	0.0509	<0.0200	1			
NO <sub>3</sub>	0.999	1.06	10			
Cl	20.1	28.4		250		300
Fluoride (F)	0.284	0.608	4.0	2.0		2.0
PO <sub>4</sub>	0.0720	0.0110				
Total Alkalinity	117	105				
Phenolphthalein Alkalinity	0	0				
Non-CO <sub>3</sub> Hardness	19.3	43.3				
Total Hardness	136	148				
Langelier Index	-	[+ 0.150]				

\* milligrams per liter

Table 3-4. NTMWD Water Quality Trace Element Analysis (April 2012) – Raw and Treated Water Withdrawn from Lavon Lake

Trace Element Analysis	Standards					
	Raw (mg/L)	Treated (mg/L)	USEPA Primary (mg/L)	USEPA Secondary (mg/L)	TCEQ Primary (mg/L)	TCEQ Secondary (mg/L)
Arsenic (As)	<0.00500	<0.00500	0.01		0.01	
Barium (Ba)	0.0528	0.0432	2		2	
Cadmium (Cd)	<0.00100	<0.00100	0.005		0.005	
Chromium (Cr)	<0.00500	<0.00500	0.1		0.1	
Copper (Cu)	0.0267	0.186	1.3		1.3	1.0
Fe	0.685	<0.200		0.3		
Lead (Pb)	<0.00100	<0.00100	0.15		0.15	
Manganese (Mn)	0.0232	<0.00100		0.5		0.05
Mercury (Hg)	<0.000100	<0.000100	0.002		0.002	
Nickel (Ni)	0.00399	0.00547				
Selenium (Se)	0.00106	<0.00100	0.05		0.05	
Silver (Ag)	<0.00100	<0.00100		0.10		0.1
Zinc (Zn)	0.00651	<0.00500		5		5

Table 3-5. NTMWD Water Quality Other Analysis (April 2012) – Raw and Treated Water Withdrawn from Lavon Lake

Analysis	Standards					
	Raw	Treated	USEPA Primary	USEPA Secondary	TCEQ Primary	TCEQ Secondary
Chlorine Residual (mg/L)	-	3.23	4.0		4.0	
Total Coliform (Present/Absent)	-	A	A		A	
pH @ 25°	8.07	7.75		6.5-8.5		>7.0
Specific Conductance (Umhos) <sup>1</sup>	369	443				
Turbidity (NTU) <sup>2</sup>	15.0	0.0999	0.3		0.3	
Threshold Odor Number	EARTHY	ND				3

<sup>1</sup>Umhos = micromhos<sup>2</sup>NTU = Nephelometric Turbidity Units



In summary, water quality at Lavon Lake can be characterized as generally good. Water quality is not static and can change over time as a result of changes in the landscape and human activity within the watershed. Lavon Lake, with a drainage area of approximately 770 square miles, receives significant runoff from agricultural row crop production and suburban land. Water testing over the years has indicated elevated levels of nitrate at times which may result in algal blooms in the lake. Common sources of nitrate loading include runoff of applied fertilizer from agricultural fields. Having a well-vegetated buffer along the shoreline of the lake can have a positive impact on nutrient loading by absorbing nutrients before they reach the water body. However, the primary source of nutrient loading is from activities taking place throughout the watershed in areas remote from USACE-managed lands. Any attempt to reduce nutrient loading from the watershed would require the cooperation of many governmental entities and private landowners.

As with many reservoirs in Texas, warm summer temperatures can cause lake stratification resulting in very low levels of DO in deeper areas of the lake. This causes displacement of fish and other aquatic organisms to less deep parts of the lake where DO levels remain at sufficient levels.

### **3.2.1 Alternative 1: No Action Alternative**

There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on water resources as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

### **3.2.2 Alternative 2: Proposed Action**

The reclassifications, resource management objectives, and resource plan required for the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources; therefore, there would be no significant adverse impacts on water supply or quality. With implementation of the 2016 Master Plan beneficial impacts on water quality could occur. For instance, the reclassifications proposed in the 2016 Master Plan include 4,319 acres as Environmentally Sensitive Areas. Included as Environmentally Sensitive were areas of high-value bottomland hardwood and riparian forest, and areas supporting high-value native prairie communities, all of which can act as ecological buffers capturing sediment, removing nutrients, and improving water quality.

## **3.3 CLIMATE**

The climate of Collin County is warm, temperate, subtropical, and humid, with hot summers and mild winters. Occasional extreme temperatures occur in winter and summer months but are of short duration. The average low and high temperatures range from 36 degrees Fahrenheit (°F) in January to 96°F in July. The lowest minimum recorded temperature is 1°F in 1989, and the highest maximum recorded temperature is 112°F in 1980.

The average frost-free period is 287 days, but this can vary significantly from year to year. The average first freeze occurs in mid-November, and the average last

freeze occurs in late March. Annual precipitation within the county averages 33.7 inches per year and is fairly evenly distributed throughout the year, with the highest rainfall typically occurring in April and May. Snow seldom falls and is an insignificant source of moisture. Relative humidity ranges from 38 percent to 93 percent with the driest period around late July and the most humid period in early May. The prevailing surface winds are southeasterly, with strong winds from the north-northwest occurring frequently in winter months. In a typical year, wind speeds vary from zero to 17 miles per hour (mph) and rarely exceed 25 mph.

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

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

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

Revision of the Lavon Lake Master Plan would have no impact on the climate of the study area. There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on climate as a result of implementing the No Action Alternative.

## **3.4 CLIMATE CHANGE AND GREENHOUSE GASES**

CEQ drafted guidelines for determining meaningful greenhouse gas (GHG) decision-making analysis. The CEQ guidance states that if a project would be reasonably anticipated to cause direct emissions of 25,000 U.S. tons or more of carbon dioxide (CO<sub>2</sub>)-equivalent (CO<sub>2</sub>e) GHG emissions per year, the project should be considered in a qualitative and quantitative manner in NEPA reporting (CEQ 2014). CEQ proposes this as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ 2014).

According to the most recent estimating tools from the U.S. Environmental Protection Agency (USEPA), there are five GHG contributors within Collin County, one of which, Roy Olinger Power Plant, is located adjacent to Lavon Lake (USEPA 2016). The general operations and recreation facilities associated with Lavon Lake do not approach the proposed reportable limits. Lavon Lake does have management plans in place such as routine equipment maintenance, holistic vegetative management plans, natural resource management plans, and public education and outreach programs to protect regional natural resources from GHG impacts. In addition, USACE will continue monitoring programs as required to meet applicable laws and policies.

Two Executive Orders (EOs), EO 13514 and EO 13653, as well as the President's Climate Action Plan (CAP), set forth requirements to be met by Federal agencies. These requirements range from preparing general preparedness plans to meeting specific goals to conserve energy and reduce GHG emissions. The USACE

has prepared an Adaptation Plan in response to the EOs and CAP. The Adaptation Plan includes the following USACE policy statement:

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

The USACE manages project lands and recreational programs to advance broad national climate change mitigation goals, including but not limited to climate change resilience and carbon sequestration, as set forth in EO 13653, EO 13693, and related USACE policy.

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

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions. There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on climate change or contributions to GHG emissions as a result of implementing the No Action Alternative.

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

Under the Proposed Action, current Lavon Lake project management plans and monitoring programs would not be changed. There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on climate change or contributions to GHG emissions as a result of implementing the 2016 Master Plan. In the event that GHG emission issues become significant enough to impact the current operations at Lavon Lake, the 2016 Master Plan and all associated documents would be reviewed and revised as necessary.

### **3.5 AIR QUALITY**

National Ambient Air Quality Standards (NAAQS) have been established by the USEPA, Office of Air Quality Planning and Standards (OAQPS), for six criteria pollutants that are deemed to potentially impact human health and the environment. These include 1) carbon monoxide (CO); 2) Pb; 3) nitrogen dioxide (NO<sub>2</sub>); 4) ozone (O<sub>3</sub>); 5) particulate matter <10 microns (PM<sub>10</sub>); and 6) sulfur dioxide (SO<sub>2</sub>). Ground level or "bad" O<sub>3</sub> is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO<sub>x</sub> and VOC (USEPA 2011).

In 2012, the USEPA designated 10 counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise) in north-central Texas as in nonattainment for the pollutant O<sub>3</sub> in accordance with the 1997 eight-hour O<sub>3</sub> NAAQS. These standards are designed to protect human and environmental health, and ground

level O<sub>3</sub> is monitored and targeted for reductions due to its potentially harmful effects. Four main sources of O<sub>3</sub>-causing emissions include on-road mobile sources like cars and trucks, non-road mobile sources like construction equipment, point sources like electricity-generating utilities and industrial boilers, and area sources like solvent use and agriculture.

Development of an air quality plan, known as the State Implementation Plan (SIP), is required for all nonattainment areas in order to demonstrate how O<sub>3</sub> will be reduced to levels compliant with the NAAQS. The SIP for the Dallas-Fort Worth nonattainment area, in which the lake is located, includes programs to get older cars off the road, technologies to clean up vehicles already on the road, and education programs so that citizens can do their part in improving air quality in north-central Texas.

In conducting routine operations and maintenance activities at Lavon Lake, the USACE will comply with all Federal, state, and local laws governing air quality and will implement BMPs to protect air quality. Prescribed fire is a useful land management tool for improving native prairie and certain forested areas and will be conducted in accordance with the Texas Administrative Code, Section 111.211(1). Statutory requirements governing prescribed fire and other types of outdoor burning are explained in the TCEQ publication "Outdoor Burning in Texas" available on the TCEQ website. USACE guidance for wildland fire management is set forth in EP 1130-2-540.

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

There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on air quality as a result of implementing the No Action Alternative, since there would be no change to the existing Master Plan.

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

Existing operation and management of Lavon Lake is compliant with the Clean Air Act and would not change with implementation of the revised land use classifications in the 2016 Master Plan. No short- or long-term, minor, moderate or major, beneficial, or adverse impacts on air quality would occur as a result of implementing the proposed revisions to the Lavon Lake Master Plan.

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

### Topography

Lavon Lake is located in north-central Texas entirely within Collin County on the East Fork of the Trinity River. The lake is split into two arms, the East Fork of the Trinity River to the west, and Pilot/Sister Grove Creeks to the east. The topography of the area varies from gently rolling in the upper portion of the watershed to generally flat in the lower portion. The gently undulating slightly rolling upland areas have historically been intensely cultivated. The study area lies within the West Gulf Coastal Plains section of the Coastal Plains physiographic province. The floodplain of the East Fork of the Trinity



River has an average width of two miles and is confined between valley walls that rise fairly steeply to terrace flats and rolling uplands.

The main body of the impounded water at elevation 492.0 feet (top of conservation pool storage) has a maximum length of 12 miles and a maximum width of 4.75 miles. Maximum depth at conservation pool is approximately 45 feet and the average depth is 18 feet. The water level fluctuates about 7.1 feet annually. The elevation of the terrain at Lavon Lake ranges from 430 feet at the bottom of the inundated East Fork river channel, to approximately 675 feet NGVD in the surrounding hill tops.

### Geology

Lavon Lake is underlain by an eastward and southeastward-dipping series of Upper Cretaceous marine sedimentary rocks, overlain locally by Pleistocene fluvial terrace deposits of recent floodplain alluvium. Change in the strike of beds from north to east across Collin County may be in response to deposition of Cretaceous units over now-buried, plunging folds of the Ouachita or Arbuckle mountain systems.

Shoreline geology of Lavon Lake consists primarily of fluvial terrace deposits, gravel, sand, and silt. Alluvium floodplain and channel deposits of sand, silt, clay, and gravel are located in stream channels flowing into Lake Lavon. Small areas near the confluence of these stream channels and the lake show deposits of Wolfe City Sand. Between one and four miles east of the lake and south of Elm Creek/Tom Bean Creek the geology is predominantly Pecan Gap Chalk, with small pockets of Marlbrook Marl.

### Soils

Soils in the Lavon Lake area can be generally characterized as heavy clays and clay loams in the Houston Black and Trinity-Frio associations. Widespread farming activity in the watershed has resulted in moderately higher deposition of sediment in Lavon Lake than was estimated during the initial lake project planning and design.

Six soil associations have been identified and mapped within Collin County. Soils of the Houston Black-Austin association occur primarily on rocks of the Austin group. These deep clayey soils are found on gently sloping to sloping uplands over argillaceous marl and chalk. The Houston Black-Houston soils are associated with the Ozan and Marlbrook formations. These deep clayey soils occur on gently sloping to sloping uplands over calcareous clays and minor limestone units. Soils formed on the Pleistocene fluvial terrace deposits belong to the Houston Black-Burleson association. These deep, clayey soils occur on nearly level to gently sloping stream terraces.

The deep clayey and loamy soils of the nearly level floodplains belong to the Trinity-Frio Association and are developed on recent alluvium. The eroded, deep, clayey soils of the Ferris-Houston Association occur on sloping to strongly sloping uplands. These soils were developed on Pecan Gap Chalk and Wolfe City Formation, consisting

of fine grained calcareous sand, silt, and chalky limestone. The Wilson-Burleson soils are associated with the Eagle Ford formation. These deep, loamy and clayey soils occur on nearly level to gently sloping uplands are underlain by gypsum bearing shale.

These soil types are representative of the Texas Blackland Prairie Ecoregion tallgrass prairie community of soils associated with floodplains, stream terraces, and uplands along this portion of the Trinity River floodplain. This community is characterized by deeper soils underlain at rather shallow depths by dense, hard, clayey material. This “claypan” restricts air and water movements, as well as root penetration.

The floodplain areas with slopes of less than one percent consist of Frio and Trinity soils these are deep, calcareous, and clayey with high fertility and water holding capacity. These clayey soils have a high shrink/swell capacity and develop large cracks during dry weather.

The upland areas are gently sloping to rolling and consist of Houston clay, Altoga silt clay, Burleson clay, and Lewisville silt clay. These soils are deep and calcareous with moderately high water holding capacity. Soil texture ranges from clay to silt clay loam. The clayey soils shrink and crack during dry periods. Moderate to severe sheet and gully erosion is present on areas where vegetation has been removed.

#### Prime Farmland

The Farmland Protection Policy Act (FPPA) of 1980 and 1995 requires Federal agencies to minimize the extent to which their Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. Prime Farmland is one of several kinds of important farmland defined by the USDA NRCS. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is suitable for cropland, pastureland, rangeland, or forestland. It is not suited to urban or water use. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods (USDA NRCS 2007). Prime Farmland is defined in the Federal Register, Vol. 6, Parts 400-699, January 1, 2001, Section 657.5(a). Approximately 25,700 acres in Collin County meet the requirements for Prime Farmland, with several hundreds of acres of Prime Farmland adjacent to Lavon Lake.

#### Sedimentation and Shoreline Erosion

During the planning of the original Lavon Dam, the USDA NRCS estimated that the annual rate of sediment deposition in the lake would be 1.23 acre-feet per square mile of drainage area. At this rate, the average annual deposition would be 956 acrefeet. Based on this estimate a total of 47,800 acre-feet of storage space was provided in Lavon Lake to accommodate sediment deposition for a period of 50 years.

In November 1959, six years after the dam was completed, a sediment survey was completed revealing a deposition rate of 1.92 acre-feet per square mile of drainage area and an average annual deposition rate of about 1,415 acre-feet. In October 1965, a second sediment survey was completed at Lavon Lake. This survey revealed an even greater sediment deposition rate of 2.03 acre-feet per square mile of drainage area and an average annual deposition rate of about 1,496 acre-feet.

The 1959 and 1965 sediment surveys were conducted when the top of conservation pool was at elevation 472.0 feet NGVD and the top of flood control was at elevation 490.0 feet NGVD. The results of both surveys showed that the rate of sedimentation was higher than initially estimated. The high rate of sedimentation may be due in part to the amount of clay in the watershed and the relatively high percentage of land in the watershed that is in agricultural production. The USDA NRCS water retention structures in the watershed undoubtedly retained some sediment over the years but the tendency of colloidal suspended clay to stay in suspension for extended periods of time has probably contributed to the higher than anticipated accumulation of sediment in Lavon Lake.

The planned enlargement of Lavon Lake took place in the early 1970s with deliberate impoundment of the enlarged reservoir starting in December 1975. The enlargement raised the conservation pool from 472.0 feet to 492.0 feet NGVD. The estimated 100-year sediment load was increased to 92,600 acre-feet below elevation 492.0 feet NGVD. A sedimentation resurvey has not been conducted at Lavon Lake since the conservation pool was raised.

Shoreline erosion at Lavon Lake can be severe during times of high pool elevations. During the record flood pool elevations of 1990-91, and again more recently in 2015, significant shoreline erosion occurred in many of the designated recreation areas. Damage to park facilities and roads required extensive repair. Shorelines exposed to significant wind and wave action required protection in the form of riprap and other treatments.

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

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so there would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on topography, geology, soils, Prime Farmland, sedimentation, or shoreline erosion as a result of implementing the No Action Alternative.

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

Topography, geology, soils, Prime Farmland, sedimentation, and shoreline erosion were considered during the refining process of land reclassifications for the 2016 Master Plan. Lands under the prior classification of Recreation-Intensive Use were converted to the new and similar classification of High Density Recreation, but total acreage was reduced from 2,971 acres to 2,007 acres. This reduction is partly because of the loss of acreage due to shoreline erosion at several parks. The conversion of

these lands and loss of acreage due to shoreline erosion would have no effect on current or projected public use.

Soil-disturbing activities associated with land management, public recreation area maintenance, out-granted recreation area maintenance and improvements, and other routine operation and maintenance activities would be assessed individually as they arise. Therefore, under the Proposed Action, there would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on topography, geology, soils, Prime Farmland, sedimentation, and shoreline erosion as a result of implementing the 2016 Master Plan.

### **3.7 NATURAL RESOURCES**

In preparation for revision of the Lavon Lake Master Plan, the USACE requested the assistance of the USFWS to describe existing wildlife habitat conditions on project lands. A team of USFWS and USACE biologists conducted field work from July 12-28, 2010, and the report was completed later that year. The fieldwork consisted of identifying major habitat types on project lands and collecting data at 154 sample locations randomly selected throughout the major habitat types. Developed recreation areas and the main body of the lake were excluded from the study. Data collection was done using the Habitat Evaluation Procedures (HEP) developed by the USFWS. Habitat types identified included bottomland hardwood (9,490 acres), herbaceous wetlands (526 acres) and grassland (6,771 acres). The report is included as Appendix D of the 2016 Master Plan.

The Texas Conservation Action Plan (TCAP) 2012 and the accompanying Texas Blackland Prairies Ecoregion Handbook (Handbook), published by TPWD in August 2012, were used extensively in the preparation of the 2016 Master Plan. The TCAP and Handbook were invaluable in identifying Species of Greatest Conservation Need (SGCN), rare plant communities, regional conservation issues, and a suite of conservation actions needed to reduce negative effects on SGCN and rare plant communities. The TCAP and Handbook were especially valuable in preparing the Land Classifications and Resource Objectives in the 2016 Master Plan.

#### Vegetation

The ecoregion that spans the entire vicinity of Lavon Lake is the Texas Blackland Prairie Ecoregion (TBPR ecoregion). This prairie community forms a belt across Texas and was dominated by tallgrass prairies on uplands prior to the now-established row crop agriculture and suburban development. The intense suburban and agricultural development has almost completely annihilated all vestiges of tallgrass prairie. As noted in the TCAP, less than 5,000 acres of scattered patches of Texas Blackland Prairie remain out of the 12 million acres that once existed. Intact Texas Blackland Prairie remains predominantly as a treeless rolling prairie of bunch and short grasses; however, hardwoods such as elm species (*Ulmus* spp.), hackberry (*Celtis occidentalis*), pecan (*Carya illinoensis*), and oak species occur along streams and bottomlands. Groundcover consists of such native grasses as buffalograss (*Bouteloua dactyloides*),



various bluestems (*Adropogon* spp.), and grama grasses (*Bouteloua* spp.) combined with various forbs and vines.

Collin County lies in the Texan biotic province, a transitional zone between the forested Austroriparian province to the east and the grassland provinces (Kansan and Balconian) to the west. While the region exhibits a combination of eastern forest and western prairie flora and fauna, the bottomlands are primarily Austroriparian species. Stream bottoms were often wooded with bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), hackberry, elm, ash (*Fraxinus* spp.), eastern cottonwood (*Populus deltoides*), and pecan. There are, however, hardwoods such as elm, hackberry, pecan, oak, and Bois d'Arc (*Maclura pomifera*) occurring along streams. Brushy species such as honey mesquite (*Prosopis glandulosa*) and eastern redcedar have invaded many portions of the grasslands as a result of the minimization of natural and man-made fires.

The TBPR ecoregion is perhaps the most critically threatened in the state. It lies along one of the most development-intensive and populated areas in Texas, the Interstate 35 corridor that stretches through Dallas, Waco, Temple, Austin (eastern portions), San Marcos, New Braunfels, and San Antonio. Gently rolling to mostly flat, this region is easily developed and has few barriers to development like the adjacent ecoregions, which require clearing, leveling, and geotechnical work. Historically, the region was a vast tallgrass prairie of little bluestem (*Schizachyrium scoparium*), bigbluestem (*Andropogon gerardii*), yellow Indian grass (*Sorghastrum nutans*), tall dropseed (*Sporobolus compositus*), eastern gamagrass (*Tripsacum dactyloides*), and many forbs, such as asters (*Aster* spp.), clovers (*Trifolium* spp.), and black-eyed Susan (*Rudbeckia* spp.), which supported wide-ranging abundant herds of bison (*Bison bison*) and pronghorn (*Antilocapra americana*), greater prairie-chickens (*Tympanuchus cupido*), and ocelot (*Leopardus pardalis*). Within the TBPR ecoregion, the TCAP lists several rare plant communities (Table 3-6).

**Table 3-6. Rare Plant Communities within the TBPR Ecoregion**

Common Name	State Rank
Bur Oak–Shumard Oak <i>Mixed Bottomland Forest</i>	S3? – Vulnerable ("?" denotes inexact rank)
Eastern Grama grass –Switch grass <i>Floodplain Herbaceous Vegetation</i>	S1 – Critically Imperiled
Eastern Grama grass–Switch grass–Yellow Indian grass– Michaelmas-Daisy <i>Herbaceous Vegetation</i>	S1 – Critically Imperiled
Silveus Dropseed – Longspike Tridens <i>Herbaceous Vegetation</i>	S1S2 – Critically Imperiled and Imperiled
Silveus Dropseed – Mead's Sedge <i>Herbaceous Vegetation</i>	S1 – Critically Imperiled
Southern Elm – Chinquapin Oak <i>Forest</i>	S1S2? – Critically Imperiled and Imperiled (Inexact rank)
Upper West Gulf Coastal Plain Dry <i>Calcareous (Blackland) Prairie</i>	S1S2 – Critically Imperiled and Imperiled
<i>Vertisol Blackland Prairie</i>	S1S2 – Critically Imperiled and Imperiled

Determining the presence or absence and extent of these communities requires careful field investigations that will be accomplished at Lavon Lake as time and funding permits. A few relic patches of tallgrass prairie, as well as a few acres of Southern Elm – Chinquapin Oak Forest and Bur Oak – Shumard Oak Bottomland Forest, are known to exist at Lavon Lake and efforts to restore and expand these areas are included in the resource objectives described in this Plan. Crosscutting this prairie were dense meandering bands of riparian hardwoods (composed primarily of bur oak, Shumard oak, sugar hackberry, elm, ash, eastern cottonwood, and pecan) along broad floodplains. Rare vertisol blackland prairie communities are known to exist in small pockets at Lavon Lake (Photograph 3-1).

The current dominant canopy species along creeks in the study area include pecan, black willow (*Salix nigra*), cedar elm (*Ulmus crassifolia*), and eastern cottonwood. The dominant sapling/shrub species within both areas include young tree species, buttonbush (*Cephalanthus occidentalis*), flameleaf sumac (*Rhus lanceolata*), and roughleaf dogwood (*Cornus drummondii*). Finally, herbaceous species near the aquatic resources were dominated by wild rye (*Elymus* spp.), coralberry (*Symphoricarpos orbiculatus*), smartweed (*Polygonum* spp.), cocklebur (*Xanthium strumarium*), inland seaoats (*Chasmanthium latifolium*), cattail (*Typha latifolia*), sedge (*Carex* spp.), and the herbaceous species within the upland areas are dominated by giant ragweed (*Ambrosia trifida*), Bermudagrass, and perennial ryegrass (*Lolium perenne*). However, there are still remnants of native prairie that support little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), tall dropseed (*Sporobolus compositus*), goldenrod (*Solidago* sp.), and cut-leaf daisy (*Erigeron compositus*). Invasive species such as King Ranch bluestem (*Bothriochloa ischaemum* var. *songarica*), Johnsongrass, and broomweeds are now common in many portions of the grasslands.



**Photograph 3-1. Rare vertisol blackland prairie community at East Fork Park (Photograph taken in July 2015).**

## Wetlands

In accordance with national USACE policy, wetlands at operational projects are inventoried using the protocol established by USFWS in their *Classification of Wetlands and Deepwater Habitats of the United States*. The current USACE inventory for Lavon Lake indicates there are 526 acres of emergent wetlands located in shallow shoreline areas in the upper reaches of the main tributaries. The National Wetland Inventory (NWI) maps prepared by the USFWS and available in the Wetland Mapper tool on the USFWS website, show these and more emergent wetlands, as well as a significant acreage of forest/shrubland and freshwater pond wetlands in the upper reaches of the main tributaries to Lavon Lake. However, as explained by the USFWS regarding use of the NWI map data, the data represents reconnaissance level mapping using high altitude imagery. The actual presence and boundaries of wetlands shown on NWI maps requires verification through detailed, on-the-ground inspection. During preparation of the 2010 Habitat Evaluation Report (see Appendix D of the 2016 Master Plan), on-site inspection of USACE lands indicated that most of the wetlands described using the Wetland Mapper tool do not exist on the ground. Most of the “freshwater pond” and “forested” wetlands shown by the Wetland Mapper tool are actually open water of the lake or tracts of bottomland hardwood forest. USACE is aware that the acreage of NWI wetlands at Lavon Lake exceeds, to some extent, the 526 acres of known wetlands, and as time and funding permits, USACE intends to verify the NWI data to determine the full extent of wetlands at Lavon Lake.

## Fisheries and Wildlife Resources

A variety of mammals are known to inhabit the study area and/or surrounding land. These include opossum (*Didelphis virginiana*), cave myotis (*Myotis velifer*), beaver (*Castor canadensis*), nutria (*Myocastor coypus*), plains pocket gopher (*Geomys bursarius*), eastern flying squirrel (*Glaucomys volans*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), California jackrabbit (*Lepus californicus*), eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), mink (*Mustela vison*), spotted skunk (*Spilogale putorius*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Many of these species have been able to tolerate urbanization, while species that formerly inhabited the region, such as black bear (*Ursus americanus*), gray and red wolves (*Canis lupus* and *Canis rufus*, respectively), mountain lion (*Felis concolor*), river otter (*Lutra canadensis*), and bison, were extirpated from the area due to hunting, trapping, or behavioral intolerance to human activity.

The study area is used by both resident and migratory birds, reptiles, and amphibian species that are tolerant of human activity. Resident passerines use the wooded areas along the forks, main stem, and tributaries of the East Fork of the Trinity River for nesting, for foraging, and as a dispersion corridor. The more heavily impacted woodlands upstream and downstream of the study area are most likely used by a variety of migratory and resident passerine, owl, and hawk species which may disperse from the less impacted study area. Some common resident bird species that may be observed in the study area are sparrows (various species), northern mockingbird

(*Mimus polyglottos*), American robin (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*), blue jay (*Cyanocitta cristata*), common grackle (*Quiscalus quiscula*), scissortailed flycatcher (*Tyrannus forficatus*), barred owl (*Strix varia*), common crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), Carolina chickadee (*Parus carolinensis*), and red-tailed hawk (*Buteo jamaicensis*). The species more intolerant to human activity have declined, while the more tolerant species have flourished. A large number of bird species utilize the stream bottomlands in Collin County, and species such as the house sparrow (*Passer domesticus*), great-tailed grackle (*Quiscalus mexicanus*), common crow, and European starling (*Sturnus vulgaris*) dominate the more urbanized areas.

Common reptile species documented near the study area include lizards and various snakes, such as the copperhead (*Agkistrodon contortrix*), cottonmouth (*Agkistrodon piscivorus*), bullsnake (*Pituophis melanoleucus sayi*), and diamondback rattlesnake (*Crotalus atrox*). Amphibians, including turtles and frogs, are seen occasionally.

The common fish species known to be in Lavon Lake and its tributaries include various species of bass (*Micropterus* spp.), bluegill (*Lepomis macrochirus*), gar (*Atractosteus spatula*), shad (*Dorsoma* spp.), white crappie (*Pomoxis annularis*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), freshwater drum (*Aplodinotus grunniens*), carp (*Aplodinotus grunniens*), and suckers (Family Catostomidae). Freshwater mussels common to the Upper Trinity drainage are giant floater (*Pyganodon grandis*), Texas liliput (*Toxolasma texasiensis*), southern mapleleaf (*Quadrula apiculata*), and pink papershell (*Potamilus ohiensis*).

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

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

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

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

The reclassifications proposed in the 2016 Master Plan include 4,319 acres as Environmentally Sensitive Areas. Under this reclassification, several land parcels that were previously classified as Recreation – Low Density Use would be converted to 11 Environmentally Sensitive Areas in order to recognize those areas having the highest



ecological value and to ensure they are given the highest order of protection among possible land classifications. Included as Environmentally Sensitive were areas of high-value bottomland hardwood and riparian forest, and areas supporting high-value native prairie communities. The reclassification of lands also resulted in the classification of 6,480 acres as MRML – Wildlife and Vegetation Management. The conversion of these lands was supported by public comment and recommendations from the USFWS and TPWD.

Furthermore, the utility corridors at Lavon Lake were designated to avoid and minimize impacts on current natural resources by future actions by selecting corridors with lesser quality habitats and that would avoid continued fragmentation of habitats.

The conversion of these lands to Environmentally Sensitive Areas and MRML – Wildlife and Vegetation Management will have no effect on current or projected public use. However, long-term, beneficial impacts on natural resources could occur as a result of implementing the 2016 Master Plan.

### **3.8 THREATENED AND ENDANGERED SPECIES**

In accordance with the Trust Resources Report generated by the USFWS webbased Information for Planning and Conservation tool, there are two Federally listed endangered species and two threatened species that potentially occur at Lavon Lake. The four species, all birds, are listed in Table 3-7. The Trust Resources Report, included as part of the 2016 Master Plan as Appendix E, also lists several Birds of Conservation Concern. The bald eagle (*Haliaeetus leucocephalus*) has the potential to occur at Lavon Lake and was formerly listed by the USFWS as an endangered or threatened species. Although recently delisted, the bald eagle is provided specific protections under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c).

Designated critical habitat is not present for any of the Federally listed threatened or endangered species within the study area. Additionally, none of the Federally listed species have been observed during on-site investigations. The whooping crane (*Grus americana*) and interior least tern (*Sterna antillarum athalassos*) are known to migrate through, but not nest at Lavon Lake. However, the bald eagle has been known to nest on the East Fork of the Trinity River downstream of Lavon Lake and at nearby lakes in the region such as Bardwell Lake and Benbrook Lake.

In addition to the Federally listed species for Lavon Lake, TPWD maintains lists by Ecoregion for SGCN. The list for the TBPR Ecoregion is available in Appendix F of the 2016 Master Plan and provides both the Federal and State listing status, as well as a global and state abundance rank for approximately 150 species of plants and animals. The list also provides general habitat requirements for each of the species on the list. The white-faced ibis (*Plegadis chihi*) and wood stork (*Mycteria americana*) are migratory birds that breed along the Texas coast, and there is a likelihood of both species being present at Lavon Lake during migration. Habitat preferred by other state-listed species included in the list, such as the Texas horned lizard (*Phrynosoma cornutum*), was not observed within the study area; therefore, the likelihood of observing these species

within the study area is low. Habitat for many of the other species on the state list, particularly migratory songbirds and the timber/canebrake rattlesnake (*Crotalus horridus*), does exist on USACE lands, and these species are considered in management plans.

**Table 3-7. Federally Listed Endangered and Threatened Species with Potential to Occur at Lavon Lake**

Common Name	Scientific Name	Federal Status	State Status
Piping Plover	<i>Charadrius melodus</i>	Threatened	Threatened
Whooping Crane	<i>Grus americana</i>	Endangered	Endangered
Interior Least Tern	<i>Sterna antillarum athalassos</i>	Endangered	Endangered
Red Knot	<i>Calidris canufus rufa</i>	Threatened (for wind projects only)	Not Listed

### 3.8.1 Alternative 1: No Action Alternative

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

### 3.8.2 Alternative 2: Proposed Action

Under the Proposed Action, the USACE would continue cooperative management plans with the USFWS and TPWD to preserve, enhance, and protect wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications proposed in the 2016 Master Plan include 4,319 acres as Environmentally Sensitive Areas and 7,300 acres as MRML – Wildlife and Vegetation Management. Under this reclassification, several land parcels that were previously classified as Recreation – Low Density Use were converted to Environmentally Sensitive Areas in order to recognize those areas having the highest ecological value and to ensure they are given the highest order of protection among possible land classifications. Included as Environmentally Sensitive were areas of high-value bottomland hardwood and riparian forest, and areas supporting high-value native prairie communities. The conversion of these lands was supported by public comment and recommendations from the USFWS and TPWD. In addition, the establishment of 11 strategically located utility corridors will serve to reduce future loss of natural resources that could potentially occur from placement of utility lines on project lands.

The conversion of these lands and utility corridors will have no effect on current or projected public use. However, long-term, beneficial impacts on natural resources could occur as a result of implementing the revised land use classifications and utility corridors in the 2016 Master Plan. Any future activities which could potentially result in impacts on Federally listed species shall be coordinated with USFWS through Section 7 of the Endangered Species Act (ESA).

### 3.9 INVASIVE SPECIES

Several non-native invasive species have been documented at Lavon Lake. Zebra mussels have garnered the most visibility given Lavon Lake's importance as a water supply and outdoor recreation asset. Zebra mussels can have a detrimental effect on water control structures, raw water facilities, and the general health and productivity of the aquatic environment. A reproducing zebra mussel population has been documented in one of the tributaries (Sister Grove Creek) that feeds into Lavon Lake, and isolated adult individuals have been found on recreational vessels over the last few years. Attempts to eradicate zebra mussels in Sister Grove Creek exhibited limited success, as live but stressed individuals remained post-treatment. No reproducing population has been documented within Lavon Lake, but given the proximity of established zebra mussel populations and a robust recreation footprint facilitating boat traffic, the risk of establishment remains high for the foreseeable future.

Feral hogs (*Sus scrofa*) continue to have a presence at differing levels throughout the year given food availability and the abundance of cover afforded by bottomland hardwoods around Lavon Lake. Signs of land degradation, conversion of the understory plant community, and accelerated soil instability have all been documented and are assumed to continue in natural resource and park areas around the lake. Lavon Lake does have an active hunting program, with feral hogs being one of the animals allowed for harvesting.

Other nuisance species that impact the health and productivity of the natural resources at Lavon Lake include exotic Johnsongrass and native eastern redcedar. Both species are prolific and can out-compete more desirable native species, further degrading prairie components that were historically the dominant vegetation type in the Texas Blackland Prairies.

The emerald ash borer (EAB) (*Agilus planipennis*) is another invasive species of concern that has not been detected in the area, but has slowly moved east across North America and has been detected near the east Texas border. The EAB is native to Asia and was first recorded in North America in 2002. The EAB specifically utilizes true ash species to complete its life cycle. Female emerald ash borers lay their eggs on the surface of ash trees, and when the eggs hatch the larvae burrow into the tree, feeding and developing into adult beetles. At maturity, the beetle leaves the host tree and the cycle is repeated. This feeding activity kills the tree within a few years. Lavon Lake has considerable acreage where green ash (*Fraxinus pennsylvanica*) is a dominant or co-dominant species. All stands of green ash commonly found in the upper Trinity River watershed would be in jeopardy if the EAB spreads to the area.

#### 3.9.1 Alternative 1: No Action Alternative

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

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

The land reclassifications, resource management objectives, and resource plan required to revise the Lavon Lake Master Plan are compatible with the lake's invasive species management practices. Therefore, invasive species would continue to be managed, and no significant adverse impacts on resources would occur as a result of implementing the 2016 Master Plan.

## **3.10 MINERAL AND TIMBER RESOURCES**

The Texas Railroad Commission database shows very little mineral extraction activity in Collin County and virtually no activity in the immediate area of Lavon Lake. A few dry exploratory oil and gas holes are shown several miles north and east of the lake. This is in sharp contrast to the significant oil and gas drilling and production activity approximately 25 miles west of Lavon Lake in the natural gas rich Barnett Shale area of Denton County. Most of the minerals underlying Federal land at Lavon Lake are privately owned with the exception of the immediate area underlying the Lavon Lake Dam and a few other isolated tracts. In general terms, during the land acquisition process for the Lavon Lake project, the mineral estate underlying the dam was purchased by the Federal government as a precautionary measure to protect the integrity of the dam structure.

Currently, with few exceptions, the stipulations used in the USACE, Fort Worth District, do not allow surface occupancy of Federal lands for the extraction of Federally owned minerals. Exploration and extraction of privately owned minerals may, in some cases, be allowed to occur on Federal lands at Lavon Lake in so far as the integrity of the dam and related facilities are not at risk and every precaution is taken to reduce the risk of pollution and other environmental damage to the lands and waters of the lake. The bottomland forests of the main tributaries of Lavon Lake have high value as wildlife habitat, but do not have significant value as commercial timber. This is due in part to the location being approximately 100 miles west of any appreciable timber resources that support a viable forest products industry, and secondarily to the lack of tree species and sizes with high commercial timber value.

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

The No Action Alternative does not involve any activities that would contribute to changes in existing conditions, so mineral and timber resources at Lavon Lake would continue to be managed according to the existing management practices. There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on mineral or timber resources as a result of implementing the No Action Alternative.

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

The land reclassifications, resource management objectives, and resource plan proposed in the 2016 Master Plan are compatible with Lavon Lake's mineral and timber management practices. Therefore, these resources would continue to be managed, and no significant adverse impacts on resources would occur as a result of implementing the 2016 Master Plan. Should oil and gas exploration ever occur within Lavon Lake's Federally-owned mineral estate, the leasing of the minerals would be administered by



the Bureau of Land Management, U.S. Department of the Interior. Any leasing of the minerals would be subject to stipulations imposed by the USACE.

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

#### Cultural History Sequence

##### *Prehistoric*

The earliest well-documented evidence of human occupation in north-central Texas dates to about 12,000 years before present (B.P.). Prehistory is divided generally into three broad time periods: Paleo-Indian (12,000-8,500 B.P.), Archaic (8,500-1,250 B.P.), and Late Prehistoric (1,250-300 B.P.).

Evidence for Paleo-Indian period occupation is relatively rare in the Lavon Lake area, and is known primarily from distinctive projectile point styles dating to this time period found in surface collections or in mixed multi-component sites. It is likely that intact Paleo-Indian camp sites may be buried deeply beneath Holocene floodplain alluvium, as was the case with the Aubrey Clovis site on the Elm Fork Trinity River. Evidence suggests that the region was occupied by small groups of highly mobile hunter-gatherers that traveled over very large territories. Traditionally thought of as big-game hunters of mammoth and bison, more recent evidence indicates that Paleo-Indians exploited a much broader range of animal and plant resources.

The Archaic period is divided into Early (8,500-6,000 B.P.), Middle (6,000-3,500 B.P.), and Late (3,500-1,250 B.P.) sub-periods. During this long time period, a generalized hunting and gathering subsistence strategy is indicated. Trends through time suggest increasing population density and decreasing group mobility within smaller territories. Sites with Late Archaic components are well represented in the Lavon Lake area and in north-central Texas generally. The large circular depressions known as “Wylie pit features” were first identified at Lavon Lake and had long been attributed to the subsequent Late Prehistoric period. However, more recent investigations of two such features elsewhere in the Trinity River drainage showed that their original construction dated to the Late Archaic. A similar Late Archaic age is assumed for the initial construction of these features at Lavon Lake.

The Late Prehistoric Period is marked by the presence of the bow and arrow and pottery. During the early portion of this time span, subsistence strategies remained similar to those of the preceding Late Archaic. By around 800 B.P., there is limited evidence for maize horticulture and more sedentary occupations in some north-central Texas sites. After around 600 B.P., there is widespread evidence for an increase in bison hunting. Pottery from Lavon Lake sites includes plain and decorated grog-tempered specimens in the Caddo ceramic tradition. It is unclear whether this pottery was made locally or represents trade with East Texas Caddo groups. Plain, shell tempered pottery is also found at Lavon Lake sites and is thought to show connections with southern plains groups to the north and west. This shell-tempered pottery is

generally thought to date to the late portion of the Late Prehistoric period (after circa 600 B.P.) when bison hunting became more important.

### *Historic*

Local tradition holds that Native Americans of the Caddo Nation inhabited the Lavon Lake area prior to the arrival of the first white settlers in the early 1840s. The majority of these early settlers were farmers operating small family farms growing mainly wheat and corn. When Collin County was created out of Fannin County in 1846, the estimated population was only 150. The population grew slowly between the 1840s and 1870s. The arrival of the railroads in the early 1870s allowed farmers access to markets and led to a major increase in the number of farms. Cotton farming became an important agricultural activity in the Texas Blackland Prairie region and tenant farming was a major social institution. No historic period resources were recorded by the surveys conducted prior to the initial construction or the subsequent pool raise of Lavon Lake. Most of the historic resources at Lavon Lake are expected to be the remains of house sites and farmsteads dating from the late nineteenth century through the mid-twentieth century.

### Previous Investigations

Archaeological investigations at Lavon Lake were initially conducted between 1948 and 1950 by the River Basin Surveys. During that period, 25 sites were recorded, two sites were tested, and one site (the Hogge Bridge Site) was excavated extensively. Plans to enlarge the lake led to another survey in 1964 by the Texas Archaeological Salvage Project, during which 12 new sites were recorded and 17 known sites were revisited. In 1969, four sites affected by the lake's enlargement were tested, one of which (Sister Grove Creek site) was excavated in 1974 by Southern Methodist University. Limited survey work since the mid-1970s has added to the number of known archaeological sites.

### Recorded Cultural Resources

Currently, 47 archaeological sites have been recorded at Lavon Lake. One of these sites (Sister Grove Creek) is listed on the National Register of Historic Places (NRHP). The remaining 46 sites have not yet been evaluated for NRHP eligibility. Only about 300 acres of Lavon Lake property have been inventoried to current survey standards.

### Cultural Resources Management at Lavon Lake

The cultural resources surveys of the 1970s and earlier were not systematic and are not considered adequate by current standards. As such, and dependent on funding, a Cultural Resources Management Plan (CRMP) for Lavon Lake property would be developed and incorporated into the Operational Management Plan in accordance with EP 1130-2-540. The purpose of the CRMP would be to provide a comprehensive program to direct the historic preservation activities and objectives at Lavon Lake.

Completion of a full inventory of cultural resources at Lavon Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA). All currently known and newly recorded sites would be evaluated to determine their eligibility for the NRHP.

In accordance with Section 106 of the NHPA, any proposed ground-disturbing activities or projects, such as those described in the 2016 Master Plan or as may be proposed in the future by others for right-of-way easements, would require cultural resource surveys to locate and evaluate historic and prehistoric resources. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated. All future cultural resource investigations at Lavon Lake would be coordinated with the Texas State Historic Preservation Officer (SHPO) and Federally recognized Tribes to ensure compliance with the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.

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

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

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

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications. Based on previous surveys at Lavon Lake, the required reclassifications, proposed utility corridors, resource management objectives, and resource plan would not change current cultural resource management plans or alter areas where these resources exist. All future activities, including designation of additional utility corridors, would be coordinated with the SHPO and Federally recognized Tribes to ensure compliance with Section 106 of the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. Therefore, no significant adverse impacts on cultural, historical, or archaeological resources would occur as a result of implementing the 2016 Master Plan.

### **3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

The zone of interest for this socioeconomic analysis consists of Collin, Dallas, Denton, Fannin, Grayson, Hunt, and Rockwall counties in Texas. Lavon Lake lies completely within Collin County, which is a county located north of Dallas, at the far northeastern corner of the Dallas-Fort Worth metropolitan area. The remaining counties in the zone of interest are those that are adjacent to Collin County.

#### *Population*

The total population for the zone of interest in 2014 was 4.49 million (Table 3-8). The majority (approximately 56 percent) of the population resides in Dallas County

(Table 3-8). Collin County is the second most populated county in the zone of interest, with approximately 20 percent of the zone of interest's population (Table 3-8).

**Table 3-8. Population Estimates for the Zone of Interest**

<b>Geographical Area</b>	<b>2000 Population Estimate</b>	<b>2014 Population Estimate</b>	<b>2040 Population Projection</b>
Texas	20,851,820	26,956,958	36,550,595
Collin County	491,675	885,241	1,496,177
Dallas County	2,218,899	2,518,638	3,086,679
Denton County	432,976	753,363	1,242,750
Fannin County	31,242	33,752	39,458
Grayson County	110,595	123,534	142,177
Hunt County	76,596	88,493	119,853
Rockwall County	43,080	87,809	146,334
<b>Zone of Interest Total</b>	<b>3,405,063</b>	<b>4,490,830</b>	<b>6,273,428</b>

Source: U.S. Census Bureau, American Fact Finder (2000, 2014 Estimate); Texas State Data Center 2014, The University of Texas at San Antonio (2040 Projections)

The population in the zone of interest makes up approximately 17 percent of the total population of the State of Texas. From 2014 to 2040, the population in the zone of interest is expected to increase to approximately 6.3 million, with an annual growth rate of 1.3 percent per year. By comparison, the population of the State of Texas is projected to increase at an annual rate of 1.2 percent per year, well above the expected national growth rate of 0.7 percent per year. During this time frame, Collin County and Rockwall County are the only two counties in the zone of interest with a projected annual growth rate higher than the State of Texas, with a projected growth rate of two percent each (see Table 3-8).

The distribution of the population among gender is approximately 49.2 percent male and 50.7 percent female in the zone of interest, which is very similar to the overall gender distribution in Texas (Table 3-9). The female population is slightly higher than the male population in all counties in the zone of interest except Fannin County.

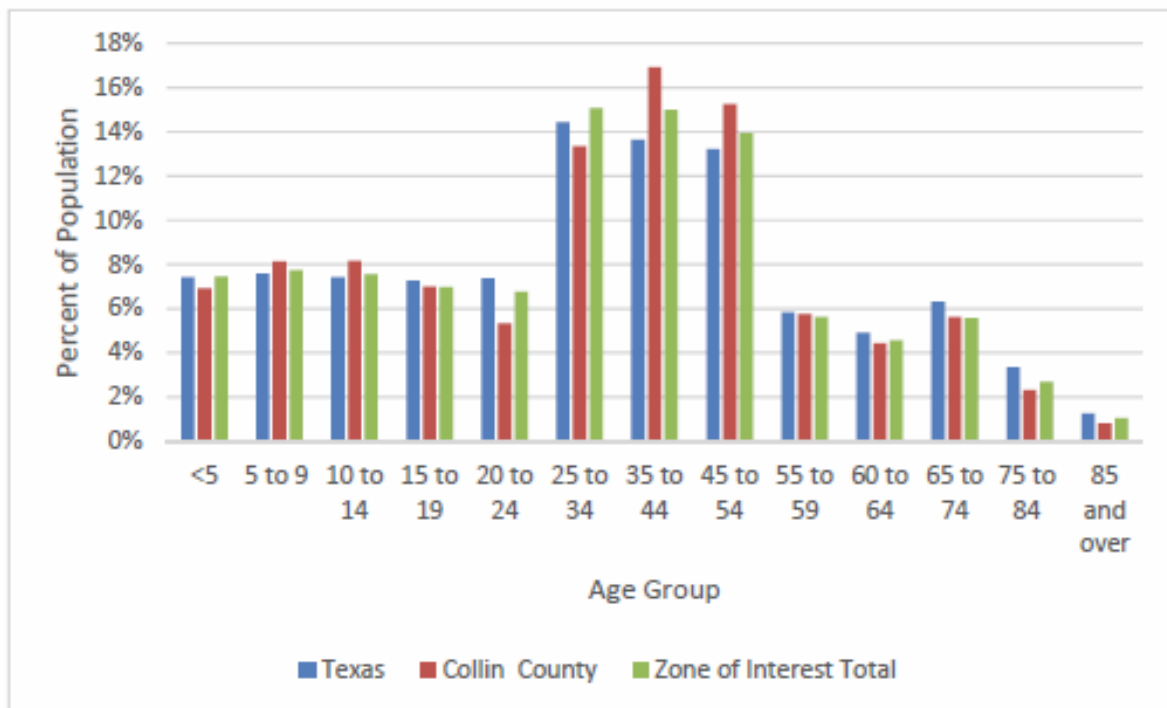
**Table 3-9. 2014 Population Estimates by Gender**

<b>Geographical Area</b>	<b>Male</b>	<b>Female</b>
Texas	13,382,386	13,574,572
Collin County	434,591	450,650
Dallas County	1,241,277	1,277,361
Denton County	370,582	382,781
Fannin County	17,889	15,863
Grayson County	60,296	63,238
Hunt County	43,718	44,775
Rockwall County	43,019	44,790
<b>Zone of Interest Total</b>	<b>2,211,372</b>	<b>2,279,458</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)



The distribution by age group is similar among the counties, zone of interest, and the State of Texas overall in terms of percentage of the population. The largest age groups in the zone of interest are the 25 to 34 group and the 35 to 44 group, which each make up approximately 15 percent of the zone of interest population. Collin County, in which the lake lies, has a slightly larger population of residents ages 35 to 54 than both the zone of interest and the State of Texas, and a slighter smaller population of individuals ages 20 to 34 (Figure 3-1).



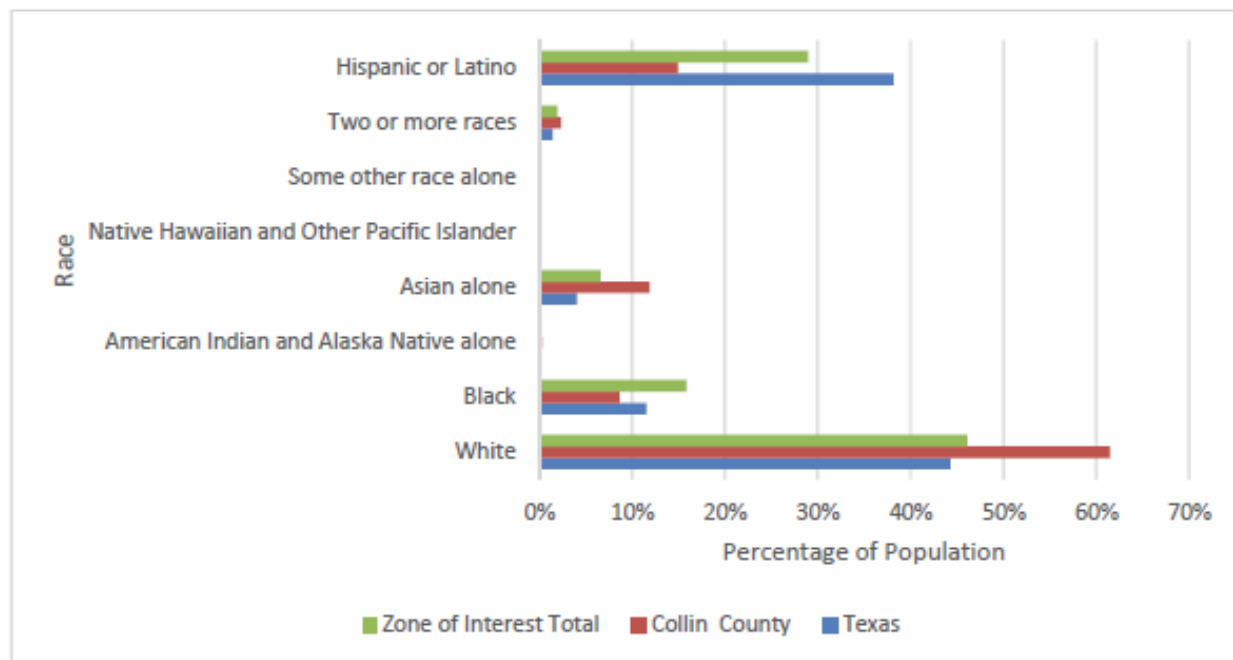
**Figure 3-1. 2014 Percent of Population by Age Group**

The race and ethnicity of the population in the zone of interest is approximately 45 percent White, 16 percent Black or African American, 29 percent Hispanic or Latino, seven percent Asian, and two percent two or more races (Table 3-10). Other ethnicities account for less than two percent each of the population. By comparison, the Hispanic or Latino population in Texas is nearly 10 percent higher than the zone of interest. When comparing Collin County to the zone of interest, the White population is 18 percent higher, the Black or African American population is seven percent lower, the Asian population is five percent higher, and the Hispanic or Latino population is 14 percent lower (Figure 3-2).

**Table 3-10. Population Estimate by Race and Ethnicity**

Geographic Area	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Two or more races	Hispanic
Texas	11,735,074	3,161,811	88,539	1,177,410	21,807	360,977	10,411,340
Collin County	534,565	81,151	3,668	112,930	554	18,735	133,638
Dallas County	782,674	560,538	7,406	145,333	1,045	32,166	989,476
Denton County	465,191	68,643	3,466	57,091	557	15,053	143,362
Fannin County	26,811	2,266	311	173	8	634	3,549
Grayson County	94,847	7,289	1,732	1,350	53	2,705	15,558
Hunt County	64,955	7,085	573	1,187	116	1,360	13,217
Rockwall County	63,710	5,049	389	2,355	61	1,353	14,892
<b>Zone of Interest Total</b>	<b>2,032,753</b>	<b>732,021</b>	<b>17,545</b>	<b>320,419</b>	<b>2,394</b>	<b>72,006</b>	<b>1,313,692</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)

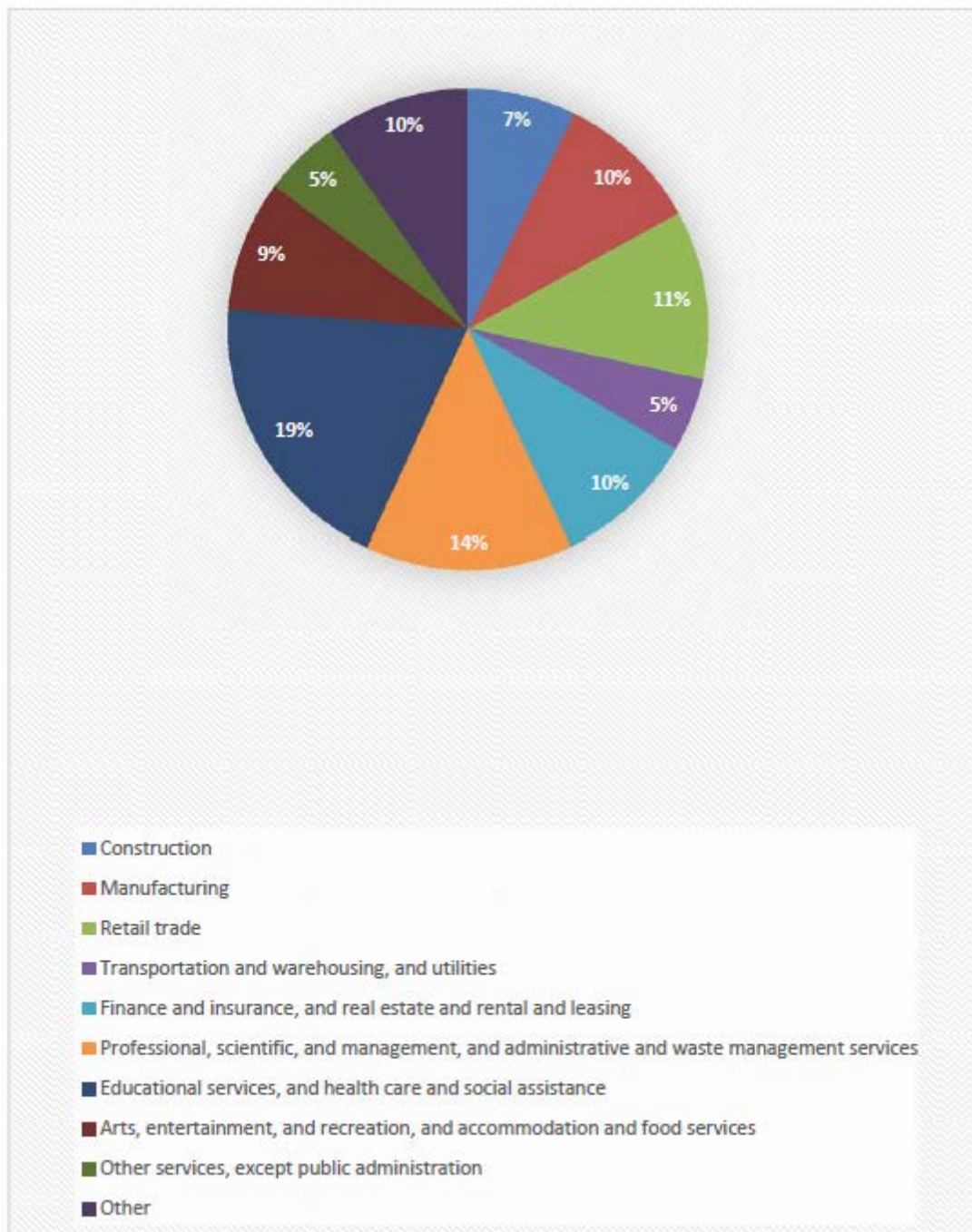


**Figure 3-2. Population Estimate by Ethnicity**

## Education and Employment

Table 3-11 displays the highest level of education attained by the population ages 25 and over in both Texas and the zone of interest. In the zone of interest, eight percent of the population has less than a 9<sup>th</sup> grade education; eight percent has between a 9<sup>th</sup> and 12<sup>th</sup> grade education; 22 percent has a high school diploma or equivalent; 21 percent has some college and no degree; 6 percent has an Associate's degree; 23 percent has a Bachelor's degree; and 12 percent has a graduate or professional degree. These percentages are similar to those for the State of Texas, though the zone of interest has a slightly larger population that has received a higher level diploma. In Texas, 9 percent of the population has less than a 9<sup>th</sup> grade education; another nine percent has between a 9<sup>th</sup> and 12<sup>th</sup> grade education; 25 percent has at least a high school diploma or equivalent; 23 percent has some college; six percent has an Associate's degree; 18 percent has a Bachelor's degree; and nine percent has a graduate or professional degree. In Collin County, 32 percent of the population ages 25 and over has at least a Bachelor's degree (Table 3-11).

Employment by sector is presented in Figure 3-3. The largest percentage in the zone of interest is employed in the educational services, and health care and social assistance sector. The civilian labor force in the zone of interest accounts for approximately 17.8 percent of the civilian labor force of the State of Texas (Table 3-12). The unemployment rate of the zone of interest was 7.6 percent in 2014, which was comparable to the unemployment rate of the State of Texas. The 2014 unemployment rates in Dallas, Fannin, Grayson, and Hunt counties were higher than that of the state, while the unemployment rates in Collin, Denton, and Rockwall counties were lower.



**Figure 3-3. 2014 Annual Average Employment by Sector  
(Figure Source: USACE 2016)**



**Table 3-11. 2014 Population and Estimate of Highest Level of Educational Attainment for Individuals 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
Texas	16,426,730	1,519,482	1,505,854	4,145,289	3,726,610	1,079,891	2,948,330	1,501,274
Collin County	539,347	17,434	17,977	84,066	112,979	40,314	173,951	92,626
Dallas County	1,541,324	175,753	168,456	357,261	311,877	85,131	285,669	157,177
Denton County	448,049	16,588	19,475	85,093	108,036	35,347	126,892	56,618
Fannin County	23,574	1,510	2,761	8,179	5,897	1,551	2,416	1,260
Grayson County	81,569	3,879	6,965	25,524	22,025	6,717	10,821	5,638
Hunt County	57,178	3,364	6,358	19,714	14,064	3,708	6,498	3,472
Rockwall County	53,527	1,985	2,457	11,703	13,579	4,142	13,514	6,147
<b>Zone of Interest Total</b>	<b>2,744,568</b>	<b>220,513</b>	<b>224,449</b>	<b>591,540</b>	<b>588,457</b>	<b>176,910</b>	<b>619,761</b>	<b>322,938</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)

**Table 3-12. 2014 Annual Averages for Labor Force, Employment, and Unemployment Rates**

Geographic Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Texas	12,791,590	11,809,010	982,580	7.7 percent
Collin County	454,649	429,486	25,163	5.5 percent
Dallas County	1,269,810	1,161,634	108,176	8.5 percent
Denton County	398,807	373,978	24,829	6.2 percent
Fannin County	14,384	13,197	1,187	8.3 percent
Grayson County	58,610	53,283	5,327	9.1 percent
Hunt County	40,580	35,749	4,831	11.9 percent
Rockwall County	42,976	40,068	2,908	6.8 percent
<b>Zone of Interest Total</b>	<b>2,279,816</b>	<b>2,107,395</b>	<b>172,421</b>	<b>7.6 percent</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)

### Households and Income

Table 3-13 displays the number of households and average household sizes as of the 2010 census. There were approximately 8.9 million households in the State of Texas, with an average household size of 2.75 persons. There are approximately 1.5 million households in the zone of interest, with an average household size of 2.76 persons (Table 3-13).

**Table 3-13. 2010 Household and Household Size Estimates**

Geographic Area	Total Households	Average Household Size
Texas	8,922,933	2.75
Collin County	283,759	2.74
Dallas County	855,960	2.73
Denton County	240,289	2.71
Fannin County	12,149	2.53
Grayson County	46,905	2.53
Hunt County	32,076	2.63
Rockwall County	26,448	2.94
<b>Zone of Interest Total</b>	<b>1,497,586</b>	<b>2.76</b>

Source: U.S. Census Bureau, American Fact Finder (2010 Estimate)

As shown in Table 3-14, the median household income varies greatly within the zone of interest. The median household incomes in Dallas, Fannin, Grayson, and Hunt counties are slightly lower than the median household income of the state, while the median incomes are substantially higher than the state in Collin, Denton, and Rockwall counties (Table 3-14). Collin County has the second highest median household income when compared with the other counties within the zone of interest. Per capita income in

the zone of interest is \$30,605, which is greater than that of Texas at \$26,513 23 (Table 3-14).

**Table 3-14. 2014 Median and Per Capita Income**

Geographic Area	Median Household Income	Per Capita Income
Texas	\$52,576	\$26,513
Collin County	\$84,233	\$38,575
Dallas County	\$49,925	\$27,195
Denton County	\$74,662	\$34,528
Fannin County	\$44,432	\$20,784
Grayson County	\$47,631	\$24,614
Hunt County	\$44,898	\$22,446
Rockwall County	\$86,597	\$34,850
<b>Zone of Interest Total</b>	<b>N/A</b>	<b>\$30,605</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)

As shown in Table 3-15, the percentage of the population in the zone of interest whose incomes in 2014 were below the poverty level in the last 12 months is lower than in the State of Texas as a whole. Hunt and Dallas counties have the highest percentage of the population living below the poverty level, followed by Fannin County, Grayson County, Denton County, Collin County, and Rockwall County.

**Table 3-15. Percent of Families and People Whose Income in the Past 12 Months Is Below the Poverty Level (2014)**

Geographic Area	All Persons	All Families
Texas	17.7 percent	13.7 percent
Collin County	7.9 percent	5.8 percent
Dallas County	19.3 percent	15.9 percent
Denton County	8.9 percent	5.8 percent
Fannin County	17.7 percent	13.1 percent
Grayson County	15.8 percent	11.6 percent
Hunt County	19.6 percent	14.8 percent
Rockwall County	6.3 percent	5.3 percent
<b>Zone of Interest Total</b>	<b>15.0 percent</b>	<b>N/A</b>

Source: U.S. Census Bureau, American Fact Finder (2014 Estimate)

## Environmental Justice

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

wide environmental justice strategy. A Presidential Transmittal Memorandum issued with the EO states that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC section 4321, et seq.”

EO 12898 does not provide guidelines as to how to determine concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the proposed actions. The U.S. Census reports numbers of minority individuals and the American Community Survey provides the most recent poverty estimates available. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or Other. Poverty status is used to define low-income. Poverty is defined as the number of people with income below poverty level, which was \$24,230 for a family of four in 2014, according to the U.S. Census Bureau. A potential disproportionate impact may occur when the minority in the study area exceeds 50 percent or when the percent minority and/or low-income in the study area are meaningfully greater than those in the region.

Collin County is relatively low minority and low poverty compared to the zone of interest, Texas, and the U.S. Collin County’s population is 39.6 percent minority, which is below 50 percent and substantially below the minority populations of the zone of interest and the State of Texas, which are 55 and 56.5 percent minority, respectively. The poverty rate in Collin County is 7.9 percent, which is approximately half the poverty rate in the zone of interest (15.0 percent) and the U.S. (15.4 percent) and less than half the poverty rate for the State of Texas (17.6 percent).

### Protection of Children

EO 13045 requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas. The U.S. Census estimates that persons under 18 years of age account for 27 percent of the population of Collin County in 2014.

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

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



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

Lavon Lake is beneficial to the local economy through indirect job creation and local spending by visitors, offers a variety of free recreation opportunities, and uses innovative maintenance and planning programs to minimize usage fees. The land reclassifications, resource management objectives, and resource plan reflect changes in land management and land uses that have occurred since 1972 and projected to until 2040. Therefore, no adverse impacts on area economic stability or environmental justice populations would result from the revision of the Lavon Lake Master Plan.

### **3.13 RECREATION**

The primary area having a significant influence on the public use and management of Lavon Lake includes all of Collin County and portions of the adjoining counties of Dallas, Denton, Grayson, Fannin, Hunt, and Rockwall. The majority of visitors to Lavon Lake come from within a 100-mile radius of the lake area. Lavon Lake visitors are a diverse group ranging from campers who utilize the campgrounds around the lake, full-time and part-time residents of housing developments that border the lake, hunters who utilize the lands managed for wildlife, day-users who picnic in the private and Federally operated parks, fishermen, recreational boaters, marina customers, pedestrian and bicycle trail users, and many other user groups.

The peak visitation months on Lavon Lake are April through September, when 88 percent of visits occur. July is the highest visitation month and accounts for 18 to 20 percent of the annual total. Approximately 90 percent of visits to recreation areas occur in USACE-managed recreation areas. The remaining visitation takes place onto USACE lands that have been leased to marina operators and to Collin County. Lavon Lake experiences an unknown amount of dispersed recreation visits from adjacent landowners walking on to USACE lands, hunters and fishermen parking at undesignated/unmonitored access points, and trail users parking at trailheads that are not monitored. One indication of dispersed use is the number of USACE-issued hunting permits for Lavon Lake. In the hunting seasons of 2012-2014, annual hunting permits issued by the USACE ranged from 1,700 to 2,000. Permits are valid for the entire hunting season, and many hunters make several trips during the season.

At the national level, the USACE is currently preparing computerized visitation models/programs that will estimate the level of dispersed visitation at all USACE lakes. Table 3-16 provides the Fiscal Year 2012 report on the number of total recreation visits to each designated High Density Use Recreation area at Lavon Lake. More recent data are unavailable as a result of a nationwide revision of the procedures for collecting and reporting visitation data.

**Table 3-16. Fiscal Year 2012 Visitation for the 16 Designated Recreation Areas 33 and Stilling Basin Access Point at Lavon Lake**

<b>Recreation Area</b>	<b>Total Visits</b>
Avalon Park	30,113
Bratonia Park	8,741
Brockdale Park	29,606
Caddo Park (temporarily closed)	0
Clear Lake Park	38,065
Collin Park	168,149
East Fork Park	124,456
Elm Creek Park	11,239
Highland Park	21,029
Lakeland Park	13,259
Lavonia Park	50,155
Little Ridge Park	15,971
Mallard Park	52,511
Pebble Beach Park	9,937
Stilling Basin Access	102,641
Tickey Creek Park	27,788
Twin Groves Park	5,986

Recreational use at Lavon Lake continues to evolve, but 2 day-use activities primarily include swimming, picnicking, fishing, and boating, as well as overnight camping, and are the principal activities pursued by most visitors. As of the date of this EA, the most recent summer where the lake elevation was close to the normal or conservation pool elevation was 2012. Using 2012 data generated by the National Recreation Reservation Service (NRRS), there were 11,346 camping permits issued at Lavon Lake in 2012. For the three campgrounds participating in the NRRS (Clear Lake Park, East Fork Park, and Lavonia Park), the campers making those reservations originated from nearby counties as shown in Table 3-17. For Lavonia and East Fork Parks, campers are originating primarily from cities to the south and west including Wylie, Plano, Richardson, McKinney, Garland, and Dallas. For Clear Lake Park, campers originate primarily from Princeton and McKinney. No data are available that would show where day-use visitors are coming from, but the USACE believes it is safe to assume that, like campers, more than 90 percent of day-users at Lavon Lake are originating from the nearby cities listed above.

**Table 3-17. County of Origin for Registered Campers in 2012  
(Percent of total registered campers within each listed park)**

<b>Camping Area</b>	<b>Collin County</b>	<b>Dallas County</b>	<b>Rockwall County</b>
Clear Lake Park	71	20	2
East Fork Park	47	35	9
Lavonia Park	49	26	10

While visitation in designated recreation areas remains strong, there is an unknown, but considerably high level of recreation use originating from the many subdivisions that share a common boundary with the USACE lands at Lavon Lake.

Adjacent landowners are allowed pedestrian access to the shoreline throughout most of the lake area, with the exception of developed parks and prohibited access areas, such as near the dam or water intake structures. This easy access to the shoreline results in dispersed recreation use, such as bank fishing, hiking, and nature study.

The Texas Outdoor Recreation Plan – 2012 (TORP), published by the TPWD, was developed using results from web surveys to garner public input on the outdoor recreational needs of Texans. The TORP demonstrated that Lavon Lake is the largest and most important outdoor recreation venue in Collin County, Texas. Of the 27,309 recreation-conservation acres designated for Collin County in the TORP, approximately 16,000 of those acres are USACE lands at Lavon Lake that lie above the normal pool of the lake.

While traditional camping, picnicking, and power boating at Lavon Lake continue to be very popular, the TORP revealed that Texas residents have a strong desire for a broad array of passive-use recreation activities that have potential for expansion on Federal lands at Lavon Lake. Furthermore, public comment received during the preparation of the 2016 Master Plan indicates a strong interest in equestrian, biking, and hiking trails.

Designated High Density Recreation Areas, Uses, and Facilities Outdoor recreation at Lavon Lake generally falls within two broad categories of land or water-based recreation. Land-based recreation opportunities, activities, areas and facilities that typically occur on, or adjacent to, USACE land and water include, but are not limited to, camping, hiking, swimming, hunting, fishing, horseback riding, picnicking, geocaching, wildlife/bird viewing, and sightseeing. Land-based recreation areas include campgrounds, day-use areas, overlooks, trails, and wildlife management areas (Table 3-18). Facility types typically found within these recreation areas include campsites, picnic sites, restrooms, shower facilities, boat ramps, and courtesy docks (Table 3-18). These recreation areas are managed by several entities including the USACE, county government, and private/commercial concessionaires.

**Table 3-18. Designated High Density Recreation Areas and Facilities at Lavon Lake**

<b>Park Name</b>	<b>Acres Above Normal Pool</b>	<b>Type of Use</b>	<b>Boat Ramp</b>	<b>Operator</b>	<b>Number of Campsites Or Picnic Sites</b>
Avalon Park	60	Day Use	Yes-4 Lane	USACE	56 Picnic Sites
Bratonia Park	138	Day Use	Yes-2 Lane	USACE	NA
Brockdale Park	114	Day Use	Yes-4 Lane	USACE	NA
Caddo Park	515	Day Use	Yes-4 Lane	USACE	13 Picnic Sites
Clear Lake Park	88	Camping	Yes-8 Lane	USACE	23 Camp Sites; 18 Picnic Sites
Collin Park	160	Camping	Yes	Lessee	61 Camp Sites
East Fork Park	102	Camping and Day Use	Yes- 8 Lane	USACE & Lessees	62 Camp Sites; 27 Picnic Sites

Table 3-18, continued

Park Name	Acres Above Normal Pool	Type of Use	Boat Ramp	Operator	Number of Campsites Or Picnic Sites
Elm Creek Park	189	Day Use	Yes- 2 Lane	USACE	NA
Highland Park	131	Day Use	Yes- 4 Lane	USACE	NA
Lakeland Park	105	Camping	Yes- 4 Lane	USACE	32 Camp Sites (Tent)
Lavonia Park	126	Camping and Day Use	Yes- 8 Lane	USACE	53 Camp Sites; 51 Picnic Sites
Little Ridge Park	45	Day Use	Yes- 4 Lane	USACE	28 Picnic Sites
Mallard Park	81	Day Use	Yes- 4 Lane	USACE	10 Picnic Sites
Pebble Beach Park	35	Day Use	Yes- 4 Lane	USACE	21 Picnic Sites
Ticky Creek Park	38	Day Use	Yes- 4 Lane	USACE	16 Picnic Sites
Twin Groves Park	115	Day Use	Yes- 4 Lane	USACE	NA

### Water-Use Recreation

Management of the water surface for recreational purposes at Lavon Lake rests primarily with the USACE, but close coordination is maintained with TPWD and Collin County Sheriff's Office with respect to enforcement of rules and regulations that apply to boating. Marina concessionaires are also important stakeholders in water-based recreation management. Water-based outdoor recreation includes, but is not limited to fishing, boating, swimming, water skiing, scuba diving, seaplane operations, and kayaking.

### Recreational Carrying Capacity

Recreational carrying capacity is considered by the USACE to ensure that visitors have a high-quality and safe recreational experience, and that natural resources are not irreparably damaged. An example of a carrying capacity consideration at Lavon Lake is the management of public hunting on USACE lands wherein hunting activity may be restricted by species or by area, depending on population or habitat conditions.

In 2002, the USACE, Fort Worth District, adopted a policy governing water-related recreation development that has the potential to affect the degree of boating traffic on the water surface of all the District's lakes. The USACE has determined that the number of existing parking spaces and slips at Lavon Lake as of the date of this EA has the potential to exceed the target capacity and may have already exceeded the target. In view of this potential, the USACE would require a comprehensive water-related recreation use study prior to making a decision to approve or deny a proposal for additional slips or boat ramp parking spaces at Lavon Lake.

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

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



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

Lavon Lake is beneficial to the local visitors and also offers a variety of free recreation opportunities. Even though the amount of acreage available for High Density Recreation and Low Density Recreation would decrease with implementation of the revised land use classifications in the 2016 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1972 at Lavon Lake. The conversion of these lands would have no effect on current or projected public use. Therefore, no adverse impacts on area recreational resources would result from the revision of the Lavon Lake Master Plan.

### **3.14 AESTHETICS**

Lavon Lake proper and surrounding Federal lands offer public, open space values and scenic vistas that are unique in Collin County. The aesthetic qualities inherent in Lavon Lake are recognized by the NCTCOG in their North Texas 2050 vision document and in the Collin County Parks and Open Space Program Strategic Plan. The NCTCOG vision document stresses that “business as usual” with regard to a rapidly expanding population and the continuation of low density housing developments within the 16-county NCTCOG area, which includes Collin County and adjacent Denton, Dallas, Rockwall and Hunt counties will result in a lower quality of life for the regions citizens. The “business as usual” future would result in the loss of approximately 900,000 acres of agricultural land as well as substantial acreage of natural habitat and would add significantly to traffic congestion. The NCTCOG vision document recommends the adoption of several policies that would work toward a better quality of life for the region. One of the policy areas that relates directly to Lavon Lake is focused on Natural Areas and includes the following statement:

*“The purpose of this policy area is to preserve and protect open spaces, public parks, greenways, lake shores, significant views, stands of trees, and floodplains. The development that occurs near these natural features is planned with these important environmental features in mind. Retaining and managing the natural assets that are at the heart of these areas is the goal.”*

The Collin County Parks and Open Space Strategic Plan stresses the importance of parks and open space and the need for more land dedicated to these purposes going into the future. The following is a quote from the Strategic Plan that relates directly to Lavon Lake:

*“...the parks and open space system should reflect sustainable financial, cultural, and environmental objectives that promote the conservation of natural and human resources for current and future citizens.”*

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

There would be no short- or long-term, minor, moderate or major, beneficial, or adverse impacts on aesthetics as a result of implementing the No Action Alternative, as there would be no changes to the existing Master Plan.

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

Lavon Lake currently plays a pivotal role in availability of parks and open space in Collin County. Even though the amount of acreage available for High Density Recreation and Low Density Recreation would decrease with implementation of the revised land use classifications in the 2016 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1972 at Lavon Lake. The conversion of these lands would have no effect on current or projected public use. Furthermore, the increase in the acreage of land classified as Environmentally Sensitive Areas would protect lands that are aesthetically pleasing at Lavon Lake and limit future development. Therefore, no adverse impacts on aesthetics would result from implementation of the revised land use classifications in the 2016 Master Plan.

## **3.15 HAZARDOUS MATERIALS AND SOLID WASTE**

This section describes existing conditions within the Lavon Lake study area with regard to potential environmental contamination and the sources of releases to the environment. Lavon Lake does not presently experience any particular contamination issues or have major contamination contributors. Contaminants could enter the Lavon Lake environment via air or water pathways. The highways and roads, railroads, and oil and gas pipelines in the vicinity could also provide sources of contaminants to the study area. Illegal trash dumping on project lands by individuals and businesses is a persistent problem. USACE and area law enforcement officials work cooperatively to apprehend those responsible for illegal trash dumping.

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

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

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

The land reclassifications required to revise the Master Plan would be compatible with Lavon Lake hazardous and toxic waste management practices. Therefore, no short- or long-term, minor, moderate or major, beneficial, or adverse impacts due to hazardous, toxic, or radioactive wastes would occur as a result of implementing the revised land use classifications, resource management objectives, and resource plan in the 2016 Master Plan.

## **3.16 HEALTH AND SAFETY**

Lavon Lake's authorized purposes include flood control, water supply, water quality, and recreation. The USACE, with assistance from the TPWD, has established public outreach programs to educate the public on water safety and conservation of natural resources. In addition to the water safety outreach programs, the USACE has established recreation management practices to protect the public. These include safe boating and swimming regulations, safe hunting regulations, and speed limit and pedestrian signs for park roads. Lavon Lake also has solid waste management plans in

place for camping and day-use areas. Lavon Lake personnel are in place to enforce these policies, rules, and regulations during normal park hours.

#### **3.16.1 Alternative 1: No Action Alternative**

Under the No Action Alternative, the 1972 Master Plan would not be revised. No significant adverse impacts on human health or safety would be anticipated.

#### **3.16.2 Alternative 2: Proposed Action**

Under the Proposed Action, the proposed revisions to the Lavon Lake Master Plan would be compatible with project safety management plans. The revised classifications of Restricted water surface and Designated No-Wake areas would improve boating safety near key recreational water access areas such as boat ramps. The Project would continue to have reporting guidelines in place should water quality become a threat to public health. Existing regulations and safety programs throughout the Lavon Lake study area would continue to be enforced to ensure public safety. There would be no short- or long-term, minor, moderate or major, adverse impacts on public health and safety as a result of implementing the Proposed Action.

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## **SECTION 4: CUMULATIVE IMPACTS**

The CEQ defines cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, or local) or individuals. CEQ guidance on cumulative impacts requires the definition of the scope of the other actions and their interrelationship with the Proposed Action (CEQ 1997). The scope must consider geographic and temporal overlaps with the Proposed Action and all other actions occurring within the zone of interest. Informed decision making is served by consideration of cumulative impacts resulting from activities that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. This cumulative impacts analysis summarizes expected environmental impacts from the combined impacts of past, current, and reasonably foreseeable future activities affecting any part of the human or natural environments impacted by the Proposed Action.

### **4.1 PAST IMPACTS WITHIN THE ZONE OF INTEREST**

Lavon Lake was originally constructed in 1953-54 and was modified and enlarged in 1974-75. The modification and enlargement of Lavon Lake required acquisition of additional lands bringing the total fee simple land base to 37,515 acres. In addition to these lands, a total of 849 acres of flowage easement was also acquired. In the watershed above Lavon Lake, the USDA NRCS has constructed at least 149 water retention structures. In more recent years, Collin County’s increasing population has resulted in an expansion of urbanized area, with residential development consisting of a variety of housing types and increased non-residential development ranging from retail to manufacturing.

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

Future management of the 849 acres of Flowage Easement Lands at Lavon Lake includes routine inspection of these areas to ensure that the Government’s rights specified in the easement deeds are protected. In almost all cases, the Government acquired the right to prevent placement of fill material or habitable structures on the easement area. Placement of any structure that may interfere with the USACE flood risk management and water conservation missions may also be prohibited.

USACE policy encourages the establishment of designated corridors on project lands, where feasible, to serve as the preferred location for future outgrants such as easements for roads or utility lines. After obtaining public input and examining the location of existing roads and utility lines on project lands, the USACE determined that only utility corridors would be designated at Lavon Lake. Because USACE policy in EP 1130-2-550, Chapter 17, states that project lands will generally be available only for roads that are considered regional arteries or freeways, and all current regional and

county mobility plans include no proposals for regional arterials crossing USACE land at Lavon Lake, there is no need for designation of roadway corridors. Future use of these corridors, where the corridor is limited to an existing easement, would in most cases require prior approval of those entities that have legal rights to the easement.

The CCRTMP describes several future trails and trail corridors at Lavon Lake with uses that could include additional designated natural surface hike, bike, and equestrian trails. Future regional and county mobility plans that call for widening of existing roadways across USACE lands will be addressed on a case-by-case basis. Significant local road expansion or construction projects that could be anticipated to take place within the zone of interest during the planning horizon of the 2016 Master Plan include U.S. or State Highways and Farm to Market (FM) roads maintained by the Texas Department of Transportation (TxDOT), county roads maintained by Collin County, or municipal roads maintained by the cities of Wylie, St. Paul, Lucas, Lowry Crossing, Princeton, Farmersville, or Lavon.

Most of the principal roadways mentioned above would likely be widened in the coming years to accommodate the projected significant growth in Collin County population. In addition to the Collin County Mobility Plan, the 2035 Metropolitan Transportation Plan (MTP) published by the NCTCOG addresses the major, controlled access, regional arterial freeways and tollways constructed and operated by TxDOT or the North Texas Tollway Authority. The MTP includes planned and envisioned roadways near Lavon Lake, but none that would directly impact USACE-managed lands or the water surface. However, any major freeway or tollway constructed near Lavon Lake would likely cause increased residential and commercial development.

#### **4.3 ANALYSIS OF CUMULATIVE IMPACTS**

Impacts on each resource were analyzed according to how other actions and projects within the zone of interest might be affected by the No Action Alternative and Proposed Action. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis the intensity of impacts will be classified as negligible, minor, moderate, or major. These intensity thresholds were previously defined in Section 3.0. Collin County is the fastest growing county in Texas, population growth and development are expected to continue in the vicinity of Lavon Lake and cumulative adverse impacts on resources could be expected when added to the impacts of activities associated with the Proposed Action. A summary of the anticipated cumulative impacts on each resource is presented below.

##### **4.3.1 Land Use**

A major impact would occur if any action is inconsistent with adopted land use plans or if an action would substantially alter those resources required for, supporting, or benefiting the current use. Land use around Lavon Lake has experienced major developmental change in the past several years with the large increase in the population in the Collin County. Under the No Action Alternative, land use would not change. Although the Proposed Action would result in the reclassification of project lands, the reclassifications were developed to enhance regional goals associated with

good stewardship of land and water resources that would allow for continued use and development of project lands. Therefore, cumulative impacts on land use within the area surrounding Lavon Lake, when combined with past and proposed actions in the region, are anticipated to be minimal.

#### **4.3.2 Water Resources**

A major impact would occur if any action is inconsistent with adopted water surface classifications, water use plans, or if an action would substantially alter those resources required for, supporting, or benefiting the current use. When considering watershed restoration activities, operations agreements, and updates to local conservation and drought emergency plans, beneficial, long-term cumulative impacts will be experienced as a result of the increased ability to meet water supply demands in the basin, as well as benefiting aquatic resources.

Other activities surrounding Lavon Lake, such as the addition of future utility lines in corridors, which would require boring beneath streams in most cases to avoid impacts, have been identified as having the potential to contribute directly to the cumulative impacts on water quality; however, water quality monitoring will continue to be used to assess any changes in these conditions. Due to the large increase in the population of Collin County and the future population projections, cumulative impacts on water supply would likely be experienced in the future as water demands increase in the study area. However, the cumulative impacts on water quality from the Proposed Action at Lavon Lake are anticipated to be negligible when combined with past and proposed actions in the area.

#### **4.3.3 Climate**

The Proposed Action would neither affect nor be affected by the climate. Therefore, implementation of the revised land use classifications in the 2016 Master Plan, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on the climate.

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

Under the Proposed Action, current Lavon Lake project management plans and monitoring programs would not be changed. In the event that GHG emission issues become significant enough to impact the current operations at Lavon Lake, the 2016 Master Plan and all associated documents would be reviewed and revised as necessary. Therefore, implementation of the 2016 Master Plan, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on climate change or GHG.

#### **4.3.5 Air Quality**

For the area surrounding Lavon Lake, activities that could add to air emissions in the area are likely few and minor in nature. The Proposed Action would not adversely impact air quality within the area. Vehicle traffic along park and area roadways and routine daily activities in nearby communities contribute to current and future emission sources. Seasonal prescribed burning on Lavon Lake lands would have minor, negative

impacts on air quality through elevated ground-level O<sub>3</sub> and particulate matter concentrations; however, these seasonal burns are generally scheduled so that impacts are minimized. Minor improvements to the communities in the Lavon Lake area, such as construction of new business buildings and highway improvement projects could also contribute to minor future emissions. In addition, with a growing population in Collin County, more vehicles on the road, and presumably more visitors to Lavon Lake, there could be cumulative impacts on air quality in the study area.

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

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

Land use around Lavon Lake has changed in the past several years. Given the projected population growth and vast acreage of Prime Farmland in Collin County, there could be cumulative impacts on Prime Farmland in the study area. However, the cumulative impacts on Prime Farmland from the Proposed Action at Lavon Lake are anticipated to be negligible when combined with past and proposed actions in the area.

#### **4.3.7 Natural Resources**

The Proposed Action, especially the revised land classifications and establishment of utility corridors, would allow land management and land uses to be compatible with the goals of good stewardship of natural resources. The Proposed Action would allow project lands to continue supporting the USFWS and the TPWD missions associated with wildlife conservation and implementation of operational practices that would protect and enhance wildlife and fishery populations. In addition, the Proposed Action would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186. Long-term, beneficial impacts on natural resources could occur as a result of implementing the reclassifications outlined in the 2016 Master Plan. Therefore, implementation of the 2016 Master Plan, when combined with other existing and proposed projects in the region, would result in minor beneficial cumulative impacts on natural resources in the Lavon Lake area.

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

A major impact on protected species would occur if any action resulted in a jeopardy opinion for any endangered, threatened, or rare species. Under the Proposed Action, the USACE would continue cooperative management plans with the USFWS and TPWD to preserve, enhance, and protect wildlife habitat resources. To further management opportunities and beneficially impact habitat diversity, the reclassifications proposed in the 2016 Master Plan include 4,319 acres as Environmentally Sensitive Areas. The conversion of these lands was supported by public comment and recommendations from the USFWS and TPWD. Long-term, beneficial impacts on natural resources could occur as a result of implementing the reclassifications outlined



in the 2016 Master Plan. Therefore, implementation of the revised land use classifications in the 2016 Master Plan, when combined with other existing and proposed projects in the region, would result in minor to moderate beneficial cumulative impacts on natural resources, which may also have beneficial impacts on threatened and endangered species, in the Lavon Lake area.

#### **4.3.9 Invasive Species**

Zebra mussels are present at Lavon Lake. Potential adverse impacts include infestation of other water bodies through equipment that is not properly cleaned and movement of water and sediment infested with zebra mussels. Additional current and future activities such as recreational boating and other in-lake operation and maintenance activities could result in the transport of zebra mussels to other water bodies. Continued information and education, as well as construction permit requirements, will help reduce the potential transport of these invasive species.

Feral hogs continue to have a presence at differing levels throughout the year given food availability and the abundance of cover afforded by bottomland hardwoods around Lavon Lake; however, Lavon Lake does have an active hunting program with feral hogs being one of the animals allowed for harvesting. Other nuisance species that impact the health and productivity of the natural resources at Lavon Lake include exotic Johnsongrass and native eastern redcedar. The EAB, although not yet detected in the area, is another invasive species of concern since Lavon Lake has considerable acreage where green ash is a dominant or co-dominant species. All stands of green ash commonly found in the upper Trinity River watershed would be in jeopardy in the future if EAB spreads to the area.

Future plans for the control of invasive species at Lavon Lake may include grazing, tree removal and herbicide application. Implementing BMPs would help to control the introduction and distribution of invasive species, ensuring that implementation of the revised land use classifications in the 2016 Master Plan would not contribute to the overall cumulative impacts related to invasive species.

#### **4.3.10 Mineral and Timber Resources**

Currently, with few exceptions, the stipulations used in the USACE, Fort Worth District, do not allow surface occupancy of Federal lands for the extraction of Federally owned minerals. Exploration and extraction of privately owned minerals may, in some cases, be allowed to occur on Federal lands at Lavon Lake in the future as long as the integrity of the dam and related facilities are not at risk and every precaution is taken to reduce the risk of pollution and other environmental damage to the lands and waters of the lake. The bottomland forests of the main tributaries of Lavon Lake have high value as wildlife habitat, but do not have significant value as commercial timber. Although mineral and timber resource extraction may increase in the Lavon Lake area in the future, cumulative impacts on these resources from implementation of the revised land use classifications in the 2016 Master Plan, when combined with past and proposed actions in the region, are anticipated to be negligible.

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

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

#### **4.3.12 Socioeconomics and Environmental Justice**

The Proposed Action would not result in the displacement of persons (minority, low-income, children, or otherwise) as a result of implementing the revised land classifications. Therefore, the effects of the Proposed Action on environmental justice and the protection of children, when combined with other ongoing and proposed projects in the Lavon Lake area, would not be considered a major cumulative effect.

#### **4.3.13 Recreation**

Lavon Lake is beneficial to the local visitors and also offers a variety of free recreation opportunities. The majority of recreational users at Lavon Lake come from within a 100-mile radius of the lake area. The 2012 TORP demonstrated that Lavon Lake is the largest and most important outdoor recreation venue in Collin County, Texas. Some of the popular recreation activities at Lavon Lake are, on a national basis, either static or declining in participation. For example, camping activity, power boating, hunting, and fishing have experienced small to moderate declines in recent years. In contrast to these declines, significant increases in hiking, walking, sightseeing, wildlife viewing and canoeing/kayaking have occurred in recent years.

Even though the amount of acreage available for High Density Recreation and Low Density Recreation would decrease with implementation of the revised land use classifications in the 2016 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1972 at Lavon Lake. The conversion of these lands would have no effect on current or projected public use. Collin County's Parks and Open Space Strategic Plan provides guidance for new parks and open space resources on up to 7,400 acres of existing municipally owned parks and open spaces in order to provide recreational opportunities to the county's growing population. Therefore, the Proposed Action, when combined with other existing and proposed projects in the region, would result in minor to moderate beneficial cumulative impacts on area recreational resources.

#### **4.3.14 Aesthetics**

Actions that cause the permanent loss of the characteristics that make an area visually unique or sensitive would be considered to cause a major impact. No major impacts on visual resources would occur from implementation of the revised land use classifications in the 2016 Master Plan. The Proposed Action, in conjunction with other projects in the region, would result in minor beneficial cumulative impacts on the visual resources in the Lavon Lake area, with the reclassification of Environmentally Sensitive Areas and their aesthetic appeal at Lavon Lake.

#### **4.3.15 Hazardous Materials and Solid Waste**

Major impacts would occur if an action creates a public hazard, if a project is implemented in an area that is considered a hazardous waste site that poses health risks, or if the action would impair the implementation of an adopted emergency response or evacuation plan. No hazardous material or solid waste concerns would be expected with implementation of the 2016 Master Plan; therefore, when combined with other ongoing and proposed projects in the Lavon Lake area, there would be no major cumulative effects on hazardous materials and solid waste.

#### **4.3.16 Health and Safety**

No health or safety risks would be created by the Proposed Action. The effects of implementing the 2016 Master Plan, when combined with other ongoing and proposed projects in the Lavon Lake area, would not be considered a major cumulative effect. The revised classifications of Restricted water surface and Designated No-Wake areas would improve boating safety near key recreational water access areas such as boat ramps and would result in minor, beneficial effects in the study area.

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## SECTION 5: COMPLIANCE WITH ENVIRONMENTAL LAWS

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

Fish and Wildlife Coordination Act of 1958, as amended – Because no construction or change in operation of the reservoir is proposed, there is no plan to coordinate under the Act; however, information provided by USFWS and TPWD on fish and wildlife resources has been utilized in the development of this assessment.

ESA of 1973, as amended – Current lists of threatened or endangered species were compiled for the revision of the Master Plan. There will be no adverse impact on threatened or endangered species resulting from the revision of the Master Plan.

EO 13186 (Migratory Bird Habitat Protection) – Sections 3a and 3e of EO 13186 direct Federal agencies to evaluate the impacts of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative impacts on migratory birds. The Master Plan revision will not result in adverse impacts on migratory bird habitat and may result in beneficial impacts as larger areas of habitat for migratory birds are protected as Environmentally Sensitive Areas.

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

Clean Water Act of 1977 – The Proposed Action is in compliance with all state and Federal Clean Water Act regulations and requirements and is regularly monitored by the USACE and TCEQ for water quality. A state water quality certification pursuant to Section 401 of the Clean Water Act is not required for the Master Plan revision. However, any future utilities occupying the proposed utility corridors would be required to comply with all Clean Water Act requirements. There will be no change in the existing management of the reservoir that would impact water quality.

NHPA of 1966, as amended – Compliance with the NHPA of 1966, as amended, requires identification of all properties in the study area listed in, or eligible for listing in, the NRHP. All surveys and site salvages were coordinated with the Texas SHPO. Known sites are mapped and avoided by maintenance activities. Areas that have not undergone cultural resources surveys or evaluations will need to do so prior to any earthmoving or other potentially impactful activities.

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

FPPA of 1980 and 1995 – The FPPA's purpose is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. Prime Farmland is present adjacent to Lavon Lake. The Proposed Action would not impact Prime Farmland present on Lavon Lake project lands.

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

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

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

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

## **SECTION 6: IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES**

NEPA requires that Federal agencies identify “any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented” (42 U.S.C. § 4332). An irreversible commitment of resources occurs when the primary or secondary impacts of an action result in the loss of future options for a resource. Usually, this is when the action affects the use of a nonrenewable resource or it affects a renewable resource that takes a long time to renew. The impacts from implementing the 2016 Master Plan would not be considered an irreversible commitment because much of the land could be converted back to prior use at a future date.

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## **SECTION 7: PUBLIC AND AGENCY COORDINATION**

In accordance with 40 CFR §§1501.7, 1503, and 1506.6, the USACE initiated public involvement and agency scoping activities to solicit input on the 2016 Master Plan revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. The USACE began its public involvement process with a public scoping meeting to provide an avenue for public and agency stakeholders to ask questions and provide comments. This public scoping meeting was held on 10 March 2015 at the City of Wylie Recreation Center in Wylie, Texas. The USACE, Fort Worth District, placed advertisements on the USACE webpage, social media, and print publications prior to the public scoping meeting. A second public meeting was held on 5 May 2016 at the Hyatt Place Hotel, 5101 North President George Bush Highway in Garland, Texas. This meeting was established to introduce the public to the Draft EA and to begin the 30-day public review period of the Draft EA. As with the first public meeting, the USACE, Fort Worth District, placed advertisements on the USACE webpage, social media, and print publications (*The Wylie News*). At the close of the 30-day public review period (5 May to 5 June, 2016), several public comments had been received on the Draft EA. These comments were primarily from governmental agencies and are presented in Appendix A. Appendix A also includes the ads published in the local newspaper, the agency coordination letters, and the distribution list for the coordination letters. The EA was coordinated with 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 EA is also included in Appendix A. Please refer to Section 7.1 and Appendix H of the 2016 Master Plan for a summary of comments received at the public meetings.

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## SECTION 8: REFERENCES

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## SECTION 9: ACRONYMS/ABBREVIATIONS

2016 Master Plan	2016 Lavon Lake Master Plan
°F	degrees Fahrenheit
Ag	silver
As	arsenic
Ba	barium
BMPs	Best Management Practices
B.P.	before present
Ca	calcium
CAP	Climate Action Plan
CCRTMP	Collin County Regional Trails Master Plan
Cd	cadmium
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
Cl	chlorides
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2e</sub>	carbon dioxide-equivalent
CO <sub>3</sub>	carbonates
Cr	chromium
CRMP	Cultural Resources Management Plan
Cu	copper
DO	dissolved oxygen
EA	Environmental Assessment
EAB	Emerald ash borer
EIS	Environmental Impact Statement
EO	Executive Order
EP	Engineer Pamphlet
ESA	Endangered Species Act
Fe	iron
Fl	fluoride
FM	Farm to Market
FPPA	Farmland Protection Policy Act
GHG	greenhouse gas
GMA	Groundwater Management Area

Handbook	Texas Blackland Prairies Ecoregion Handbook
HEP	Habitat Evaluation Procedures
HCO <sub>3</sub>	bicarbonates
Hg	mercury
K	potassium
MBTA	Migratory Bird Treaty Act
Mg	magnesium
mg/L	milligrams per liter
Mn	manganese
mph	miles per hour
MRML	Multiple Resource Management Lands
MTP	Metropolitan Transportation Plan
Na	sodium
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NH <sub>3</sub>	ammonia
NHPA	National Historic Preservation Act
Ni	nickel
NO <sub>2</sub> --	nitrite
NO <sub>2</sub>	nitrogen dioxide
NO <sub>3</sub>	nitrate
NO <sub>x</sub>	oxides of nitrogen
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRRS	National Recreation Reservation Service
NTMWD	North Texas Municipal Water District
NTTA	North Texas Tollway Authority
NWI	National Wetland Inventory
O <sub>3</sub>	ozone
OAQPS	Office of Air Quality Planning and Standards
OH	hydroxides
Pb	lead
PL	Public Law
PM <sub>10</sub>	particulate matter less than 10 microns
PO <sub>4</sub>	ortho-phosphate
RPEC	Regional Planning and Environmental Center
Se	selenium
SGCN	Species of Greatest Conservation Need

SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SiO <sub>2</sub>	silica
SO <sub>2</sub>	sulfur dioxide
SO <sub>4</sub>	sulfate
TBPR ecoregion	Texas Blackland Prairie Ecoregion
TCAP	Texas Conservation Action Plan
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
TOC	total organic carbon
TORP	Texas Outdoor Recreation Plan – 2012
TPWD	Texas Parks and Wildlife Department
TSS	total suspended solids
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
VSS	volatile suspended solids
Zn	zinc

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

Jennifer Purcell - Regional Economist, Regional Planning and Environmental Center; 1 year of USACE experience.

Carey Lynn Perry - NEPA Specialist, Gulf South Research Corporation; 10 years of experience.

Mandy McGuire - Environmental Resources Planner, Regional Planning and Environmental Center; 5 years of USACE experience.

Don Wiese - Natural Resources Manager, Regional Planning and Environmental Center; 41 years of USACE experience.

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# News Release

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG®

For Immediate Release: NR16-023  
April 13, 2016

Contact: Denisha Braxton, 817-886-1435  
denisha.l.braxton@usace.army.mil

## Corps to host public meeting for the Draft Lake Lavon Master Plan Update

*FORT WORTH*, Texas – The Fort Worth District, U.S. Army Corps of Engineers will host a public meeting on May 5, 2016 to present the draft Lake Lavon Master Plan Update. The draft document is based on government analysis and public comment from the initial public meeting held February 24, 2015.

The public meeting will be held at the Hyatt Place Garland , 5101 North President George Bush Highway Garland, Texas, 75040 and is open to the public. A formal presentation will begin at 5:30 p.m. At the conclusion of the presentation, there will be an open forum for individual discussion with Corps representatives. A draft document will be available to the public prior to the meeting at the Fort Worth District website under Lakes Recreation, Master Plan Updates.

The current Master Plan is dated May 13, 1972 and was completed as part of the planned enlargement of Lavon Lake, which was completed in December 1975. Collin County and adjacent Rockwall and Denton counties each experienced population growths of more than 50 percent during the 2000-2010 census period. Increased urban growth around the lake and surrounding communities creates a need for bigger roads, more electricity, more water and sewer, and more public recreation opportunities.

All of these factors affect management of the Federal lands at Lavon Lake and necessitate a need for an updated Master Plan.

The Master Plan study area will include the Lavon Lake proper and all adjacent recreational and natural properties under federal control.

The primary purposes of the Lavon Lake project are flood risk management, water supply, and recreation.

Questions pertaining to the proposed revision can be addressed to: Mr. Ryan Shackelford, Project Manager, CESWF-PEC-PM, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1717

**About the Fort Worth District:** The Fort Worth District, U.S. Army Corps of Engineers was established in 1950. The District is responsible for water resources development in two-thirds of Texas, and design and construction at military installations in Texas and parts of Louisiana and New Mexico. Visit the Fort Worth District Web site at: [www.swf.usace.army.mil](http://www.swf.usace.army.mil) and SWF Facebook at: <http://www.facebook.com/pages/Fort-Worth-District-US-Army-Corps-of-Engineers/188083711219308>. Lake Lavon Master Plan Update documents and related information are available to the public at: <http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates/LavonLake.aspx>.

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U.S. ARMY CORPS OF ENGINEERS – FORT WORTH DISTRICT  
819 TAYLOR STREET  
FORT WORTH, TX 76102  
WWW.SWF.USACE.ARMY.MIL





STATE OF TEXAS  
COUNTY OF COLLIN

Before me, the undersigned authority, on this day personally appeared Chad Engbrock, publisher of C & S Media, dba *The Wylie News*, a newspaper regularly published in Collin County, Texas and having general circulation in Collin County, Texas, who being by me duly sworn, deposed and says that the foregoing attached:

**U. S. Army Corp. of Engineers  
Lavon Lake Master Plan Update**  
was published in said newspaper on the following date(s), to-wit:  
**April 27, 2016**

Chad Engbrock, Publisher

Subscribed and sworn before me on this, the 28 day of April, 2016  
to certify which witness my hand and seal of office.



Notary Public in and for  
The State of Texas

My commission expires 9-2-2016



### Legal Notice

under Docket No. PB1-0508-2016 pending in the Probate Court of Collin County, Texas, to Elizabeth Ann Davis Allen. Claims may be presented in care of the attorney for the Estate addressed as follows:

Pamela Wells

Estate of

MARJORIE E. DAVIS

111 Martin Dr.

Wylie, Texas 75098

All persons having claims against this Estate which is currently being administered are required to present them within the time and in the manner prescribed by law.

Dated April 19, 2016

Pamela A. Wells

Attorney for Applicant

#### INVITATION FOR BIDS NORTH TEXAS MUNICIPAL WATER DISTRICT

#### FOUR 25-CUBIC YARD HEAVY DUTY VACUUM LOAD- ABLE ROLL OFF CONTAINERS

Sealed bids addressed to the Executive Director of the North Texas Municipal Water District will be received at the office of the Executive Director of the North Texas Municipal

### Legal Notice

Water District, 501 East Brown Street, Wylie, Texas 75098 until 2:00 p.m. May 19, 2016, and then publicly opened and read, for procurement of four 25-cubic yard heavy duty vacuum loadable roll off containers, specifications and bidding documents may be examined and purchased at no charge at the offices of the North Texas Municipal Water District, 501 East Brown Street, Wylie, Texas. Direct questions to Ashley Burt at aburt@ntmwd.com or by phone at (972) 442-5405 during regular business hours Monday through Friday, 8:00 a.m. until 5:00 p.m.

**NORTH TEXAS MU-  
NICIPAL WATER  
DISTRICT**  
By JOE JOPLIN  
President  
Board of Directors

#### INVITATION FOR BIDS NORTH TEXAS MUNICIPAL WATER DISTRICT

**WYLIE WATER  
TREATMENT  
PLANTS I AND II  
SLUDGE HAN-  
DLING IMPROVE-  
MENTS PROJECT  
NO. 367**

### Legal Notice

Sealed bids addressed to the Executive Director of the North Texas Municipal Water District will be received at the office of the Executive Director of the North Texas Municipal Water District, 505 East Brown Street, Wylie, Texas until May 27, 2016 and then publicly opened and read, for Wylie Water Treatment Plants I and II Sludge Handling Improvements at 810 HWY 78, Wylie, Texas 75098. A non-mandatory pre-bid meeting will be held on May 12, 2016 at 2:00 PM Plans, specifications and bidding documents may be examined at the office of the North Texas Municipal Water District, 505 East Brown Street, Wylie, Texas, and may be viewed at, and purchased from Alan Plummer Associates, Inc., 1320 S. University Dr., Suite 300 Fort Worth TX 76107, 817-806-1700, during regular business hours Monday through Friday, 8:00 a.m. until 5:00 p.m.

**NORTH TEXAS MU-  
NICIPAL WATER  
DISTRICT**  
By Joe Joplin  
President  
Board of Directors

### Legal Notice

The Fort Worth District, U.S. Army Corps of Engineers will host a public meeting on May 5, 2016 to present the draft Lavon Lake Master Plan Update. The draft document is based on government analysis and prior public comment.

The public meeting will be held at the Hyatt Place Garland, 5101 North President George Bush Highway Garland, Texas, 75040 and is open to the public. A formal presentation will begin at 5:30 p.m. At the conclusion of the presentation, there will be an open forum for individual discussion with Corps representatives. A draft document will be available to the public at the Lavon Lake office and at the Fort Worth District website under Lakes Recreation, Master Plan Updates. May 5, 2016 starts the 30 day public review period.

REFERENCE: <http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates/LavonLake.aspx>.

51-1t-51li



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**FORT WORTH DISTRICT, CORPS OF ENGINEERS**  
**LAVON LAKE PROJECT OFFICE**  
3375 SKYVIEW DRIVE  
WYLIE, TX 75098

April 13, 2016

CESWF-OD-LA

MEMORANDUM FOR: Lavon Lake Partners, Local Municipalities, and Stakeholders

SUBJECT: Lavon Lake Master Plan

The Fort Worth District, U.S. Army Corps of Engineers (USACE) will host two meetings on May 5, 2016 to present the draft Lake Lavon Master Plan Update. The draft document is based on government analysis and public comment from the initial public meeting held February 24, 2015.

a. The first meeting will be held for our partners, local municipalities, and key stakeholders. The meeting will be held at the Hyatt Place Garland, 5101 North President George Bush Highway Garland, Texas, 75040. The formal presentation will begin at 3:00 p.m. At the conclusion of the presentation there will be time for attendees to view maps, ask questions and provide comments about the project and draft document.

b. We will also conduct a public meeting at the Hyatt Place Garland, 5101 North President George Bush Highway Garland, Texas, 75040. A formal presentation will begin at 5:30 p.m. At the conclusion of the presentation there will be time for the public to view maps, ask questions and provide comments about the project and draft document. Enclosed is a copy of the news release announcing the public meeting.

A Master Plan is defined by USACE as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. In general, it defines "how" the resources will be managed for public use and resource conservation. Revision of the Master Plan will not address in detail the technical operational aspects of the lake related to the water supply or flood risk management missions of the project.

The current Master Plan is dated May 13, 1972 and was completed as part of the planned enlargement of Lavon Lake, which was completed in December 1975. Collin County and adjacent Rockwall and Denton counties each experienced population growths of more than 50 percent during the 2000-2010 census period. Increased urban growth around the lake and surrounding communities creates a need for bigger roads, more electricity, more water and sewer, and more public recreation opportunities.

All of these factors affect management of the Federal lands at Lavon Lake and necessitate a need for an updated Master Plan.

The Master Plan study area will include the Lavon Lake proper and all adjacent recreational and natural properties under federal control.

The primary purposes of the Lavon Lake project are flood risk management, water supply, and recreation.

Questions pertaining to the proposed revision can be addressed to: Mr. Ryan Shackelford, Project Manager, CESWF-PEC-PM, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1717.

MICHAEL K. KINARD  
Lavon Lake Manager  
Trinity Region Project



Our Lands and Waters Foundation POC: Tom Burrell Title: President, OLWF	1801 N. Mill Street Suite B Lewisville, Texas 75057	972-436-0176 <a href="mailto:tom@ourlandsandwaters.com">tom@ourlandsandwaters.com</a>
Collin Park and Marina POC: Joe Castro Title:	2200 Saint Paul Rd. Wylie, TX 75098	469-855-5086 / 972-442-3567 <a href="mailto:Joecastro1@yahoo.com">Joecastro1@yahoo.com</a>
East Fork Marina POC: Martin Bowles Title: President	P.O. Box 742585 Dallas, Texas 75374	Office: 972-442-1143 Cell: 972-742-5911 <a href="mailto:mbbowles@gmail.com">mbbowles@gmail.com</a>
North Texas Municipal Water District POC: James Parks Title: Executive Director, NTMWD	505 E. Brown Street P.O. Box 2408 Wylie, Texas 75098	972-442-5405 <a href="mailto:jparks@ntmwd.com">jparks@ntmwd.com</a>

<b>Name of the Organization Point of Contact</b>	<b>Mailing Address</b>	<b>Telephone Number Email Address</b>
City of Wylie POC: Mindy Manson Title: City Manager	300 Country Club Rd. Wylie, TX 75098	972-516-6010 <a href="mailto:citymgr@wylietexas.gov">citymgr@wylietexas.gov</a>
City of Lavon POC: Title: City Manager	P.O. Box 340 Lavon, TX 75166	972-843-4220
City of Lucas POC: Jeff Jenkins Title: City Manager	665 Country Club Rd. Lucas, TX 75002	972-727-8999 x226 <a href="mailto:jjenkins@lucastexas.us">jjenkins@lucastexas.us</a>
City of St. Paul POC: Opie Walter, Mayor	2505 Butscher's Block Saint Paul, Collin County, TX 75098-8046	972-442-7212 <a href="mailto:townofstpaul@verizon.net">townofstpaul@verizon.net</a>

City of Princeton POC: Derek Borg Title: City Manager	123 W. Princeton Dr. Princeton, TX 75407	972-736-2416 <a href="mailto:dborg@princetontx.us">dborg@princetontx.us</a>
City of Allen POC: Peter H. Vargas Title: City Manager	305 Century Parkway Allen, TX 75043	214-509-4110 <a href="mailto:rvice@cityofallen.org">rvice@cityofallen.org</a>
City of McKinney POC: Jason Gray Title: City Manager	222 N. Tennessee St. McKinney, TX 75069	972-547-7520 <a href="mailto:Contact-citymanger@mckinneytexas.org">Contact-citymanger@mckinneytexas.org</a>

<b>Name of the Organization Point of Contact</b>	<b>Mailing Address</b>	<b>Telephone Number Email Address</b>
Collin County Parks and Open Space POC: Jeff Durham Title: Special Projects Manager	825 N. McDonald Street, Suite 145 McKinney, Texas 75069	972-424-1460 ext 3744 <a href="mailto:openspace@collincountytx.gov">openspace@collincountytx.gov</a>
Collin County Planning & Development POC: Misty Brown Title: Division Manager	4690 Community Ave. #200 McKinney, TX 75071	972-548-5585 <a href="mailto:dscor@collincountytx.gov">dscor@collincountytx.gov</a>
Audubon – Dallas Chapter POC: Cathy Atwood Title: President	7171 Mountain Creek Pkwy Dallas, TX 75249	972-709-7784 <a href="mailto:C_atwood@att.net">C_atwood@att.net</a>
Texas Department of Transportation/Roads POC: Title:	125 E. 11 <sup>th</sup> St. Austin, TX 78701	512-305-9500
Garland Power and Light POC: Jeff Janke	217 N. 5 <sup>th</sup> St. Garland, TX 75040	972-205-2670 <a href="mailto:jjanke@gpltexas.org">jjanke@gpltexas.org</a>

Kansas City Southern Railroad POC: Keith Simoneaux Title: Road Master	3939 Skyview Court Wylie, TX 75098	318-218-5355 <a href="mailto:ksimoneaux@ksouthern.com">ksimoneaux@ksouthern.com</a>
Texas Parks and Wildlife Department POC: Josh Ross Title: Game Warden	346 Oak Trail Ste# 100 Garland, TX 75043	214-471-2846 / 972-226-9966

<b>Name of the Organization Point of Contact</b>	<b>Mailing Address</b>	<b>Telephone Number Email Address</b>
Collin County Sheriff's Office POC: Terry G. Box Title: Sheriff	4300 Community Ave. McKinney, TX 75071	972-547-5100 <a href="mailto:sheriffbox@collincountytexas.gov">sheriffbox@collincountytexas.gov</a>
Wylie Police Department POC: Duscio Title: Chief of Police	2000 N. Hwy 78 Wylie, TX 75098	972-442-8170 <a href="mailto:police@wylietexas.gov">police@wylietexas.gov</a>
Lavon Police Department POC: Mike Jones Title: Chief of Police	501B Lincoln Ave. Lavon, TX 75166	972-843-4219 <a href="mailto:Mike.jones@cityoflavon.org">Mike.jones@cityoflavon.org</a>
Farmersville Police Department POC: Michael P. Sullivan Title: Chief of Police	134 N. Washington St. Farmersville, TX 75442	972-782-6141 <a href="mailto:m.sullivan@farmersvilletx.com">m.sullivan@farmersvilletx.com</a>
Princeton Police Department POC: James Waters Title: Chief of Police	306 Main St. Princeton, TX 75407	972-736-3901 <a href="mailto:jwaters@princetonpd.com">jwaters@princetonpd.com</a>
Wylie Fire Department POC: Randy Corbin, Chief	2000 N. Hwy 78 Wylie, TX 75098	972-442-8110 <a href="mailto:Cheryl.smith@wylietexas.gov">Cheryl.smith@wylietexas.gov</a>

Farmersville Fire Department POC: Kim Morris Title: Chief	134 N. Washington St. Farmersville, TX 75442	972-782-6093 <a href="mailto:k.morris@farmersvilletx.com">k.morris@farmersvilletx.com</a>
Branch Fire Department POC: Title:	7777 FM 546 Princeton, TX 75407	972-736-1310
Lucas Fire Department POC: Jim Kitchens Title: Fire Chief	165 Country Club Rd. Lucas, TX 75002	972-727-1242 <a href="mailto:jkitchens@lucastexas.us">jkitchens@lucastexas.us</a>
Copeville SUD POC: Title:	P.O. Box 135 Copeville, TX 75031	972-853-4630
Culleoka Water Supply Corp POC: Title:	P.O. Box 909 Princeton, TX 75407	972-736-2592
Lavon Water Supply Corp POC: Title:	P.O. Box 188 Lavon, TX 75166	972-843-2101
Wylie NE Special Utility District POC: Title:	P.O. Box 1029 745 Parker Rd. Wylie, TX 75098	972-442-2075
Direct Energy Business POC: Title:	P.O. Box 660749 Dallas, TX 75266	888-925-9115



Name of the Organization Point of Contact	Mailing Address	Telephone Number Email Address
Grayson-Collin Electric Co-op, Inc. POC: Title:	P.O. Box 548 Van Alstyne, TX 75495-0548	903-482-7100 / 800-967-5235
StarTex Power POC: Title:	P.O. Box 650827 Dallas, TX 75265-0827	866-917-8271
TXU Energy POC: Title:	P.O. Box 650638 Dallas, TX 75265-0638	972-791-2830 / 888-399-5501



**US Army Corps  
of Engineers®**

# Draft Master Plan Public Meeting

## Comment Form

**Lavon Lake, Texas**

***Master Plan Revision***

**Garland, Texas**

Thursday, May 5, 2016

### **Questions, comments, or suggestions?**

We need your review of the Lavon Lake Draft Master Plan revision and accompanying environmental assessment prepared in accordance with the National Environmental Policy Act (NEPA). Your participation is key to developing a meaningful Master Plan. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public meeting or within 30 days, to the address below. Thank you for your participation!

The following comments represent the views of the Board of Directors of the Trinity Trail Preservation Association (TTPA), and by extension, the members of TTPA and the equestrian community in North Texas.

1. TTPA agrees with the land classifications assigned to the USACE lands through which the Trinity Trail runs. Specifically, the lands defined as ESA 1, ESA 2, ESA 3, ESA 4, ESA 5, East Fork Park, Collin Park, Brockdale Park, Highland Park, and the Wildlife Management areas along the southwest and west shores of Lavon Lake.

2. TTPA suggests that the land area south of Highland Park and north of the bridge be classified as Wildlife Management, not Low Density Recreation. There are no adjacent landowners on this stretch.

3. TTPA agrees with the inclusion of natural surface equestrian trails as an allowed future use in the ESA 6, ESA 7, ESA 8, ESA 9, ESA 10, ESA 11, MRML (pages 4-4, 5-17, 5-18), and High Density Recreation areas.

Continued on next comment page

**Optional Information (used for mailing list to keep you informed and will not be used for any other purpose):**

Name: Duke Monson, President Affiliation: Trinity Trail Preservation Association

Address: 500 Farms Rd City: McKinney State: Tx

Zip code: 75071 Phone: 214 / 422-2929 Email: duke.fhollow@earthlink.net

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

**Mr. Ryan Shackelford, USACE - Fort Worth District - PEC-PM**  
**819 Taylor Street, Room 3B10, Fort Worth, Tx 76102**  
**Email: [lavonlakemp@usace.army.mil](mailto:lavonlakemp@usace.army.mil)**

Additional information and comment sheets can be found at the following:  
<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>



**US Army Corps  
of Engineers®**

# Draft Master Plan Public Meeting

## Comment Form

**Lavon Lake, Texas**

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Thursday, May 5, 2016

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TTPA comments continued, page 2 of 2

4. TTPA agrees with the general prohibition of hard-surface trails in non-High Density Recreation areas as described on page 6-8, para 6.4.2

5. TTPA agrees with the high priority given to boundary line maintenance on page 6-10. Incursions on the Trinity Trail by pickups and unauthorized ATV's have damaged the trail and surrounding meadows, and facilitated the misuse of the land with litter and bonfires.

### Optional Information (used for mailing list to keep you informed and will not be used for any other purpose):

Name: Duke Monson, President Affiliation: Trinity Trail Preservation Association

Address: 500 Farms Rd City: McKinney State: Tx

Zip code: 75071 Phone: 214 / 422-2929 Email: duke.fhollow@earthlink.net

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

**Mr. Ryan Shackelford, USACE - Fort Worth District - PEC-PM**

**819 Taylor Street, Room 3B10, Fort Worth, Tx 76102**

**Email: [javonlakemp@usace.army.mil](mailto:javonlakemp@usace.army.mil)**

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<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>



## Comment Form

## Master Plan Revision

Thursday, May 5, 2016

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[illegible]

Zip code: \_\_\_\_\_ Phone: \_\_\_\_/\_\_\_\_ Email: \_\_\_\_\_

Email: [lavonlakemp@usace.army.mil](mailto:lavonlakemp@usace.army.mil)

<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>





**Life's better outside.®**

May 16, 2016

Mr. Ryan Shackelford  
USACE – Fort Worth District RPEC-PM  
819 Taylor Street, Room 3B10  
Fort Worth, Texas 76102

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---

Carter P. Smith  
Executive Director

Re: Lavon Lake Draft Master Plan Revision (Collin County)  
TPWD Project 36569

Dear Mr. Ryan Shackelford:

The Texas Parks and Wildlife Department (TPWD) received the April 13, 2016 notice regarding the Draft Report for the Lavon Lake Master Plan Revision. The U.S. Army Corps of Engineers Fort Worth District (USACE) has proposed a revision of the plan to meet current guidelines and to reflect social, ecological and outdoor recreation changes in the area.

**Project Description**

The project involves updating the 1972 plan so that it is current to escalating pressures and changes such as rapid urbanization and suburbanization, demand for water, and changing trends in outdoor recreation in the North Central Texas and Collin County area. The updated plan will revise land classifications, adopt new resource management objectives, and identify project recreational facility needs into the foreseeable future. Proposed land classifications include project operations (508 acres), high density recreation (2,011 acres), environmentally sensitive areas (4,319 acres), and multiple resource management units identified as low density recreation (2,468 acres), wildlife management (6,476 acres), and vegetation management (824 acres). Additional land classifications at Lavon Lake include restricted water surface (63 acres), designated no-wake water surface (42 acres), and open recreation water surface (21,295 acres).

As the state agency with primary responsibility for protecting the state's fish and wildlife resources and in accordance with the authority granted by Parks and Wildlife Code §12.0011, the TPWD has reviewed the draft report and offer the following comments and recommendations.

TPWD supports the proposed revisions to the plan; the plan would create a balance between recreational opportunity and stewardship of the natural resources at the Lake Lavon project. Key improvements include the newly-incorporated environmentally sensitive areas and plans for management to enhance the natural resources and to protect areas from future development.

Regarding specific items in the plan, page 2-11, line 964 refers to the TPWD lists by ecoregion of species of greatest conservation need (SGCN). Please note that in addition to the Texas Conservation Action Plan (TCAP) lists of SGCN by ecoregion, TPWD maintains a website that identifies state-listed species and SGCN that have the potential to occur in each Texas county.

**Recommendation:** TPWD recommends also referring to the TPWD list of rare species by county which can be obtained via <http://tpwd.texas.gov/gis/rtest/>.

Page 2-12, line 970 indicates that habitat for the state-listed timber rattlesnake was not observed within the project area and that the likelihood of observing the timber rattlesnake within the project area is uncommon. Please note that habitat for the timber rattlesnake includes dense cover in swamps, floodplains, upland pine and deciduous woodlands, riparian zones or abandoned farmland. In fact recent occurrences of the timber rattlesnake have been reported one county to the north in Grayson County, three counties to the east in Wood County and four counties to the south in Freestone County. The project area includes both upland, bottomland and riparian woodlands with sufficient cover to serve as suitable habitat for the timber rattlesnake. The plan would generally provide stewardship of habitat suitable for the timber rattlesnake through much of the land classified as multiple resource management units and environmentally sensitive areas.

**Recommendation:** TPWD recommends indicating that the suitable habitat for the timber rattlesnake occurs within the project area and that the timber rattlesnake has potential to occur within the project area.

Page 3-10, Table 3.4 identifies a general management objective to ensure green design, construction, and operation practices. In addition to energy efficiency, water conservation and environmentally sustainable building materials, the green design, construction, and operation practices should consider design and materials that may minimize potential impacts on fish and wildlife resources. The following design, construction and operation best management practices are recommended to minimize potential impacts to wildlife resources:

- *Erosion control blankets:* For soil stabilization and/or revegetation of disturbed areas within the project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, particularly snakes, TPWD recommends the use of hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.

- *Vertical pipe:* Open top vertical pipes are a hazard to birds, lizards, small mammals and other wildlife that enter the pipe and become trapped. As a practice to ensure green operation practices, TPWD recommends the Lavon Lake project identify open top vertical pipes and cap, close, remove or screen open top vertical pipes as small as one inch diameter.
- *Lighting:* TPWD recommends that design and operations include practices that consider lighting affects to birds and night skies. Because artificial lighting can attract and disorient night-migrating birds and cause exhaustion mortality, TPWD recommends using the minimum amount of nighttime lighting needed for safety and security and designing lighting to be down-shielded to reduce glare.
- *Building glass:* TPWD recommends that design include practices that consider reducing potential bird collisions with building glass. More information regarding best practices can be found at <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/buildings-and-glass.php>.
- *Development of High Density Recreation Areas:* TPWD recommends that future plans for development and improvement within high density recreation areas be designed to minimize impacts to fish and wildlife habitat through minimizing the footprint with selective placement of amenities and retaining riparian, shoreline and wetland grow zone buffers.
- *Mowing:* In addition to ensuring that tallgrass prairie structure is provided for nesting birds, the structure provided by standing tallgrass over winter provides essential cover for wintering species, thus TPWD recommends limiting mowing or conducting mowing in patches based on a multiyear mowing rotation to maximize the availability of over-winter tallgrass structure.
- *Reporting:* To aid in the scientific knowledge of a resource's status and current range, TPWD encourages reporting encounters of state-listed species and rare vegetative communities to the Texas Natural Diversity Database (TXNDD) according to the data submittal instructions found at <http://tpwd.texas.gov/txndd>.

Map sheets LA15MP-OD-01 through 05 represent depth contours of the project area. The legend for these sheets identify boat ramps and recreation areas, however, these items are not depicted on sheets 01-05.

**Recommendation:** TPWD recommends revising the legend on sheets LA15MP-OD-01 through 05 to only identify items depicted on the maps.

Review of map sheet LA15MP-OU-01 regarding proposed utility corridors, map sheet LA15MP-OC-09 regarding land classification, and publicly available data

from the TXNDD regarding known occurrences of rare resources, indicates that the proposed Utility Corridor Number 6 contains native prairie habitat. The draft master plan classifies the area south of US Highway 380 on the east side of the project area as a multiple resource management unit sub-classified for vegetation management for prairie restoration. A recently-mapped Vertisol Blackland Prairie identified as Element Occurrence (EOID) 11908 in the TPWD TXNDD either includes portions of the Lavon Lake vegetation management unit or is directly adjacent to it. Review of Google Earth aerial imagery and Street View images indicates that the land classified for vegetation management south of US HWY 380, appears to contain similar vegetation and characteristics as the TXNDD mapped prairie with some eastern red cedar (*Juniperus virginiana*) invasion. Chapter 6 regarding utility corridors indicates that natural resources damaged or destroyed within a utility corridor shall be mitigated per USACE requirements.

**Recommendation:** TPWD recommends obtaining data directly from the TXNDD for more information regarding the Vertisol Blackland Prairie mapped as EOID 11908 by choosing the request data link at [http://tpwd.texas.gov/huntwild/wild/wildlife\\_diversity/txndd/](http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/txndd/). TPWD supports the mitigation requirement for loss to prairie habitat or other natural resources associated with future temporary and/or permanent development within the utility corridors.

Page 5-18 regarding the Multiple Resource Management Lands – Wildlife Management land classification, indicates that migratory species, both game and non-game, will be generally given priority over non-migratory species when implementing wildlife management measures.

**Recommendation:** TPWD recommends identifying why priority would be given to migratory species (game and non-game) over non-migratory species for wildlife management measures. As an alternative, TPWD recommends the USACE consider if the sentence regarding priority of species is necessary in the plan so that it does not set unforeseen limitations on flexibility and adaptive wildlife management over the 25-year life of the plan.

The plan indicates the current interest and use of equestrian trails within the project area. The plan also indicates that some areas contain livestock grazing leases. Horses and other livestock have potential to distribute seed either through seed attached to the fur or seed ingested from pastures and/or hay.

**Recommendation:** To minimize the introduction of invasive or undesirable species into environmentally sensitive areas or areas being restored with native vegetation, TPWD recommends USACE establish a plan to educate the equestrian users of the potential to spread seed and the need to stay on designated trails. TPWD recommends considering the use of designated pasture areas to temporarily hold new livestock brought into the project area to allow for previously-ingested material to pass prior to being placed on other project lands.



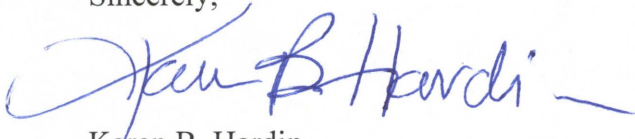
Ryan Shackelford

Page 5

May 16, 2016

Thank you conserving the fish and wildlife resources of Texas. If you have any questions, please contact me at (903) 322-5001 or [Karen.Hardin@tpwd.texas.gov](mailto:Karen.Hardin@tpwd.texas.gov).

Sincerely,

A handwritten signature in blue ink that reads "Karen B. Hardin". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

Karen B. Hardin  
Wildlife Habitat Assessment Program  
Wildlife Division

kbh/36569

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Jon Niermann, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

May 31, 2016

Mr. Ryan Shackelford  
Master Planning Section  
Regional Planning and Environmental Center  
819 Taylor Street, Room 3B10  
Fort Worth, TX 76102

Re: Draft Lake Lavon Master Plan Environmental Assessment

Dear Mr. Shackelford:

The Texas Commission on Environmental Quality (TCEQ) is in receipt of the 2016 Draft Lake Lavon Master Plan Environmental Assessment (EA). The Regional Planning and Environmental Center plans to revise the 1972 Master Plan so that it is compliant with United States Army Corps of Engineers regulation and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends.

As stated in the Draft EA, the proposed action alternative would meet regional goals associated with good stewardship of land and water resources, meet regional recreation goals, address identified recreational trends, and allow for continued use and development of project lands without violating national policies or public laws.

After preliminary review of the EA, the TCEQ has no objection to this project since no surface water features were identified by the Corps on the subject property in their database review and site visit. However, if relevant concerns are identified from comments, the TCEQ will submit a comment letter to identify those concerns.

The TCEQ encourages the use of Best Management Practices during and after any construction for as long as is necessary to protect water quality.

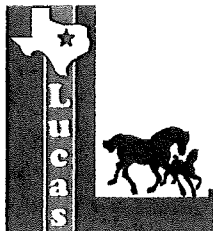
The TCEQ looks forward to receiving and evaluating other agency or public comments during or after the comment period. Please provide any agency comments, public comments, as well as the applicant's comments regarding water quality issues, to Jenna R. Lueg of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Lueg may also be contacted by e-mail at [jenna.lueg@tceq.state.tx.us](mailto:jenna.lueg@tceq.state.tx.us), or by telephone at (512) 239-4590.

Sincerely,

A handwritten signature in dark ink, appearing to read "David W. Galindo".

David W. Galindo, Director  
Water Quality Division

DWG/JL/tc



## City of Lucas

665 Country Club Road  
Lucas, Texas 75002  
972.727.8999  
[www.lucastexas.us](http://www.lucastexas.us)

May 23, 2016

Mr. Michael K. Kinard  
Lavon Lake Manager  
3375 Skyview Drive  
Wylie, TX 75098

Re: Lavon Lake Master Plan Update

Mr. Kinard,

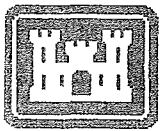
On behalf of the Lucas City Council, we would like to thank you and the US Army Corps of Engineers for allowing us to be part of the process associated with updating the Master Plan for Lavon Lake. The overall emphasis on preservation and your focus on maintaining wildlife habitat and environmentally sensitive areas is appreciated.

We would like to take this opportunity to invite you to participate in our upcoming Founders Day event scheduled for Saturday, October 22. Our annual Founders Day Celebration is an enjoyable family-friendly community event. Unlike other special events in the area, this one has a local flavor that focuses on what makes Lucas unique. It provides entertainment for families including a childrens costume contest and a "Trick or Treat Trail" and offers the adults a relaxing atmosphere and yes, a free lunch. Back by popular demand is the famous stick horse rodeo event and the city staff dunk tank. The parade is a great way to experience Lucas either as a participant or spectator. We are hopeful that will consider participating in the event by setting up a booth and offering the community information about Lavon Lake and the USACE.

Sincerely,

Joni Clarke  
City Manager

Copy: Mr. Ryan Shackelford  
USACE – Fort Worth District – PEC-PM  
819 Taylor Street, Room 3B10  
Fort Worth, TX 76102



**US Army Corps  
of Engineers®**

# Draft Master Plan Public Meeting

## Comment Form

**Lavon Lake, Texas**

**Master Plan Revision**

**Garland, Texas**

**Thursday, May 5, 2016**

### **Questions, comments, or suggestions?**

We need your review of the Lavon Lake Draft Master Plan revision and accompanying environmental assessment prepared in accordance with the National Environmental Policy Act (NEPA). Your participation is key to developing a meaningful Master Plan. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public meeting or within 30 days, to the address below. Thank you for your participation!

PLEASE SEE ATTACHED LETTER

**Optional Information (used for mailing list to keep you informed and will not be used for any other purpose):**

Name: OPIE WALTER, MAYOR Affiliation: TOWN OF ST. PAUL

Address: 2505 GUTSCHESS BLVD City: ST. PAUL State: TX

Zip code: 75098 Phone: 972/442 7212 Email: TOWN OF ST PAUL@VERIZON.NET

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

**Mr. Ryan Shackelford, USACE - Fort Worth District - PEC-PM  
819 Taylor Street, Room 3B10, Fort Worth, Tx 76102  
Email: [lavonlakemp@usace.army.mil](mailto:lavonlakemp@usace.army.mil)**

Additional information and comment sheets can be found at the following:

<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>





## **TOWN OF ST. PAUL**

**2505 Butscher's Block  
St. Paul, TX 75098-8046**

**[www.stpaultexas.us](http://www.stpaultexas.us)**

**972-442-7212**

**972-905-7406 (Fax)**

Mayor: Opie Walter

Mayor pro tem: Robert Simmons

Town Secretary: Robert A. London

Municipal Judge: David Moore

Building Inspector:

Jim Olk: 214-850-5077

Code Enforcement Officer:

Travis Caperton

May 19, 2016

Ryan Shackleford, USACE - Ft. Worth District -RPEC-PM  
819 Taylor St., Room 3B10  
Ft. Worth, TX 76102

Re: Lavon Lake Master Plan Revision

Officials of the Town of St. Paul, including the Mayor, Mayor Pro-Tem, and Town Secretary, attended the Lavon Lake Draft Master Plan Public Meeting on May 5, 2016. The town has a vested interest in the long term plans for the lake, particularly as it relates to Collin Park which abuts our town borders.

Lavon Lake's Collin Park has a campground and a marina facility that is currently leased to Collin Park Marina, Inc. ( Lease agreement DACW63-1-80-0656). The campground facility has been functioning as a trailer park for quite a few years. There are numerous residents that have been in the same sites for 5+ years without ever moving. This seems to be contrary to the customary 2 week stay limit enforced on all other USACE campgrounds and all federal campgrounds.

The access road to this campground has been under water on three separate occasions in 2015. On one occasion, the road was under water for well over a month. We believe USACE may have ordered the evacuation of other parks affected by high water in the interest of public safety but not Collin Park. There has never been a requirement to evacuate the residents of this campground prior to the high water events. Wylie Fire-Rescue cannot bring in emergency equipment in the event of a fire or medical emergency when the road is under water. The health, safety, and welfare of these residents is in peril. There is no designated parking area for those campers who were able to get their cars out before the water covered the road and they end up parking on and clogging residential streets of our town. Their only access is to hike through the private property of St. Paul residents to get to their campers.

This situation also has a profound negative effect on the health, safety, welfare, and quality of life of the residents of St. Paul. Emergency vehicle access to our residents is hindered when campers' cars park on our narrow streets, not allowing room for firetrucks and ambulances to respond to emergencies. It has also forced school bus drivers to alter their routes upsetting parents of school age children.

There is also concern that with the increase of campground spaces and marina boat slips that the capacity of the septic treatment facility may be inadequate, especially considering the high rate of year round occupancy. This could have a negative environmental impact and affect Lavon Lake water quality.

Section 21. paragraph B of the Collin Park lease agreement states;

"...the District Engineer, upon discovery of any hazardous conditions on the premises that presents an immediate threat to the health and/or danger to life or property, will so notify the Lessee and will require that the affected part or all of the premises be closed to the public until such condition is corrected and the danger to the public eliminated."

The Town of St. Paul expects the USACE District Engineer to enforce the terms of its lease agreement with Collin Park Marina, Inc. with regards to public safety. USACE should require mandatory evacuation of all campers, trailers, and vehicles from the Collin Park Campground when the lake reaches a predetermined level and threatens to cover the road.

The Town of St. Paul also requests that any new lease agreement for Collin Park include terms to guarantee that the campground has a limited term of stay, as do all federally owned campgrounds. Continuous multi-year residency on federal property should not be allowed. The town also requests any new lease agreement contain mandatory campground evacuation at a predetermined lake level.

It is hoped that these comments are given the consideration they deserve. Please feel free to contact me with any questions.

Best regards,

The Honorable Opie Walter, Mayor  
Town of St. Paul, TX  
2505 Butscher's Block  
St. Paul, TX 75098  
[opie.walter@stpaultexas.us](mailto:opie.walter@stpaultexas.us)

Law Offices  
**Gay, McCall, Isaacks & Roberts**

A Professional Corporation  
Attorneys and Counselors  
777 East 15<sup>th</sup> Street  
Plano, Texas 75074  
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TEXAS BOARD OF LEGAL SPECIALIZATION

+ATTORNEY – MEDIATOR

June 3, 2016

Ryan Shackelford  
USACE - Fort Worth District - RPEC-PM  
819 Taylor Street, Room 3B10  
Fort Worth

Re: Lake Lavon Master Plan and Environmental Assessment Comments

Dear Mr. Shackelford:

The following comments to the draft of the Lake Lavon Master Plan and Environmental Assessment are being submitted on behalf of the North Texas Municipal Water District.

**Comments to USACE Plans for Utility Corridors around Lake Lavon**

- (1) The proposed corridors do not provide adequate area for the installation and maintenance of water and sewer transmission pipelines required by NTMWD and other utilities.**

The North Texas Municipal Water District (NTMWD) is a regional provider of water, wastewater, and solid waste services for approximately 29 cities. The water provided by NTMWD to the cities serves almost two million (2,000,000) people. NTMWD's primary water treatment plant is located on the south side of Lake Lavon in the city of Wylie, Texas. Lake Lavon was the first lake utilized by NTMWD as its water source and continues to be used both as a water source and as the reservoir into which water is received from other sources. On a peak day, as much as 172 million gallons per day may be placed into Lake Lavon or transported to NTMWD's treatment plant

from other sources, including Lake Texoma, Lake Chapman, Lake Tawakoni, NTMWD's wetland project in Kaufman County, and discharges from NTMWD wastewater treatment plant. Additional sources of water will be required in the future due to the continued growth of the North Texas area, requiring additional pipelines to deliver water to Lake Lavon and the NTMWD Plant.

Many of NTMWD's water sources require pipelines to be constructed to transport and discharge water into Lake Lavon or at the NTMWD Plant necessitating crossing USACE (Corps) property. Although it did not cross Corps property, the most recent pipeline constructed to NTMWD's Wylie treatment plant was a 96" pipeline from Lake Texoma to the plant. Most of NTMWD's water transmission pipelines range from 72" to 96". Easements of not less than fifty feet (50') are required for a single pipeline of this size due to the width of the trench and work space required for installation.

Along with operating its water pipeline system, NTMWD also provides regional wastewater service to cities. This system also required the installation of pipelines, some as large as 48 inches. The utility corridor proposed by USACE is not sufficient to allow construction and repair of the water and wastewater pipelines of the size required by NTMWD, particularly as the corridor is designed to include multiple pipelines. The corridor is simply inadequate to allow for construction, repair and maintenance of large diameter pipelines.

In addition, the spacing suggested in the USACE corridor plan is insufficient even if pipelines of a much smaller diameter are installed within the corridor. Spacing between smaller diameter pipelines of any less than 3-5 feet does not allow sufficient room for excavation and repair of pipelines without a high likelihood of damage to other pipelines. For larger pipelines more spacing is required due to the depth of the trench. In addition, wastewater pipelines are often buried at a depth of 10-20 feet or more, which requires an extremely wide area for installation and repair. The spacing provided in the corridor plan simply will not allow sufficient space for multiple pipelines of this nature.

**(2) The proposed utility corridors are insufficient for the future growth and needs of the North Texas area.**

NTMWD serves the cities of Wylie, Farmersville and Princeton, along with more developed cities to the south and west. As the cities of Wylie, Farmersville and Princeton develop, it is likely that additional potable water transmission lines will be required to be installed from the NTMWD water treatment plant in Wylie to the areas north and east of the plant and Lake Lavon. This additional development and population growth will require additional supplies of water, necessitating installation of a number of additional pipelines to serve that area. Likewise, additional sewer lines will be required to transport wastewater from the cities to the wastewater treatment plants.



The number and width of USACE proposed corridors does not account for the number of water and sewer pipelines that need to be installed in the future to meet the demands of the growing North Texas population north and east of Wylie. This deficiency in the corridor plans will thwart future lines needed to service the areas of the north and east of the Wylie Treatment Plant. In addition, for the reasons set forth in comment one, the utility corridors do not allow sufficient spacing for these future lines within the proposed corridor area.

(3) Summary of deficiencies

For each of the reasons set forth above the proposed utility corridors are insufficient, both in number and in width, for the contemplated use of multiple utility lines. The impact of these deficiencies will hamper, if not eliminate, NTMWD's ability to construct water transmission pipelines and sewer collection pipelines required to meet the needs of the developing areas north and east of Lake Lavon.

**Comments on USACE Lavon Lake Master Plan Revision.**

1. The USACE plan speaks to the observed increase in erosion of the shoreline and sedimentation rate in the reservoir, especially during times of high pool elevations. Although the plan speaks to the fact that the affected areas require repair and treatment it does not propose a strategy for reducing the amount of shoreline erosion. This issue of erosion and sedimentation should be more greatly emphasized and additional management practices should be identified, as well as critical areas for shoreline erosion. As NTMWD relies heavily on the water yield from Lake Lavon to meet its obligation to supply water to the public maintaining the capacity and yield of Lake Lavon is critical. NTMWD requests USACE to identify and implement additional management practices to reduce the observed erosion and resulting sedimentation.
2. The Natural Resource Objectives do not speak specifically to managing or treating runoff from recreational areas. Stormwater management practices, both structural and nonstructural, should be identified and implemented to reduce the amount of nonpoint source pollution from recreational areas, especially those areas designated for intense recreational use. Again, because Lake Lavon is so critical to NTMWD's ability to provide a quality potable water supply to the public, this is a matter of high importance to the District.
3. Information should be added to the Visitor Information, Education and Outreach objectives about the prevention of litter and nonpoint source pollution in areas adjacent to the lake. Educating visitors about best practices when recreating can help protect water quality as well as the quality of the recreational areas themselves.

Ryan Shackelford  
USACE - Fort Worth District - RPEC-PM  
June 3, 2016  
Page 4

Thank you for your consideration of NTMWD's comments.

Very truly yours,

*/s/ Lewis L. Isaacks*

Lewis L. Isaacks

LLI/tlm  
cc: NTMWD

**From:** [Dan Bennett](#)  
**To:** [MasterPlan\\_CESWF-OD-LA](#)  
**Cc:** [John Moczygemba](#)  
**Subject:** [EXTERNAL] Master Plan comments  
**Date:** Thursday, June 02, 2016 1:29:51 PM

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Thank you for the opportunity to comment on the updated Lavon Reservoir Master Plan. We have prepared the following comments as they relate to maintaining or improving reservoir fisheries.

1. Chapter 3-3: Table 3.1 Recreational Objectives

Consider flood/conservation pool to address potential impacts to recreational facilities and fisheries habitat (i.e. campsites, boat ramps, courtesy docks, aquatic vegetation, littoral area, etc.).

Consider incorporating "fisheries habitat" as a component of flood/conservation pool recreational objectives. Fisheries habitat in the form of aquatic vegetation, littoral area, and coarse substrate have been found to degrade rapidly even with water level reductions of just 1 to 2 meters. These components of the aquatic ecosystem provide nursery habitat for juvenile fishes and directly impact recruitment and standing yield of reservoir fishes.

2. Lavon Reservoir maintains a popular winter crappie fishery, and extension of one or more boat ramps, available year-round, can provide reservoir access during periods of prolonged drought. In the 2015 Fisheries Survey Report (cited below) for Lavon Reservoir, extensions to boat ramps at multiple lakeside parks were believed to be feasible. Those parks were: Little Ridge, Mallard Park, Lavonia Park, Clear Lake, Collin Park, and East Fork Park. The terminus of those boat ramps occurred at approximately 478 ft. above mean sea level. An extension to the Avalon Park ramp is mentioned in the draft master plan; however, Avalon Park would currently provide the last remaining public access to the reservoir during periods of low water level (ramp ends at 474 ft. above msl). However, Avalon Park is closed during winter months.

Hysmith, B.T. and J.H. Moczygemba. 2015. Statewide freshwater fisheries monitoring and management program survey report for Lavon Reservoir, 2014. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-5, Austin. Available at:

[Blockedhttp://tpwd.texas.gov/publications/pwdpubs/media/lake\\_survey/pwd\\_rp\\_t3200\\_1321\\_2014.pdf](http://tpwd.texas.gov/publications/pwdpubs/media/lake_survey/pwd_rp_t3200_1321_2014.pdf)

3. Because Lavon Reservoir is in close proximity to reservoirs impacted by invasive aquatic vegetation species such as giant salvinia and water hyacinth, consider adding these species to the Natural Resource Management Objectives. Preventing the spread of these species from one reservoir to another can be encouraged by educating the public through signage at area boat ramps or periodic inspection of boat trailers. Identifying invasive aquatic species soon after introduction is also important for eradication and successful management.

Thank you again,

Dan Bennett  
Denison District Supervisor  
Inland Fisheries Management  
Texas Parks and Wildlife  
P.O. Box 1446  
Pottsboro, Texas 75076  
O: 903.786.2389  
C: 903.439.8331  
F: 903.786.9871

TEXAS HISTORICAL COMMISSION  
*real places telling real stories*

June 2, 2016

Douglas C. Sims, RPA  
Chief, NEPA and Cultural Resources Section  
Regional Planning and Environmental Center  
Fort Worth District, Corps of Engineers  
P.O. Box 17300  
Fort Worth, Texas 76102-0300

Re: Project review under Section 106 of the National Historic Preservation Act of 1966, *Draft Lavon Lake Master Plan, FONSI and EA, East Fork of the Trinity River*, Collin County (COE, Fort Worth District/THC #201607127)

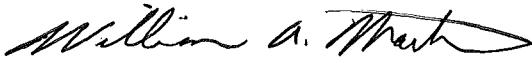
Dear Mr. Sims:

Thank you for providing us for review the above referenced project. This letter serves as comment on the federal undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

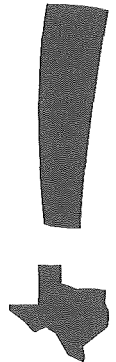
Our review staff, led by Rebecca Shelton, has completed its review. We concur with the Long-Term Objectives for Cultural Resources as described in the Master Plan (Section 2.3.5, page 41 of the PDF). In addition, we concur with the conclusions in the cultural resources section of the EA (Section 3.11, page 217 of the PDF) that future ground-disturbing activities be coordinated with us to ensure compliance with Section 106.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions please contact Rebecca Shelton of our staff, at 512.463.6043 or [Rebecca.Shelton@thc.state.tx.us](mailto:Rebecca.Shelton@thc.state.tx.us).**

Sincerely,



for  
Mark Wolfe, State Historic Preservation Officer  
MW/rls



**From:** [Karen Hardin](#)  
**To:** [Wiese, Donald N SWF](#); [Dan Bennett](#)  
**Cc:** [Shackelford, Ryan SWF](#); [Irwin, Eric J SWF](#); [Wadlington, Brandon SWF](#); [Fields, Rhonda SWF](#); [Mcguire, Amanda SWF](#)  
**Subject:** [EXTERNAL] RE: USACE Response to TPWD Comments - Lavon Lake Master Plan (UNCLASSIFIED)  
**Date:** Monday, July 18, 2016 12:58:39 PM

---

Donald,

The USACE responses to the TPWD Wildlife comments are sufficient. I will let Dan provide a response regarding the TPWD Fisheries comments.

Thanks,

Karen Hardin  
Habitat Assessment Biologist  
Wildlife Habitat Assessment Program  
Texas Parks and Wildlife Department

Support Texas Wildlife!

Order a conservation license plate today at [Blockedwww.conservationplate.org](#)

-----Original Message-----

From: Wiese, Donald N SWF [<mailto:Donald.N.Wiese@usace.army.mil>]  
Sent: Friday, July 15, 2016 3:36 PM  
To: Karen Hardin <[Karen.Hardin@tpwd.texas.gov](mailto:Karen.Hardin@tpwd.texas.gov)>; Dan Bennett <[Dan.Bennett@tpwd.texas.gov](mailto:Dan.Bennett@tpwd.texas.gov)>  
Cc: Shackelford, Ryan SWF <[Ryan.Shackelford@usace.army.mil](mailto:Ryan.Shackelford@usace.army.mil)>; Irwin, Eric J SWF <[Eric.J.Irwin@usace.army.mil](mailto:Eric.J.Irwin@usace.army.mil)>; Wadlington, Brandon SWF <[Brandon.Wadlington@usace.army.mil](mailto:Brandon.Wadlington@usace.army.mil)>; Fields, Rhonda SWF <[Rhonda.Fields@usace.army.mil](mailto:Rhonda.Fields@usace.army.mil)>; Mcguire, Amanda SWF <[Amanda.Mcguire@usace.army.mil](mailto:Amanda.Mcguire@usace.army.mil)>  
Subject: USACE Response to TPWD Comments - Lavon Lake Master Plan (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Karen and Dan,

Thanks to both of you for taking time to attend the public meeting and provide comments on the draft Lavon Lake Master Plan. Attached are the USACE draft responses to your comments.

Also attached are three photos taken during our inspection of the Vertisol Prairie Site (EOID 11908 on TXNDD) site on 14 July. A map of the area in question is also provided showing where the USACE boundary line crosses the site in question. The blue dots on the map represent where the attached photos were taken with the "Overview-Looking North" photo corresponding to the most easterly blue dot, the "Looking NW" photo corresponding to the blue dot in the middle, and the "Looking East" photo corresponding to the most westerly blue dot.

Your comments will result in edits to the draft Master Plan and our response will be included in the final Master Plan. Please let me know if we have responded sufficiently to each of your comments.

Donald N. Wiese  
Natural Resources Manager  
U.S. Army Corps of Engineers  
Fort Worth District Attn: CESWF-PEC-PM P.O. Box 17300 Fort Worth, TX 76102  
Phone: 817-886-1568

CLASSIFICATION: UNCLASSIFIED



**From:** [Dan Bennett](#)  
**To:** [Wiese, Donald N SWF](#); [Karen Hardin](#)  
**Cc:** [Shackelford, Ryan SWF](#); [Irwin, Eric J SWF](#); [Wadlington, Brandon SWF](#); [Fields, Rhonda SWF](#); [Mcguire, Amanda SWF](#)  
**Subject:** [EXTERNAL] RE: USACE Response to TPWD Comments - Lavon Lake Master Plan (UNCLASSIFIED)  
**Date:** Tuesday, July 19, 2016 1:13:55 PM

---

Mr. Wiese,

Thank you for the opportunity to provide comments on the master plan, and for incorporating the suggestions! If TPWD can assist in the future by supporting any boater access grants applications to help with improving boat ramps at Lake Lavon, please let us know. There is a potential that some funding could be available.

Blocked<https://tpwd.texas.gov/business/grants/recreation-grants/boating-access>

Thank you,

Dan Bennett  
Inland Fisheries

Sent from my Verizon, Samsung Galaxy smartphone

----- Original message -----

From: "Wiese, Donald N SWF" <Donald.N.Wiese@usace.army.mil>  
Date: 7/15/16 3:37 PM (GMT-06:00)  
To: Karen Hardin <Karen.Hardin@tpwd.texas.gov>, Dan Bennett <Dan.Bennett@tpwd.texas.gov>  
Cc: "Shackelford, Ryan SWF" <Ryan.Shackelford@usace.army.mil>, "Irwin, Eric J SWF" <Eric.J.Irwin@usace.army.mil>, "Wadlington, Brandon SWF" <Brandon.Wadlington@usace.army.mil>, "Fields, Rhonda SWF" <Rhonda.Fields@usace.army.mil>, "Mcguire, Amanda SWF" <Amanda.Mcguire@usace.army.mil>  
Subject: USACE Response to TPWD Comments - Lavon Lake Master Plan (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

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Your comments will result in edits to the draft Master Plan and our response will be included in the final Master Plan. Please let me know if we have responded sufficiently to each of your comments.

Donald N. Wiese  
Natural Resources Manager  
U.S. Army Corps of Engineers  
Fort Worth District Attn: CESWF-PEC-PM  
P.O. Box 17300  
Fort Worth, TX 76102  
Phone: 817-886-1568

## **Appendix C – List of Pertinent Design Memorandums**

- Definite Project Report on Lavon Dam and Reservoir July 1946
- Design Memorandum No. 1A - Hydrology
  - Part A - Hydrology-Lavon Reservoir Modification June 1965
  - Part B - Hydrology-East Fork Channel Improvement August 1965
- Design Memorandum No. 2 - Availability of Materials September 1965
  - Real Estate (additional reservoir land) February 1958
- Design Memorandum No 2C - Updated Master Plan - Cost Data June 1961
- Report of Sedimentation - Lavon Dam June 1961
- Design Memorandum No. 3 – Real Estate
  - Part 1 - Real Estate for Reservoir Area April 1966
  - Part 2 - Lands for Construction Area April 1966
- Design Memorandum No. 4 - Relocations
  - Part 1 - Railroads (A.T. & S.F. Railway) December 1965
  - Supplement No. 1 May 1968
- Design Memorandum No. 5 - General Reservoir
  - Part 1 - Reservoir February 1966
- Design Memorandum No. 6, 6A - Recreation
  - Preliminary Master Plan February 1966
- Design Memorandum No. 7- Sedimentation and Degradation Ranges June 1966
- Design Memorandum No. 8 - Embankment and Spillway July 1966
  - Supplement No. 1 November 1966
  - Supplement No. 2 August 1967
- Design Memorandum No. 9 - Relocations (Collin County Roads) November 1966
  - Supplement No. 1 May 1967
  - Supplement No. 2 July 1968
  - Supplement No. 3 June 1969
- Design Memorandum No. 10 - Relocations – State Highway No. 24 April 1967
- Design Memorandum No. 11 - Relocations - State Highway No. 78 March 1967
- Design Memorandum No. 12 – General – Channel and Levees December 1967
  - Supplement No. 1 March 1969
- Design Memorandum No. 13 – Master Plan (Resv. Management) March 1969
  - Updated Master Plan (Lavon Lake Modification) May 1972
- Design Memorandum No. 14 – Relocations
  - Texas State Highway No. FM 546 November 1967
- Design Memorandum No. 15 – Relocations
  - Texas State Highway No. FM 982 February 1969

- Design Memorandum No. 16 – Relocations  
- Southwestern Bell Telephone Company June 1968
- Design Memorandum No. 17 – Relocations  
- Texas State Highway No. FM 1377 and  
- Texas State Highway No. FM 2756 January 1969
- Design Memorandum No. 18  
- South Access Road September 1970
- Design Memorandum No. 19 - Relocations – Electric Transmission Lines  
- Texas Power and Light Company
- - Community Public Service Company, Inc. October 1968  
- Supplement No. 1 November 1970
- Design Memorandum No. 20 – Reservoir Clearing March 1968
- Design Memorandum No. 23 Relocations  
- Farmers Electric Cooperative Inc. December 1970
- Design Memorandum No. 25 Relocations  
-Grayson-Collin Electric Cooperative, Inc.
- Design Memorandum No. 26 Relocations  
- Texas Power and Light Company February 1972
- Design Memorandum No. 27 Relocations
- - Community Public Service Company, Inc. July 1971
- Design Memorandum No. 28 Relocations  
- Wylie Northeast Water Supply Corporation September 1970
- Design Memorandum No. 29 Relocations  
- Culleoka Water Supply Corporation April 1971
- Design Memorandum No. 30 Relocations  
- Milligan Water Supply Corporation November 1970
- Design Memorandum No. 32 Relocations  
- Lavon Water Supply Corporation April 1971
- Recreational Development Plan for the Handicapped April 1971
- Design Memorandum No. 33 Relocations  
- Garland Power and Light Company June 1971
- Design Memorandum No. 34 Relocations  
- Lone Star Gas Company October 1971
- Design Memorandum No. 35 Relocations  
- North Texas Municipal Water District's 14-inch water line July 1972
- Lavon Lake – Report of Sedimentation June 1975
- Design Memorandum No. 37  
- Relocation of Collin County Road No. 115 June 1976
- Lavon Reservoir – Operations and Maintenance

Manual FWDP 1130-2-9

- Updated

- Lavon Lake – Water Quality Report
- Lavon Lake – Flood Emergency Plan
- Lavon Lake – Water Quality Report

July 1962

September 1975

July 1982

May 1988

June 1999



## **Appendix D – 2010 Habitat Evaluation Report**

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# **EXISTING HABITAT CONDITIONS FOR THE USACE LAVON LAKE MASTER PLAN UPDATE COLLIN COUNTY, TEXAS**

## **INTRODUCTION**

The purpose of this report is to describe existing fish and wildlife resources within the Lavon Lake Corps property study area in Collin County, Texas and to recommend preliminary measures for resource protection. This planning assistance is provided to the U.S. Army Corps of Engineers (Corps), pursuant to the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This information does not represent a final report of the Secretary of the Interior within the meaning of Section 2(b) of the FWCA. It is being provided to assist the Corps in preparation of a Master Plan Update for Lavon Lake, and no specific federal authorization initiated this study.

## **STUDY AREA**

### ***Location***

The environmental study area consists of the entire Corps property surrounding Lavon Lake. Spatial data provided by the Corps indicate that the study area encompasses approximately 37,485 acres located within Collin County, Texas and lying within the Trinity River Basin. Approximately 16,787 terrestrial acres of the study area were evaluated for wildlife habitat suitability.

This reservoir is located in north Texas on the East Fork of the Trinity River adjacent to State Highway 78. Started in 1948 and completed in 1953, the lake was designed for flood control, conservation storage, and recreational use. Its construction assisted in preventing seasonal flooding of rich bottomland in southeastern Collin County and stimulated land development along the shores of the lake.

### ***Climate, Topography, and Ecology***

The climate of Collin County is moderate humid subtropical with hot summers and mild winters, with an occasional front of extremely cold temperatures. The average low and high temperatures range from 36°F in January to 96°F in July. The lowest minimum recorded temperature is 1°F in 1989 and the highest maximum 112°F in 1980. Annual precipitation within the county averages 33.7 inches per year. The terrain consists of gently rolling hills generally sloping to the east and southeast.

The study area is located in the Blackland Prairie ecological area of Texas (Gould 1962) and is within the identically-named Blackland Prairie natural vegetational area (Diggs et al. 1999). Historically, the area was predominantly tall grass prairie with trees along watercourses,

sometimes scattered on the prairie or concentrated in certain areas possibly as a result of locally favorable soil conditions or topography. Fire was probably an important factor in maintenance of the original prairie vegetation and had a major impact on the community structure (Strickland & Fox 1993). Tall grass prairie fires, intensely hot, would have been stopped only by the lack of dry fuel or a change in topography. Even streambank vegetation was susceptible during dry years. The end result was that trees were rare even along some stream banks, and prairie margins probably extended somewhat beyond the limits of the soil types usually associated with prairie (Hayward & Yelderman 1991). There is considerable variation in the tall grass prairie communities of the Blacklands (Diamond & Smeins 1993) and disagreement about specific community types (Simpson & Pease 1995). However, common dominant grasses of this tall grass prairie ecosystem include little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), switch grass (*Panicum virgatum*), eastern gramma grass (*Tripsacum dactyloides*), tall dropseed (*Sporobolus compositus*), Texas cup grass (*Eriochloa sericea*), Florida paspalum (*Paspalum floridanum*), and long-spike tridens (*Tridens strictus*) (Collins et al. 1975). As a whole, most of the Blackland Prairie is a complex mosaic of tall grass communities; an example of this can be seen in northern Grayson County where four of the community types discussed above can be seen within a few miles (Diggs et al. 1999).

With the exception of preserves, small remnants, or native hay meadows, almost nothing remains of the original Blackland Prairie communities. Conversion of the Blackland Prairie for agriculture was the most significant cause of the destruction of this ecosystem, with only marginal, steeply sloped land not rapidly brought under cultivation. High prices for cotton and grains eventually resulted in the cultivation of these areas as well. Once stripped of protective grass, these areas eroded rapidly with disastrous effects. Given the relatively high rainfall and continuing suppression of fire by humans, native trees and shrubs (e.g. eastern red cedar (*Juniperus virginiana*) and cedar elm (*Ulmus crassifolia*), as well as introduced species are able to invade and eventually take over areas that were formerly prairie (Diggs et al. 1999).

Soil-types within the study area are composed largely of the Trinity-Frio, Eddy-Stephen-Austin, Silawa-Silstid-Bastil, and Austin-Houston Black representing the Tallgrass Prairie Community of soils associated with floodplains, stream terraces, and uplands along this portion of the Trinity River floodplain. This community is characterized by deeper soils underlain at rather shallow depths by dense, hard, clayey material. This “claypan” restricts air and water movements, as well as root penetration. It is typically dominated by warm-season, perennial tallgrasses, with warm-season, perennial midgrasses filling most of the remaining species composition. The warm-season, perennial forb component varies between 5 and 15 % depending on climatic patterns and local precipitation. Historically, woody species made up a minor component of the community, 5% or less (USDA 2009). The tree species noted most often in the study area during data collection were green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), black willow (*Salix nigra*), American elm (*Ulmus americana*), hackberry (*Celtis occidentalis*), cedar elm, red mulberry (*Morus rubra*), and bur oak (*Quercus macrocarpa*). Although past agriculture practices have brought upland characteristics to portions of the study area, historically more of it was likely dominated by additional bottomland hardwood forest.

The study area is used by both resident and migratory wildlife species that are tolerant of human

activity. Small mammals and migratory and resident passerines use the wooded areas along the forks, mainstem and tributaries of the river for nesting, foraging and as a dispersion corridor. The more heavily impacted woodlands upstream and downstream of the study area are most likely used by a variety of migratory and resident passerine, owl, and hawk species which may disperse from the less impacted study area. Some common resident bird species that may be observed in the study area are sparrows (various species), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*), blue jay (*Cyanocitta cristata*), common grackle (*Quiscalus quiscula*), scissor-tailed flycatcher (*Tyrannus forficatus*), barred owl (*Strix varia*), common crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), Carolina chickadee (*Parus carolinensis*), and red-tailed hawk (*Buteo jamaicensis*). Mammal species that may utilize appropriate habitats in the study area include raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), eastern cottontail (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), and small rodents. Various species of frogs and turtles may be found in less impacted reaches of the river, while lizards and snakes may also persist in viable terrestrial areas within the study area. A list of floral and faunal species that were observed during field investigations in the study area is included on each site observation sheet in Appendix A.

## EXISTING TERRESTRIAL HABITATS AND WILDLIFE RESOURCES

### *Habitat Evaluation Methods*

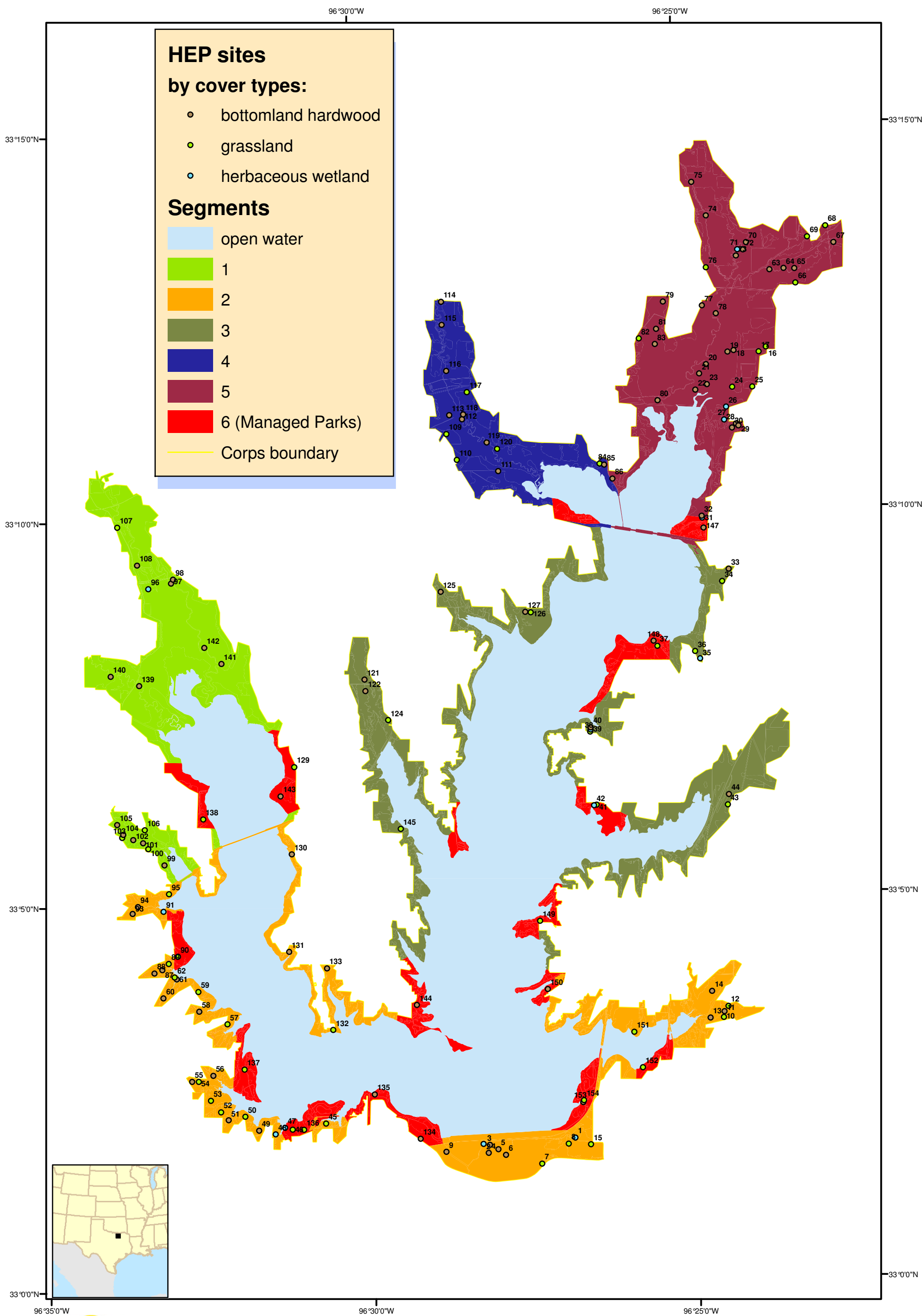
An interagency team composed of Corps, TPWD, and Service personnel was convened to conduct a habitat evaluation of the study area. The Service's *Habitat Evaluation Procedures* (HEP) (U.S. Fish and Wildlife Service 1980) were used to analyze and describe the various existing habitats in the study area.

The biologist team collected field data on July 12 – 28, 2010. One hundred and fifty-four survey sites were randomly selected within the three terrestrial habitat types delineated in the study area: bottomland hardwoods, grasslands, and herbaceous wetlands. Figure 1 displays the locations of the data sites that were recorded using a Trimble GeoTX handheld unit. These sites are also depicted on aerial maps in Appendix E and their geographical locations are listed in Appendix F. Spatial data depicting habitat cover types utilized in the analysis and evaluation which were provided by the Corps are illustrated in Figure 2.

Ten wildlife indicator species were selected to represent the wildlife communities that use the three habitats evaluated. The raccoon, fox squirrel, Carolina chickadee, barred owl, downy woodpecker (*Picoides pubescens*), and wood duck (*Aix sponsa*) were selected to represent those species that use bottomland hardwoods. Species selected for herbaceous wetland habitat suitability evaluation included green heron (*Butorides virescens*), raccoon, and wood duck. The eastern meadowlark (*Sturnella magna*), eastern cottontail, and American kestrel were selected to represent the wildlife communities in grasslands.

HEP requires the use of Habitat Suitability Index (HSI) models developed for each indicator species that best represent groups of species that use the habitats. The HEP models contain a list





**U.S. Fish & Wildlife Service**  
**Arlington, Texas, Ecological Services Field Office**  
 Projection: UTM Zone 14N, NAD 1983, GRS 1980  
 Production Date: 1/27/2011

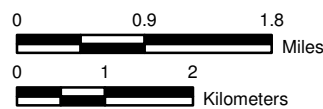
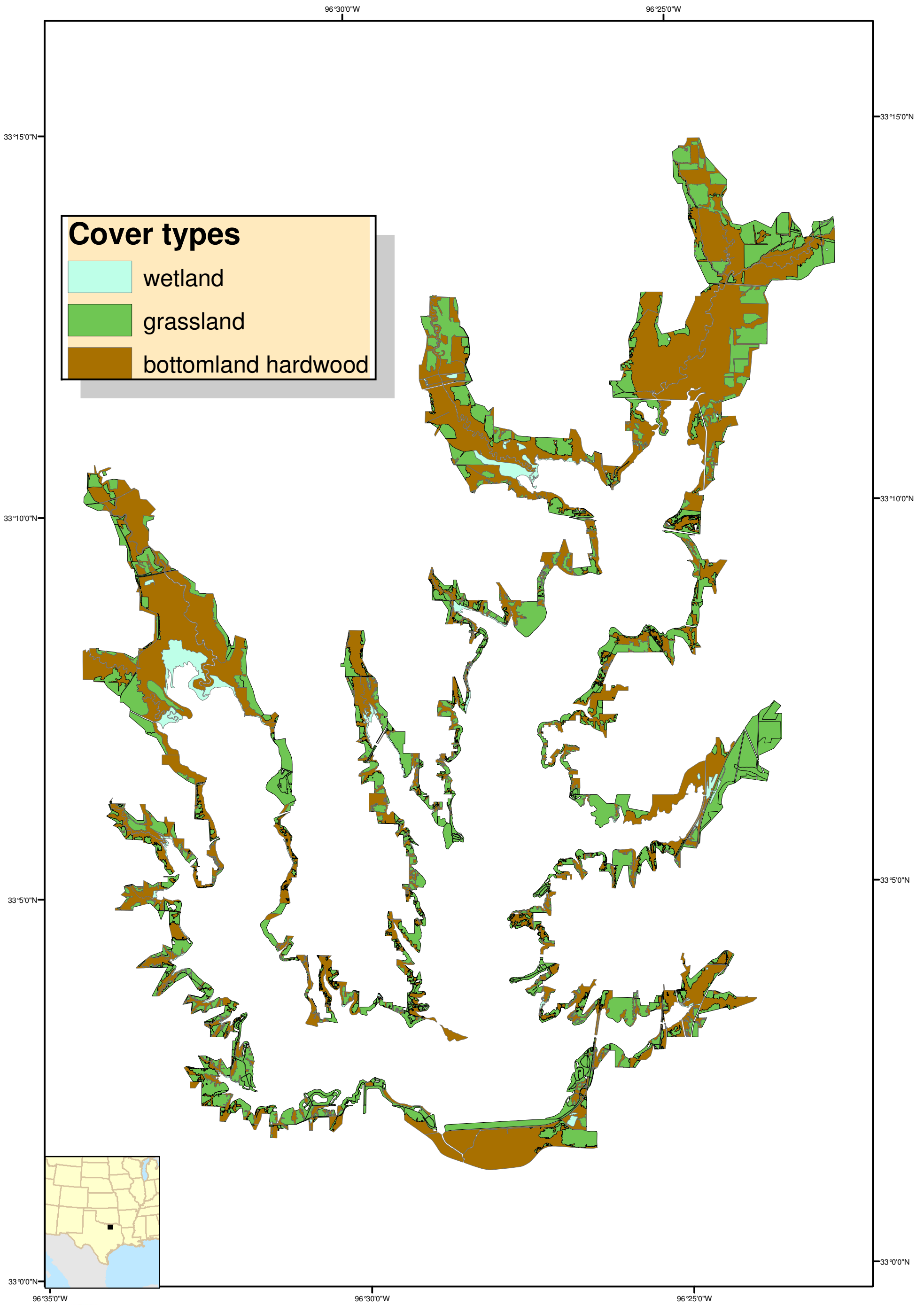


Figure 1: Lavon Lake study area segments and HEP data sites



**U.S. Fish & Wildlife Service**

**Arlington, Texas, Ecological Services Field Office**  
 Projection: UTM Zone 14N, NAD 1983, GRS 1980  
 Production Date: 2/15/2011

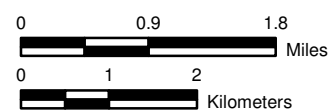


Figure 2: Lavon Lake study area habitat cover types

of structural habitat composition variables that are contained in optimum habitat. All variables for each species representing each habitat are compiled and measured in the field (Appendix C). Nineteen variables were compiled for the bottomland hardwoods (C -1 through C -9). There were 14 grassland habitat variables (C -10 through C -14), and 12 herbaceous wetland variables (C -15 through C -16). These variables were measured or estimated within a tenth-acre data site within the habitat they represent. They are used as indicators of habitat condition or value.

Baseline habitat conditions are expressed as a numeric function (HSI value) ranging from 0.0 to 1.0, where 0.0 represents no suitable habitat for an indicator species and 1.0 represents optimum conditions for the species. HSI values ranging from 0.01 to 0.24 are considered “poor” habitat, 0.25 to 0.49 are considered “below average” habitat, 0.50 to 0.69 are “average” habitat, 0.70 to 0.89 are “good” habitat, and 0.90 to 1.00 are considered “excellent” habitat. Habitat Units are calculated by multiplying the HSI for each habitat by the amount of acres of the same habitat.

A complete list of plant species observed during the surveys is included in Appendix A. Appendix B includes the individual site observation sheets that contain a physical description of each site and a list of plants and animals observed at the site. Appendix D contains photographs taken in each compass direction from the center of each survey site.

### ***Habitat Descriptions and Suitability Index Values***

The study area was divided into six evaluation segments which were independently analyzed for habitat suitability in order to assess possible differences in their existing conditions. Existing habitat conditions across these groupings were expected to vary due to differences in topography and past impacts. This targeted approach is intended to better illustrate the likely impact of future project alternatives on habitat values within these differing reaches.

The project’s study area, which corresponds to the Lavon Lake Corps boundary, contains approximately 20,698 acres of urban development, roads, and open water which were excluded from evaluation for terrestrial wildlife habitat suitability. There are three terrestrial wildlife habitats types evaluated within the remaining study area: bottomland hardwoods, grasslands, and herbaceous wetlands. The average HSI value for each habitat within the study area ranged from 0.45 (below average) for herbaceous wetlands within segment 6 (managed parks) to 0.75 (good) for grasslands in both segment 3 and segment 5.

The following are the preliminary findings and tables containing the Habitat Suitability Indices (HSI) for the three habitats per evaluation area per species. Table 4 contains a summary of the existing habitat acres, HSIs, and Habitat Units (HU). Preliminary planning recommendations for these habitats are included at the end of this evaluation.

### **Bottomland Hardwood**

The HEP defines the bottomland hardwood cover type as wetland areas dominated by deciduous trees, usually along streams, and that are occasionally flooded. In optimum conditions, this cover type provides food, cover, nesting habitat, and living space to riparian forest dependent

species. Large trees are important as nesting habitat for the fox squirrel, wood duck, and barred owl, and escape cover for raccoons, wood ducks, and passerines. Large mast producing trees and shrubs provide food for the fox squirrel. Brush piles and snags provide necessary food, cover, and shelter for the raccoon and passerines. The close proximity to water is important for the raccoon and wood duck. Riparian forest habitats are essential in maintaining biodiversity and providing important wildlife travel corridors.

Located primarily along the Trinity River and its inflows, many of these woodlands are periodically flooded and are predominately composed of green ash, American elm, cedar elm, pecan, black willow, and box elder. Other trees species present include bur oak, red mulberry, and sugar hackberry.

Bottomland hardwoods in Segment 3 were valued in the higher range of below average habitat. Those in all other segments scored average habitat values (Table 1). Segments 4 and 5 contained the largest patches of intact, mature bottomland hardwood forest concentrated along streambanks.

**Table 1. HSI Values for Bottomland Hardwood Habitat per Indicator Species within the Lavon Lake study area segments.**

<b>Indicator Species</b>	<b>Bottomland Hardwood Evaluation Areas</b>					
	<b>Segment 1</b> 1886.05ac	<b>Segment 2</b> 1749.80ac	<b>Segment 3</b> 1489.91ac	<b>Segment 4</b> 1020.11ac	<b>Segment 5</b> 2695.37ac	<b>Managed Parks (6)</b> 648.87ac
Barred owl	0.78	0.70	0.62	0.71	0.76	0.71
Carolina Chickadee	0.95	0.92	0.87	0.92	0.91	0.91
Raccoon	0.76	0.60	0.52	0.67	0.60	0.72
Wood Duck*	0.09	0.13	0.06	0.12	0.07	0.02
Fox Squirrel	0.50	0.19	0.39	0.31	0.40	0.53
Downey Woodpeker	0.48	0.88	0.40	0.53	0.68	0.54
<b>HSI Average</b>	<b>0.59</b>	<b>0.57</b>	<b>0.48</b>	<b>0.54</b>	<b>0.57</b>	<b>0.57</b>
<b>Habitat Units</b>	<b>1119.06</b>	<b>997.39</b>	<b>710.19</b>	<b>554.26</b>	<b>1536.36</b>	<b>369.86</b>

\*Multi-habitat Species

The limiting factors for bottomland hardwoods in Segment 1:

- minimal winter and brood cover along the banks for the wood duck
- number of potentially suitable tree cavities too few for wood duck nesting
- minimal winter food (hard mast producing vegetation) available for the fox squirrel
- number of snags >6 inches too few to provide adequate nesting sites for downy woodpecker

The limiting factors for bottomland hardwoods in Segment 2:

- the overstory trees are generally too small to provide preferred raccoon habitat
- minimal winter and brood cover along the banks for the wood duck
- number of potentially suitable tree cavities too few for wood duck
- minimal winter food (hard mast producing vegetation) available for the fox squirrel

The limiting factors for bottomland hardwoods in Segment 3:

- the overstory trees are generally too small to provide preferred raccoon habitat
- minimal winter and brood cover along the banks for the wood duck
- available trees provide minimal nesting opportunities for wood duck
- minimal winter food (hard mast producing vegetation) available for the fox squirrel
- the overstory trees are generally too small to provide preferred fox squirrel habitat
- the overstory trees are generally too small to provide nest sites for barred owl
- number of snags >6 inches too few to provide adequate nesting sites for downy woodpecker

The limiting factors for bottomland hardwoods in Segment 4:

- minimal winter and brood cover along the banks for the wood duck
- number of potentially suitable tree cavities too few for wood duck nesting
- minimal winter food (hard mast producing vegetation) available for the fox squirrel
- the overstory trees are generally too small to provide preferred raccoon habitat
- number of snags >6 inches too few to provide adequate nesting sites for downy woodpecker

The limiting factors for bottomland hardwoods in Segment 5:

- minimal winter and brood cover along the banks for the wood duck
- number of potentially suitable tree cavities too few for wood duck nesting
- minimal winter food (hard mast producing vegetation) available for the fox squirrel
- the overstory trees are generally too small to provide nest sites for barred owl
- the overstory trees are generally too small to provide preferred raccoon habitat
- number of snags >6 inches too few to provide adequate nesting sites for downy woodpecker

The limiting factors for bottomland hardwoods in Segment 6 (Managed Parks):

- minimal winter and brood cover along the banks for the wood duck
- number of potentially suitable tree cavities too few for wood duck nesting



- minimal winter food (hard mast producing vegetation) available for the fox squirrel
- number of snags >6 inches too few to provide adequate nesting sites for downy woodpecker

## Herbaceous Wetlands

Herbaceous wetlands are wetland areas dominated by non-woody vegetation. Wetlands provide food and cover for fish, resident and migratory birds, small mammals, invertebrates, and the predators that feed on these species. Wetlands are important nesting habitat for wading birds and waterfowl and are comprised primarily of rushes, sedges, wetland grasses, and aquatic plants located along the edges of waterbodies and creeks, and in seasonally flooded areas. Most of the wetlands evaluated are permanent, but some are likely seasonal.

Segment 6 (managed parks) was valued as below average quality herbaceous wetland habitat. Wetlands in Segments 1, 3, and 5 were valued as average quality habitat while Segments 2 and 4 were found to contain good quality wetland habitat (Table 2).

**Table 2. HSI Values for Herbaceous Wetland Habitat per Indicator Species within the Lavon Lake study area segments.**

Indicator Species	Herbaceous Wetlands Evaluation Areas					
	Segment 1 243.33ac	Segment 2 47.28ac	Segment 3 99.74ac	Segment 4 119.85ac	Segment 5 6.10ac	Managed Parks (6) 10.42ac
Green Heron	0.50	1.00	0.83	1.00	1.00	0.62
Raccoon	1.00	1.00	1.00	1.00	1.00	0.71
Wood Duck *	0.09	0.13	0.06	0.12	0.07	0.02
<b>HSI Average</b>	<b>0.53</b>	<b>0.71</b>	<b>0.63</b>	<b>0.71</b>	<b>0.69</b>	<b>0.45</b>
<b>Habitat Units</b>	<b>128.96</b>	<b>33.57</b>	<b>62.84</b>	<b>84.69</b>	<b>4.21</b>	<b>4.69</b>

\*Multi-habitat Species

The limiting factors for herbaceous wetlands in Segment 1:

- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck
- lack of woody cover over water surface for green heron
- lack of herbaceous canopy in the littoral zone for green heron

- water generally too deep for green heron foraging

The limiting factors for herbaceous wetlands in Segment 2:

- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck

The limiting factors for herbaceous wetlands in Segment 3:

- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck

The limiting factors for herbaceous wetlands in Segment 4:

- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck

The limiting factors for herbaceous wetlands in Segment 5:

- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck

The limiting factors for herbaceous wetlands in Segment 6 (Managed Parks):

- lack of woody cover over water surface for green heron
- lack of herbaceous canopy in the littoral zone for green heron
- water generally too deep for green heron foraging
- available trees provide minimal nesting opportunities for wood duck
- minimal winter and brood cover along the banks for the wood duck

The HSI calculations for wood duck in each of the six segments did not require interspersed factoring because neither the bottomland hardwoods nor herbaceous wetlands within those areas score 0.0 for any life requisite.

## Grasslands

Grasslands are dominated by grasses, native or introduced, that are not regularly planted or mowed, and have a minimal canopy cover of 25%. Grasslands provide open space, a food source for passerines and the eastern cottontail, and cover for escape and nesting by means of tall grass, scattered brush piles and shrubs for a variety of animals. Red-tailed hawks hunt for prey in open grasslands.

Until recently, many grasslands within the study area have been impacted by long-term cattle grazing. These areas show a lack of diversity and an abundance of poor quality, grazing resistant vegetation. Other areas show less evidence of past agricultural practices and are populated with a greater diversity of native grassland species. In general, grasslands at Lavon Lake are comprised of short native and introduced grasses and forbs, and occasional scattered trees. The grass species found in the data plots were Johnsongrass (*Sorghum halepense*), coastal bermuda

(*Cynodon dactylon*), KR bluestem (*Bothriochloa ischaemum*), Indiangrass (*Sorghastrum nutans*), lovegrass (*Eragrostis* sp.), knotroot bristlegrass (*Setaria parviflora*), little bluestem (*Schizachyrium scoparium*), silver bluestem (*Andropogon saccharoides*), Canada wildrye (*Elymus canadensis*), Japanese brome (*Bromus japonicas*), and Virginia wildrye (*Elymus virginicus*). Forb species also found include western ragweed (*Ambrosia psilostachya*), oxalis sp., daisy fleabane (*Erigeron strigosus*), dollarweed (*Hydrocotyle umbellata*), giant ragweed (*Ambrosia trifida*), snow on the prairie (*Euphorbia bicolor*), goldenrod (*Solidago* sp.), milkweeds (*Asclepias* sp.), coneflower (*Echinacea* sp.), bee balm (*Monarda didyma*), and balloonvine (*Cardiospermum halicacabum*).

The grassland habitats within Segments 1,2,4, and 6 were valued as average. Grassland habitats within Segments 3 and 5 were valued as good habitat (Table 3).

**Table 3. HSI Values for Grassland Habitat per Indicator Species within the Dallas Floodway Project Area.**

Indicator Species	Grassland Evaluation Areas					
	Segment 1 722.30ac	Segment 2 1191.86ac	Segment 3 1766.26ac	Segment 4 573.68ac	Segment 5 1333.17ac	Managed Parks (6) 1184.12ac
Eastern Meadowlark	0.40	0.41	0.56	0.52	0.69	0.36
Eastern Cottontail	0.77	0.83	0.98	0.71	0.89	0.85
American Kestrel	0.65	0.69	0.68	0.66	0.65	0.66
<b>HSI Average</b>	<b>0.61</b>	<b>0.64</b>	<b>0.74</b>	<b>0.63</b>	<b>0.74</b>	<b>0.62</b>
<b>Habitat Units</b>	<b>438.20</b>	<b>766.76</b>	<b>1307.03</b>	<b>361.42</b>	<b>990.99</b>	<b>738.10</b>

\*Multi-habitat Species

The limiting factors for grasslands in Segment 1:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel
- minimal availability of herbaceous canopy  $\leq$  12 inches preferred by kestrel
- distance to perch sites typically too great for eastern meadowlark
- minimal proportion of grass in herbaceous canopy for eastern meadowlark

The limiting factors for grasslands in Segment 2:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel

- minimal availability of herbaceous canopy  $\leq 12$  inches preferred by kestrel
- distance to perch sites typically too great for eastern meadowlark
- minimal cover for eastern cottontail (shrub/tree and persistent herbaceous vegetation)

The limiting factors for grasslands in Segment 3:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel
- minimal availability of herbaceous canopy  $\leq 12$  inches preferred by kestrel
- distance to perch sites typically too great for eastern meadowlark

The limiting factors for grasslands in Segment 4:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel
- minimal availability of herbaceous canopy  $\leq 12$  inches preferred by kestrel
- minimal proportion of grass in herbaceous canopy for eastern meadowlark
- minimal cover for eastern cottontail (shrub/tree and persistent herbaceous vegetation)

The limiting factors for grasslands in Segment 5:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel
- minimal availability of herbaceous canopy  $\leq 12$  inches preferred by kestrel
- minimal proportion of grass in herbaceous canopy for eastern meadowlark

The limiting factors for grasslands in Segment 6:

- lack of nest sites (i.e., cliffs, earth banks, abandoned buildings and trees larger than 12 inches dbh) for the kestrel
- minimal availability of herbaceous canopy  $\leq 12$  inches preferred by kestrel
- distance to perch sites typically too great for eastern meadowlark
- minimal cover for eastern cottontail (shrub/tree and persistent herbaceous vegetation)

**Table 4. Summary of Existing Wildlife Habitat Acres, Habitat Suitability Indices and Habitat Units.**

Evaluation Areas	Bottomland Hardwood			Wetland			Grassland		
	Acres	HSI Average	HUs	Acres	HSI Average	HUs	Acres	HSI Average	HUs
Segment 1	1886.05	0.59	1119.06	243.33	0.53	128.96	722.30	0.61	438.20
Segment 2	1749.80	0.57	997.39	47.28	0.71	33.57	1191.86	0.64	766.76
Segment 3	1489.91	0.48	710.19	99.74	0.63	62.84	1766.26	0.74	1307.03
Segment 4	1020.11	0.54	554.26	119.85	0.71	84.69	573.68	0.63	361.42
Segment 5	2695.37	0.57	1536.36	6.10	0.69	4.21	1333.17	0.74	990.99
Managed Parks (6)	648.87	0.57	369.86	10.42	0.45	4.69	1184.12	0.62	738.10
<b>TOTALS</b>	<b>9,490.11</b>	<b>0.55</b>	<b>5,287.12</b>	<b>526.72</b>	<b>0.62</b>	<b>318.96</b>	<b>6771.39</b>	<b>0.66</b>	<b>4602.5</b>

### ***Threatened and Endangered Species and Birds of Conservation Concern***

The only federally listed threatened or endangered species known to occur in Collin County is the endangered whooping crane (*Grus americana*). Whooping cranes may be encountered in any county in north central Texas during migration. Autumn migration normally begins in mid-September, with most birds arriving on the wintering grounds at Aransas National Wildlife Refuge between late October and mid-November. Spring migration occurs during March and April. Whooping cranes prefer isolated areas away from human activity for feeding and roosting, with vegetated wetlands and wetlands adjacent to cropland being utilized along the migration route. Foods consumed usually include frogs, fish, plant tubers, crayfish, insects, and waste grains in harvested fields. It is possible that whooping cranes may temporarily utilize habitats present within the study area during their annual migration but an encounter would be a rare occurrence.

The bald eagle (*Haliaeetus leucocephalus*) was formerly listed in Collin County but was removed from the federal threatened and endangered species list effective August 8, 2007. However, bald eagles are still afforded safeguards under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. We recommend all activities be conducted in accordance with the Service's National Bald Eagle Management Guidelines which may be accessed at <http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>.



The Service published the *Birds of Conservation Concern 2002* (BCC) in December 2002. “The overall goal of the BCC is to accurately identify the migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent our highest conservation priorities and draw attention to species in need of conservation action” (U.S. Fish and Wildlife Service 2002).

Copies of the *Birds of Conservation Concern 2002* may be obtained by writing to the Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Mail Stop 4107, Arlington, VA 22203-1610, ATTN: BCC 2002. It is also available for downloading on the Division of Migratory Bird Management's web page at <http://migratorybirds.fws.gov>.

The following 23 species on the BCC lists may utilize appropriate habitat types within the general vicinity of study area:

little blue heron (*Egretta caerulea*) - inlands marshes and ponds  
northern harrier (*Circus cyaneus*) - marshes, prairies, and savannas  
peregrine falcon (*Falco peregrinus*) - generalist  
American golden-plover (*Pluvialis dominica*) - prairies, and savannas  
long-billed curlew (*Numenius americanus*) – open water, prairies, and savannas  
Hudsonian godwit (*Limosa haemastica*) - inlands marshes  
buff-breasted sandpiper (*Tryngites subruficollis*) - prairies, margins of lakes  
red-headed woodpecker (*Melanerpes erythrocephalus*) - woodlands  
scissor-tailed flycatcher (*Tyrannus forficatus*) – prairies, savannas, and open shrubland  
loggerhead shrike (*Lanius excubitor*) – open savanna, shrubland  
Bell’s vireo (*Vireo bellii*) - dense thicket  
Sprague’s pipit (*Anthus spragueii*) - short grass prairie  
prothonotary warbler (*Protonotaria citrea*) – bottomland hardwood  
worm-eating warbler (*Helmitheros vermivorus*) - woodlands  
Swainson’s warbler (*Limnithlypis swainsonii*) - bottomland hardwood  
Kentucky warbler (*Oporornis formosus*) - bottomland hardwood  
field sparrow (*Spizella pusilla*) – old fields, scrubland, forest edge  
Henslow’s sparrow (*Ammodramus henslowii*) – grasslands with scattered shrub  
Le Conte’s sparrow (*Ammodramus caudacutus*) – thick, damp grassy areas, wetlands  
Harris’ sparrow (*Zonotrichia querula*) - scrub, undergrowth in open woodlands and savanna, thickets, brushy fields, and hedgerows  
Smith’s longspur (*Calcarius pictus*) – short grassland  
chestnut-collared longspur (*Calcarius ornatus*) - shortgrass prairie, plowed field, overgrazed pasture  
painted bunting (*Passerina ciris*) - riparian and thorn forest, oak woodlands, savanna, brushy pastures, and hedgerows

Because some of these species could potentially utilize appropriate habitats within the study area, especially as temporary stopover breaks during annual migration, we recommend that future

projects avoid and/or minimize adverse impacts to intact upland and riparian habitats whenever possible.

## **PRELIMINARY PLANNING RECOMMENDATIONS**

Our habitat analysis indicates the following specific measures could be beneficial for the restoration of natural habitats impacted by urban development within the study area.

1. We recommend that the Corps consider the designation of Environmentally Sensitive Area to habitats throughout the study area which were found to be highly functioning or have the potential to be restored to this state. These habitats may include, but are not limited to, the mature, intact bottomland hardwood forests within Segments 4 and 5; highly diverse native grasslands within segment 2; and any other areas deemed fit for this designation by the Corps.
2. Widen the bottomland hardwood corridors along the creeks and their associated tributaries as much as possible (up to 150 feet on each side) by planting native mast producing trees and shrubs to create a more functional riparian buffer zone. Riparian buffer zones provide several benefits for terrestrial and aquatic resources. First, riparian zones stabilize eroding banks by absorbing the erosive force of flowing water while roots hold soil in place. Second, riparian zones filter sediment, nutrients, pesticides, and animal waste runoff. Finally, riparian zones provide shade, shelter, and food for wildlife and aquatic organisms. Native mast producing trees and shrubs, such as pecan, bur oak, red oak, black walnut (*Juglans nigra*), wild plum (*Prunus mexicana*), sumac (*Rhus sp.*), hawthorne (*Crataegus sp.*), and coral-berry, should be planted in the expanded portion of the bottomland hardwood to improve canopy cover and food base. We recommend planting 70 percent woody stems, with no more than 25 percent consisting of soft mast producers. Shrubs should be planted at no more than 30 percent stems. Some scattered open spaces should be maintained for fox squirrel movement.
3. Thin portions, but not all, of the existing riparian corridor and upland deciduous forest under mast producing trees where the understory is too dense in order to improve fox squirrel habitat and to open the stands as preferred by numerous species.
4. We recommend planting mast producing trees and shrubs in the existing woodlands where they are lacking to improve the canopy cover and food base. The thick overstory and/or understory may need to be thinned and cleared around the young trees to provide space and sunlight. Leave snags standing and let downed logs remain. Existing mast producing trees should be allowed to mature and increase in size.
5. Provide brush and log piles in all existing habitats where needed to provide cover for small mammals. This may be accomplished both by leaving fallen timber where it lies, and by piling any timber which might be cut during essential, permitted clearing.

6. If hazardous materials testing has not been conducted in areas to be restored as habitat, we suggest that it be done before any restoration work is initiated if there is any potential for past contamination.
7. Herbaceous wetlands could be created off stream providing essential wildlife habitat and nonpoint source pollution control. In this role, wetlands would provide several benefits that contribute to water quality improvements. First, the wetlands provide water quality function through solids settling, nutrient transformation, and biological uptake. Second, because they provide a fairly large surface area, wetlands provide floodwater storage and serve to collect peak flood flows known to carry most of the polluted runoff from nonpoint sources. Finally, wetlands provide diversity in the landscape and supply a unique habitat for many plant and animal species.
8. Plant locally available native aquatic plants and shrubs around the water edges. We recommend the use of locally available sedges, water willow (*Justicia americana*), softstem bulrush (*Schoenoplectus tabernaemontani*), water pennywort (*Hydrocotyle umbellata*), switch grass, smartweeds (*Polygonum sp.*), and buttonbush (*Cephalanthus occidentalis*). The wetland should not be mowed unless it is absolutely necessary to manage non-desirable plant species (i.e., invasives, exotics).
9. Restore native grasslands where possible throughout the study area to replace bermudagrass, Johnsongrass, and non-grass herbaceous monocultures commonly found where long-term grazing has impacted the study area. We recommend planting native grass and forb species appropriate for the soils. Little bluestem, big bluestem, Indian grass, side-oats grama, switch grass, vine-mesquite, Illinois bundle-flower (*Desmanthus illinoensis*), Maximilian sunflower (*Helianthus maximilian*), and Engelmann's daisy (*Engelmannia peristeri*) are excellent forage and seed producing species to consider. Plant a few shrub mottes and briar thickets in grasslands, and shrub and tree savannas, but maintain them to only about 5 percent canopy cover.
10. Any mowing schedule that may be developed should promote tall grass growth, but not interfere with tall-grass nesting birds. The grassland should not be mowed until after July 15. Maintain a "no mow" zone around herbaceous wetlands and stream shorelines. Understandably, this is generally not possible in public parkland areas.
11. We recommend that the direct, indirect, and cumulative impacts and conservation needs of the *Birds of Conservation Concern 2002* (BCC) be considered during any restoration or flood control project planning.

In addition, the following are some general recommendations for improving and maintaining lands in and adjacent to the study area for wildlife habitat that the city could practice and recommend to landowners:

1. We recommend that the use of controlled burning be investigated to promote healthy prairie ecosystems. Fire is a natural and essential component of grassland/prairie

maintenance useful in controlling the abundance of invasive species while promoting the growth of natural, fire-dependent native prairie vegetation.

2. Reduce mowing on managed areas and along the water's edge. Reseed and manage portions of these areas as native grasslands or wetland herbaceous plants.
3. Develop a program to eradicate exotic plants in areas where their abundance may prevent natural reestablishment of native vegetation. Use only native plants during the restoration project.
4. Control bank erosion through use of biological engineering to the extent possible and necessary.
5. Develop a plan to greatly reduce or eliminate the use of fertilizers, pesticides, and herbicides on public lands.
6. Initiate a program to help landowners/developers to plan their development footprint in order to avoid sensitive areas and provide upland buffers adjacent to streams.

## **SUMMARY**

The Lavon Lake – Trinity River watershed has been heavily impacted by urban development. Of the 154 data sites, all have been somewhat impacted. However, there are numerous valuable wildlife habitats remaining within the watershed. The specific habitat restoration measures including those recommended in this report could help improve some of the natural habitats that have been impacted and advance habitat diversity and quality of remaining habitats, thus benefitting a variety of resident and migratory wildlife species. Designation of Environmentally Sensitive Areas could also further safeguard existing quality habitats from further degradation.

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## **Appendix E – USFWS Trust Resources Report**

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# Lavon Lake Master Plan

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## *IPaC Trust Resource Report*

Generated September 01, 2015 03:00 PM MDT



US Fish &amp; Wildlife Service

# IPaC Trust Resource Report



## Project Description

**NAME**

Lavon Lake Master Plan

**PROJECT CODE**

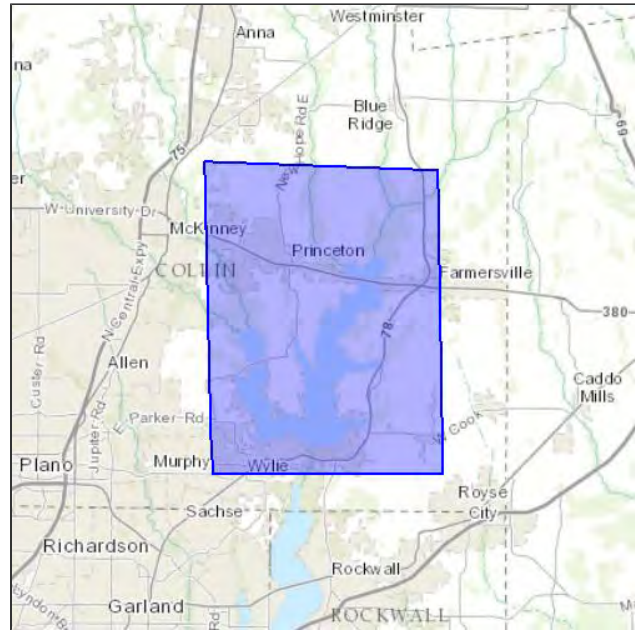
LHYGY-HUVHV-BGJBN-PSYJQ-5YFV3U

**LOCATION**

Collin County, Texas

**DESCRIPTION**

The Lavon Lake Master Plan is a comprehensive land use planning document that guides the natural resources and outdoor recreation management programs administered by the U.S. Army Corps of Engineers at Lavon Lake. The Master Plan has a projected effective life of 25 years.



## U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

**Arlington Ecological Services Field Office**

2005 Ne Green Oaks Blvd

SUITE 140

Arlington, TX 76006-6247

(817) 277-1100

# Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the [Endangered Species Program](#) and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under [Section 7](#) of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

## Birds

### Least Tern *Sterna antillarum*

**Endangered**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B07N>

### Piping Plover *Charadrius melodus*

**Threatened**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B079>

### Red Knot *Calidris canutus rufa*

**Threatened**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind Energy Projects

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM>

### Whooping Crane *Grus americana*

**Endangered**

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B003>



## Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

# Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service ([1](#)). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

<b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B008">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B008</a>	<b>Bird of conservation concern</b>
<b>Bell's Vireo</b> <i>Vireo bellii</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Burrowing Owl</b> <i>Athene cunicularia</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Dickcissel</b> <i>Spiza americana</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Fox Sparrow</b> <i>Passerella iliaca</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Golden Eagle</b> <i>Aquila chrysaetos</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B0DV">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B0DV</a>	<b>Bird of conservation concern</b>
<b>Harris's Sparrow</b> <i>Zonotrichia querula</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Hudsonian Godwit</b> <i>Limosa haemastica</i> Season: Migrating	<b>Bird of conservation concern</b>
<b>Lark Bunting</b> <i>Calamospiza melanocorys</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Le Conte's Sparrow</b> <i>Ammodramus leconteii</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Least Bittern</b> <i>Ixobrychus exilis</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Little Blue Heron</b> <i>Egretta caerulea</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Loggerhead Shrike</b> <i>Lanius ludovicianus</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B0FY">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B0FY</a>	<b>Bird of conservation concern</b>
<b>Mississippi Kite</b> <i>Ictinia mississippiensis</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Orchard Oriole</b> <i>Icterus spurius</i> Season: Breeding	<b>Bird of conservation concern</b>

<b>Painted Bunting</b> <i>Passerina ciris</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Prothonotary Warbler</b> <i>Protonotaria citrea</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Red-headed Woodpecker</b> <i>Melanerpes erythrocephalus</i> Year-round	<b>Bird of conservation concern</b>
<b>Rusty Blackbird</b> <i>Euphagus carolinus</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Scissor-tailed Flycatcher</b> <i>Tyrannus forficatus</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Short-eared Owl</b> <i>Asio flammeus</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD</a>	<b>Bird of conservation concern</b>
<b>Sprague's Pipit</b> <i>Anthus spragueii</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GD">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GD</a>	<b>Bird of conservation concern</b>

## Refuges

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

Refuge data is unavailable at this time.

# Wetlands

Impacts to [NWI 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](#).

## DATA LIMITATIONS

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

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

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

## DATA EXCLUSIONS

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

## DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.



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## **APPENDIX F**

**TPWD List of Species of Greatest Conservation Need**

**For Texas Blackland Prairies Ecoregion**

**and**

**TPWD Rare Species Listings for Collin County Texas**

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TEXAS BLACKLAND PRAIRIES SPECIES OF GREATEST CONSERVATION NEED								
Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
MAMMALS								
<i>Blarina hylophaga plumblea</i>	Elliot’s short-tailed shrew			G5T1Q	S1	Savanna/Open Woodland		N
<i>Geomys attwateri</i>	Attwater's pocket gopher			G4	S4	Shrubland		Y
<i>Lutra canadensis</i>	River otter			G5	S4	Riparian	Appendix II, CITES	N
<i>Mustela frenata</i>	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland	Statewide	N
<i>Myotis austroriparius</i>	Southeastern myotis			G3G4	S3	Caves/Karst, Forest, Riparian		N
<i>Myotis velifer</i>	Cave myotis			G5	S4	Caves/Karst,		N
<i>Puma concolor</i>	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian	Statewide	N
<i>Spilogale putorius</i>	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland		N
<i>Sylvilagus aquaticus</i>	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland		N
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia	Statewide	N
<i>Taxidea taxus</i>	American badger			G5	S5	Grassland, Desert scrub, Woodland, Savanna/Open Woodland, Forest		N
<i>Ursus americanus</i>	Black bear	SAT	T	G5	S3	Forest, Woodland, Savanna/Open Woodland, Desert Scrub, Shrubland	see also Louisiana black bear; may overlap with Louisiana black bear in TBPR, ECPL	N
Mammals References: W.B. Davis and D.J. Schmidly. 1997 and 1994. Mammals of Texas (online and in print). Texas Tech University (1997) and Texas Parks and Wildlife Department (1994). <a href="http://www.nsr.ttu.edu/tmot1/Default.htm">http://www.nsr.ttu.edu/tmot1/Default.htm</a> (accessed 2011)								
BIRDS								
BIRDS ONLY: instead of endemism these numbers are for taxonomic sorting								
<i>Ammodramus henslowii</i>	Henslow's Sparrow			G4	S2S3N,SX B	Grassland, Savanna/Open Woodland	Winter	100
<i>Ammodramus leconteii</i>	Le Conte's Sparrow					Grassland	Winter	101
<i>Ammodramus savannarum</i>	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural	Year-round	97
<i>Anas acuta</i>	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine	Winter	2
<i>Anthus spragueii</i>	Sprague's Pipit	C		G4	S3N	Barren/Sparse Vegetation, Grassland, Shrubland, Agricultural	Winter	80
<i>Asio flammeus</i>	Short-eared Owl			G5	S4N	Grassland, Shrubland, Agricultural	Winter	65
<i>Buteo lineatus</i>	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland	Year-round	26
<i>Butorides virescens</i>	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic	Breeding	16
<i>Calcarius mccownii</i>	McCown’s Longspur			G4	S4	Grassland, Agricultural	Winter, TBPR (northern), ECPL (northern)	104
<i>Calcarius pictus</i>	Smith's Longspur					Grassland, Agricultural	Winter	105
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian	Breeding	66
<i>Charadrius montanus</i>	Mountain Plover	PT		G3	S2	Agricultural, Grassland	Winter	43
<i>Chondestes grammacus</i>	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	98
<i>Circus cyaneus</i>	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland	Year-round	23

Texas Blackland Prairies Ecoregion Species of Greatest Conservation Need

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<i>Cistothorus platensis</i>	Sedge Wren			G5	S4	Grassland, Freshwater Wetland	Winter	78
<i>Colinus virginianus</i>	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	deleted for CHIH	4
<i>Dendroica dominica</i>	Yellow-throated Warbler			G5	S4B	Woodland, Forest, Riparian	Breeding	84
<i>Dryocopus pileatus</i>	Pileated Woodpecker			G5	S4B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	69
<i>Egretta caerulea</i>	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	13
<i>Egretta thula</i>	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	12
<i>Euphagus carolinus</i>	Rusty Blackbird			G4	S3	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland	Winter	110
<i>Haliaeetus leucocephalus</i>	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland	Year-round, added CRTB	22
<i>Hylocichla mustelina</i>	Wood Thrush			G5	S4B	Woodland, Forest, Riparian	Breeding	79
<i>Icterus spurius</i>	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian	Breeding	111
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Breeding	20
<i>Ixobrychus exilis</i>	Least Bittern			G5	S4B	Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary	Breeding	11
<i>Lanius ludovicianus</i>	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed	Year-round	73
<i>Limnothlypis swainsonii</i>	Swainson's Warbler			G4	S3B	Woodland, Forest, Riparian	Breeding	88
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	67
<i>Meleagris gallopavo</i>	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural	Year-round, added <i>merriami</i> for CHIH	8
<i>Mycteria americana</i>	Wood Stork		T	G4	SHB,S2N	Riverine, Freshwater wetland	Migrant	18
<i>Oporornis formosus</i>	Kentucky Warbler			G5	S3B	Woodland, Forest	Breeding	90
<i>Passerina ciris</i>	Painted Bunting			G5	S4B	Shrubland, Agricultural	Breeding	107
<i>Piranga rubra</i>	Summer Tanager			G5	S5B	Urban/Suburban/Rural	Breeding	106
<i>Pluvialis dominica</i>	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural	Migrant	39
<i>Poecile carolinensis</i>	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	76
<i>Protonotaria citrea</i>	Prothonotary Warbler			G5	S3B	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland	Breeding	86
<i>Scolopax minor</i>	American Woodcock			G5	S2B,S3N	Woodland, Forest, Riparian	Winter (some breeding during that time)	51
<i>Seiurus motacilla</i>	Louisiana Waterthrush			G5	S3B	Woodland, Forest, Riparian	Breeding	89
<i>Spiza americana</i>	Dickcissel			G5	S4B	Grassland, Agricultural	Breeding	108
<i>Spizella pusilla</i>	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	96
<i>Sternula antillarum</i>	Least Tern	LE*	E*	G4	S3B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Marine, Developed: Industrial	Year-round; subspecies <i>athalassos</i>	54
<i>Sturnella magna</i>	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round; subspecies <i>lilliana</i> added for CHIH	109
<i>Thryomanes bewickii</i> ( <i>bewickii</i> )	Bewick's Wren			G5	S5B	Shrubland, Savanna/Open Woodland, Woodland, Developed: Urban/Suburban/Rural	Year-round, red-backed form only	77
<i>Tympanuchus cupido</i>	Greater Prairie-Chicken (Interior)			G4	S1B	Grassland	Year-round	6
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed	Breeding	71
<i>Vireo bellii</i>	Bell's Vireo			G5	S3B	Desert scrub, Shrubland, Riparian	Breeding	74
<i>Zonotrichia querula</i>	Harris's Sparrow			G5	S4	Shrubland, Agricultural	Winter	103



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<b>Birds References:</b> The Birds of North America Online (A. Poole, Ed.). 2005 (with current updates by species). Retrieved from The Birds of North America Online database: http://bna.birds.cornell.edu/BNA/ (accessed 2011). Supported by information from the Cornell Lab of Ornithology and the American Ornithologists' Union (http://www.aou.org/).								
<b>REPTILES AND AMPHIBIANS</b>								
<i>Anaxyrus (Bufo) woodhousii</i>	Woodhouse's toad			G5	SU	Woodland, Forest, Freshwater Wetland		N
<i>Apalone mutica</i>	smooth softshell turtle					Riparian, Riverine, Lacustrine, Freshwater Wetland	added	N
<i>Apalone spinifera</i>	spiny softshell turtle					Riparian, Riverine, Lacustrine, Freshwater Wetland	added, not AZNM	N
<i>Cheylydra serpentina</i>	Common snapping turtle					Riparina, Riverine	added	N
<i>Crotalus atrox</i>	Western diamondback rattlesnake				S4	Barren/Sparse Vegetation, Desert Scrub, Grassland, Shrubland, Savanna, Woodland, Caves/Karst		N
<i>Crotalus horridus</i>	Timber (Canebrake) Rattlesnake		T	G4	S4	Woodland, Forest, Riparian		N
<i>Graptemys caglei</i>	Cagle's map turtle		T	G3	S1	Riparina, Riverine		Y
<i>Graptemys versa</i>	Texas map turtle			G4	SU	Riparina, Riverine		Y
<i>Heterodon nasicus</i>	Western hognosed snake					Desert Scrub, Grassland, Shrubland	added	N
<i>Macrochelys temminckii</i>	alligator snapping turtle		T	G3G4	S3	Riparian, Riverine, Cultural Aquatic	added	N
<i>Ophisaurus attenuatus</i>	western slender glass lizard					Grassland, Savanna	added	N
<i>Phrynosoma cornutum</i>	Texas horned lizard		T	G4G5	S4	Desert Srub, Grassland, Savanna		N
<i>Pseudacris streckeri</i>	Strecker's Chorus Frog			G5	S3	Grassland, Savanna, Woodland, Riparian, Cultural Aquatic, Freshwater Wetland		N
<i>Sistrurus catenatus</i>	massasauga					Grassland, Barren/Sparse Vegetation, Shrubland, Coastal,	added	N
<i>Terrapene carolina</i>	Eastern box turtle			G5	S3	Grasslands, Savanna, Woodland		N
<i>Terrapene ornata</i>	Ornate box turtle			G5	S3	Grassland, Barren/Sparse Vegetation, Deset Scrub, Savanna, Woodland		N
<i>Thamnophis sirtalis annectans</i>	Texas Garter Snake (Eastern/Texas/ New Mexico)			G5	S2	Riparian, Around Lacustrine and Cultural Aquatic Sites		Y
<i>Trachemys scripta</i>	Red-eared slider					Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic	added	N
<b>Reptiles and Amphibians References:</b> J.E. Werler and J.R. Dixon. 2000. Texas Snakes: Identification, Distribution, and Natural History. University of Texas Press, Austin. 519 pgs. J.R. Dixon. 1987. Amphibians and Reptiles of Texas. Texas A&M University Press, College Station. 434 pp.								
<b>FRESHWATER FISHES</b>							Range in Texas, as known	

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<i>Anguilla rostrata</i>	American eel			G4	S5	Streams and reservoirs in drainages connected to marine environments	Originally found in large rivers from the Red River to the Rio Grande; Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River. Extirpated in several drainages (dams)	N
<i>Atractosteus spatula</i>	alligator gar					Near surface habitats in slack water and backwater habitats of rivers. Preferred pool, pool-bank snag, pool-channel snag, pool-snag complex, pool-edge, and pool-vegetation habitat	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River	N
<i>Cycleptus elongatus</i>	Blue sucker		T	G3G4	S3	Large, deep rivers, and deeper zones of lakes	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, Colorado River, San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River), Nueces River	N
<i>Etheostoma fonticola</i>	Fountain darter	LE	E	G1	S1	Thermally constant (21-24 °C) springs and the upper San Marcos (Hays Co.) and Comal (Comal Co.) rivers, usually in dense beds of <i>Vallisneria</i> , <i>Elodia</i> , <i>Ludwigia</i> and other aquatic plants; substrate normally mucky	Upper San Marcos (Hays Co.) and Comal (Comal Co.) rivers, San Antonio Bay drainage unit Note: original population in the Comal River extirpated in mid-1950's when Comal Springs ceased to flow; a population from San Marcos was reintroduced into Comal Springs in 1975	Y

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<i>Macryhbopsis storeriana</i>	Silver chub					Broad rivers with low gradient which flow through old mature valley; bottoms gravel to silt, but more common over silt or mud, turbid water with very soft sand/silt substrate Normally inhabits pools, will move to riffle if siltation is heavy; when large streams very turbid or depositing unusually large amounts of silt, will temporarily migrate into clearer streams of higher gradients; when waters were very clear individuals move to deeper water	Red River and the lower Brazos River; Brazos River population is apparently disjunct from other populations of this species, which range through the Mississippi River Basin to Mobile Bay	N
<i>Micropterus treculii</i>	Guadalupe bass			G3	S3	Small lentic environments; commonly taken in flowing water	Endemic to the streams of the northern and eastern Edwards Plateau including portions of the Brazos, Colorado, Guadalupe, and San Antonio basins; species also found outside of the Edwards Plateau streams in decreased abundance, primarily in the lower Colorado River; two introduced populations have been established in the Nueces River system	Y
<i>Notropis atrocaudalis</i>	Blackspot shiner					More abundant near headwaters; runs and pools over all types of substrates, generally avoiding areas of backwater and swiftest currents	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), and Brazos River	N
<i>Notropis bairdi</i>	Red River shiner					Turbid waters of broad, shallow channels of main stream, over bottom mostly of silt and shifting sand; streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation, and high concentrations of dissolved solids; tolerant of high salinities	Red River, from the mouth upstream to and including the Kiamichi River	N
<i>Notropis buccula</i>	Small eye shiner	C		G2Q	S2	Turbid waters of broad, sandy channels of main stream, over substrate consisting mostly of shifting sand; broad condition tolerances (turbidity, salinity, oxygen).	Brazos River; historically as far south as Hempstead (Waller County)	Y
<i>Notropis chalybaeus</i>	Ironcolor shiner					Small to medium sized streams that drain pine woodlands; acid, tannin-stained, non-turbid sluggish Coastal Plain streams and rivers of low to moderate gradient; often at the upstream ends of pools, with a moderate to sluggish current, and sand, mud, silt, or detritus substrata; usually associated with aquatic vegetation; in the San Marcos River (Hays Co.), a disjunct population is restricted to clear, spring-fed waters with abundant aquatic vegetation	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), San Antonio Bay (including minor coastal drainages west of mouth of Colorado River to mouth of Nueces River, isolated population found in the San Marcos River headwaters)	N

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<i>Notropis oxyrhynchus</i>	Sharpnose shiner	C		G3	S3	Moderate current velocities and depths, sand bottom	Brazos River drainage; Red River drainage, when a tributary to the Brazos River was captured into the Red River drainage; introduced in Colorado River drainage	Y
<i>Notropis potteri</i>	Chub shiner		T	G4	S3	Turbid, flowing water with silt or sand substrate; tolerant of high salinities	Brazos River, Colorado River, San Jacinto River, Trinity Rivers, and Galveston Bay	N
<i>Notropis shumardi</i>	Silverband shiner					Large rivers, smaller tributaries and oxbow lakes that frequently reconnect to Brazos River mainstem; main channel with moderate to swift current velocities and moderate to deep depths; associated with turbid water over silt, sand, and gravel; tolerant of high turbidity	Red River (from the mouth upstream to and including the Kiamichi River), Sabine Lake (including minor coastal drainages west to Galveston Bay), Galveston Bay (including minor coastal drainages west to mouth of Brazos River), Brazos River, and Colorado River	N
<i>Percina apristis</i>	Guadalupe darter					Riffles; most common under or around boulders in the main current; moderately turbid water; absent in collections from the clearest waters tributary to the Guadalupe, namely spring heads and the main river west of Kerrville	Guadalupe River and its tributaries, the San Marcos and Blanco Rivers; apparently absent from the headwaters of the Blanco and the entirety of the San Antonio River	Y
<i>Polyodon spathula</i>	Paddlefish		T	G4	S3	Large river systems and tributaries; deepwater channel habitats; low-gradient areas of moderate to large-sized rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if connected to/can access free-flowing streams in the spring for spawning	Historically occurred in Texas in every major river drainage from the Trinity Basin eastward; currently only Red River, from the mouth upstream to and including the Kiamichi River	N
<i>Satan eurystomus</i>	Widemouth blindcat		T	G1	S1	Karst: Subterranean waters	Restricted to 5 artesian wells penetrating the San Antonio Pool of the Edwards Aquifer (Edwards Limestone, Lower Cretaceous) in the vicinity of San Antonio (Bexar County)	Y
<i>Trogloglanis pattersoni</i>	Toothless blindcat		T	G1	S1	Karst: Subterranean waters	Restricted to 5 artesian wells penetrating the San Antonio Pool of the Edwards Aquifer (Edwards Limestone, Lower Cretaceous) in the vicinity of San Antonio (Bexar County)	Y
<b>Freshwater Fish References:</b> C. Thomas, T.H. Bonner and B.G. Whiteside. 2007. Freshwater Fishes of Texas: A Field Guide. Sponsored by The River Systems Institute at Texas State University, published by Texas A&M University Press. Editor's Note: All freshwater fishes life history information in this table was sourced directly from the online version; citations are embedded in the online version at <a href="http://www.bio.txstate.edu/~tbonner/txfishes/">http://www.bio.txstate.edu/~tbonner/txfishes/</a>								
<b>INVERTEBRATES</b>								
<i>Bombus pensylvanicus</i>	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland	Terrestrial - Insect - Bee/Wasp/Ant	
<i>Chimarra holzenthali</i>	Holzenthal's Philopotamid caddisfly			G1G2	S1	Riparian, Riverine	Aquatic - Insects - Caddisflies; added TBPR, ECPL	
<i>Cotinis boylei</i>	A scarab beetle			G2*	S2*	Grassland, Shrubland, Woodland	Terrestrial - Insect - Beetles	
<i>Nicrophorus americanus</i>	American Burying Beetle	LE		G1	S1	Grassland, Savanna/Open Woodland	Terrestrial - Insect - Beetles	
<i>Potamilus amphichaenus</i>	Texas heelsplitter		T	G1G2	S1	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	
<i>Procambarus regalis</i>	Regal burrowing crayfish			G2G3	S2?*	Freshwater Wetland, Grassland	Aquatic - Crustaceans - Crayfish	

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<i>Procambarus steigmani</i>	Parkhill prairie crayfish			G1G2	S1S2*	Freshwater Wetland, Grassland	Aquatic - Crustaceans - Crayfish	
<i>Pseudocentropiloides morihari</i>	A mayfly			G2G3	S2?*	Riverine, Riparian	Aquatic - Insects - Mayflies	
<i>Sphinx eremitoides</i>	Sage sphinx			G1G2	S1?*	Grassland	Terrestrial - Insect - Butterflies/Moths	
<i>Susperatus tonkawa</i>	A mayfly			G1	S1*	Riparian, Riverine	Aquatic - Insects - Mayflies	
<b>Invertebrates References:</b> www.bugguide.net – good tool for identification and taxonomic information. www.texasento.net – compilation of information on insects in Texas www.odonatacentral.org – resource for identification and distribution of damselflies and dragonflies www.butterfliesandmoths.org – resource for identification and distribution of Lepidoptera www.texasmussels.wordpress.com – resource for information on freshwater mussels in Texas Howells, R. G., R. W. Neck and H. D. Murray. 1996. Freshwater Mussels of Texas. Texas Parks and Wildlife Press, Austin. Burlakova, L. E., A. Y.Karatayev, V. A. Karatayev, M. E. May, D. L. Bennett and M. J. Cook. 2011. Biogeography and conservation of freshwater mussels (Bivalvia:Unionidae) in Texas: patterns of diversity and threats. Diversity andDistributions: 1-15.								
<b>PLANTS</b>								
<i>Agalinis densiflora</i>	Osage Plains false foxglove			G3	S2	Savanna/Open Woodland - Outcrops	Terrestrial	N
<i>Astragalus reflexus</i>	Texas milk vetch			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Calopogon oklahomensis</i>	Oklahoma grass pink			G3	S1S2	Savanna/Open Woodland; Grassland; Freshwater Wetland	Terrestrial	N
<i>Carex edwardsiana</i>	canyon sedge			G3G4S3S4	S3S4	Woodland (slopes above Riparian)	Wetland	Y
<i>Carex shinneryi</i>	Shinner's sedge			G3?	S2	Grassland	Wetland	N
<i>Crataegus dallasiana</i>	Dallas hawthorn			G3Q	S3	Riparian (creeks in the Blackland Prairie)	Terrestrial	Y
<i>Cuscuta exaltata</i>	tree dodder			G3	S3	Woodland	Terrestrial	N
<i>Dalea hallii</i>	Hall's prairie-clover			G3	S3	Savanna/Open Woodland; Grassland	Terrestrial	Y
<i>Echinacea atrorubens</i>	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland	Terrestrial	N
<i>Hexalectris nitida</i>	Glass Mountains coral-root			G3	S3	Woodland	Terrestrial	N
<i>Hexalectris warnockii</i>	Warnock's coral-root			G2G3	S2	Woodland	Terrestrial	N
<i>Hymenoxys pygmaea</i>	Pygmy prairie dawn			G1	S1	Barren/Sparse Vegetation with Grassland matrix (saline prairie)	currently being described	Y
<i>Liatris glandulosa</i>	glandular gay-feather			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Paronychia setacea</i>	bristle nailwort			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Phlox oklahomensis</i>	Oklahoma phlox			G3	SH	Savanna/Open Woodland	Terrestrial	N
<i>Physaria engelmannii</i>	Engelmann's bladderpod			G3	S3	Savanna/Open Woodland	Terrestrial	Y
<i>Polygonella parksii</i>	Parks' jointweed			G2	S2	Savanna/Open Woodland (sandhills); Grassland	Terrestrial	Y
<i>Prunus texana</i>	Texas peachbush			G3G4	S3S4	Savanna/Open Woodland; Grassland	Terrestrial	Y
<i>Thalictrum texanum</i>	Texas meadow-rue			G2	S2	Savanna/Open Woodland; Riparian (bottomland forest)	Terrestrial	Y
<i>Zizania texana</i>	Texas wild rice	LE	E	G1	S1	Riverine (spring-fed, clear, thermally constant, moderate current, sand to gravel substrate)	Aquatic	Y



## COLLIN COUNTY

### BIRDS

		Federal Status	State Status
<b>American Peregrine Falcon</b>	<i>Falco peregrinus anatum</i>	DL	T
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
<b>Arctic Peregrine Falcon</b>	<i>Falco peregrinus tundrius</i>	DL	
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.			
<b>Bald Eagle</b>	<i>Haliaeetus leucocephalus</i>	DL	T
found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds			
<b>Henslow's Sparrow</b>	<i>Ammodramus henslowii</i>		
wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking			
<b>Interior Least Tern</b>	<i>Sterna antillarum athalassos</i>	LE	E
subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony			
<b>Peregrine Falcon</b>	<i>Falco peregrinus</i>	DL	T
both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.			
<b>Piping Plover</b>	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			

## COLLIN COUNTY

### BIRDS

		Federal Status	State Status
<b>Red Knot</b>	<i>Calidris canutus rufa</i>	T	
<p>Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (<i>Donax</i> spp.) on beaches and dwarf surf clam (<i>Mulinia lateralis</i>) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.</p>			
<b>Sprague's Pipit</b>	<i>Anthus spragueii</i>		
<p>only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.</p>			
<b>Western Burrowing Owl</b>	<i>Athene cunicularia hypugaea</i>		
<p>open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows</p>			
<b>White-faced Ibis</b>	<i>Plegadis chihi</i>		T
<p>prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats</p>			
<b>Whooping Crane</b>	<i>Grus americana</i>	LE	E
<p>potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties</p>			
<b>Wood Stork</b>	<i>Mycteria americana</i>		T
<p>forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960</p>			

### CRUSTACEANS

		Federal Status	State Status
<b>A crayfish</b>	<i>Procambarus steigmani</i>		
<p>burrower in long-grass prairie; all animals were collected with traps, thus there is no knowledge of depths of burrows; herbivore; crepuscular, nocturnal</p>			

## COLLIN COUNTY

### MAMMALS

		Federal Status	State Status
<b>Plains spotted skunk</b>	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie			
<b>Red wolf</b>	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			

### MOLLUSKS

		Federal Status	State Status
<b>Louisiana pigtoe</b>	<i>Pleurobema riddellii</i>		T
streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins			
<b>Texas heelsplitter</b>	<i>Potamilus amphichaenus</i>		T
quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins			

### REPTILES

		Federal Status	State Status
<b>Alligator snapping turtle</b>	<i>Macrochelys temminckii</i>		T
perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October			
<b>Texas garter snake</b>	<i>Thamnophis sirtalis annectens</i>		
wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August			
<b>Texas horned lizard</b>	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			
<b>Timber rattlesnake</b>	<i>Crotalus horridus</i>		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto			

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## **Appendix G – Notice to Seaplane Pilots March 2000**



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**NOTICE TO SEAPLANE PILOTS**  
**U.S. Army Corps of Engineers, Fort Worth District**  
**Prohibitions and Restrictions Governing the Use of Seaplanes**

**POLICY**

In accordance with Title 36, Chapter III, Part 328 of the Code of Federal Regulations, it is the objective of the Corps of Engineers natural resources management mission to maximize public enjoyment and use of Corps lakes, consistent with their aesthetic and biological values. Within that context, the following restrictions governing the use of seaplanes have been developed.

**DISTRICT-WIDE PROHIBITIONS AND RESTRICTIONS**

1. Pilots are responsible for knowing the rules and regulations pertaining to aircraft as set forth in Title 36, Chapter III, Part 327.4 of the Code of Federal Regulations. Copies are available from any Corps of Engineers Lake Office.
2. Seaplanes may not be operated between sunset and sunrise. Where not specifically restricted or prohibited, recreational seaplane operations are allowed seven days a week.
3. Aircraft larger than 5,000 pounds gross weight are prohibited from landing without special permission from the District Engineer.
4. Commercial seaplane operations are prohibited unless authorized by the District Engineer. Commercial operations, if authorized, will be limited to the hours of 10 a.m. to 5 p.m., Monday through Friday, from November 1 to April 1.
5. Individual letter permits may be issued for seaplanes to operate in prohibited areas on a one-time-only basis.
6. The operation of a seaplane at Corps of Engineers lakes is at the risk of the plane's owner, operator, and passenger(s). All lakes in the Fort Worth District are operated as flood control reservoirs with widely fluctuating pool elevations. Pilots are encouraged to contact each lake project office for current pool elevation information. Addresses and phone numbers of each lake are listed in the attached Visitor's Guide. Information may also be obtained from the Corps of Engineers web site at [www.swf.usace.army.mil](http://www.swf.usace.army.mil)
7. Where landings and takeoffs are not totally prohibited at a given lake, a minimum distance of 500 feet from shore or structures must be maintained during landing and takeoffs.
8. The attached information lists specific restrictions and prohibitions for each lake in the Fort Worth District.

**SEAPLANE OPERATIONS ARE PROHIBITED ON THE FOLLOWING LAKES**

Lake Georgetown  
Grapevine Lake  
Hords Creek Lake  
O.C. Fisher Lake  
B.A. Steinhagen Lake  
Waco Lake

**SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION**

<p><b>AQUILLA LAKE</b></p> <p>Seaplane operations are prohibited in all areas except on 'open water' areas of the lake from the dam northeast to the mouth of Hackberry Creek Branch and from the dam northwest to an East-West line extending from the north bank of the Old School branch.</p>	<p><b>JIM CHAPMAN LAKE - COOPER DAM</b></p> <p>Landings and takeoffs are prohibited in the uncleared portion of the lake west of a line running from the west end of South Sulphur State Park to the peninsula at the mouth of Doctors Creek and in the cove formed Doctors Creek.</p>
<p><b>BARDWELL LAKE</b></p> <p>Landings and takeoffs are prohibited north of Highway 34 and in all coves off the main body of the lake.</p>	<p><b>GRANGER LAKE</b></p> <p>Landings and takeoffs are prohibited in both major arms of the lake formed by Willis Creek and the San Gabriel River and in the large, shallow lake area north of a line from the outlet structure to the east tip of the San Gabriel Wildlife Area.</p>
<p><b>BELTON LAKE</b></p> <p>Landings and takeoffs are prohibited north of Highway 36, in the coves formed by Owl Creek and Cedar Creek, and in the arm of the lake formed by Cowhouse Creek upstream from the northwest end of the Fort Hood Recreation Area.</p>	<p><b>JOE POOL LAKE</b></p> <p>Landings and takeoffs are prohibited in all lake areas west of the Lakeridge Parkway bridges.</p>
<p><b>BENBROOK LAKE</b></p> <p>Landings and takeoffs are prohibited in the lake area south of the abandoned pump station on the east shore and in the coves formed by East and West Dutch Branch Creeks.</p>	<p><b>LAKE O THE PINES</b></p> <p>Landings and takeoffs are prohibited in all coves and bays off the main body of the lake and in uncleared and shallow areas of the lake.</p>
<p><b>CANYON LAKE</b></p> <p>Landings and takeoffs are prohibited upstream from Cranes Mill Park and in all coves and major bay areas off of the main body of the lake. (Including the large lake area east and west of Canyon Park.)</p>	<p><b>LAVON LAKE</b></p> <p>Landings and takeoffs are prohibited in lake areas north of Collin Park, north of Tickey Creek Park, and in all coves and bays off the main body of the lake.</p>

<b>SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION</b>	
<p><b>LEWISVILLE LAKE</b></p> <p>Landings and takeoffs are prohibited in uncleared areas north of Crescent Oaks Park, the entire area west of IH 35 and north of Highway 720, and in large uncleared portions of the entire eastern half of the lake.</p>	<p><b>SOMERVILLE LAKE</b></p> <p>Landings and takeoffs are prohibited west of the west end of Birch Creek Unit of Somerville Lake State Park and in all coves and bays off the main body of the lake.</p>
<p><b>NAVARRO MILLS LAKE</b></p> <p>Landings and takeoffs are prohibited west of Wolf Creek Park 1.</p>	<p><b>STILLHOUSE HOLLOW LAKE</b></p> <p>Landings and takeoffs are prohibited west and south of Cedar Knob Road and in large shallow areas surrounding unnamed islands in the main body of the lake.</p>
<p><b>PROCTOR LAKE</b></p> <p>Landings and takeoffs are prohibited in all areas north and west of the eastern tip of Promontory Park and all areas west of the southwest tip of Promontory Park.</p>	<p><b>WHITNEY LAKE</b></p> <p>Seaplane operations are prohibited in areas downstream from a line drawn from the northern tip of Walling Bend park to the mouth of Frazier Creek and upstream from a line drawn from the mouth of Cedar Creek southwest to the opposite undeveloped shoreline. The coves formed by King Creek and Cedron Creek are also prohibited</p>
<p><b>RAY ROBERTS LAKE</b></p> <p>Landings and takeoffs are prohibited north of Highway 3002 and in areas north and east of a line from the northeast tip of Johnson Park to the southwest tip of Jordan Park.</p>	<p><b>WRIGHT PATMAN LAKE</b></p> <p>Landings and takeoffs are prohibited in all coves and bays off main body of lake and in uncleared and shallow areas of the lake.</p>
<p><b>SAM RAYBURN RESERVOIR</b></p> <p>Landings and takeoffs are prohibited west of Highway 147, north of Highway 83, and in scattered uncleared areas of the reservoir.</p>	

**NOTE:** The latest revision to this Notice to Seaplane Pilots was completed in March of 2000.

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**Appendix H**

**Summary of Public Comments and Government Response**

**During Plan Formulation and Following Release of Final Draft Plan**

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## **APPENDIX H**

### **SUMMARY OF PUBLIC COMMENTS RECEIVED DURING PLAN FORMULATION**

#### **Government and City Stakeholder Comment**

##### City of Lucas

1. Wild hog management.

USACE: Management of wild or feral hogs will be in accordance with USACE policies and Texas Parks and Wildlife regulation. Management and control measures are implemented cooperatively with TPWD and USFWS. Hogs may be hunted in designated areas.

2. Lease agreement for Brockdale Park.

USACE: A Park and Recreation Lease can be considered. All lease agreements must be in accordance with USACE policies. Cities must meet minimum criteria and demonstrate capability to maintain parks and recreation areas.

3. Lease agreement for Highland Park.

USACE: A Park and Recreation Lease can be considered. All lease agreements must be in accordance with USACE policies. Cities must meet minimum criteria and demonstrate capability to maintain parks and recreation areas.

4. Define utility corridors; do not adversely affect natural beauty of Lucas or negatively impact quality of life for citizens.

USACE: Concur.

5. Preserve wildlife habitat.

USACE: Concur.

6. Preserve Raptor Center.

USACE: Concur.

7. Lucas supports TTPA and safe horse trails.

USACE: Concur.

8. Expansion of trails network and future connectivity.

USACE: This type of recreation is acceptable. Future development is funding and partner dependent. USACE does support trail connectivity when such connectivity does not contradict operational policies or Federal regulations that do not allow for this activity in the interest of national security.

9. Coordination of public emergency services; protect assets, deter vandalism, protect against wild fires.

USACE: Concur.

10. Focus on low intensity use of waterways; environmentally sensitive.

USACE: Concur.

11. Prohibit expansion of marinas; control current number and size.

USACE: Marina expansion and current usage shall be in accordance with USACE operation and real estate management regulations and policy. Public need and boating capacity are factors to consider. Marina expansion is not a consideration at this time.

#### TxDOT

1. Included provisions for expanding existing roads which may be widened during the life of the master plan.

USACE: Per national USACE policy set forth in ER 1130-2-550, widening of existing roads shall be addressed on a case-by-case basis. Regional mobility plans shall be considered.

2. Mitigation ratios and planting specifications for impact from roadway expansion should be included in the plan and areas for storage mitigation and habitat restoration/enhancement should be identified.

USACE: Mitigation, including but not limited to planting specifications, flood storage, and habitat restoration shall be addressed on a case-by-case basis for roadway widening proposals. These issues are typically included in the preparation of NEPA documents.

3. Roadways crossing USACE property should have maintenance easements to allow for bridge repairs without requiring a temporary construction license. Mitigation for the impacts to these easements could be established elsewhere on USACE Lavon Lake property.

USACE: When existing easements are found to be inadequate to allow for routine bridge repairs, consideration will be given for increased easement boundaries.

#### TPWD

1. Concern is the sports fisheries of the lake; angler access to the lake should be year round.  
USACE: Concur.

2. Upper lake access is usually available at the Little Ridge boat ramp. However, there are no lower lake areas open during the winter months which have boat ramps that can be used in low level conditions.

USACE: Under current operational procedures, USACE-operated boat ramps in East Fork Park, Lavonia Park and Mallard Park are open year round and provide convenient angler access to the southwest and southeast sectors of the lake. Concessionaire-operated boat ramps in Collin Park also provide angler access to the southwest sector of the lake when open.

3. Open Avalon Park in the fall and winter for boat launching and low level conditions.

USACE: See above response under item 2. Avalon Park is located adjacent to East Fork Park where ramps are open year round.

4. Develop paddling trails including access for kayaks and canoes; new or existing park adapted launch ramp, restroom facilities, and parking.

USACE: Concur with the concept of paddling trails and associated trailhead facilities.

Establishment of paddling trails, as with land-based trails, are generally funding and partnership dependent.

5. Do not support any transfer of public lands to private land development.

USACE: Concur. No such transfers are under consideration. Minor land disposals may be pursued to correct boundary errors or resolve encroachments, but major transfers/disposals are normally the subject of Congressional legislation.

6. Continue controlling zebra mussels in Lake Lavon.

USACE: Concur.

## **Public Comment**

### Bicycle

1. The addition of bicycle (bike and hike) trails to Lavon Lake, concrete trails, 10 mile long, connected to existing streets or existing trails.

USACE: Long trails that extend beyond the boundaries of High Density Recreation areas (developed parks) are almost exclusively natural surface trails. Shorter trails that are confined to the boundaries of park areas may be constructed of concrete, depending on the degree of soil disturbance required. Connection to trails outside federal properties is encouraged in the interest of community connectivity and requires close coordination with the surrounding municipalities. Such connections may not be appropriate for controlled access park areas.

2. Bicycle trails associated within park areas.

USACE: This type of recreation is acceptable within Federal boundaries. Future development would be funding and partner dependent.

3. The addition of mountain bicycle (off-road bike and hike) trails to Lavon Lake, 20 mile long, partner with DORBA.

USACE: This type of recreation is acceptable within Federal boundaries when in accordance with operational policies and land classifications. Multi-mile trails are funding and partner dependent. Trails outside Federal properties should be coordinated with the surrounding municipalities.

4. The Skyview (road) should be open to cyclists.

USACE: We assume this comment is directed at the road across Lavon Dam. Non-Concur. Federal regulations do not allow for this access due to increased national security.

5. Remove barriers that hinder connectivity.

USACE: USACE is in support of connectivity when such connectivity does not contradict operational policies or Federal regulations that do not allow for this access type access due to increased national security.

6. Open dam to cyclists and pedestrians.

USACE: Non-Concur. Federal regulations do not allow for this access due to increased national security.

7. Hike, bike, and equestrian path connecting Dallas/Fort Worth Trail System to the North East Texas Trail (NETT). The NETT goes 130 miles from Farmersville to New Boston. Paved or unpaved bicycling or hiking trail along Lake Lavon's east side, connecting these two public-use trails.

USACE: The Government is aware of the NETT and can participate in discussion about connectivity through USACE land at Lavon Lake.



### Boat Ramps

1. The addition of low water ramps that work for all size boats.

USACE: This type of recreation feature is acceptable within Federal boundaries. Future development would be funding and/or partner dependent.

2. Increase the length of existing boat ramps.

USACE: This type of recreation feature is acceptable within Federal boundaries. Future development would be funding and partner dependent.

3. Open additional ramps to year round.

USACE: This can be reviewed. Boat ramp usage is based upon current operational policies, seasonal lake traffic and funding available for operation.

### Campgrounds

1. RV campground facilities at Clear Lake are limited.

2. Add secure, peaceful, shaded RV campground parks with water, sewer and 50 amp electrical hookups; spacious layout of pad sites so not crowded.

3. Extended camping season at Clear Lake.

USACE: Concur in the general improvement and expansion of camping facilities within Clear Lake Park. Progress will be funding dependent.

### Disk Golf

1. 18 hole disk golf course

USACE: This type of recreation is acceptable within USACE-operated parks. In parks that are leased to others, recent USACE regulations at ER 1130-2-550 specify that recreational facilities such as a disk golf course are not water-dependent and do not rely on the project's natural resources and therefore may not be approved as a stand-alone facility. Such a facility may be acceptable as an amenity associated with a comprehensive resort. Future development in a USACE-operated park would be funding and/or partner dependent.

### Equestrian

1. Request that land containing the Trinity Trail trail bed are classified as Low Intensity Recreational, from the water line to the Corps boundary. This will preserve the natural feel and look of the woods and fields that the trail traverses, increasing the enjoyment of the trail by hikers and equestrians.

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

2. Request that the Trinity Trail trailheads be classified as Low Intensity Recreational. This will prevent further development of the trailheads beyond their current uses (i.e. Ample parking for horse trailers, bathrooms, picnic tables, pavilions, water for horses, electric outlets for gatherings at the pavilions).

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

3. Request that the Sycamore grove along the north and south sides of Wilson Creek, containing the Giant Sycamore, and the area within the 'Sycamore Loop' of the trail, containing the Bent Sycamore (see Trinity Trail Emergency Markers 92 through 87) be classified as an Environmentally Sensitive Area. This will ensure that no development or hardened trails are allowed in this area.

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

4. Request that the watershed along White Rock Creek (between Trinity Trail Emergency Markers 67 through 64) be classified as an Environmentally Sensitive Area.

Since the creek does overflow and flood the adjacent land in high rainfall events, it doesn't appear to have ever been farmed and the area contains a large number of old growth trees. This will ensure that no development or hardened trails are allowed in this area.

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

5. Request that the meadows approximately 2-1/2 and 3 miles south of the Brockdale trailhead (between Trinity Trail Emergency Markers 27 and 26), be classified as an Environmentally Sensitive Area. This stretch of meadows sitting high above the lake, and offers the most scenic view of the lake along the entire length of the trail. Allowing any development in this area would greatly impact the vistas available from the trail.

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

6. Request that each of the major meadows traversed by the trail be examined for native grasses and if the meadow is a native grass meadow, the meadow and its environs should be classified as an Environmentally Sensitive Area.

USACE: During master plan development the indicated area will be reviewed and evaluated for potential designation to this land classification.

7. Request that the Corps continue its policy of excluding bicycles and other wheeled vehicles (except emergency and TTPA maintenance vehicles) from the Trinity Trail. Mixing wheeled vehicles and equestrians on the same trail will create dangerous situations and conflict on a trail that was designed and maintained solely for hiking and equestrian use.

USACE: Lavon Lake is a federal property designated for public use, open to all user groups. Organizations and groups with organized activities within USACE boundaries do not own the real property and shall not be afforded exclusive rights within these boundaries. Research indicates that there are many multi-use trails with successful coexistence of human, cycle, and equine traffic. The Trinity Trail is operated under a Memorandum of Understanding (MOU) between USACE and Collin County with the majority of maintenance performed by volunteers. In accordance with the MOU trail use is currently restricted to equine and pedestrian traffic and USACE has no plans to actively seek the integration of bicycle traffic. Future management of the trail will be partly dependent on the direction that Collin County wishes to pursue.

8. For safety reasons, no bikes should be allowed on the Trinity Trail. The trail is used by beginner horses and horse riders that are not parade ready or advanced enough to ride with bicycles. As a rule, new horses and new horse riders (usually children) do not mix with bicycles on a trail. We need to preserve the Trinity Trail as it is, as an equestrian and hiker trail. Safety should come first.

USACE: See response for item 7 above.

9. I am for a bike trail on the east side of Lake Lavon so the Northeast Texas Trail can hook up through Wylie. There needs to be a trail made for the bikes to get across the Trinity River along Highway 78.

USACE: The Government is aware of the NETT and can participate in discussion about connectivity through USACE land at Lavon Lake.

10. TTPA maintains the equestrian trails therefore only they should use them.

USACE: See response for item 7 above.

11. Include educational signage for interaction between activities.

USACE: Signage on USACE lands is governed by the USACE national sign manual.

Educational signs are appropriate in many situations to increase visitor enjoyment and safety.

12. Limit Trinity Trails to horse only due to the number of less experienced riders and horses that use the trail.

USACE: See response to number 7 above.

### General

1. Limit technical mountain bikers on trails due to erosion.

USACE: Concur. Mountain bike or off-road bike traffic shall be confined to designated trails and trails shall be monitored for erosion damage.

2. No motorized vehicles on trails.

USACE: Concur with the exception of maintenance vehicles.

3. Recreation sites, expanded as population grow requires.

USACE: During development of the master plan expansion of recreation facilities will be considered.

4. Water shortage concerns.

USACE: Comment noted. Use of water below the conservation pool elevation of 492.0 NGVD, is monitored and controlled by NTMWD.

5. Concern over resorts on perimeter; Development around the lake perimeter, on Corps land, should not deny public use on lake lands.

USACE: The Government cannot control development on private lands that adjoin USACE land. USACE is willing to discuss public access points with Collin County and surrounding municipalities.

6. Tree removal from the dry lake beds would increase the recreational use of the water surface.

USACE: The extent of tree clearing during construction of Lavon Lake sought to balance the need for recreational use of the water surface as well as the need for fisheries habitat offered by the standing dead timber in the lake. The trees that were not removed are generally located in the upper portions of the reservoir where water depth is generally less than 12 feet when the lake is at the conservation pool elevation of 492.0 NGVD. With only small reductions in pool elevation from evaporation and water withdrawals, these shallow areas quickly become

shallower, rendering these areas unsuitable for typical recreational boat traffic. USACE has no plans to pursue removal of standing dead trees in the reservoir.

7. Develop a stump removal plan to increase recreational area.

USACE: See response to No. 6 above.

8. Maintaining ecologically friendly uses of the land.

USACE: Concur. The USACE natural resources management mission statement in USACE regulation ER 1130-2-540, states that natural resources shall be conserved and managed using ecosystem management principles.

9. Concern over protecting adjacent landowners, their families and property from burglars and child predators masquerading as "walkers?!" if new trails were built around lake.

USACE: Recent outdoor recreation surveys conducted by TPWD and USFS, indicate high public demand for additional public trails and connectivity of trail systems. Existing trails at Lavon Lake and several other USACE lakes in the Dallas-Fort Worth region are heavily used with few, if any, incidents such as those described in this comment. However, future placement of trails near residential areas would require public involvement giving both trail users and adjacent homeowners an opportunity to comment.

### Hunting

1. Maintain and/or expand available acreage for archery hunting.

USACE: Archery hunting is available at Lavon Lake in accordance with TPWD regulations and USACE hunting policy with the exception that USACE currently does not allow whitetail deer to be hunted on USACE land. TPWD only recently authorized archery-only whitetail deer hunting in Collin County and USACE plans to coordinate with TPWD to conduct a whitetail deer population survey to determine if the population on USACE land is sufficient to allow hunting.

2. Support a limited archery whitetail deer season.

USACE: See USACE comment above.

### Lake Water Level

1. Increase lake level up to 10 feet for long term water supply and recreation use.

USACE: The Master Plan does not address the management of water for water supply or flood risk management operations. Increasing the conservation pool elevation of any USACE reservoir is a major action that would likely require Congressional authorization, study sponsors, and years of study.

2. Make the lake deeper to reduce evaporation; use bulldozers to add depth to the lake while it is low. Use excess dirt to create peninsulas and islands for wildlife habitat.

USACE: The Master Plan does not address the management of water for water supply or flood risk management operations. Excavation to deepen the lake would be a major, costly, and multi-year task, requiring careful analysis of the cost versus benefits and environmental impacts. There is currently no initiative being undertaken to deepen the lake by excavation.

3. Maintain constant level; no release to Ray Hubbard when low.

USACE: The Master Plan does not address the management of water for water supply or flood risk management operations. In accordance with contracts between the Government and NTMWD, the management and control of water when the lake is at or below the conservation pool elevation of 492.0 NGVD is the responsibility of NTMWD.

### Blackland Prairie Raptor Center

1. Maintain current lease agreement and BPRC mission.

USACE: Concur

2. Change Brockdale Park classification, identified in 1972 as Recreation Lands/High Density Recreation, be changed to reflect the work of Blackland Prairie Raptor Center; Environmentally sensitive and low density.

USACE: By definition, High Density Recreation areas are those areas having developed facilities such as paved roads, buildings, camping and picnic facilities. During master plan development the classification of Brockdale Park will be reviewed.

3. With the understanding of the requirements of permits from the U.S. Fish and Wildlife Services and Texas Parks and Wildlife Department for maintaining Education Raptors and Rehabilitating Raptors, designate half of the area currently called Brockdale Park as inactive, to remain wild.

USACE: See above response under item 2.

### Roads and Utilities

1. Included provisions for expanding existing roads which may be widened during the life of the master plan.

USACE: In accordance with national USACE policy in ER-1130-2-550, Chapter 17, expansion of existing roads will be considered on a case-by-case basis. Regional mobility plans will be considered.

2. Mitigation ratios and planting specifications for impact from roadway expansion should be included in the plan and areas for storage mitigation and habitat restoration/enhancement should be identified.

USACE: Mitigation, including but not limited to planting specifications, flood storage, and habitat restoration shall be addressed on a case-by-case basis for roadway widening proposals. These issues are typically included in the preparation of NEPA documents.

3. Roadways crossing USACE property should have maintenance easements to allow for bridge repairs without requiring a temporary construction license. Mitigation for the impacts to these easements could be established elsewhere on USACE Lavon Lake property.

USACE: When existing easements are found to be inadequate to allow for routine bridge repairs, consideration will be given for increased easement boundaries.

4. Define utility corridors; do not adversely affect natural beauty of Lucas or negatively impact quality of life for citizens.

USACE: During master plan development, designation of utility corridors will be considered.



## **SUMMARY OF PUBLIC COMMENTS RECEIVED ON DRAFT MASTER PLAN**

### **Government and City Stakeholder Comment**

#### City of Lucas

Comment: Supports Master Plan focus on maintaining wildlife habitat and environmentally sensitive areas.

USACE response: Concur

#### City of St. Paul

Comment: General concern over the operation of Collin Park. The topics include emergency ingress and egress during times of flooding, adequacy of wastewater treatment system, and campground occupancy rates.

USACE response: Topics mentioned are operational issues that are not addressed in the conceptual framework of a master plan. USACE is addressing these topics with the Town of St. Paul through coordination separate from the master plan process.

#### North Texas Municipal Water District

1. Comment: Planned utility corridors are insufficient, both in number and in width, for the contemplated use of multiple utility lines

USACE response: USACE experience with utility corridors at both Grapevine and Lewisville Lakes since 2002 indicates that the planned corridors for Lavon Lake are sufficient in both number and width to serve utility needs for the foreseeable future. The planned corridors provide sufficient north-south and east-west options for future utilities and each of the corridors includes the width of an existing road or utility easement plus an additional parallel strip of USACE land that, in total, exceeds 100 feet in width for all except one corridor. Efficient use of corridors will require space-saving construction techniques such as trench support systems, use of force mains instead of gravity flow sewer lines, subsurface boring instead of open trenching, and telecommunication pipe chase systems. Currently, no utility line easement proposals involving USACE lands at Lavon Lake have been proffered by NTMWD or other utility providers and USACE is confident that the planned corridors will meet regional utility easement needs for the foreseeable future while minimizing the fragmentation of important wildlife habitat. Future use of planned corridors will require close coordination and cooperation of all utility providers operating around Lavon Lake.

2. Comment: The master plan should place more emphasis on shoreline erosion and resulting sedimentation.

USACE response: The master plan includes a natural resource management objective in Chapter 3 specifying that shoreline erosion and sedimentation be monitored and alternatives be developed to resolve issues. Chapter 2 notes that shoreline erosion control measures have been constructed to protect critical park infrastructure from wave induced erosion. Chapter 2 also notes that watershed characteristics such as clay soils and a high level of agricultural activity throughout the watershed has probably contributed to the high rate of sedimentation. In accordance with master plan objectives, USACE will continue to implement shoreline erosion control measures where reasonable, but any significant reduction in the overall sedimentation rate will require a comprehensive watershed plan that would address soil erosion taking place on private lands many miles from Lavon Lake. While USACE would certainly be willing to participate in a watershed planning effort, such an effort would require initiation by state government in cooperation with municipalities and entities such as NTMWD.

3. Comment: The master plan should address stormwater management practices to reduce the amount of non-point source pollution that might originate from recreational areas.

USACE response: Concur. In Chapter 2, Paragraph 2.2.9 Water Quality, mentions the problem of nutrient loading that occurs primarily from stormwater runoff from agricultural areas within the watershed. The paragraph mentions the benefit of maintaining a well vegetated buffer around Lake Lavon to slow runoff and absorb nutrients before they enter the lake, but like sediment accumulation in the lake, the vast majority of nutrient loading comes from areas in the watershed that are remote from Lavon Lake. In summary, the negative effects of stormwater runoff will be specifically addressed in the Natural Resource Management Objectives to reinforce the information presented in Chapter 2. Add language to emphasize that urban areas are a major contributor of non-point pollution.

4. Comment: A Visitor Information, Education and Outreach objective is needed to promote the prevention of litter and nonpoint source pollution at Lavon Lake.

USACE response: Concur. A new objective will be added to address this important topic.

#### Texas Commission on Environmental Quality (TCEQ)

Comment: After preliminary review of the EA, TCEQ has no objection to the project (master plan revision).

USACE response: Noted

### Texas Historical Commission (THC)

1. Comment: Concur with the long-term objective for cultural resources as described in the Master Plan in Section 2.3.5.

USACE response: Noted

2. Comment: Concur with the conclusion noted in the cultural resources section of the EA, Section 3.11 that future ground-disturbing activities be coordinated with THC to ensure compliance with Section 106 of the National Historic Preservation Act.

USACE comment: Noted

### Texas Parks & Wildlife Department (TPWD) - Wildlife

1. Comment: TPWD supports the proposed revisions to the Master Plan; the plan would create a balance between recreational opportunity and stewardship of natural resources at Lavon Lake.

USACE response: Noted

2. Comment: In addition to the TPWD list of Species of Greatest Conservation Need (SGCN), TPWD recommends referring to the TPWD list of rare species by county which can be obtained via <http://tpwd.texas.gov/gis/rtest/>.

USACE response: Concur. The list of rare species for Collin County will be added to Appendix F of the Master Plan which also includes the SGCN list and text will be referenced in Chapter 2.

3. Comment: TPWD recommends indicating that suitable habitat for the timber rattlesnake occurs within the project area and that the timber rattlesnake has potential to occur within the project area.

USACE response: Concur. Text will be added to the Threatened and Endangered Species Section in Chapter 2.

4. Comment: TPWD recommends incorporation of the following green design best management practices that minimize potential impacts to wildlife resources: erosion control blankets that do not pose entrapment hazards to wildlife, particularly snakes; elimination of open-top vertical pipes that pose an entrapment hazard to wildlife; minimize nighttime lighting and only use down-shielded lighting to prevent disorientation of night-migrating birds; when installing glass in buildings, follow USFWS guidelines to prevent bird collisions; preserve and restore wildlife habitat in high density recreation areas; ensure that mowing practices provide standing tallgrass over winter to provide essential cover for wintering birds; report state-listed species and rare vegetative communities to the Texas Natural Resources Diversity Database.

USACE response: Concur. The best management practices will be incorporated into Chapter 5 of the Master Plan where the future management of the various land classifications is set forth.

5. Comment: Revise legends on the maps showing depth contours to only identify items depicted on the map.

USACE response: Concur.

6. Comment: Check the TXNDD database to determine if the area south of Highway 380 on the east side of the project area for the presences of rare Vertisol Blackland Prairie. Additionally, TPWD supports the mitigation requirement for loss of prairie habitat or other natural resources associated with future temporary and/or permanent development within utility corridors.

USACE response: USACE requested the location of the site in question through the Texas Natural Diversity Database and subsequently inspected the site. The field inspection revealed that few native prairie species exist on the site and the majority of the site that is located in Utility Corridor 6 is highly disturbed from frequent inundation and the presences of an existing underground utility line. The site has a significant component of invasive species including King Ranch bluestem and Johnsongrass. The current Vegetation Management classification for the area in question is appropriate and will guide future management of the site to improve conditions for native prairie vegetation.

7. Comment: Explain why priority would be given to migratory species over non-migratory species in the implementation of wildlife management measures. Alternatively, TPWD recommends the USACE consider whether this statement is necessary as it may create unforeseen limitations on flexibility and adaptive wildlife management over the 25 year life of the plan.

USACE response: Concur. The statement in the Master Plan on page 5-18 will be revised to explain that use of available funds for wildlife management must be prioritized to meet legal mandates and regional priorities. While exceptions can occur, management actions will be guided by the following, in order of priority: 1) Protect federal and state-listed threatened and endangered species. 2) Meet the needs of species protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. 3) Meet the needs of rare species and Species of Greatest Conservation Concern. 4) Meet the needs of resident species not included in the above priorities.

8. Comment: USACE should establish a plan to educate equestrian users of the potential to spread non-native and invasive species through the use of hay that is not certified as weed free. Also, if livestock grazing is allowed on project lands, livestock should be held in a confined area to allow for previously-ingested material to pass prior to being placed on other project lands.

USACE response: Concur. This topic will be addressed in various sections in Chapter 3, 5 and in the Trails Section of Chapter 6.

#### TPWD – Fisheries

9. Comment: Consider flood/conservation pool to address potential impacts to recreational facilities and fisheries habitat (i.e. campsites, boat ramps, courtesy docks, aquatic vegetation, littoral area, etc.). Consider incorporating “fisheries habitat” as a component of flood/conservation pool recreational objectives. Fisheries habitat in the form of aquatic vegetation, littoral area, and coarse substrate have been found to degrade rapidly even with water level reductions of just 1 to 2 meters. These components of the aquatic ecosystem provide nursery habitat for juvenile fishes and directly impact recruitment and standing yield of reservoir fishes.

USACE response: Concur. Text will be added to the Natural Resources Objectives in Chapter 3.

10. Comment: Lavon Reservoir maintains a popular winter crappie fishery, and extension of one or more boat ramps, available year-round, can provide reservoir access during periods of prolonged drought. In a TPWD 2015 Fisheries Survey Report for Lavon Reservoir, extensions to boat ramps at multiple lakeside parks were believed to be feasible. Those parks were: Little Ridge, Mallard Park, Lavonia Park, Clear Lake, Collin Park, and East Fork Park. The terminus of those boat ramps occurred at approximately 478 ft. above mean sea level. An extension to the Avalon Park ramp is mentioned in the draft master plan; however, Avalon Park would currently provide the last remaining public access to the reservoir during periods of low water level (ramp ends at 474 ft. above msl). However, Avalon Park is closed during winter months.

USACE response: Concur. Text will be added to the future management actions for Little Ridge, Lavonia, Clear Lake and East Fork Parks noting that extensions to existing ramps will be accomplished as funding is available. Ramp extensions in Mallard Park are not feasible due to shallow water and any ramp extensions in Collin Park would be the responsibility of the lessee. The process of extending ramps is expensive and is generally possible only during very low pool conditions.

11. Comment: Because Lavon Reservoir is in close proximity to reservoirs impacted by invasive aquatic vegetation species such as giant salvinia and water hyacinth, consider adding these species to the Natural Resource Management Objectives. Preventing the spread of these species from one reservoir to another can be encouraged by educating the public through signage at area boat ramps or periodic inspection of boat trailers. Identifying invasive aquatic species soon after introduction is also important for eradication and successful management.

USACE response: Concur. Text will be added to the Natural Resources Management Objectives in Chapter 3.



## Caddo Nation of Oklahoma

Comment: The Caddo Nation of Oklahoma concurs with the draft master plan as presented and requests that the Nation be kept informed as any work progresses.

USACE response: Noted.

## **Public Comment**

### Equestrian

1. Comment: Add equestrian trail users to the list of recreational visitors described in Section 2.4.2 of the draft Master Plan.

USACE response: Concur.

2. Comment: The Trinity Trail initially opened in 1989 and the text in Section 2.4.3 should include that date instead of 1995.

USACE response: Concur.

3. Comment: The Trinity Trails Preservation Association (TTPA) agrees with the land classification of those lands traversed by the Trinity Trail.

USACE response: Noted.

4. Comment: The TTPA agrees with inclusion of natural surface equestrian trails as an allowed future use in ESA 6-11 and in MRML and High Density Recreation land classifications.

USACE response: Noted

### Land Classification

1. Comment: Recommend the southeast corner at the intersection of FM 546 and County Road 318 be designated as High Density Recreation to allow for possible future construction of an equestrian trailhead.

USACE response: The area in question is classified as Multiple Resource Management Lands – Wildlife Management. Currently, the area is already used as an undesignated parking area by hunters and fishermen and an easement granted to NTMWD traverses the location. Low intensity trailheads are appropriate within MRML – Wildlife Management lands although future construction of a trailhead would need to take into account existing uses, existing easements, and the potential effects on private lands located on the west side of County Road 318.

2. Comment: Disappointed to see the loss of 5000 acres of recreational land.

USACE response: The reclassification of land from the 1972 Master Plan to the revised Master Plan is intended to reflect how these lands have been managed and used by the public in the

past and how they will be managed and used in the future. The greatest change resulted in the reclassification of approximately 3,935 acres of Low Intensity Recreation to MRML – Wildlife Management and ESA. Also reclassified were 960 acres of Recreation – High Intensity to Project Operations, MRML – Wildlife Management, and ESA. These reclassifications responded to agency and public comment, as well as project operational needs and do not represent a “loss” of recreational lands because existing recreational uses of these lands are allowed to continue. More detailed reasons and justifications for land reclassifications are provided in Chapter 8 of the Master Plan.

3. Comment: Please explain or describe the small High Density Recreation area on the south side of Skyview Drive adjacent to ESA 1 as shown on Land Classification Map (Sheet 01).

USACE response: The small area described was incorrectly mapped as a High Density Recreation Area and will be changed to the correct classification of Multiple Resource Management Lands – Wildlife Management.

4. Comment: The Trinity Trail Preservation Association (TTPA) recommends changing the land classification in the area south of Highland Park and north of East Lucas Road from Low Density Recreation to Wildlife Management

USACE response: Non-concur. The narrow configuration, small size, and potential for adjacent residential development are factors that make Low Density Recreation the most appropriate land classification.

### General

1. Comment: The TTPA agrees with the general prohibition of hard-surface trails in non-High Density Recreation Areas

USACE response: Noted

2. Comment: The TTPA agrees with the need to place high priority on boundary line maintenance. Unauthorized use of the Trinity Trail by off-road vehicles have damaged the trail and surrounding meadows, and facilitated the misuse of public land with litter and bonfires

USACE response: Noted

3. Comment: Are there plans to renovate Ticky Creek Park to include a security gate and a repaired courtesy dock?

USACE response: Ticky Creek Park is a day use area and future management includes replacement of the west side restroom and repair of roads and parking lots. The courtesy dock will be repaired as a routine maintenance task, but there are currently no plans to construct a gated security entrance.

4. Comment: When will East Fork Park be reopened to boaters?

USACE response: All parks are subject to temporary closure as needed for public safety, repair of flood damage, and/or protection of facilities and other issues at manager discretion.

## Water Management

1. Comment: Will Lavon Lake be a constant level lake after completion of Bois d'Arc Reservoir?

USACE response: The Lower Bois d'Arc Creek Reservoir (LBCR) is a project of NTMWD. Details on this 16,000 acre reservoir in Fannin County are available on the NTMWD website at [www.ntmwd.com](http://www.ntmwd.com). The LBCR will have no effect on the flood damage reduction mission of Lavon Lake because the two reservoirs are located in different river basins (LBCR is in the Red River basin and Lavon Lake is in the Trinity River basin). How this new reservoir may affect the water supply mission of Lavon Lake will depend on how NTMWD manages the water in the two reservoirs as well as other water sources used by NTMWD. As NTMWD begins to utilize water from LBCR, there may be indirect effects on the water level in Lavon Lake, but there is no plan calling for Lavon Lake to be a constant level lake.

2. Comment: How do we contact NTMWD to request more water be allowed to stay in Lavon Lake when weather forecasts predict months of drought?

USACE response: The NTMWD website is a good source of contact information. The website is [www.ntmwd.com](http://www.ntmwd.com)

3. Does Lavon Lake recreation plans depend on a constant lake level?

USACE response: Current and future recreation plans for Lavon Lake do not require a constant level lake. Land management and recreation plans at Lavon Lake must take into account the effects of a fluctuating pool elevation resulting from drought and floods.

**Appendix I – Comments from TPWD**  
**Waterfowl Management**

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10/20/2015

Jared Laing  
Texas Parks and Wildlife Department  
1942 FM 848 Tyler, TX 75707

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Fort Worth

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Carter P. Smith  
Executive Director

U.S. Army Corps of Engineers  
Michael Kinard, Lake Manager  
Lavon Lake Office  
3375 Skyview Drive  
Wylie, Texas 75098

**Dear Mr. Kinard:**

I am writing this letter, as requested, in response to the meeting between our agencies at the Lake Lavon field office on October 2, 2015 regarding waterfowl hunting regulations at Lake Lavon. At this meeting we were presented with information from the USACE about current waterfowl hunting regulations on the lake. We were asked one question in particular; whether there is a justification for designated waterfowl sanctuary areas on the lake. For clarification purposes, we will define sanctuary areas as any area that attracts and holds waterfowl where they are not disturbed. Disturbance is any activity that causes waterfowl to alter their natural behavior. Examples of disturbance include boat traffic, vehicle traffic, low-flying aircraft, pedestrian traffic, hunting, predator avoidance, etc... Since waterfowl are very adept flyers and travel thousands of miles each year, a main issue affecting the value of sanctuary areas is the attributes of the landscape adjacent to the property in question. That being said, the landscape around Lake Lavon has numerous water features, primarily small ponds and lakes, as well as Lake Ray Roberts, on which no hunting is allowed. With the amount of waterfowl habitat surrounding Lake Lavon, the majority of which has little, if any, disturbance during the season when larger concentrations of waterfowl are present (September-March), we believe that designated sanctuary areas are of little value from a biological standpoint. However, we understand there may be social or political issues on the topic.



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Fort Worth

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Carter P. Smith  
Executive Director

I hope this letter is what you were looking for and that it helps with your decisions as you move forward. Please let me know if I can be of any further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "Jared Laing", written over a large, stylized, circular flourish.

Jared Laing  
Regional Waterfowl Biologist  
Texas Parks and Wildlife Department

## **Appendix J – Pertinent Public Laws**

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## **Appendix J - Pertinent Public Laws**

- 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. Public Law 75-761, Flood Control Act of 1938. - This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- d. Public Law 78-534, Flood Control Act of 1944. - Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- e. Public Law 79-525, River and Harbor Act of 1946. - This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- f. Public Law 83-780, Flood Control Act of 1954. - This act authorizes the construction, maintenance, and operation of public park and recreational facilities in reservoir areas under the control of the Department of the Army and authorizes the Secretary of the Army to grant leases of lands in reservoir areas deemed to be in the public interest.
- g. Public Law 85-624, Fish and Wildlife Coordination Act 1958. - This act as amended in 1965 sets down the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.
- h. Public Law 86-717, Forest Conservation. - This act provides for the protection of forest and other vegetative cover for reservoir areas under the jurisdiction of the Secretary of the Army and the Chief of Engineers.



- i. Public Law 87-874, Rivers and Harbors Act of 1962. - This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- j. Public Law 88-578, Land and Water Conservation Fund Act of 1965. - This act established a fund from which Congress can make –appropriations for outdoor recreation. Section 2(2) makes entrance and user fees at reservoirs possible by deleting the words "without charge" from Section 4 of the 1944 Flood Control Act as amended.
- k. Public Law 89-72, Federal Water Project Recreation Act of 1965. - This act requires that not less than one-half the separable costs of· developing recreational facilities and all operation and maintenance costs at Federal reservoir projects shall be borne by a non-Federal public body. An OCE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.
- l. Public Law 89-90, Water Resources Planning Act (1965). - This act established the Water Resources Council and gives it the responsibility to encourage the development, conservation, and use of the Nation's water and related land resources on a coordinated and comprehensive basis.
- m. Public Law 89-272, Solid Waste Disposal Act, as amended by PL 94-580, dated October 21, 1976. - This act authorized a research and development program with respect to solid-waste disposal. It proposes (1) to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of national resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid waste; and (2) to provide technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal programs.
- n. Public Law 89-665, Historic Preservation Act of 1966. - This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
- o. Public Law 90-483, River and Harbor and Flood Control Act of 1968, Mitigation of Shore Damages. - Section 210 restricted collection of entrance fee at USACE lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.
- p. Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). - NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a "continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote

the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act.

- 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 (PL 91- 224), established the basic tenet of uniform State standards for water quality. Public Law 92-500 strongly affirms the Federal interest in this area. "The objective of this act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters."
- 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 93-251, 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.
- w. Public Law 93-291, Archeological Conservation Act of 1974. - The Secretary of the Interior shall coordinate all Federal survey and recovery activities authorized under this expansion of the 1960 act. The Federal Construction agency may transfer up to one percent of project funds to the Secretary with such transferred funds considered nonreimbursable project costs.
- x. 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.

- y. 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.
- z. 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.
- aa. Public Law 99-662, The Water resources Development Act 1986. - Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.
- bb. 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 research methods for demonstration projects to benefit and enhance recreation.

## **Appendix K – List of Acronyms**

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## **Appendix K – Acronyms**

ADA	Americans with Disabilities Act
CAP	Climate Action Plan
CCRTMP	Collin County Regional Trails Master Plan
CRMP	Cultural Resources Management Plan
DC	District Commander
EA	Environmental Assessment, NEPA Document
EC	Engineer Circular
EM	Engineering Manual
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Area
FONSI	Finding of No Significant Impact
GIS	Geographical Information Systems
HDR	High Density Recreation
HQ	USACE Headquarters
LEED	Leadership in Engineering and Environmental Design
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
NHPA	National Historic Preservation Act
NRRS	National Recreation and Reservation Service
NRHP	National Register of Historic Places
NSRE	National Survey on Recreation and the Environment
NGVD	National Geodetic Vertical Datum
NWI	National Wetland Inventory
NCTCOG	North Central Texas Council of Governments

NRCS	Natural Resources Conservation Service
NTMWD	North Texas Municipal Water District
NEPA	National Environmental Policy Act, 1970
NOA	Notice of Availability
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OMBIL	Operations and Maintenance Business Information Link
OMP	Operational Management Plan for a specific lake Project
OPM	Operations Project Manager
PDT	Project Development Team
PM	Project Management or Project Manager
PMP	Project Management Plan
SGCN	Species of Greatest Conservation Need
SHPO	State Historical Preservation Office
SWF	U. S. Army Corps of Engineer's Fort Worth District Office
SWF-OD	Operations Division, U. S. Army Corps of Engineers, Fort Worth
SWF-RPEC	Regional Planning & Environmental Center located in Fort Worth
TCAP	Texas Conservation Action Plan
TCEQ	Texas Council on Environmental Quality
TXDOT	Texas Department of Transportation
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
USACE	United States Army Corps of Engineers
USACE-SWF	U. S. Army Corps of Engineer's Fort Worth District Office
USFW	U. S. Fish and Wildlife Service
USFS	U.S. Forest Service