

Lake O' the Pines Master Plan

Cypress Creek, Texas: Red River Basin

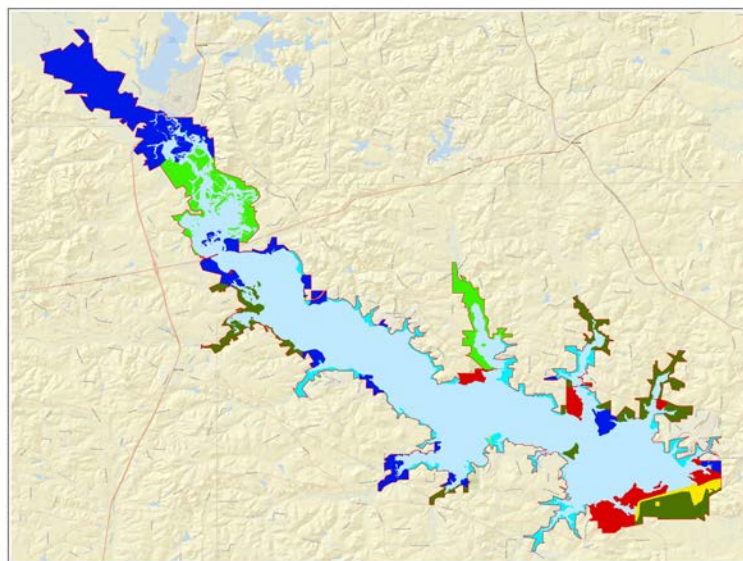
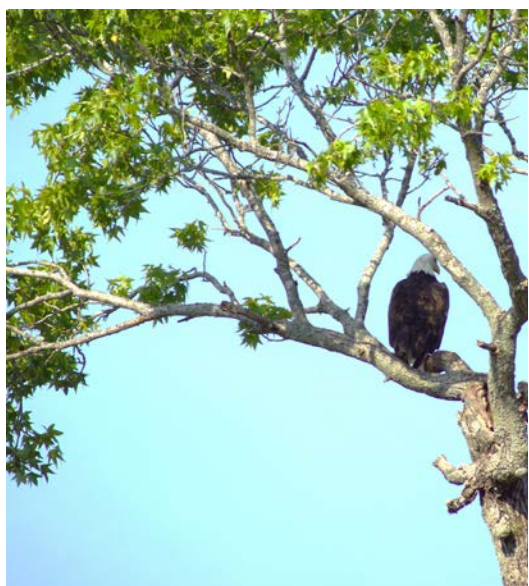
JANUARY 2019



US Army Corps of Engineers

Lake O' the Pines is 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."

Marion, Harrison, Upshur, Camp, Titus, and Morris Counties, Texas



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

CESWF-PEC

23 January 2019

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

SUBJECT: Lake O' the Pines and Dam, Texas Master Plan Revision (January 2019)

1. PURPOSE: Enclosed subject Master Plan is submitted 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 Lake O' the Pines Master Plan is intended to bring the Master Plan up to date to reflect ecological, socio-demographic, and outdoor recreation trends that are currently affecting the lake, as well as those anticipated to occur within the planning period of 2019 to 2044, a 25-year period.
3. SUMMARY OF CHANGES: The revision resulted in the preparation of new resource management objectives and the following changes to land use classifications:

Prior (1989) Land Classifications	Acres	New Land Classifications	Acres
Project Operations	211	Project Operations	290
Recreation	1,596	High Density Recreation	1,231
ESA- Recreation	520		-
Environmentally Sensitive Areas	858	Environmentally Sensitive Areas	4,236
Recreation (Low Density)	3,567	MRML – Low Density Recreation	1,782
Wildlife Management	3,731	MRML – Wildlife Management	1,774
Vegetative Management	800	MRML – Vegetative Management	2,325
Inactive/Future Recreation	175	MRML – Future/Inactive Recreation	5
ESA-Inactive/Future Recreation	185		-
Permanent pool	18,700	Permanent pool	17,767
Flowage Easement	16,054	Flowage Easement	16,063*

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 threatened and endangered species and their habitat, as well as culturally significant sites and unique views and landscapes.

b. In accordance with the National Environmental Policy Act of 1969, including guidelines in 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 2019 Lake O' the Pines Master Plan (2019 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 1989 Master Plan) and the implementation of the 2019 Master Plan. Based on the findings of the EA, the implementation of the 2018 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, 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.

CESWF-PEC

SUBJECT: Lake O' the Pines and Dam, Texas Master Plan Revision (Jan 2019)

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 Findings of No Significant Impact by the commander.

Approve ✓
Disapprove _____
Date 23 Jan 19


ARNOLD R. NEWMAN
Director, Regional Planning & Environmental
Center


Approve ✓
Disapprove _____
Date 1 Feb 2019


ROCKY D. LEE
Chief, Real Estate Division

Approve ✓
Disapprove _____
Date 4 Feb 19


BRIAN G. PHELPS
Acting Chief, Operations Division

Approve KNR
Disapprove _____
Date 7 Feb 2019


KENNETH N. REED, PMP
Colonel, EN
Commanding

EXECUTIVE SUMMARY

PURPOSE

The revision of the *Lake O' the Pines Master Plan* (hereafter Plan or Master Plan) is a framework built collaboratively to serve as a guide toward appropriate stewardship of U.S. Army Corps of Engineers (USACE) administered resources at Lake O' the Pines over the next 25 years. The 1989 update to the Lake O' the Pines Master Plan was completed following the transfer of management from the New Orleans District to the Fort Worth District in October 1979, and was intended to serve through 2005.

In addition to the inherent mission of environmental stewardship, the lake and dam's primary purposes are flood risk management, water conservation/quality, fish and wildlife conservation, recreation, and water supply. The Master Plan is primarily a land use and outdoor recreation strategic plan that does not address the storage of water for flood risk management or water conservation purposes. Water management is addressed in the USACE Water Control Manual for Lake O' the Pines. The 1989 Master Plan classifies a total of 13,275 acres of USACE land and 18,700 acres of surface water at the winter conservation pool (elevation 228.5 feet above mean sea level, NGVD29) within the fee boundary. Due to land changes from erosion and sedimentation as well as improved measurement technology, this number has decreased. Currently, Lake O' the Pines encompasses 11,643 acres of land and 17,767 acres of surface water, providing water storage and helping to control flooding on Cypress Creek, Caddo Lake, and Twelve Mile Bayou. This Plan and supporting documentation provides an inventory, analysis, goals, objectives and recommendations for USACE lands and water surface at Lake O' the Pines, Texas.

PUBLIC INPUT

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

Approximately 36 individuals, not including USACE personnel, attended the three public scoping meetings held at the onset of the process on 25 & 27, April 2017 and 16 May 2017. USACE received a total of 3 comments during the two initial 30-day comment periods, including one from the Northeast Texas Municipal Water District. Issues raised in these comments were requests to increase the recreational opportunities and tourism, and control of invasive species. None of the comments received were directly related to possible changes to land classifications for the master plan, a key focus of the revision, however, all the public comments received were noted and will be addressed as future funds and development are considered.

Remainder to be completed following Public and Agency review of the draft MP and EA/draft Finding of No Significant Impact (FONSI).

RECOMMENDATIONS

The following land classifications changes (detailed in Chapter 8, Table 8.1) resulted from the inventory, analysis, and synthesis of data, documents, and public and agency input. In general, 38 separate land reclassifications totaling 4,630 acres were made, with total fee and conservation pool acreage changes due in part to improvements in measurement technology using Geographical Information System (GIS) technology. GIS software allows for more finely tuned measurements and thus acreages may vary slightly from official land acquisition records.

Table ES.1 Change from Prior Land Classification to New Land Classification

Prior (1989) Land Classifications	Acres	New Land Classifications	Acres
Project Operations	211	Project Operations	290
Recreation	1,596	High Density Recreation	1,231
ESA- Recreation	520		
Environmentally Sensitive Areas	858	Environmentally Sensitive Areas	4,236
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ESA-Inactive/Future Recreation	185		
Permanent pool	18,700	Permanent pool	17,767
Flowage Easement	16,054	Flowage Easement	16,063*

*USACE has an additional 125 acres with permit to flood not included in this number.

PLAN ORGANIZATION

Chapter 1 of the Master Plan presents an overall introduction of Lake O' the Pines. Chapter 2 consists of an inventory and analysis of project resources. Chapters 3 and 4 lay out management goals, resource objectives, and land allocation and classification. Chapter 5 is the resource plan that identifies how project lands will be managed through a resource use plan for each land use classification. This includes current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management.

Chapter 6 details topics that are unique to Lake O' the Pines. Chapter 7 identifies the coordination efforts and stakeholder input gathered for the development of the Master Plan, and Chapter 8 gives a summary of the changes in land classification from the previous master plan to the present one. Finally, the appendices include information and supporting documents for this Master Plan revision, including Land Classification and Park Plate Maps (Appendix A).

An EA analyzing alternative management scenarios for Lake O' the Pines has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality; and USACE regulations, including Engineer Regulation 200-2-2: Procedures for Implementing NEPA. The EA is a separate document that informs this Master Plan and can be found in its entirety in Appendix B.

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

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CHAPTER 1: INTRODUCTION

1.1. OVERVIEW

Lake O' the Pines and Ferrells Bridge Dam is a multipurpose water resources project constructed and operated by the U.S. Army Corps of Engineers (USACE), Fort Worth District. The lake and associated federal lands are located in Marion, Harrison, Upshur, Camp, Titus, and Morris Counties, Texas (TX). Ferrells Bridge Dam is situated on Cypress Creek approximately nine (9) miles west of Jefferson, Texas. The dam and associated infrastructure, as well as all lands acquired for the Lake O' the Pines project, are federally owned and administered by the USACE.

The Lake O' the Pines Master Plan (hereafter Plan or Master Plan) is a revision of the 1989 Master Plan and is intended to serve as a comprehensive land and recreation management guide with an effective life of approximately 25 years. The focus of the Plan is to (1) guide the stewardship of natural and cultural resources, and (2) make provision for outdoor recreation facilities and opportunities on federal land associated with Lake O' the Pines.

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

The USACE Sustainability Policy and Strategic Plan states that:

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

Sustainability is an umbrella concept that encompasses energy, climate change and the environment to ensure today's actions do not negatively impact tomorrow. The Corps of Engineers is a steward for some of the Nation's most valuable natural resources, and must ensure customers receive products and services that provide sustainable solutions that address short and long-term environmental, social, and economic considerations."

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

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

1.2. PROJECT PURPOSE AND AUTHORIZATION

Lake O’ the Pines and Ferrells Bridge Dam is a multipurpose water resource project constructed and operated by USACE for the purpose of flood risk management and water supply, with added authorization for recreation and fish and wildlife programs. Environmental stewardship, though not listed as a primary project purpose, is a major responsibility and inherent mission in the administration of federally owned lands.

Lake O’ the Pines was created by the construction of the Ferrells Bridge Dam on the Big Cypress Bayou approximately 81 miles upstream from the Red River. The reservoir is part of the comprehensive plan for the control of floods within the Red River basin below Denison Dam, Oklahoma and Texas. The project was authorized as the Ferrells Bridge Dam and Reservoir by the Flood Control Act of 1946, but the name of the project was officially changed to Lake O’ the Pines and Ferrells Bridge Dam in 1958. Additional purposes of both recreation and water supply were added during construction.

The bayou has a length of 140 miles and a total drainage area of 850 square miles above the dam site which is approximately 30 percent of the drainage area of Cypress Creek and approximately 3 percent of the drainage area of the Red River below Denison Dam, excluding the Ouachita-Black River Basin.

An additional benefit accruing from Lake O’ The Pines is the storage of water for municipal and industrial uses. The Northeast Texas Municipal Water District (NETMWD) is the state agency created in 1953 by the Texas legislature to administer the water supply features of the project. The NETMWD has a mission “to develop and deliver an adequate water supply to cities and industries in Northeast Texas.”

The NETMWD currently supplies ten local communities with 8 million gallons of treated water per day. In March 2001 an easement was granted to the city of Longview, Texas to construct, operate and maintain a water intake structure and pipeline for the purpose of transporting raw water from Lake O’ the Pines to treatment facilities in Longview. The intake plant has the capacity to deliver 35 million gallons of water per day. The city of Longview estimates they use 20,000 acre feet of water per year from the lake.

Congressional authority for the recreational program at reservoir projects under the control of the Department of the Army is contained in the Flood Control Act approved 22 December 1944 (Public Law 534, 78th Congress, 2d Session) as amended

by subsequent acts. Congressional authority for the fish and wildlife program at reservoir projects under the control of the Department of the Army is contained in the Fish and Wildlife Coordination Act of 1958 (Public Law 85-624, 72 Stat 563), as amended.

A number of laws place emphasis on environmental stewardship of Federal lands. These laws - including but not limited to Public Law 91-190, National Environmental Policy Act of 1969 (NEPA) and Public Law 86-717, Forest Cover Act - place emphasis on the environmental stewardship of Federal lands and USACE-administered Federal lands, respectively. A list of Federal laws pertinent to the project are listed in section 1.7 of this Plan.

1.3. MASTER PLAN PURPOSE AND SCOPE

In accordance with Engineering Regulation (ER) 1130-2-550 Change 07, dated 30 January 2013 and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 January 2013, master plans are required for most USACE water resources development projects having a federally owned land base. This revision of the Lake O' the Pines Master Plan is intended to bring the master plan up to date to reflect current ecological, socio-demographic, and outdoor recreation trends that are affecting the lake, as well as those anticipated to occur within the planning period of 2018 to 2043 (i.e., 25 years).

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

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

- Regional and ecosystem needs
- Project resource capabilities and suitability

- Expressed public interests that are compatible with Lake O' the Pines authorized purposes
- Environmental sustainability elements.

It is important to note what the Master Plan does not address. As noted in Section 1.1, the Plan does not address the flood risk management or water supply purposes of Lake O' the Pines. The Plan also does not address details of design, management and administration, and implementation, but these are addressed in the Lake O' the Pines Operational Management Plan (OMP). In addition, the Master Plan does not address the specifics of regional water quality, shoreline management with respect to private actions conducted by adjoining landowners such as vegetation modification, or water level management. The operation and maintenance of primary project operations facilities, including but not limited to the dam, spillway, and gate-controlled outlet, are also not included in this Plan.

The 1989 update of the original 1963 Master Plan (formally Design Memorandum 11) was sufficient for prior land use planning and management. Changes in outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy have occurred over the past decades. Additionally, increasing fragmentation of wildlife habitat, national policies related to land management, climate change, and growing demand for recreational access and protection of natural resources are all factors affecting Lake O' the Pines and the region in general. In response to these continually evolving trends, USACE determined that a full revision of the 1989 Plan is required as set forth in this Plan.



Photo 1.1 Lake O the Pines Dam (USACE Photo)

1.4. BRIEF PROJECT AND WATERSHED DESCRIPTION

Lake O' the Pines was created by the construction of the Ferrell's Bridge Dam on the Big Cypress Bayou, approximately 81 miles upstream from the Red River. Authorized by the Flood Control Act of 1946, the reservoir was created as part of the overall plan for flood control in the Red River Basin below Denison Dam in Oklahoma. Construction began in 1955 and the lake was placed into operation in 1959.

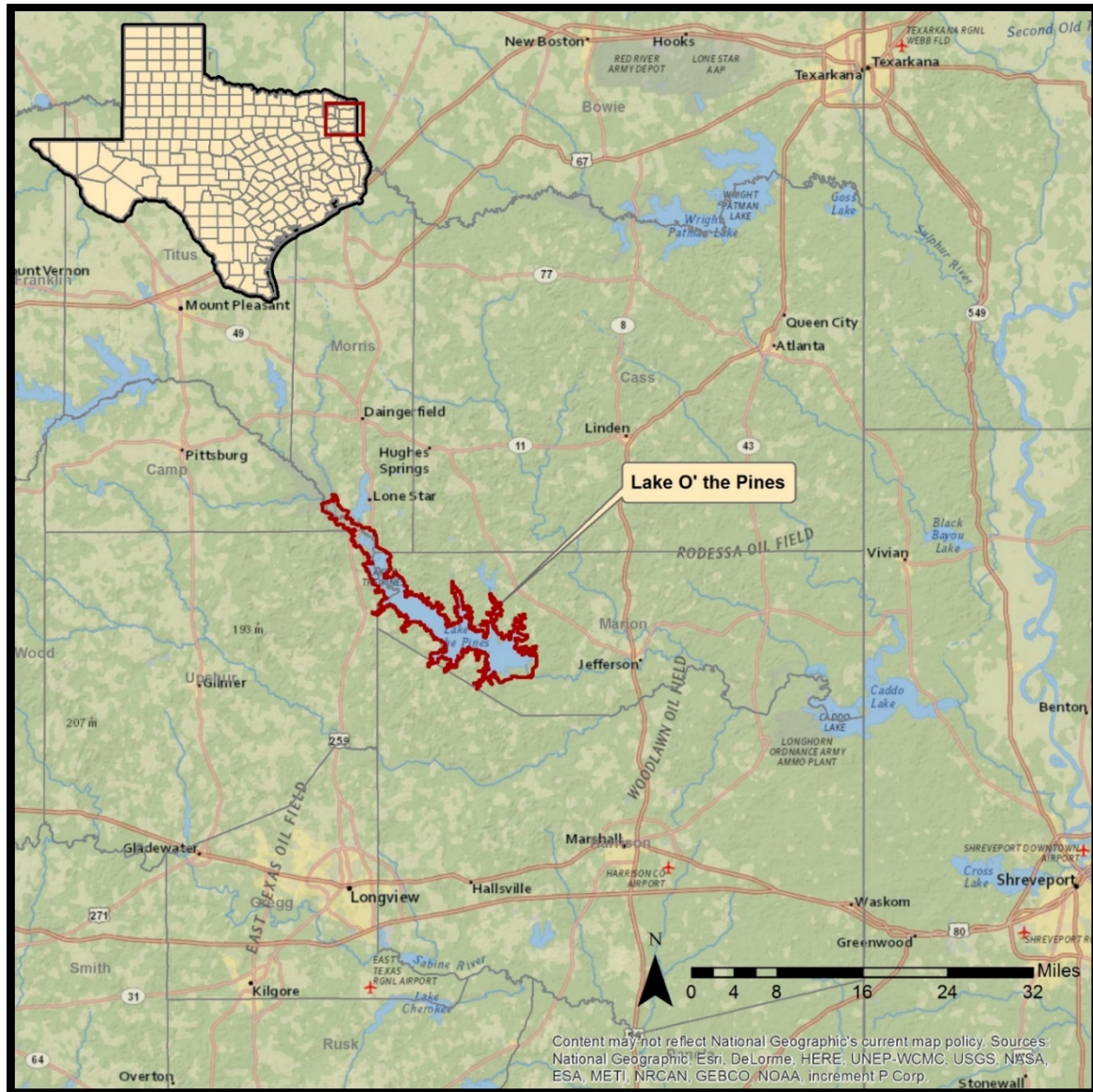


Figure 1.1 Lake O' the Pines Location Map

The dam consists of approximately four million cubic yards of rolled earth embankment and is about 10,600 feet in length, with a maximum height of about 77 feet above the original streambed. An uncontrolled concrete spillway, 200 feet in width, is located at the east end of the dam. The impounded reservoir is approximately 18 miles long and 1 mile wide with water extending into 8 tributaries. Additional purposes of both recreation and water supply were added during construction.

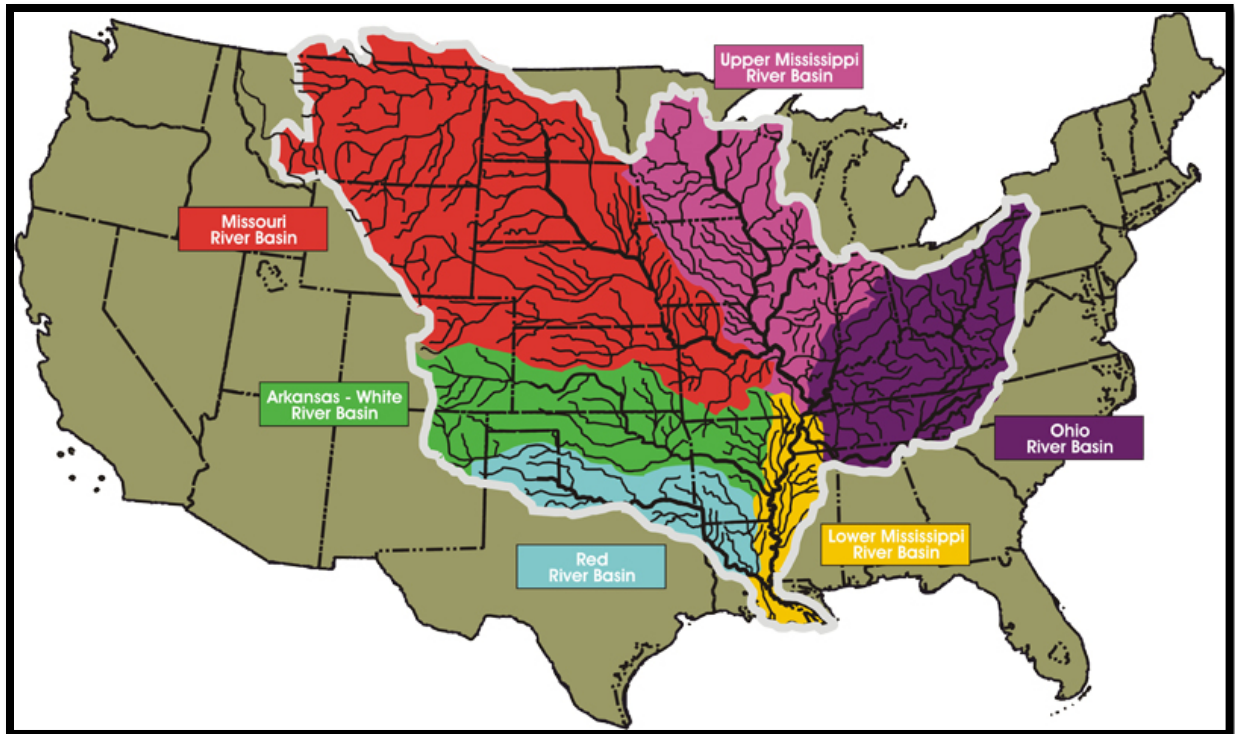


Figure 1.2 Red River Basin Location Map (Source USACE)

Big Cypress Bayou has a length of 140 miles and a total drainage area of 850 square miles. The lake provides water supply storage for the Northeast Texas Municipal Water District, which serves numerous communities throughout northeast Texas. The water supply storage exists in the conservation pool between elevations 201 feet and 228.5 feet National Geodetic Vertical Datum (NGVD29). Water intake structures are located at various points on the lake, with one downstream of the lake. Discharges from the two gates in the control structure located near the east end of the dam vary from a minimum of five (5) cubic feet per second to a maximum of 3,000 cubic feet per second. The top of the dam is at elevation 277 feet NGVD29, while the maximum design water surface can reach to 269.9 feet NGVD29. At top of flood control pool (crest of uncontrolled spillway), elevation 249.5 feet NGVD29, the lake will cover 38,200 acres and store 842,100 acre feet of water. The lake's normal conservation pool is 230.0 feet NGVD29 during the summer and 228.5 feet NGVD29 during the winter. At the winter elevation, the lake can store 241,363 acre-feet of water encompassing a surface area of 17,638 acres. Pertinent lake elevations are set forth in Table 1.2 found in Section 1.9 below.

1.5. PROJECT ACCESS

Major highway access to Lake O' the Pines is via Interstates 20 south of the lake and 30 north of the lake, U.S. Highway (HWY) 259 west of the lake, and Texas State Highway (SH) 59 east of the lake. FM 726 crosses the creek on the crown of the dam providing easy access to the north and south sides of the lake when combined with FM

450, 557, 1968, SH 155, and U.S. Highway 259. HWY 259 and SH 155 cross the lake about 17 and 14 miles northwest of the dam, respectively. FM 729 extends along the north side of the lake between SH 59 and SH 155, and FM 726 generally extends along the south side of the lake.

The Texas Department of Transportation (TXDOT) currently plans to widen Hwy 155 and construct a new bridge at Lake O' the Pines. No other new roadways or major improvements to existing roadways are planned. USACE policy at 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 Lake O' the Pines. As regional and county mobility plans call for widening of existing roadways across USACE lands, these will be addressed on a case-by-case basis.

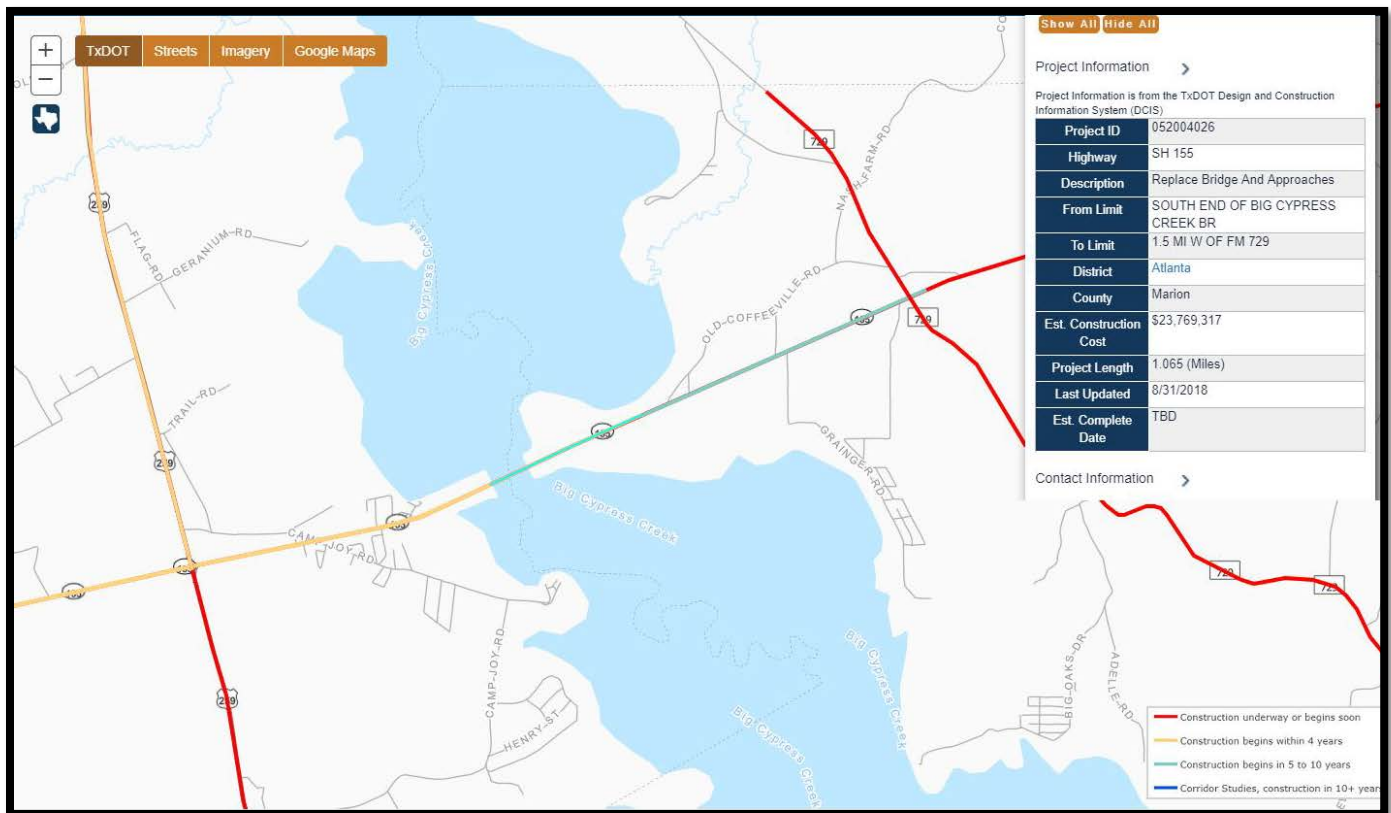


Figure 1.3 Highway 155 Alignment

1.6. PRIOR DESIGN MEMORANDUMS

Design Memorandums were prepared from 1956 thru 1970 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. The Design Memoranda for Lake O' the Pines that are most relevant to this Master Plan are listed in Table 1.1 below.

Table 1.1 Prior Design Memorandum

Design Memo	Title	Date
1	Hydrologic and Hydraulic Analyses	Mar 1953
2	General Design Memorandum	May 1953
3	Detailed Design	May 1953
4	Real Estate	Mar 1954
5	Relocations	Oct 1954
6	Reservoir Clearing	Jan 1954
7	Detailed Cost Estimate and Derivation of Annual Charges	Feb 1954
8	Channel Below Ferrell's Bridge Dam	Jan 1958
9	Channel Below Ferrell's Bridge Dam	Sep 1959
10	Recreation Facilities	Dec 1962
10A	Recreation Facilities	Apr 1963
11	Master Plan, Revised	Dec 1971
12	Master Plan	Jun 1975
13	Master Plan for Resource Use	May 1989

1.7. PERTINENT LAWS

Numerous public laws apply directly or indirectly to the management of Federal land at Lake O' the Pines. Listed below are several key public laws that are most frequently referenced in planning and operational documents. Additional information on Federal Statutes applicable to Lake O' the Pines can be found in the Environmental Assessment for the Lake O' the Pines Master Plan in the Appendix B of this Plan. A more comprehensive list of public laws can be found in Appendix G.

- 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 89-665, Historic Preservation Act of 1966. - This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
- Public Law 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 deplete-able resources.
- Public Law 95-632, Endangered Species Act Amendments of 1978. This law amends the Endangered Species Act Amendments of 1973. Section 7 directs agencies to conduct a biological assessment to identify threatened or endangered species that may be present in the area of any proposed project. This assessment is conducted as part of a Federal agency's compliance with the requirements of Section 102 of NEPA.
 - Public Law 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.

1.8. REAL ESTATE

1.8.1 Project Land Acquisition

In general, USACE acquired two types of real estate interests at Lake O' the Pines; fee simple interest and flowage easements. Fee simple interest was acquired on lands that USACE has all right, title, and interest in the property, and flowage easements was acquired on lands on which USACE has the perpetual right to periodically flood. Although flowage easement lands are privately owned, there are restrictions on their use that are listed in each specific flowage easement deed. Land acquisition for Lake O' the Pines took place under the 1953 - 1962 acquisition policy, sometimes referred to as the Eisenhower Policy, which was a very conservative land acquisition policy that applied to water resource projects administered by the Department of the Army and Department of the Interior. In general terms, this policy directed USACE to acquire fee simple interests only on lands lying below the five-year flood frequency level. Flowage easements were then obtained on lands above this level to the full pool level. Minimum additional lands were acquired in fee simple or through easements where needed for operations or for public access.

In accordance with the 1953 - 1962 Joint Acquisition Policy and pool elevation-frequency studies, the five-year flood contour was established at 236.0 feet NGVD29 at Lake O' the Pines. Below this guide taking contour, 29,033 acres of land were acquired in fee simple, which includes land for public use areas.

A perpetual flowage easement was acquired on lands for flood control between elevation 236.0 feet and 254.5 feet NGVD29. In total, a flowage easement was acquired

on 16,063 acres. Purchase of flowage easement by the Government constitutes payment for the right to periodically flood the land and for the damage and expense to the landowner resulting from project operation. Construction of buildings for habitation, alteration of the existing terrain in a way that reduces flood storage capability, or a raise in elevation of the land above 254.5 feet NGVD29 is not be permitted in the flowage easement area. Construction of structures and improvements for use other than habitation require formal written authorization and coordination with USACE Operations and Real Estate Divisions.

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

In addition to the flowage easement, Lone Star Steel permits the USACE to periodically inundate 124.54 acres during flood events. Lone Star Steel has the primary authority and responsibility for management of these lands and retains the rights to develop and permit USACE to flood lands.

1.8.2 Forest Products/Timber Sales

Forest products generated through clearing, flood damage and salvage operations, or planned harvests, and not required for USACE use, will be sold. Disposal procedure for standing timber is a real estate function, and all proposed sales incorporate a disposal plan. Planning for the sale of forest products is initiated by USACE personnel working at the lake. The disposal plan includes justification for the sale, sale boundaries, volume estimates, and harvest conditions. Timber sales are administered through USACE, Real Estate Division, Fort Worth District. A complete description of the forest management efforts at Lake O' the Pines is provided in Section 2.2.9.

1.8.3 Outgrants

Outgrants at Lake O' the Pines include easements, licenses, leases, consents and other formal real estate documents wherein USACE has granted a legal interest in real property. A summary of outgrants at Lake O' the Pines is provided as follows:

- Easements: 62
- Licenses: 5
- Consents: 26
- Leases: 6
- Total Outgrants: 99

Personnel of the Fort Worth District Real Estate Division, in coordination with Operations Division, Safety Office, and Lake O' the Pines staff, conduct compliance inspections of major outgranted areas annually in accordance with applicable regulations and policies.

Individuals and companies interested in lease acquisition to provide services to the public on USACE fee lands should be aware that specific restrictions and procedures apply to such leases. In many cases, individuals or commercial entities will be encouraged to pursue a sublease with an existing lessee, such as with a marina. Any leases for new services are subject to a competitive bidding process following market studies and a determination by USACE that the prospective service or product would be beneficial to users at Lake O' the Pines. Questions regarding this topic can be directed to the lake office.

1.8.4 Trespass and Encroachment

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

The term "encroachment" pertains to an unauthorized structure or improvement on Government property. When encroachments are discovered, lake personnel will attempt to resolve the issue at the project level. Where no resolution is reached, or where the encroachment is a permanent structure, the method of resolution will be determined by Real Estate Division, with recommendations from Operations Division and Office of Counsel. USACE's general policy is to require removal of encroachments, restoration of the premises, and collection of appropriate administrative costs and fair market value for the term of the unauthorized use.

1.9. PERTINENT PROJECT INFORMATION

Table 1.2 outlines information regarding existing reservoir storage capacity at Lake O' the Pines. Water storage capacity estimates were calculated from the 228.5 feet NGVD29 conservation pool.

Table 1.2 Pertinent Data Table

Feature	Elev Feet* (NGVD29)	Reservoir Area (acres)	Reservoir Capacity			Total Spillway Capacity (cfs)	Outlet Works Capacity
			Accumulative (ac-ft)	Runoff (inches)	Incremental (ac-ft)		
Top of Dam	277.0						
PMF Design Water Surface (1982 Study)	272.3	67,300	1,998,740	44.09			
Max. Design Water Surface (1953 Study)	269.9	63,200	1,855,000	40.94		79,664	Closed
Top of Flood Control pool & Spillway Crest	249.5	38,200	842,100	18.58			6,400
Top of Conservation Pool (2009 Survey)	228.5	17,638	241,363	5.32	241		4,400
Bottom of Conservation Pool (2009 Survey)	201.0	1,049	3,147	0.07			
Invert of Conduit (2009 Survey)	200.0						
Streambed (2009 Survey)	180.0						
* The elevation listed here is based on the datum of NGVD29. The datum conversion from NGVD29 to NAVD88 is NGVD29-0.2 feet = NAVD88							
** Estimated 50 years of sediment storage below elevation 249.5 feet NGVD29 was 2,150 acre-feet. Actual sediment based on 2009 Texas Water Development Board survey is estimated as being greater than 13,000 , acres-feet Upper guide contour for acquisition of flowage easement is 254.5 feet NGVD29 Source: USACE Water Control Manual							

CHAPTER 2: PROJECT SETTING AND FACTORS INFLUENCING MANAGEMENT AND DEVELOPMENT

2.1. PHYSIOGRAPHIC SETTING

Physiographic settings are the Earth's distinct landform regions defined in a three-tiered system of (1) physiographic divisions; (2) physiographic provinces; and (3) physiographic sections. Lake O' the Pines is in the Piney Woods section of the South Central Plains. The Pineywoods region can be described as pine and pine-hardwood forests with scattered areas of cropland, planted pastures, and native pastures.

2.1.1 Ecoregion Setting

Lake O' the Pines is located in the South Central Plains level III ecoregion and Tertiary Uplands (35a) level IV ecoregion (Figure 2.1) as mapped and described by the Environmental Protection Agency (EPA.) The 2012 Texas Conservation Action Plan (TCAP) refers to this ecoregion as the Western Gulf Coastal Plain ecoregion, often called the Pineywoods of east Texas. The vegetation of the South Central Plains level III ecoregion is sometimes described as the western edge of the southern coniferous forest belt of the continental United States.

The Pineywoods region of Texas is rich with meandering rivers and complex forests and woodlands. Oak-Pine and shortleaf pine forests, longleaf pine savannah in southern portions, and bottomland hardwoods form the native forest overstory in this ecoregion. This area is habitat to a wide variety of wildlife and fish resources in the periodically flooded river edges and oxbow lakes; unique swamps, bogs, fens, springs and seeps, as well as lush, open meadows where rare plants and plant communities abound.

The rolling Tertiary Uplands, gently to moderately sloping, cover a large area in east Texas, southern Arkansas, and northern Louisiana. The landscape is dissected by numerous small streams, and the region contains a diversity of habitats and species. In east Texas, Tertiary deposits are mostly Eocene sediments, with minor amounts of Paleocene and Cretaceous sediments in the north. Soils are mostly well-drained Ultisols and Alfisols, typically with sandy and loamy surface textures. The natural vegetation has been altered by multiple timber harvests and commercial pine plantation activities. The pine-hardwood forests includes tree species of loblolly pine (*Pinus taeda*), shortleaf pine (*P. echinata*), southern red oak (*Quercus falcata*), post oak (*Q. stellata*), white oak (*Q. alba*), hickory (*Carya spp.*), and sweetgum (*Liquidambar styraciflua*), and mid and tall grasses such as yellow Indiangrass (*Sorghastrum nutans*), pinehill bluestem (*Schizachyrium scoparium var. divergens*), narrowleaf woodoats (*Chasmodon sessiliflorum*), and panicums (*Panicum spp.*). American beautyberry (*Callicarpa americana*), sumac (*Rhus spp.*), greenbriar (*Smilax spp.*), and hawthorn (*Crataegus spp.*) are part of the understory. The sandier areas, mostly found on the Sparta, Queen City, and Carrizo Sand Formations, often have more bluejack oak (*Quercus incana*), post oak (*Q. stellata*), and stunted pines. Pine density is less than in Ecoregions 35e and 35f to the south.

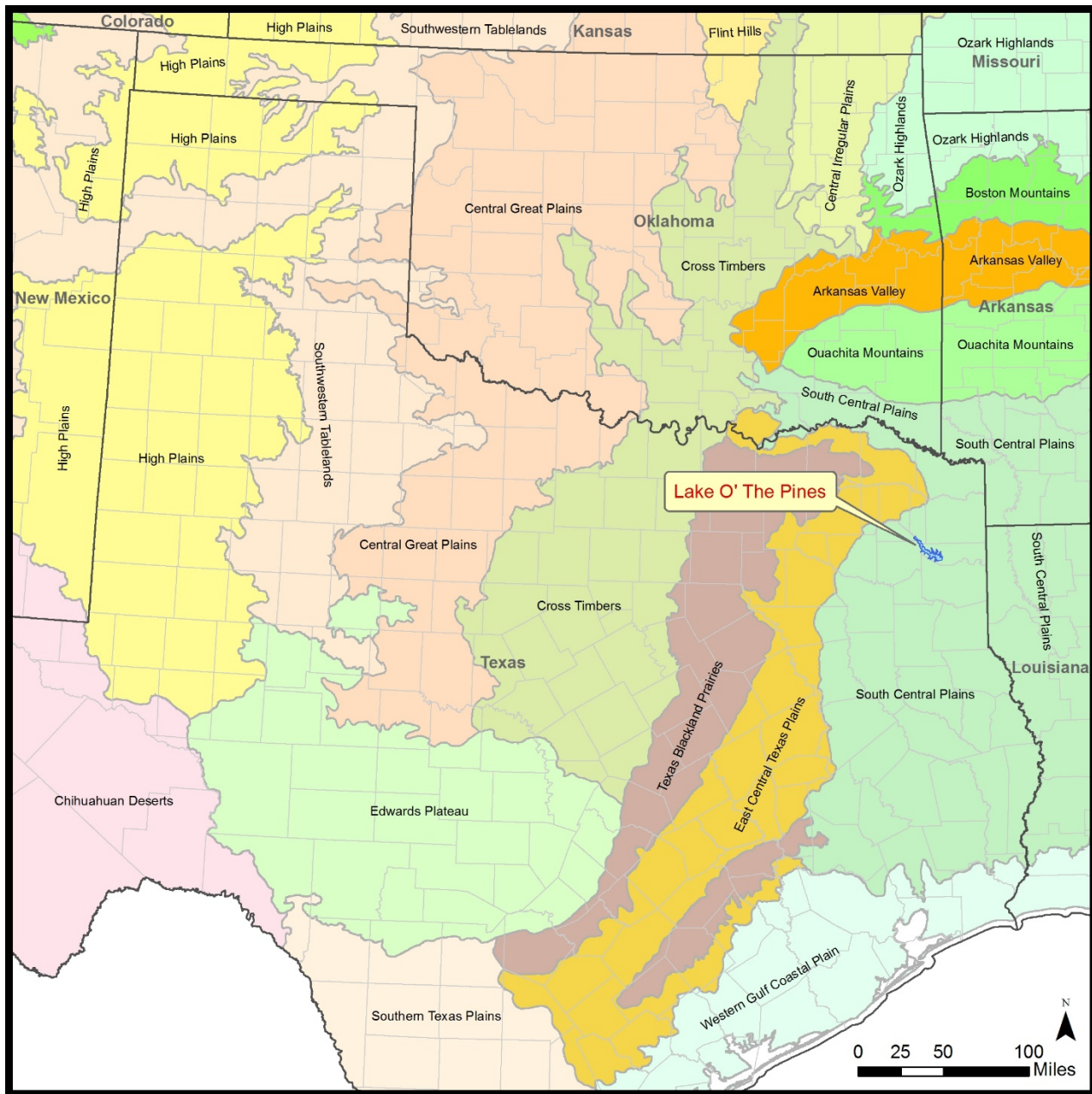


Figure 2.1 Ecoregions of Texas (Source: Environmental Protection Agency)

2.1.2 Climate

The USACE lake missions of flood risk management, water supply, fish and wildlife, and recreation all serve to protect the built and natural resources of a region from the climate extremes of drought and floods. This creates a more resilient and sustainable region for the health, welfare, and energy security of its citizens. Maintaining a healthy vegetative cover and tree canopy on Federal lands within the constraints imposed by primary project purposes helps reduce stormwater runoff and soil erosion, mitigates air pollution, and moderates temperatures.

Lake O' the Pines lies in a region characterized as warm, moist, humid, and subtropical. The area has hot, humid, long summers, with occasional temperatures of 100 °F, and short, moderate winters. However, sharp extremes are occasionally recorded as short duration freezes can occur throughout the winter. The prevailing air mass is north and western during late fall, winter and early spring, and prevailing gulf air masses the rest of the year.

Temperatures in July, August, and September are usually relatively high, so areas exposed to southern breezes are cooler than those without the exposure, so that the parks along the northern shoreline tend to be cooler in the summer. The average annual temperature is 71°F with monthly averages ranging from a maximum of 83°F for July and a minimum of 44°F for January. Extreme temperatures vary from 118°F to -13°F.

The average annual rainfall is about 45 inches, with extremes varying from 28 to 61 inches. Maximum rainfall usually occurs in April and May, while the minimum occurs in August and September. Severe frontal-type storms are rare, but intense summer thunderstorms occur frequently, depositing rain over broad areas.

2.1.3 Geology and Topography

Lake O' the Pines is situated in the West Gulf Coastal Plain section of the Coastal Plain physiographic province. The topography of land surrounding Lake O' the Pines is generally rolling, hilly uplands terrain averaging 200-500 feet, dissected by flat floodplains and terraces. Some hills are visible from the lake rise as much as 200 feet above the shoreline.

Lake O' the Pines lies within the outcrop belt of the Queen City Formation. The land surface at Lake O' the Pines has developed upon a sequence of sedimentary rock units that dip slightly more steeply toward the Gulf than the land surface, resulting in successively younger formations cropping out gulf-ward. Queen City Formation is composed of a fine-grained quartz sand varying in color from light to brownish gray. It is locally carbonaceous, contains clay, and slightly lignitic. It contains beds of glauconite, quartz green sand, and cross bedding. The thickness ranges from 100-400 feet.

The age of rock units ranges from Early Cretaceous to Quaternary (Recent Epoch). The lake lies within the East Texas Timber Belt, which consists of sandy, wooded, hilly, terrain developed on formations of Eocene (Early Tertiary) age. On the north side of the lake the hills are supported by the erosional-resistant Weches Formation, and the higher hills are capped by sands of the Sparta Formation. Surface outcrops in this area are very thin, only few feet in some locations. Small reservoirs are present on the two major streams flowing across the Weches Formation, which trap sediment before it gets to the lake.

2.1.4 Hydrology and Groundwater

Lake O' the Pines is located on Cypress Creek. Its watershed drains approximately 850 square miles above the dam and spans 6 counties (Marion, Harrison, Upshur, Camp,

Titus, and Morris) in Northeast Texas. According to the latest TWDB survey (2009), at the winter conservation pool (228.5 feet NGVD29), the reservoir contains 17,638 surface acres of water. At top of flood pool (249.5 feet NGVD29), the total storage is 842,100 acre-feet. The water supply pool capacity is 241,363 acre-feet, and covers the area of 17,638 acres. Fluctuation within the conservation pool depends upon the rate of withdrawals for water supply by the water supply entities as well as inflows and evaporation. The Lake O' the Pines ecological drainage unit sub-basin includes the ecologically significant Big Cypress Creek stream segment.

The main source of ground water in the lake area is the Cypress aquifer, which consists of four hydraulically connected units: the Wilcox group, the Carrizo Sand, the Reklaw Formation, and Queen City Sand. The ground water monitoring well in the Carrizo-Wilcox aquifer shows that water level has risen in the past few years. None of the counties spanning Lake O' the Pines is in the groundwater conservation districts. The water from shallow wells generally contains less than 500 mg/l dissolved solids and is excessive only in its iron content. The water conservation purpose of Lake O' the Pines is described in Section 1.2.

2.1.5 Soils

Lake O' the Pine is located in the Cypress Valley Watershed, which is underlain by southeasterly dipping sand, ingite, glauconite, and clay. The soil is fertile, sandy loam soils, which are generally acidic and mostly pale to dark gray sands or sandy loams with gravelly surface. The most dominant soil order at the Cypress River basin is Ultisol order. Ultisol is an ochric epipedon and argillic or kandic horizon that has few bases and commonly is calcium deficient. It supports mixed coniferous and hardwood forest vegetation as well as cropland and pasture. Other soil orders in the area include Alfisol (suborder Udalfs), Entisol (suborder Fluvent), and Vertisol (suborder Aquerts.)

Lake O' the Pines is situated in the Western Coastal Plain and Flatwoods in the soil map of Texas. The major soil group in the area of Lake O' the Pines are Cuthbert-Bowie-Kirvin and Trawick-Eastwood-Scottisville. The soils are formed on nearly level to sloping plains dissected by perennial streams and their tributaries. The parent material for the soils are alluvial and marine sediments of Tertiary age. Pinewoods soils are mostly highly weathered, acidic soils that support pine-hardwoods vegetation. Cuthbert- Bowie- Kirvin and Eastwood-Scottisville are deep soils that occur on inter-stream divides and low ridges.

A soil survey by the Natural Resource Conservation Service (NRCS) shows there are six out of the eight possible general classifications (Classes I through Class VIII) occurring in the reservoir area. The erosion hazards and limitations for use increase as the class number increases. Class I has few limitations, whereas Class VIII has many. The soil class data for project lands and a general description of the soils at Lake O' the Pines along with the land capability classes are provided in Table 2.1 This data is compiled by the NRCS and is a standard component of natural resources inventories on USACE lands. This, and other inventory data, is recorded in the USACE Operations and Maintenance Business Information Link (OMBIL). Detailed information on all soil types surrounding Lake

O' the Pines is available on websites maintained by the NRCS, U.S. Department of Agriculture.

Table 2.1 Soil Classes

Soil Class	Acreage	Description
Class I	0	<i>Class I</i> soils have slight limitations that restrict their use
Class II	760	<i>Class II</i> soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
Class III	1,980	<i>Class III</i> soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.
Class IV	260	<i>Class IV</i> soils have very severe limitations that restrict the choice of plants or require very careful management, or both.
Class V	3,039	<i>Class V</i> soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
Class VI	2,876	<i>Class VI</i> soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.
Class VII	255	<i>Class VII</i> soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.
Class VIII	0	<i>Class VIII</i> soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for aesthetic purposes.
Unassessed	91	

2.2. ECOREGION AND NATURAL RESOURCE ANALYSIS

Natural resources include the vegetation, wetland, wildlife, fisheries and aquatic resources, and the endangered, threatened and candidate species present in the vicinity of Lake of the Pines.

2.2.1 Vegetative Resources

USACE regulations and policy require a basic inventory of the vegetation at all operational projects. This inventory, referred to in EP 1130-2-540 as a Level 1 inventory, classifies the vegetation in accordance with the National Vegetation Classification System (NVCS) down to the Sub-Class level which is a very broad classification level. The inventory data, presented in Table 2.2, is recorded in the USACE national database referred to as the Operations and Maintenance Business Information Link (OMBIL) and is useful in providing a general characterization of the vegetation on all operational projects. Daily management of USACE lands requires more detailed knowledge of the vegetation

down to the Association level within the NVCS, and for most management prescriptions, down to the individual species level of dominant vegetation.

Table 2.2 Vegetation Classification and Condition 2016 Inventory

Division	Order	Class	Sub-Class	Total Sub-Class Acreage	Sustainable Areas	Transitioning Acres	Degraded Acres	Total Conditioned Acres
Non-Vegetated	Non-Vegetated	Non-Vegetated	Non-Vegetated	14,634	14,634	0	0	14,364
Vegetated	Herb Dominated	Herbaceous Vegetation	Hydromorphic rooted vegetation	3,431	431	1,000	2,000	3,431
Vegetated	Herb Dominated	Herbaceous Vegetation	Perennial gramimoid vegetation (grasslands)	283	0	83	200	283
Vegetated	Scrub Dominated	Shrubland (Scrub)	Deciduous shrubland (scrub)	40	0	20	20	40
Vegetated	Tree Dominated	Closed Tree Canopy	Deciduous closed tree canopy	5,188	588	600	4,000	5,188
Vegetated	Tree Dominated	Closed Tree Canopy	Evergreen Forest	3,175	1,175	1,000	1,000	3,175
Vegetated	Tree Dominated	Closed Tree Canopy	Mixed evergreen-deciduous closed tree canopy	890	90	400	400	890
Vegetated	Tree Dominated	Open Tree Canopy	Mixed evergreen-deciduous open tree canopy	1,400	0	0	1,400	1,400
LAKE O' THE PINES TOTALS				29,041	16,918	3,103	9,020	29,041

Note: Classification information is derived from the National Vegetation Classification System

Using habitat types and descriptions from the TCAP and EPA ecoregion descriptions, the following are the major habitat types found on USACE lands at Lake O' the Pines. Species listed are representative of dominant species found in each habitat type but should not be considered a comprehensive listing.

Pine Forest: Generally on drier sites, this is a dominant habitat type that is represented in Table 2.2 as "Evergreen forest." Pine forests are generally closed tree canopy forests dominated by loblolly pine, shortleaf pine, or a mixture of these two species. Most of the pine forest on USACE land is naturally occurring, but there are a few remnant pine plantations that were established prior to Federal ownership. Where these remnant plantations exist, slash pine may be present. These forests will generally have a minor component of deciduous trees including sweetgum, blackgum, post oak, white oak, southern red oak, mockernut hickory, shagbark hickory, American elm, winged elm, and eastern redcedar.

Pine-Oak Forest: Typically occurring on more mesic sites, this habitat type is approximately equal in abundance on USACE lands to the pine forests described above. The pine-oak forest is represented in Table 2.2 as "mixed evergreen-deciduous" forest.

Dominant and co-dominant tree species include loblolly and shortleaf pine, white oak, southern red oak, cherrybark oak, Shumard oak, hickories, black walnut, sweetgum, magnolia, and black gum.

Bottomland Hardwoods: Located along flat riverine corridors, primarily in the upper reaches of Lake O' the Pines above and below U.S. Hwy 259; along upper arms of creeks such as Alley, Johnson, Arms, Hurricane, Brushy, Sandy, Meddlin and Copeland Creeks; and below the dam, this habitat type is approximately equal in abundance to the pine forest and pine-hardwood forests and is represented in Table 2.2 as "deciduous closed tree canopy." Dominant and co-dominant species include water oak, willow oak, overcup oak, nuttall oak, swamp chestnut oak, red maple, water tupelo, river birch, bald cypress, and green ash.

Forested Wetland: Located along flat shoreline areas and the upper Big Cypress Creek areas of the reservoir this habitat type is included in the "deciduous shrubland" listed in Table 2.2. This habitat type is dominated by buttonbush flats with occasional stands of bald cypress.

Perennial Grassland: This minor habitat type is located primarily on the downstream slope of Lake O' the Pines dam and in isolated pockets in developed park areas. Grass species in these areas is dominated by exotic bermudagrass and Bahia grass with a minor component of native grasses.

Emergent Wetlands: This habitat type consists of rooted aquatic plants in shallow areas of the reservoir that are generally protected from exposure to strong wind and wave action. The dominant native species include American lotus and soft-stem bulrush. Introduced species include cattail.

A Wildlife Habitat Appraisal Procedure (WHAP) was completed in conjunction with the Lake O' the Pines Lake Master Plan and associated Environmental Assessment (EA). USACE looked at points throughout USACE land at Lake O' the Pines and scored them based on their value for wildlife habitat from a low of 0 to a high of 100. A total of 80 WHAP points around the lake were selected, all within USACE fee property. The major habitat types selected and assessed were pine forest, mixed pine forest, bottomland hardwoods, and wetlands. The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. The average, maximum, and minimum total score for each habitat type surveyed is shown in Table 2.3. The WHAP report and results can be found in Appendix E of this Plan.

Table 2.3 Average, Maximum, and Minimum Total Scores per Habitat Type

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Riparian Swamp	82	82	81
Bottomland Hardwood	78	89	71
Mesic Deciduous Forest	71	75	67
Mixed Deciduous	70	71	68
Mixed Deciduous Forest	68	68	68
Floodplain Marsh	68	76	60
Flatwoods Mixed Forest	67	79	54
Mixed Pine	65	78	56
Deciduous Forest	62	76	49
Mixed Forest	59	76	50
Pine Forest	59	81	36
Riparian CD Forest	56	71	41
Floodplain Forest	47	47	47
Grassland-Food Plot	40	40	40
Grassland	39	39	39
Grassland-Maintained	23	30	15

2.2.2 Wetland Resources

USACE has nationwide jurisdiction over waters of the United States, including wetlands as defined within the Clean Water Act (CWA). Wetlands are a subset of the waters of the United States that may be subject to regulation by USACE under Section 404 of the CWA (40 CFR 230.3). The legal definition of wetlands includes those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetlands are also defined and inventoried by the United States Fish & Wildlife Service using the Cowardin system of wetland classification. The Cowardin system is used by USACE to inventory wetlands that may be present on USACE-administered Federal lands.

As a result of the topography of the region of Lake O' the Pines, wetlands generally occur near the rivers and flatter areas on the eastern portion of the lake above Hwy 155 and above US 259. There are also some significant yet smaller parcels at the upper end sections of the major creek drainages, and some parcels below the dam. Table 2.4 lists the acreages of various types of wetlands present at Lake O' the Pines. Wetland classifications presented in the table are derived from the United States Fish and Wildlife Service (USFWS) Trust Resource List generated through the Information, Planning, and Conservation System (IPaC) decision support system.

Table 2.4 Wetland Resources

Wetland Types	Total Acres
Freshwater Emergent Wetland	34
Freshwater Forested/ Shrub Wetland	3,076
Freshwater Pond	30
Lake	17,846
Riverine	27
Other	8

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



Photo 2.1 Wetland Area at Lake O' the Pines
(Source: USACE - Lake O' the Pines WHAP)

2.2.3 Fish and Wildlife Resources

Fish and wildlife are an essential component of management and public use at Lake O' the Pines. Approximately 5,892 acres of USACE lands and 17,638 water surface acres are dedicated to fish and wildlife habitat management for multiple purposes including wildlife areas, threatened and endangered species, improvement of habitat for migratory birds and Species of Greatest Conservation Need (SGCN) as listed by Texas, and sustainability of habitat for game species such as turkey and whitetail deer. USACE directly manages habitat, access, and public use on approximately 4,500 acres that are available for public hunting.

2.2.3.1 Fish Resources

The waters of Lake O' the Pines provide abundant and diverse habitats for several species of warm-water fish, several of which were introduced or stocked in the lake. Recreational fishing continues to be an important aspect of the overall recreational program enjoyed by visitors to the lake. Some of the most common game fish in the lake for boaters and anglers are: largemouth bass (*Micropterus salmoides*), spotted bass (*Micropterus punctulatus*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), white bass (*Morone chrysops*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), bluegill sunfish (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), longear sunfish (*Leopomis megalotis*), redbreast sunfish (*Lepomis auritus*), redear sunfish (*Lepomis microlophus*), warmouth (*Lepomis gulosus*), and chain pickerel (*Esox niger*.)

While Lake O' the Pines is operated by USACE, the Texas Parks and Wildlife Department (TPWD) remains the primary agency in charge of managing the fisheries resources. The fish stocking history shows that the lake is stocked with Florida largemouth bass (*Micropterus salmoides*) fingerling sized for the last decade every other year, however it was discontinued due to low angler utilization. From the first of December to the last day in February TPWD requires anglers to keep the first 25 crappie they catch each day regardless of size to minimize excess mortality due to fish being caught in deep water.

Natural fish habitat consists of large expanses of water, offshore humps, and areas of limited standing timber, rock, coarse gravel, and mud or sand flats. Aquatic vegetation coverage ranges from 15% to 20% of the lakes surface area, with dominant species of hydrilla, buttonbush, water primrose and American lotus, though hydrilla is an invasive species of concern. Buttonbush is a common native shrub along the shorelines in many areas, growing at or above conservation pool and provides good spawning and nursery habitat when seasonally inundated.

TPWD has placed fish attractors, mapped in Figure 2.2, made of plastic pipe, tree tops and PVC cubes, installed in 2017, which was partially funded by revenue from the Texas largemouth bass conservation license plate. USACE, Northeast Texas Municipal Water District, the Cypress Basin Chapter of the Texas Master Naturalist Program, and other local partners assisted TPWD staff with construction and installation of these structures. Additional fish habitat includes man-made structures such as rip-rap, natural and artificial brush piles, and boat docks.

This lake's diverse fish community offers many angling opportunities. White bass are native to the Cypress River Basin; the population is abundant and contains many legal-size fishes. Crappie, also popular with anglers, are quite abundant with large proportions of legal-size fish available. Both white and black crappie are present with black crappie being the dominant species. Channel, blue, and flathead catfish are all present. The largemouth bass population is abundant with many legal-size fish available for harvest. Sunfish (bluegill, redear, and redbreast) are abundant with quality-size fish available.

Mercury contamination is a concern in Big Cypress Creek downstream from Lake O' the Pines in Marion County. For largemouth bass and freshwater drum, adults should limit consumption to no more than two (2), 8-ounce meals per month, and children should limit consumption to no more than two (2), 4-ounce meals per month. While no consumption advisories have been issued for Lake O' the Pines, there are consumption advisories for Ellison Creek Reservoir (above LOP) and Big Cypress Creek (below LOP).

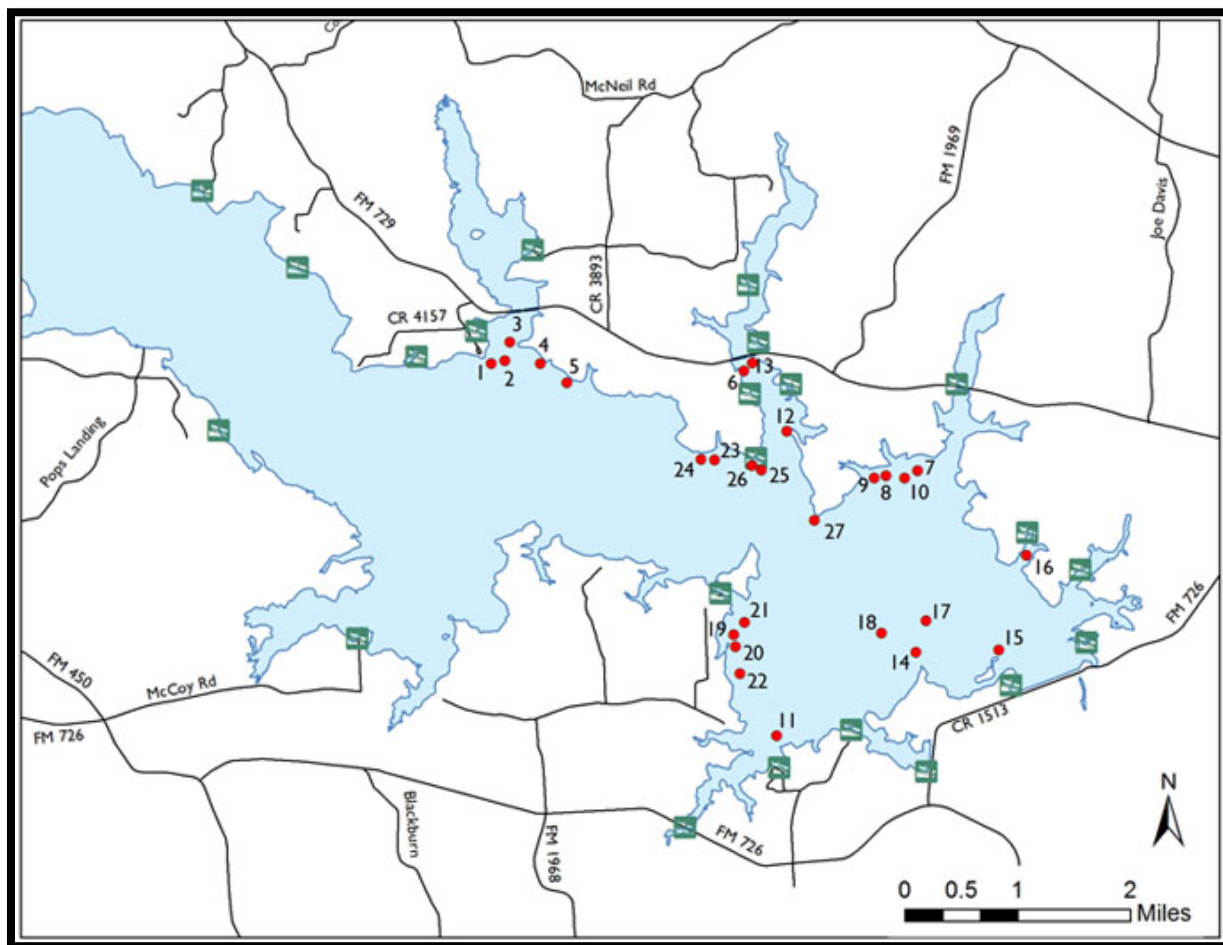


Figure 2.2 Location of Fish Attractors at Lake O' the Pines
(Source: TPWD)

2.2.3.2 Wildlife Resources

Lake O' the Pines public lands are managed by natural resource professionals from USACE and TPWD cooperatively to preserve and enhance the natural beauty of the landscapes, manage habitats, promote vegetation succession for diversity and desirable species, control erosion, control invasive species, protect federally and state listed rare and endangered species, ensure natural wildlife food sources, and, in general, to improve and sustain the carrying capacity of lands and waters for diverse, healthy populations of native terrestrial and aquatic animal species. The major habitats at Lake O' the Pines are described in Section 2.2.1 Vegetative Resources. Due to the quantity and diversity of terrestrial habitats on public lands around Lake O' the Pines there are many opportunities for consumptive recreation (hunting and fishing) and non-consumptive recreation (hiking, nature study/wildlife viewing, bird-watching, photography, outdoor education).

Most of the wildlife around at Lake O' the Pines are year-round residents of the area. Some species of birds are migratory and only in the area during migration, nesting or overwintering. Many of the birds and mammals use two or more of the vegetation communities in the project area for food or shelter. Many species, including waterfowl, upland game birds, and beaver use the riparian habitat and the bottomland hardwoods.

Common game species at the project include eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), swamp rabbit (*Sylvilagus aquaticus*), mourning dove (*Zenaida macroura*), northern bobwhite (*Olinus virginianus*), various waterfowl, feral hogs (*Sus scrofa*), and eastern wild turkey (*Meleagris gallopavo*). Figure 2-3 shows hunting areas at Lake O' the Pines. These areas are subject to annual review and changes as needed to reflect changes in TPWD regulations, wildlife populations, and public safety issues.

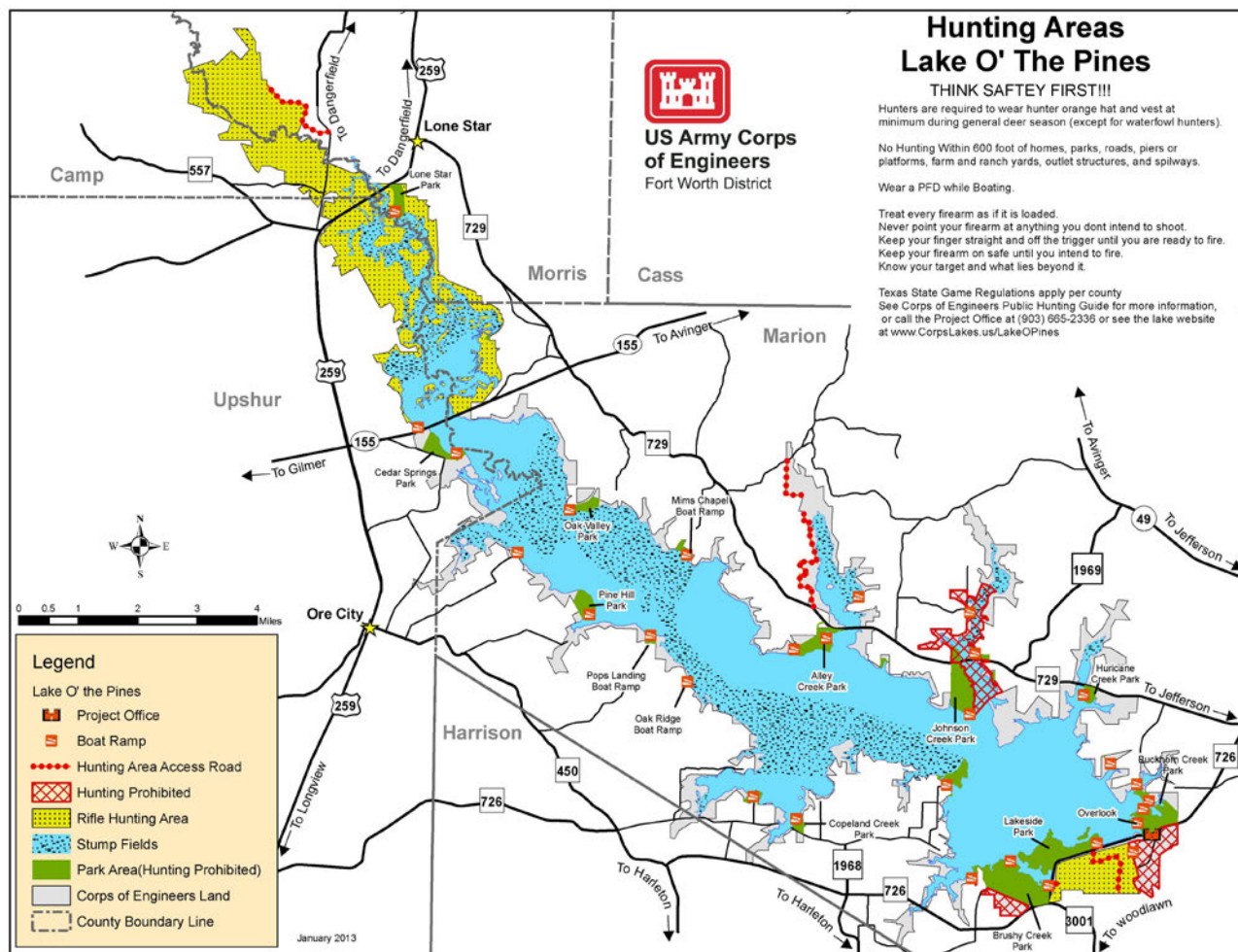


Figure 2.3 USACE Hunting Areas – Lake O’ the Pines

(Source: USACE Note: Grey areas on map are USACE lands open for hunting purposes.)

Other mammal species at the project include southern short tailed shrew (*Blarina carolinensis*), Seminole bat (*Lasiurus seminolus*), ringtail Virginia opossum (*Didlphis viriniana*), Rafinesque big-eared bat (*Corynorhinus rafinesquii*), common gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), eastern gray squirrel (*Sciurus carolinensis*), eastern flying squirrel (*Glaumoyos volans*), Attwater’s pocket gopher (*Geomys attwateri*), marsh rice rat (*Orzomys plaustris*), eastern harvest mouse (*Reithrodonmys humulis*), cotton mouse (*Peromyscus gossypinus*), prairie vole (*Microtus ochrogaster*), and river otter (*Lontra canadensis*). All types of wildlife contribute to the many forms of outdoor recreation, including hunting, fishing, or wildlife viewing.

The variety of habitats at Lake O’ the Pines support numerous species of migratory waterfowl and wading birds, migratory neotropical and nearctic birds, upland game birds, raptors, and songbirds as well as numerous mammals, amphibians, fish and reptiles. It is not the purpose of this Plan to list all species of flora and fauna that may exist in the study area. Comprehensive listings are available from numerous sources including websites maintained by the TPWD.

2.2.4 Threatened and Endangered Species

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

Threatened species are those which are likely to become endangered within the foreseeable future. Endangered species are in danger of extinction throughout all or a significant portion of their range. The USFWS IPaC states that several species of birds and flowering plants were identified as federally threatened and endangered species that potentially occur within USACE operated property at Lake O' the Pines.

Table 2.5 indicates the various species of birds and flowering plants listed by the USFWS as Threatened, Endangered or Candidate species that could potentially be found at Lake O' the Pines. Additionally, two formally listed species; the Louisiana Black Bear (*Ursus americanus luteolus*) and the Bald Eagle (*Haliaeetus leucocephalus*), are potential and common occurrences, respectively, at Lake O' the Pines.

While the Bald Eagle is no longer protected by the Endangered Species Act, the Bald and Golden Eagle Protection Act prohibits the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any Bald or Golden Eagle, alive or dead, including any part, nest, or egg, unless allowed by permit..

Table 2.5 Federally-Listed Threatened and Endangered Species

Common Name	Scientific Name	Federal Status	Occurrence
Birds			
Least Tern	<i>Sterna antillarum</i>	E	Migrant
Piping Plover	<i>Charadrius melodus</i>	T	Migrant
Red Knot	<i>Calidris canutus rufa</i>	T	Migrant
Flowering Plants			
Neches River Rose-Mallow	<i>Hibiscus dasycalyx</i>	T	Rare
Geocarpon	<i>Geocarpon minimum</i>	T	Rare

Federal Listings: E - Endangered, T - Threatened, C - Candidate

Occasional: Species is present on project site, but seen only a few times or during seasonal events.

Rare: Species is present on project site and seen at intervals of 2 to 5 years, or is present in limited numbers.

The piping plover, least tern, and red knot all potentially use the reservoir when favorable open shoreline habitat is available. However, they are only to be considered for

environmental impacts in the Lake O' the Pines area if a project entails wind energy development.

Various state-listed threatened and/or endangered species, potentially Lake O' the Pines and associated tracts of land administered by USACE. TPWD describes state-listed species occurrences on a county by county basis. Lake O' the Pines spans across six Texas counties including Marion, Harrison, Upshur, Camp, Titus, and Morris. Table 2.6 summarizes TPWD's six county reports for state listed species potentially occurring at Lake O' the Pines. TPWD also maintains a list of rare species by county. The county listings are provided in Appendix C. Additionally, TPWD maintains a list of Species of Greatest Conservation Need (SGCN) for the Pineywoods ecoregion. The listing of these species, many of which occur or potentially occur on USACE administered lands and waters at Lake O' the Pines, is also provided at Appendix C.

Table 2.6 State-Special Status Species

Species	Habitat	State Status	Occurrence
Birds			
Bachman's Sparrow (<i>Aimophila aestivalis</i>)	Open pine woods with scattered bushes and grass understory, overgrown fields, and remnant grasslands.	T	Rare
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; all reservoirs in north Texas are considered potential nesting habitat.	T	Common
Least Tern (<i>Sterna antillarum</i>)	Wintering migrant along the Texas Gulf Coast; prefers beaches and bayside mud or salt flats. Critical habitat designated outside of USACE property along the Gulf Coast.	E	Potential
Peregrine Falcon (<i>Falco peregrinus</i>)	Year-round resident and local breeder in west Texas, nests on high cliffs, often near water where prey species are most common.	T	Potential
Piping Plover (<i>Charadrius melodus</i>)	Wintering migrant along the Texas Gulf Coast; prefers beaches and bayside mud or salt flats. Critical habitat designated outside of USACE property along the Gulf Coast.	T	Potential

Species	Habitat	State Status	Occurrence
Wood Stork (<i>Mycteria americana</i>)	Prairie ponds, flooded fields, mud flats, shallow standing water, roosts in tall snags.	T	Potential
Mammals			
Black Bear (<i>Ursus americanus</i>)	Bottomland hardwoods and large tracts of inaccessible forested areas; due to field characteristics similar to Louisiana Black Bear, treat all east Texas black bears as state listed threatened.	T	Potential
Louisiana Black Bear (<i>Ursus americanus luteolus</i>)	Bottomland hardwoods, large tracts of inaccessible forested areas.	T	Potential
Rafinesque's Big-eared Bat (<i>Corynorhinus rafinesquii</i>)	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.	T	Potential
Fish			
Blackside Darter (<i>Percina maculata</i>)	Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles.	T	Rare
Bluehead Shiner (<i>Notropis hubbsi</i>)	Quiet backwater areas of small to medium-sized, sluggish streams and oxbow lakes having mud or mud-sand substrate; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation often present.	T	Occasional
Paddlefish (<i>Polyodon spathula</i>)	Prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir.	T	Occasional
Mollusks			
Louisiana Pigtoe (<i>Pleurobema riddellii</i>)	Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not	T	Potential

Species	Habitat	State Status	Occurrence
	generally known from impoundments; Sabine, Neches, and Trinity (historic) River Basins.		
Reptiles and Amphibians			
Timber Rattlesnake (<i>Crotalus horridus</i>)	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.	T	Common
Texas Horned Lizard (<i>Phrynosoma cornutum</i>)	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.	T	Potential
Northern Scarlet Snake (<i>Cemophora coccinea copei</i>)	Mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial.	T	Rare
Alligator Snapping Turtle (<i>Macrochelys temminckii</i>)	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.	T	Occasional

Source: OMBIL Notes: E = Endangered, T = Threatened

The Texas Natural Diversity Database (TXNDD), administered by TPWD, manages and disseminates occurrence of information on rare species, native plant communities, and animal aggregations in Texas to help guide project planning efforts. An official request via email was made requesting this information for the following USGS quadrangles that the Lake O' the Pines Federal Fee Boundary falls within: Harleton, Lassater, Kellyville, Ore City, and Lone Star. The next few paragraphs will summarize the information received.

Within the Lake O' the Pines Lake Federal Fee Boundary, TXNDD identified two unique plant communities: Panicked Indigobush (*Amorpha paniculata*) and Goldenwave

Tickseed (*Coreopsis intermedia*). Both communities are overlapping each other and occur only in one geographic area.

The last official recording of Panicked Indigobush (*Amorpha paniculata*) was published in 1958. The species is a flowering bush that prefers to live in wet, forested woodlands with acidic soils and spreads through the use of fire (NatureServe 2017A). Because of this information and lack of recent sightings, the occurrence of this species within Lake O' the Pines Federal Fee Boundary is considered rare.

The last official recording of Goldenwave Tickseed (*Coreopsis intermedia*) was published in 1994. The species is a flowering forb that prefers to live in low quality pine forests, especially in areas that have been clear cut (NatureServe 2017B). Because of this information and lack of recent sightings, the occurrence of this species within Lake O' the Pines Federal Fee Boundary is considered rare.

In the vicinity of Lake O' the Pines Federal Fee Boundary, TXNDD identifies the following unique communities: smooth indigobush (*Amorpha laevigata*), water oak-willow Oak (*Quercus nigra-Quercus phellos*), blackpot shiner (*Notropis atrocaudalis*), ironcolor shiner (*Notropis chalybaeus*), taillight shiner (*Notropis maculatus*), blackside darter (*Percina maculata*), and bluehead shiner (*Pteronotropis hubbsi*) communities. None of these communities overlap one another, with some of them are more abundant than others. Among these, the blackside darter and bluehead shiner are state listed as threatened and, both had last reported sightings in 1993.

2.2.5 Invasive Species

Invasive species are any kind of living organism which, if uncontrolled, causes harm to the environment, economy, or human health. Invasive species generally grow and reproduce quickly and spread aggressively. Non-native, or exotic, species have been introduced, either intentionally or unintentionally, and can out-compete native species for resources or otherwise alter the ecosystem. Native invasive species are those species that spread aggressively due to an alteration in the ecosystem, such as lack of fire or the removal of a predator from the food chain. Table 2.7 lists invasive and exotic species that occur at Lake O' the Pines. Further information on these species can be found in Appendix D.

Threats to the Lake O' the Pines fishery include exotic fish and plant species as well as environmental pollutants. Invasive species, once established, can quickly spread throughout a water body and expand to nearby to adjacent waters, which can be ecologically and economically expensive. As long as Lake O' the Pines remains a popular fishing destination the threat of significant impacts on the fishery resource by invasive species remains as well.

Table 2.7 Invasive Species Found at Lake O' the Pines

Common Name	Scientific Name	Current Impact at Lake O' the Pines
<u>Birds</u>		
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Minor
European Starling	<i>Sturnus vulgaris</i>	Moderate
Mammals		
Feral Hog	<i>Sus scrofa</i>	Major
Nutria	<i>Myocastor coypus</i>	Minor
Fish		
Bighead Carp	<i>Hypophthalmichthys nobilis</i>	Minor
<u>Insects</u>		
Emerald Ash Borer	<i>Agrilus planipennis</i>	Minor
Red Imported Fire Ant	<i>Solenopsis invicta</i>	Major
<u>Aquatic Plants</u>		
Alligatorweed	<i>Alternanthera philoxeroides</i>	Major
Egeria or Brazilian Waterweed	<i>Egeria densa</i>	Minor
Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>	Minor
Giant Salvinia	<i>Salvinia molesta</i>	Major
Hydrilla	<i>Hydrilla verticillata</i>	Major
Parrotfeather	<i>Myriophyllum aquaticum</i>	Minor
Water Hyacinth	<i>Eichhornia crassipes</i>	Major
<u>Terrestrial Plants</u>		
Bahiagrass	<i>Paspalum notatum</i>	Major
Bermudagrass	<i>Cynodon dactylon</i>	Major
Chinaberry Tree	<i>Melia azedarach</i>	Minor
Chinese Privet	<i>Ligustrum sinense</i>	Minor
Chinese Tallow Tree	<i>Triadica sebifera</i>	Major
Elephant Ear	<i>Colocasia esculenta</i>	Minor
Japanese Climbing Fern	<i>Lygodium japonicum</i>	Minor
Japanese Honeysuckle	<i>Lonicera japonica</i>	Minor
Japanese Privet	<i>Ligustrum japonica</i>	Minor
Johnsongrass	<i>Sorghum halepense</i>	Major
Kudzu	<i>Pueraria montana</i>	Minor
Nandina	<i>Nandina domestica</i>	Minor

Source: Lake O' the Pines Natural Resources Specialist

One such species, which currently has not been found at Lake O' the Pines but occurs at other Texas lakes, is the zebra mussel. Zebra mussels can multiply rapidly in favorable conditions. They also attach themselves to hard surfaces potentially damaging boats, infrastructure, and degrading habitat and swimming areas. Because zebra mussel

colonies create trophic cascades by out competing lower level organisms for food, fish populations can be degraded. Though zebra mussels are currently not found in Lake O' the Pines, continued vigilance is crucial to keeping them out.

Another example of an invasive species, which was found in October 2012 at Lake O' the Pines boat ramps, is the giant salvinia. Giant salvinia (*Salvinia molesta*) is a floating fern native to southern Brazil and is currently one of the most problematic aquatic plants found in Texas. Through its ability to quickly expand and grow in large masses, it damages native habitat by blocking out sunlight and decreasing dissolved oxygen concentrations. Multiple resource agencies have deployed various measures to combat the spread of giant salvinia including herbicide use, biological controls, and public awareness and law enforcement.

Management Strategies by Species of Primary Concern:

Japanese climbing fern (JCF) is becoming more prevalent throughout the forested areas at Lake O' the Pines. Foresters and Natural Resource Management staff have noted the increasing presence of this pest in recent years. . The main concern with JCF is the high rate of spread. Efforts are being made to treat the larger patches via herbicide application, with plans to follow-up with a prescribed burning regimen.

Chinese tallow continues to be a problem, with no relief to be seen in the future. The more significant effects of tallow are being seen in areas affected by recent hurricanes, where gap succession is taking place. Large areas of forestland that were once dominated by hardwood and wetland communities are now being invaded by tallow trees. The current plan of attack for tallow follows a consistent regimen of herbicide application and burning where practical, but those management practices have been implemented only on a small portion of the affected area.

Feral hogs are becoming a major issue. Damage to ditches and right-of-ways along park roads are prevalent, in addition to small areas rooted up below the dam. Trapping and harvest by hunters are the primary control techniques.

Lastly, the aquatic invasive plant species management program at Lake O' the Pines is growing at a rapid rate. Recent high water levels and mild winters have increased the total acreage of giant salvinia and water hyacinth. Historically, hydrilla has not caused any access issues at the reservoir and has not required treatment. Giant salvinia has been discovered at several boat ramps, but immediate containment, physical removal, and herbicide treatment have been effective in eliminating these infestations. Alligator weed and water hyacinth have recently required treatment to prevent excessive growth and provide access to boaters in the Lone Star Landing areas of the reservoir. USACE has conducted treatments in 2014 and 2015 for both species. Alligator weed flea beetles were released by USACE in 2015. An aquatic vegetation management plan was developed by TPWD, USACE, and NETMWD in January 2015 to guide invasive plant management in the reservoir.

2.2.6 Visual and Scenic Resources

Lake O' the Pines proper and surrounding Federal lands offer public, open space value and scenic vistas that are unique in the region. It is one of the most beautiful lakes in North East Texas, with clear, calm water, rolling terrain and tall pine trees. Natural resources management objectives for the lake are listed in Chapter 3 and emphasize the continuing need to minimize activities which will disturb the scenic beauty and esthetics of the lake.

Lake O' the Pines includes many acres of scenic shorelines, lake views, and wildlife viewing areas providing high visual and scenic qualities. Some areas are admired for their scenic attractiveness (intrinsic scenic beauty that evokes a positive response), scenic integrity (wholeness of landscape character), and landscape visibility (how many people view the landscape and for what reasons and how long). People come from urban communities to enjoy the scenic and naturalistic views offered at the lake. Some areas have been designated as Wildlife and Vegetative Management or Environmentally Sensitive Areas to preserve specific animal, plant, or environmental features which also add to the scenic qualities at the lake. Nearby parks have been designed to access the lake, allow access to hiking trails, and take advantage of scenic qualities at the lake and surrounding areas. Adjacent landowners are informed that removing trees to obtain a view of the lake not only destroys wildlife habitat but also lowers the scenic quality of the shoreline when viewed by the general public from the water surface. Additionally, reasonable measures must be taken to ensure that damage to the natural landscape from invasive species and catastrophic wildfire are minimized.



Photo 2.2 Dewatering Work 2017 (USACE Photo)

2.2.7 Sedimentation and Shoreline Erosion

TWDB collected bathymetric data for Lake O' the Pines between 7 November 2009 and 14 December 2009 as a jointly funded project with USACE. The 2009 survey indicates that Lake O' the Pines has a total reservoir capacity of 241,363 acre-feet encompassing 17,638 acres at the conservation pool elevation (228.5 feet above NGVD29). The 2009 TWDB sedimentation survey indicates that Lake O' the Pines has accumulated 33,080 acre-feet of sediment since impoundment in 1957. Thus, Lake O' the Pines has lost an average of 636 acre-feet of capacity per year. Sediment accumulation is well dispersed throughout the lake, although increased accumulation was found within the submerged rivers.

As development of the lands adjacent to and upriver from Lake O' the Pines grows and expands, or agriculture and industry is increased within the watershed, and the expected increase in intense weather events, it is predicted that this rate of sedimentation will increase over time. TWDB recommends that a similar methodology be used to resurvey Lake O' the Pines in 10 years or after a major flood event.

2.2.8 Water Quality

Existing water quality at Lake O' the Pines is affected by municipal discharge, rainfall, and associated storm water flows originated from natural, agricultural, residential, and commercial runoff, as well as industrial point and nonpoint sources. Although nutrients levels in surface water of the Cypress Basin are often elevated, water is generally of good quality except for few issues that arise from discharge of treated wastewater, sluggish stream flows, low aeration rates, dense aquatic plant growth, and elevated surface temperatures. EPA reports for the region show impairment in some areas due to lower dissolved oxygen levels in the water due to organic enrichment and oxygen depletion.

Texas Commission on Environmental Quality (TCEQ) sets and implements standards for surface water quality to improve and maintain the quality of water in the state based on various beneficial use categories for the water body. The Texas Integrated Report of Surface Water Quality, pursuant to the Clean Water Act Sections 305(b) and 303(d), evaluates the quality of surface waters in Texas and identifies those that do not meet uses and criteria defined in the Texas Surface Water Quality Standards (TSWQS) Page 16. The Texas Integrated Report describes the status of Texas' natural waters based on historical data, and assigns waterways to various categories depending on the extent to which they attain the TSWQS. Furthermore, the USEPA must approve the 303(d) list before it can be finalized.

According to the 2014 Texas Integrated Report Index of Water Quality Impairments, Lake O' the Pines at Alley Creek meets all the assigned water quality standards. However, the Big Cypress Creek at the 259 water segment upstream from Lake O' the Pines shows bacteria presence, segment 0401 shows sulfate, and segment 0402-04 shows mercury in edible tissue. Big Cypress Creek below Lake O' the Pines shows depressed levels of dissolved oxygen, mercury in edible tissues, pH problems, bacteria, and copper in the water as the parameter that do not meet the water quality standards.

2.2.9 Timber Resources

As described in previous sections of this Plan, the majority of project lands above the conservation pool elevation of 228.5 feet NGVD29 are forested with a mix of tree species representative of the Piney Woods ecoregion. This forested land, consisting of approximately 9,250 acres, is managed for multiple uses, one of which is a sustainable supply of timber. Management of forests on USACE lands nationwide is guided, in part, by policy set forth in Public Law 86-717, the Forest Cover Act, which states that "...project lands shall be developed and maintained to assure a future supply of timber through sustained yield programs to the extent that such management is practicable and compatible with other uses of the project." Additional forest management guidance is set forth in USACE regulations ER & EP 1130-2-540, which specifies that stewardship of project land shall be ecosystem based. Meeting the intent of the Forest Cover Act, USACE regulations, and the public interest expressed in the formulation of the Master Plan has resulted in management objectives that are set forth in Chapter 3 of this Plan.

The selective harvest of timber on USACE lands at Lake O' the Pines has occurred on a routine basis since the late 1970's. Harvest records are provided in Table 2.8 for the years since 2000. In addition to the planned sale of timber, periodic major flood events, such as occurred in 1990, 2015 and 2017, the severe drought event in 2011, ice storms and occasional storm events result in the salvage of merchantable timber. These past flood events and major drought event have had a major impact on the forests at Lake O' the Pines by significantly reducing the density of the forest, particularly along the shoreline in areas lying below elevation 240 feet NGVD29. Flood or storm-killed timber must be harvested quickly to obtain the highest value possible. Timber harvested on USACE lands is sold through a competitive bidding process. In general, timber harvest plans are prepared by project staff and forwarded to the Fort Worth District office where an invitation for bids is prepared and administered.



Photo 2.3 Dead timber due to the effects of long term inundation from the spring floods of 2015

Revenue generated by the sale of timber on USACE lands is, in most cases, returned to USACE for conducting land management activities on the project area where the revenue was generated. In times of national emergency or urgent, unplanned repair of critical USACE infrastructure, timber sale revenue could be diverted to higher priority needs. Photo 2.3 illustrates timber killed due to the effects of long-term inundation from spring floods of 2015. The killed vegetation goes up to elevation 240 feet NGVD29.

Table 2.8 Volume of Timber Harvest at Lake O' the Pines 2001 - May 2016

Marked Timber Sales					Salvaged Timber	
Year	Acres	Sawtimber	Pulpwood		Sawtimber	Pulpwood
<i>(fiscal)</i>		<i>(thousand board ft.)</i>	<i>(cords)</i>		<i>(thousand board ft.)</i>	<i>(cords)</i>
2001	481	360	261		0	0
2002	335	319	189		0	0
2003	289	299	410		0	0
2004	224	300	410		0	0

2005		238	613	995		0	0
2006		554	1,172	573		0	0
2007		45	115	120		325*	315*
2008		189	251	388		0	0
2009		0	0	0		136*	603*
2010		0	0	0		91*	133*
2011		0	0	0		162*	784*
2012		0	0	0		328*	4830*
2013		0	0	0		33*	19*
2014		284	539	218		46*	407*
2015		262	278	953		0	0
2016		135	128	156		487*	1692*
* Estimated							

The volume of timber harvested from project lands through planned sales each year can vary considerably depending on timber and weather conditions, as well as flood risk management operations. Table 2.8 provides a listing of timber volumes sold in recent years. Those volumes that resulted from the unplanned sale of salvage timber are duly noted. Management of the timber resource at Lake O' the Pines involves numerous tasks and regulatory requirements including, but not limited to, prescription burning, timber cruising and marking, reforestation, road maintenance, preparation of harvest plans, and timber sale oversight. Protection and improvement of wildlife habitat, especially streamside management zones, is given high priority in management decisions. Timber harvests and other forest management activities are planned and scheduled within the 5-year Operational Management Plan, which is updated annually.



Photo 2.4 Prescribed fire behind project office (USACE Photo)



Photo 2.5 Prescribed fire Pine Hill Area (USACE Photo)

In summary, the timber resource on USACE lands is managed for multiple purposes including wildlife habitat, recreational activities in parks, landscape aesthetics, and timber. More detailed information on forest management is included in Chapter 5 – Resource Plan.

2.2.10 Mineral Resources

The Texas Railroad Commission (RRC) database shows oil and gas exploration and production activity in the six counties surrounding Lake O' the Pines. The majority of oil and gas resources around Lake O' the Pines are located in Marion and Harrison Counties in the less productive northern fringe of the Haynesville-Bossier formation that straddles the boundary between Texas and Louisiana. The majority of producing wells located on or very near USACE land are located in western Marion County within the Upper Pettit Field. Several producing wells have been directionally drilled into deposits located beneath the reservoir. An approximate count of wells taken from the RRC website (public map viewer) includes about 20 wells where the surface location is near the lake and the directional-drill runs below the lake at conservation pool elevations. Numerous other plugged and active straight bore oil and gas wells exist on private lands around the lake, and those on USACE lands were in existence prior to acquisition and construction of the project.

The ownership of the mineral estate is of paramount importance to understand the extent to which a Federal agency can impose restrictions or best management practices. If the mineral estate is Federally-owned, very specific and protective best management practices may be imposed at the request of the surface managing agency. If the mineral

estate is privately owned, the surface owner's ability to impose protective measures is limited to any covenants or mineral subordination clauses that may exist in property deeds, and in general, to what is reasonable in each specific instance. Most of the minerals underlying USACE-administered land at Lake O' the Pines are privately owned. For many tracts, the mineral estate was subordinated to the Government's right to operate the project to fulfill its intended purpose. Subordination clauses vary from deed to deed, but can range from a "no surface occupancy" subordination to a more generic subordination stating that mineral exploration and production cannot interfere with the operation of the project or constitute a danger to persons or property. The subordinations generally cannot be used to prevent the mineral owner from having reasonable access to their property.

As a precautionary measure to protect the integrity of the dam and associated prime facilities, the mineral estate underlying the dam was purchased by the Federal Government during acquisition of land for the project. These Federally-owned minerals may be leased to private operators through the Bureau of Land Management process explained in following paragraphs, but would be leased with the stipulation that no surface occupancy and no drilling is permitted. This would allow the minerals to be "pooled" with adjacent private minerals. Where the Federally-owned mineral estate does not extend a full 3,000 feet from the dam or other prime facilities, USACE prohibits any drilling or fracturing operations within the 3,000 foot zone regardless of mineral ownership. Exploration such as geophysical or seismic surveys in areas, or by means that do not threaten the integrity of the dam or appurtenant structures may be permitted on USACE-administered land with conditions that also protect and restore natural resources.

Should oil and gas exploration be proposed within any 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. As of the date of this Plan the BLM database shows there are no active leases of federally-owned minerals underlying USACE lands at Lake O' the Pines.

Exploration and extraction of privately owned minerals is allowed to occur on USACE lands at Lake O' the Pines by virtue of written permission from USACE. USACE permit guidelines require that 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. Any applicable mineral subordinations are fully implemented when and if a surface location is authorized on USACE land. Wells that are proposed for placement on USACE flowage easements require written permission from USACE and must not violate the Government's easement rights. In general, wells proposed for placement on flowage easement may not result in the placement of fill material on the easement to the extent that flood storage capacity is reduced. Additionally, tank batteries placed on flowage easement must be constructed to prevent the tanks from floating when inundated. In addition to restrictions imposed by USACE, all wells must adhere to the rules and regulations promulgated by the RRC. Commercial injection wells exist in the region

surrounding Lake O' the Pines. These wells are used for the purpose of disposing (by deep well injection) contaminated water that is produced from some oil wells and also to dispose of contaminated water that is a by-product of hydraulic fracturing operations. Commercial injection wells are not allowed on USACE land and are regulated by the RRC.

2.2.11 Air Quality

The Clean Air Act, last amended in 1990, requires the USEPA to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. These standards are implemented by the EPA to assign limits to the amount of pollution that can be present in the atmosphere.

The State of Texas has adopted the NAAQS as the state's air quality criteria. NAAQS standards specify maximum permissible short- and long-term and concentrations of various air contaminants including primary and secondary standards for six criteria pollutants: Ozone (O₃), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Nitrogen Oxide (NO), particulate matter (PM₁₀ and PM_{2.5}), and Lead (Pb). Based on both Federal and state air quality standards, an area can be classified as either an "attainment," "maintenance," or "non-attainment" area for each pollutant. According to TCEQ current State Implementation Plan (TCEQ 2015), Upshur and Harrison Counties are in an attainment area and therefore Lake O' the Pines does not require a pollutant control strategy. The closest state air quality monitoring station (AWS 484491078) located in the Cookville City, northwest of Lake O' the Pines, describes the air quality as good. The closest EPA monitoring station to the lake is at Harrison County. The station report shows data from 366 days in 2016 with 328 days good air quality and 38 days moderate quality.

2.3. CULTURAL RESOURCE AND ANALYSIS

2.3.1 Prehistoric

Current research suggests the area around Lake O' the Pines has been occupied since the Paleo-Indian Period. This period is estimated to have lasted from 12,500-8,000 year before present (B.P.). Broadly, these earliest inhabitants were nomadic hunters and gatherers. Unfortunately, their highly-mobile lifestyle left a relatively sparse archeological record. Much of the evidence for their presence comes from the projectile points they left behind. These finely-crafted points are typically made from high-quality stone from regions outside East Texas-supporting the belief that these Paleo-Indians traveled extensively across the landscape. Often, these projectile points and other Paleo-Indian artifacts are discovered on the surface or mixed with artifacts from later inhabitants. A handful of such surface scatters exist around the lake. One, the Forrest Murphey site, was uncovered in the aftermath of the construction of the lake's dam. It produced examples of the well-known

Clovis spear point and mastodon teeth. Unfortunately, intact Paleo-Indian sites are not characteristic of the area around Lake O' the Pines.

Over time, the Paleo-Indian Period gave way to the Archaic Period. This vast expanse of prehistory began around 8,000 years B.P. and lasted to about 2,200 B.P. in East Texas. As the climate regime shifted away from the cooler climate of the Paleo-Indian Period to one warmer and drier than today, Archaic Period peoples gradually became more sedentary. Populations increased and archeological sites can be found on a wide variety of landforms. The environment of East Texas provided them with a multitude of plant and animal resources. It did not, however, provide them with high-quality materials for stone tool making, when compared to those found in the Paleo-Indian Period. Regardless, Archaic Period inhabitants expanded their toolkit and made other adaptations to the local environment that allowed for population growth over time.

The Woodland Period is generally recognized to have begun by 2200 B.C. and lasted until around 800 A.D. During the Woodland Period, ceramics are first seen in the area. Undecorated ceramics predominate. However, decorated types influenced by the Woodland Period cultures of the Lower Mississippi River valley to the east have been recovered from the area. Arrow points found on many of these sites indicate the adoption of the bow and arrow during this period. While it's generally believed that these Woodland Period cultures were still hunting and foraging, squash and native plant cultivation appears to have begun in earnest during this period. These peoples did settle some sites for long periods of time in the Big Cypress basin around present-day Lake O' the Pines. Some of these sites were quite large, covering several acres. Additionally, we see the beginnings of mound building, along with complex, intentional burial practices.

The Caddo Period began around 800 A.D. in East Texas and lasted until historic times. It is divided into the Formative, Early, Middle, Late, and Historic Caddo Periods. By the beginning of the Middle Caddo Period in 1200 A.D., the Caddo were successful agriculturalists that came to rely a great deal on cultivation of corn. Permanent settlements with many mounds, elaborate burials, and structures such as grass houses were common. The Caddo produced a wide variety of ceremonial and utilitarian ceramic vessels that are distinctive and impressive. Vast trade networks were established in this time period, with the Caddo trading for items such as salt, bison hides, marine shell, copper, and turquoise. The Big Cypress basin in the area of present-day Lake O' the Pines was intensively occupied by the Caddo. Several Late Caddo Period archeological sites were recorded in the Big Cypress basin prior to the impoundment of Lake O' the Pines. Archeologically, these sites are classified as belonging to Titus Phase.

The Historic Caddo Period is defined in Texas as the period that began with sustained European contact during the 1680s and continuing through their removal from East Texas in 1859. The earlier Titus Phase ended with the entry into the area of early European explorers. Within 100 years or so of the 1542 de Soto/Moscoso *Entrada*'s passage through the area, Titus Phase Caddo appear to have succumbed to the effects of European diseases and other cultural upheavals. The remnant populations are speculated to have joined the large Historic Period Kadohadacho and Hasinai Confederacies to the

north and south of the area. Elsewhere in the region, the Caddo were able to use the competing interests of the French and Spanish colonizers of East Texas and Louisiana to their advantage, gaining guns, horses, and previously unavailable metal tools. Recognized as a “friendly tribe,” the Caddo were valued allies that aided their European neighbors in altercations against other, more hostile groups. However, the various interruptions of the traditional Caddo way of life caused by European exploration and settlement caused the Caddo population to dwindle drastically. The Caddo creation story says that their first village was founded on Caddo Lake. In the late 1700s, the Caddo returned to vicinity of the lake east of present-day Jefferson. After the Texas War of Independence, the Caddo, along with many migrant tribes from further east, were forced from East Texas. They ultimately were relocated to Indian Territory in Oklahoma by 1859.

2.3.2 Historic

The period of European exploration and settlement and the subsequent Anglo-American and African-American development of the area of Lake O’ the Pines is briefly covered in the remaining sections. The lake is spread across the five counties of Camp, Harrison, Morris, Marion, and Upshur. The counties share similar histories and economies.

As referenced earlier, Europeans initially entered the area as part of the Spanish de Soto *Entrada* in 1542. De Soto, by this point, had perished. Luis de Moscoso de Alvarado led the remnants in an attempt to reach Mexico. The effort failed, and the party retraced its route, eventually descending the Mississippi River to the Gulf of Mexico. De Moscoso, probably passed through the area on well-worn Caddo trails.

Throughout its colonial history, the region was a province of Spain and then Mexico. Anglo-American settlement of East Texas increased after the Louisiana Purchase made most of the lands north and east of Texas territory of the United States. In the early 1800s, settlers began utilizing existing Caddo trails to smuggle horses to existing settlements further south. In 1824, Nicholas Trammell improved and added to existing trails from Red River to the *El Camino Real de los Texas* to make them more amenable to wagon travel. The route, which crossed Marion County, would be known as Trammell’s Trace.

Texas’s independence in 1836 and ultimate statehood only increased settlement in the area. Jefferson was founded in 1842. Eventually, it became the head of navigation from the Red River and the largest inland port city in Texas. Soon, a cotton and corn-based agricultural economy developed. Caddo Lake and Big Cypress Bayou saw steamboat traffic carrying crops to the coast and, likewise, ships from further south bringing manufactured wares for sale in Jefferson and a wide swath of northeast Texas.

During the Civil War, the area avoided the direct, typically disastrous impacts felt by other parts of the South. Local farmers, ranchers, and merchants profited by supplying crops, cattle, and timber to the war effort. Additionally, a meat cannery and ironworks were located in the area. In the immediate aftermath of the war, the addition of the 13th Amendment to the U.S. Constitution and a Radical Republican administration installed in Austin resulted in the loss of the sizeable workforce of enslaved Africans. However, the sharecropping system that replaced slavery meant that much of this prior workforce remained. Jefferson’s economic condition began to improve soon after the war. By the

early 1870s, Jefferson was the sixth largest city in Texas and home to the state's second largest port.

Prior to the Civil War, Jefferson had begun construction of a railroad line southward in attempt to link Shreveport and Marshall. The outbreak of hostilities ended this effort. When rail construction resumed, Jefferson was initially bypassed on a route that led from Marshall to Texarkana. The railroad did soon run a line into the town. Rail transportation, however, diminished the importance of Jefferson's river commerce.

The event that most view as the main factor in the demise of Jefferson's importance as a regional hub of commerce was the destruction of the Great Raft on the Red River. The river's route through highly erodible soils meant trees were constantly being washed into the waterway, creating a series of natural dams that elevated water levels in its nearby tributaries and creating large "raft lakes" within its floodplain. Since the 1830s, attempts had been made to remove the Great Raft from the river. In 1873, explosives were used to break up the jam. The resulting low water levels made Big Cypress Bayou seasonably unnavigable, ultimately ending river commerce. By the middle of the 1880s, Jefferson's population was half of its post-bellum peak.

In the 20th century, the discovery of oil in the area briefly sustained and increased the population of Jefferson. However, the population today is less than half its 20th century peak. Although oil and timber continue to be important to the area, Jefferson has managed to develop a booming tourism industry. The fact that many of the structures from the town's 19th century boom time are still intact has become a vital asset. Multiple individual properties are listed on the National Register of Historic Places and a large swath of the old downtown and adjacent neighborhoods lie within a designated historic district. Traditional industries, tourism, proximity to Caddo Lake, and construction of Lake O' the Pines in 1959 have sustained the city and its current estimated population of 2,043 residents.

Ore City lies just west of Lake O' the Pines in Upshur County with a currently estimated population of 1,204 residents. The town sprang up in 1911 in anticipation of the Port Bolivar Iron Ore Railroad. Eastern Upshur and adjacent western Cass counties contained large deposits of iron ore that had been mined sporadically since the 1860s. An attempt was made to construct a railroad line from the Texas coast in the belief this ore could be mined, shipped, and sold to the booming steel mills of the northeastern United States. World War I interrupted the construction of the railroad and it was abandoned in 1927, completed only as far north as the community of Warlock on the northern side of present-day Lake O' the Pines. Later 20th century mining efforts, oil, timber, and construction of the lake have sustained the town into the 21st century.

The town of Lone Star is situated at the north end of Lake O' the Pines in Morris County. Lone Star owes its existence to the aforementioned iron ore deposits in the area. In the 1930s, the town sprang up around the Lone Star Steel plant. At one point, the sprawling plant employed as many as 6,000 workers. Lone Star's population peaked in the 1980s with 2,006 residents, with the steel plant supporting the thriving petroleum industry. With the decline in oil prices and subsequent production in the 1980s, the plant began to

experience difficulties. Over the ensuing years, production and employment declined. Today the town is home to approximately 1,500 residents.

2.3.3 Previous Investigations at Lake O' the Pines

The earliest archeological studies conducted within the current fee boundary of Lake O' the Pines were performed in anticipation of lake construction in the 1950s. Through funding from the River Basin Survey and the National Park Service, Ed Jelks, E. Mott Davis, and others recorded and excavated several archeological sites in proximity to the eventual lake. Of the 60 sites found, nineteen were substantial Caddo settlements and five were mound sites. Prominent among Caddo sites excavated were the Harroun, Whelan, and Dalton sites. Various sites were recorded through the 1980s either through small-scale efforts or opportunistically by USACE personnel, volunteers, and avocational archeologists and collectors. The 1990s saw the beginning of current era of larger-scale efforts related to timber management activities by cultural resource management firms contracted by USACE. Additionally, the USACE has employed an archeologist at the lake dedicated to cultural resource concerns at Lake O' the Pines and the other four Lakes within the USACE Piney Woods Regional Operations Project. To date, archeologists have conducted cultural resource inventories on roughly 90% of fee lands at Lake O' the Pines.

2.3.4 Recorded Cultural Resources

To date, 250 archeological sites have been recorded at Lake O' the Pines. None have been formally listed on the National Register of Historic Places (NRHP) and none have received the designation of "eligible" for NRHP inclusion. In some cases, this is due to the fact that the site might be inundated by the reservoir at its conservation pool level. In other cases, it's a result of the fact that limited NRHP eligibility testing has been performed at Lake O' the Pines.

2.3.5 Long-term Cultural Resources Objectives

An Integrated Cultural Resources Management Plan (ICRMP) was developed and incorporated into the Operational Management Plan in accordance with EP 1130-2-540 in 2005 and will be updated in the near future. Such plans establish standard operating procedures pertaining to both USACE and external activities that might impact cultural resources. Completion of a full inventory of cultural resources at Lake O' the Pines is a long-term objective that is needed for compliance with Section 110 of the NHPA. Currently, just under 90% of fee owned lands above the conservation pool of the reservoir have been inventoried. Ultimately, all currently known sites, as well as those found in future inventories should be evaluated to determine their eligibility for the NRHP. Sites of currently unknown NRHP eligibility and those found in the future to be eligible for the NRHP must be protected from impacts caused by USACE or those having easements on Lake O' the Pines fee lands. All future cultural resource activities will be coordinated with the State Historic Preservation Officer at the Texas Historical Commission and with the federally-recognized Caddo Nation of Oklahoma, who recognize the area as part of their historic homeland, in order to insure compliance with the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.

2.4. DEMOGRAPHIC AND ECONOMIC ANALYSIS

2.4.1 Zone of Interest

Lake O' the Pines lies primarily in Marion County with portions extending in to Upshur and Morris Counties in Texas. The zone of interest for the socio-economic analysis of Lake O' the Pines is comprised of six Texas counties and one Louisiana Parish. The Texas counties included in the zone of interest are the counties in which the lake lies, Marion, Morris, and Upshur Counties, as well as the four additional Texas counties that surround Marion County, which are Camp, Cass, Gregg, and Harrison Counties. Caddo Parish in Louisiana, which borders Marion, Harrison, and Cass Counties, is included in the zone of interest since it encompasses the city of Shreveport, which is provided flood protection by Lake O' the Pines.

2.4.2 Population

The total population for the zone of interest in 2016 was 548,955, as shown in Table 2.9. Almost half of the zone of interest's population (approximately 46%) resides in Caddo Parish, with a majority of the Parish's residents living in the city of Shreveport. 23% of the zone of interest's population resides in Gregg County, 12% in Harrison County, 7% in Upshur County, and 6% in Cass County. The remaining counties in the zone of interest each account for 2% or less of the zone of interest's population.

Table 2.9 Population Estimates and 2045* Projections, 2000 and 2016

Geographical Area	2000 Population Estimate	2016 Population Estimate	2045* Population Projection
Louisiana	4,468,976	4,645,670	5,161,800*
Texas	20,851,820	26,956,435	38,499,538
Caddo Parish	252,161	253,125	247,440*
Camp County	11,549	12,631	16,099
Cass County	30,438	30,346	31,496
Gregg County	111,379	123,283	165,432
Harrison County	62,110	66,431	84,247
Marion County	10,941	10,191	9,487
Morris County	13,048	12,653	14,042
Upshur County	35,291	40,295	49,525
Zone of Interest Total	526,917	548,955	617,768

*Note: Population projections for the state of Louisiana and its parishes were not available past 2030; therefore, projections displayed are for 2030.

Geographical Area	2000 Population Estimate	2016 Population Estimate	2045* Population Projection
Source: U.S. Census Bureau, Population Division (2000 Estimate); U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 projections for Texas state and counties); State of Louisiana (2030 Projections for Louisiana and Caddo Parish)			

From 2016 to 2045, the zone of interest is expected to experience an annual growth rate of approximately 0.4%. Note that this number holds Caddo Parish's population constant after 2030, since this is the last year of available population projection data for the region. By comparison, the population of Texas is projected to increase at a rate of 1.2% per year, and the national growth rate is expected to be 0.6% per year between 2016 and 2045. Between 2016 and 2030, the state of Louisiana's population is expected to increase by 0.8% annually. During these specified timeframes, most counties within the zone of interest are projected to have positive growth with the exception of Caddo Parish and Marion County, both of which are forecasted to experience negative growth at a rate of 0.2% annually.

The distribution of the population among gender, as shown in Table 2.10, is approximately 48% male and 52% female in the zone of interest. The state of Texas is approximately 50% male and 50% female, while Louisiana is 49% male and 51% female.

Table 2.10 Percent of Population Estimate by Gender, 2016

Geographical Area	Male	Female
Louisiana	2,271,684	2,373,986
Texas	13,379,165	13,577,270
Caddo Parish	120,312	132,813
Camp County	6,191	6,440
Cass County	14,694	15,652
Gregg County	60,416	62,867
Harrison County	32,573	33,858
Marion County	5,013	5,178
Morris County	6,069	6,584
Upshur County	19,908	20,387
Zone of Interest Total	265,176	283,779
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

Figure 2.4 shows the population by age group. The distribution of age groups is similar between the zone of interest, the states of Texas and Louisiana. Marion County, where the majority of the lake is located, has a slightly smaller percent of the population ages 0 to 44 and a slightly larger percentage of the population ages 45 and over when compared to the zone of interest and to Texas and Louisiana.

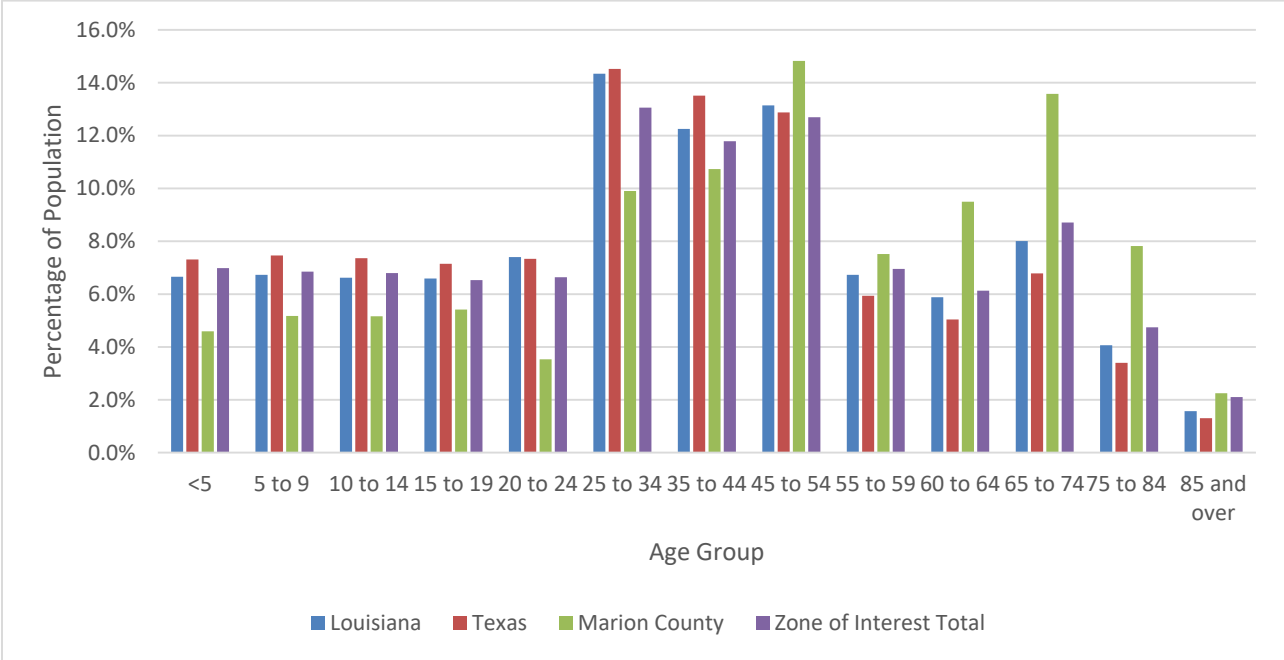


Figure 2.4 Percent of Population by Age Group, 2016
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

Population by race and Hispanic Origin is displayed in Table 2.11. The zone of interest is approximately 56% White, 32% Black, and 8% Hispanic or Latino, with the other race categories account for 1% or less for each of the population. By comparison, the state of Texas is approximately 43% White, 12% Black, 39% Hispanic or Latino, and 4% Asian. The state of Louisiana is approximately 59% White, 32% Black, 5% Hispanic or Latino, 2% Asian, and 2% two or more races.

Table 2.11 Population Estimate by Race/Hispanic Origin, 2016

Area	White	Black	American Indian and Alaska Native alone	Asian alone	Native Hawaiian and Other Pacific Islander alone	Some other race alone	Two or more races	Hispanic or Latino
Louisiana	2,754,643	1,483,906	24,050	78,263	1,264	7,563	72,573	223,408
Texas	11,705,684	3,134,962	63,336	1,161,742	18,990	35,509	423,062	10,413,150
Caddo Parish	116,429	122,408	835	3,037	81	360	3,145	6,830
Camp County	7,125	2,094	27	58	0	57	281	2,989
Cass County	23,236	5,268	41	129	13	0	374	1,285
Gregg County	72,558	24,548	483	1658	228	103	1680	22,025
Harrison County	42,652	14,184	206	349	40	22	785	8,193
Marion County	7,220	2,422	33	86	0	0	40	390
Morris County	8,304	3,046	13	14	10	0	158	1,108
Upshur County	32,618	3,483	236	196	0	9	662	3,091
Zone of Interest Total	310,142	177,453	1,874	5,527	372	551	7,125	45,911
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)								

Figure 2.5 shows the 2016 estimate compared to the 2045 projections of race/ethnicity in the zone of interest distributed between four categories, White, Black, Hispanic, and Other. The two graphs show that the Hispanic and Other categories are expected to increase by 10% and 1% respectively, while the White category decreases by 19% and the Black category decreases by 1%.

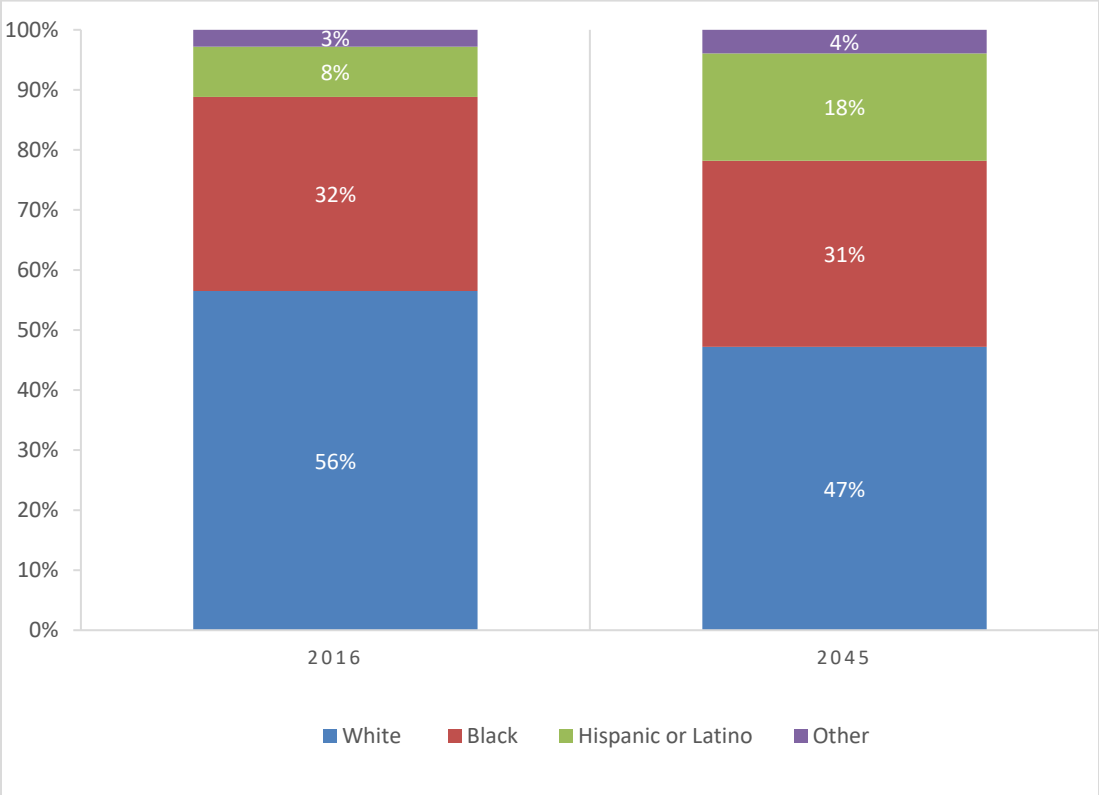


Figure 2.5 Zone of Interest Population Estimate and Projection by Race/Ethnicity

Source: Texas State Data Center, The University of Texas at San Antonio (2045 projections for Texas state and counties); State of Louisiana (2030 Projections for Louisiana and Caddo Parish);
 Note: Population projections for the state of Louisiana and its parishes were not available past 2030; therefore, projections displayed for the zone of interest hold the population for Caddo Parish constant after 2030.

2.4.3 Education

Table 2.12 displays the highest level of education attained by the population ages 25 and over. In the zone of interest, 5% of the population has less than a 9th grade education, and another 10% has between a 9th and 12th grade education; 33% has a high school diploma or equivalent, and another 24% has some college and no degree; 7% has an Associate’s degree; 14% has a Bachelor’s degree; and 7% has a graduate or professional degree. In Texas, 9% of the population has less than a 9th grade education; another 9% has between a 9th and 12th grade education; 25% has at least a high school diploma or equivalent; 22% has some college; 7% has an Associate’s degree; 18% has a Bachelor’s

degree; and 10% has a graduate or professional degree. In Louisiana, 6% of the population has less than a 9th grade education; another 11% has between a 9th and 12th grade education; 34% has at least a high school diploma or equivalent; 21% has some college; 6% has an Associate's degree; 15% has a Bachelor's degree; and 8% has a graduate or professional degree.

Table 2.12 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older, 2016

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
Louisiana	3,065,979	171,179	325,031	1,038,591	653,009	174,294	461,804	242,071
Texas	17,085,128	1,519,768	1,496,184	4,286,126	3,821,713	1,160,660	3,158,468	1,642,209
Caddo Parish	167,830	6,661	16,691	55,083	39,308	10,142	25,065	14,880
Camp County	8,178	728	810	3,119	1,737	558	826	400
Cass County	21,302	780	2,224	9,589	4,475	1,157	2,180	897
Gregg County	78,928	4,866	7,987	22,510	21,016	6203	11,172	5,174
Harrison County	43,416	2337	5,130	14,848	10,092	3,331	5,549	2,129
Marion County	7,758	379	1,153	3,067	1,683	491	618	367
Morris County	8,836	398	763	3,345	2,411	463	1,007	449
Upshur County	27,110	1,567	2,934	8,886	7,242	2,202	3,047	1,232
Zone of Interest Total	363,358	17,716	37,692	120,447	87,964	24,547	49,464	25,528
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)								

2.4.4 Households, Income, Employment, Poverty

Employment by sector is presented in Figure 2.6 and Tables 2.13 through 2.17. Figure 2.6 shows that the largest percentage of the zone of interest is employed in the Educational services, and health care and social assistance sector at 25%, followed by 13% in Retail Trade, 10% in Manufacturing, 9% each in the Arts, entertainment, and recreation, and accommodation and food services, 8% in the Professional, scientific, and management, and administrative and waste management services, and 6% each in the Construction sector and the Other services, except public Administration sector. The remainder of the employment sectors each comprise 5% or less of the zone of interest's labor force.

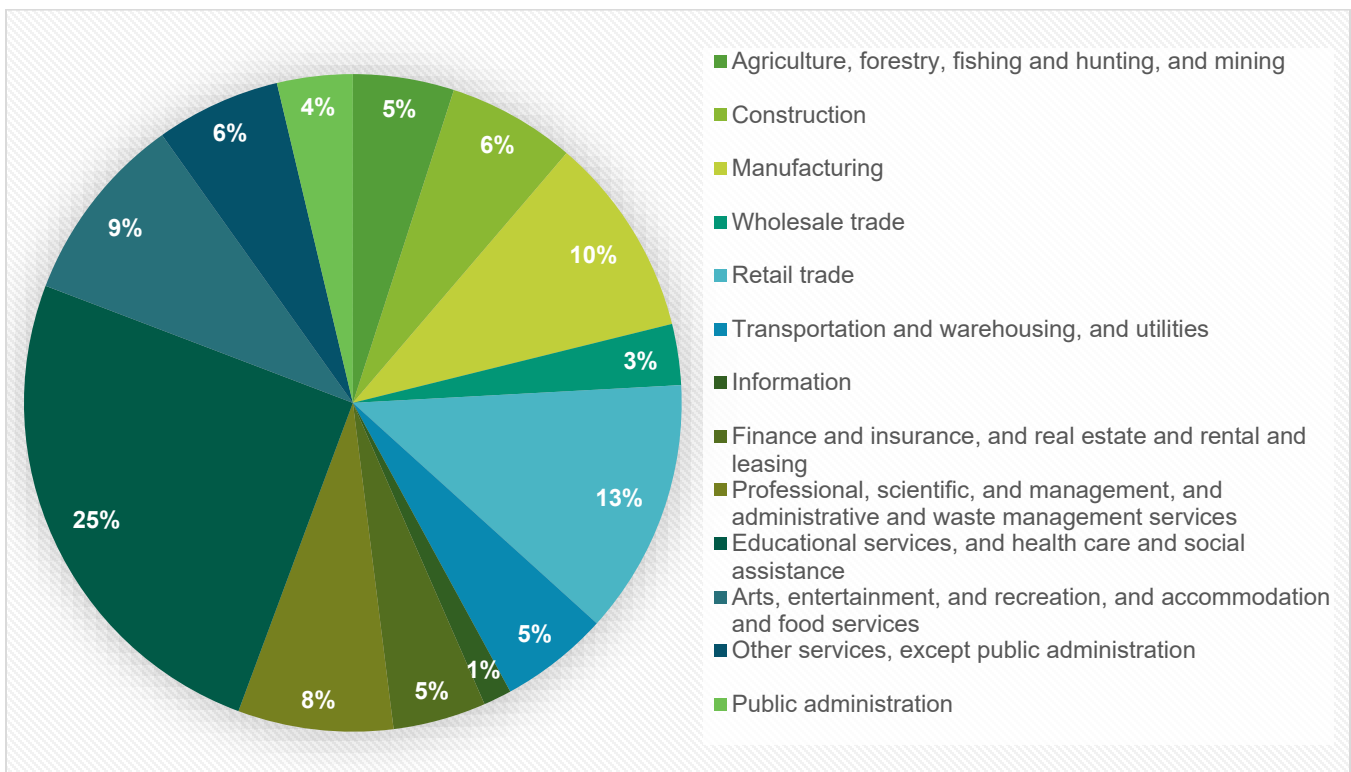


Figure 2.6 Zone of Interest Employment by Sector

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)

Table 2.13 includes a column displaying the growth rate of each industry within the East Texas Workforce Development Area (WDA) between 2014 and 2024. The East Texas WDA encompasses Marion County, where Lake O' the Pines lies. The other zone of interest counties that are encompassed in this WDA are Camp, Gregg, Harrison, and Upshur Counties. As the table shows, it is anticipated that the most growth in the area will be seen in the Arts, entertainment, and recreation, and accommodation and food services industry (26%). The Educational services, and health care and social assistance industry is expected to experience the second highest growth at 24%. The only industry that is not

expected to grow is the Agriculture, forestry, fishing and hunting, and mining industry, which is expected to decrease by 14.2%.

Table 2.13 Annual Average Employment by Sector 2016

Employment Sector	Geographic Area								Zone of Interest Total	East Texas WDA Growth Rate 2014 -2024
	Caddo Parish	Camp County	Cass County	Gregg County	Harrison County	Marion County	Morris County	Upshur County		
Civilian employed population 16 years and over	107,072	5,223	11,952	54,723	27,895	3,714	4,752	16,607	231,938	N/A
Agriculture, forestry, fishing and hunting, and mining	3,878	264	597	3,243	1,964	207	221	1,156	11,530	-14.2%
Construction	5,623	501	877	3,534	2,044	213	222	1,581	14,595	19.4%
Manufacturing	6,250	937	1,851	6,860	3,519	308	1,052	2,130	22,907	16.8%
Wholesale trade	3,114	199	253	1,712	1,087	99	66	423	6,953	22.2%
Retail trade	13,207	764	1,641	7,300	3,014	484	476	2,242	29,128	13.6%
Transportation and warehousing, and utilities	5,738	193	557	2,602	1,793	252	385	908	12,428	15.4%
Information	2,053	9	40	610	283	17	6	201	3,219	10.0%
Finance and insurance, and real estate and rental and leasing	5,027	241	336	2,752	1,313	91	199	661	10,620	14.2%
Professional, scientific, and management, and administrative and waste management services	9,402	271	563	4,293	1,583	267	194	1,140	17,713	20.9%
Educational services, and health care and social assistance	29,692	1,087	3,080	11,772	6,992	995	1,013	3,666	58,297	24.3%
Arts, entertainment, and recreation, and accommodation and food services	12,261	244	698	5,046	2,043	263	127	1,010	21,692	25.6%
Other services, except public administration	6,559	249	919	3,452	1,442	278	376	966	14,241	20.8%
Public administration	4,268	264	540	1,547	818	240	415	523	8,615	11.8%
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate), Texas Workforce Commission Labor Market and Career Information (WDA Growth Rates)										

As shown in Table 2.14, the unemployment rate in the zone of interest was 6.5% in 2016, higher than that of the states of Texas and Louisiana, which had unemployment rates of 4.6% and 6.2%, respectively. Within the zone of interest, all of the Texas counties had a higher unemployment rate than the state, with Morris County's 11% unemployment being the highest. Caddo Parish experienced a slightly higher unemployment rate than the state of Louisiana at 6.6% compared to the 6.2% state unemployment rate.

Table 2.14 Labor Force, Employment and Unemployment Rates, 2016 Annual Averages

Geographic Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Louisiana	2,127,000	1,995,000	132,000	6.2%
Texas	13,294,000	12,688,000	606,000	4.6%
Caddo Parish	107,764	100,630	7,134	6.6%
Camp County	5,039	4,696	343	6.8%
Cass County	12,249	11,353	896	7.3%
Gregg County	58,377	54,821	3,556	6.1%
Harrison County	29,862	28,055	1,807	6.1%
Marion County	4,317	4,011	306	7.1%
Morris County	4,898	4,359	539	11.0%
Upshur County	17,708	16,559	1,149	6.5%
Zone of Interest Total	240,214	224,484	15,730	6.5%
Source: Bureau of Labor Statistics, Current Population Survey (State estimate), LAUS (County estimates)				

Table 2.15 displays the number of households and average household sizes. There were approximately 9.3 million households in the state of Texas and 1.7 households in the state of Louisiana in 2016. The zone of interest contained approximately 206,000 of those homes with an average household size of 2.56.

Table 2.15 Households and Household Size

Area	Total Households	Average Household Size
Louisiana	1,731,398	2.61
Texas	9,289,554	2.84
Caddo Parish	97,497	2.54
Camp County	4,544	2.76
Cass County	11,770	2.54
Gregg County	45,446	2.62
Harrison County	23,473	2.77
Marion County	4,387	2.29
Morris County	5,015	2.49
Upshur County	13,941	2.85
Zone of Interest Total	206,073	2.56
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

In 2016, the median household income in the zone of interest ranged from \$35,424 in Marion County to \$47,724 in Upshur County, as displayed in Table 2.16. Per capita income was similar among the zone of interest, ranging from \$20,034 in Camp County to \$25,206 in Caddo Parish. The per capita incomes in the states of Louisiana and Texas were \$25,515 and \$27,828 respectively.

Table 2.16 Median and Per Capita Income, 2016

Geographic Area	Median Household Income	Per Capita Income
Louisiana	\$45,652	\$25,515
Texas	\$54,727	\$27,828
Caddo Parish	\$40,815	\$25,206
Camp County	\$40,045	\$20,034
Cass County	\$39,366	\$21,608
Gregg County	\$47,140	\$24,386
Harrison County	\$46,230	\$23,836
Marion County	\$35,424	\$22,536
Morris County	\$37,902	\$21,616
Upshur County	\$47,724	\$23,215
Zone of Interest	N/A	\$24,260
Total		
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

Table 2.17 displays the percentage of persons and families whose incomes fell below the poverty level in the past twelve months as of 2016. In the zone of interest, 15.3% of individual's incomes fell below the poverty level in 2016. In the state of Texas, 16.7% of individual's incomes fell below the poverty level, slightly higher than the state of Louisiana, where 15.1% of incomes fell below the poverty level in 2016. Within the zone of interest, Caddo Parish had the largest percentage of persons with incomes below the poverty level at 17.2%, and Upshur County had the smallest at 9.2%. In the remaining counties included in the zone of interest, the number of persons whose incomes fell below the poverty level ranged from 13% to 15%. In terms of families below the poverty level, Caddo Parish had the greatest percentage at 22.4%, and Upshur County had the smallest percentage at 13.5%. By comparison, 19.7% of Louisiana's families and 13% of Texas' families had incomes below the poverty level during the same time period.

**Table 2.17 Percent of Families and People Whose
Income in the Past 12 Months is Below the Poverty
Level, 2016**

Geographic Area	All Persons	All Families
Louisiana	15.1%	19.7%
Texas	16.7%	13.0%
Caddo Parish	17.2%	22.4%
Camp County	13.1%	19.3%
Cass County	13.3%	19.2%
Gregg County	15.1%	18.2%
Harrison County	13.4%	17.7%
Marion County	14.5%	21.6%
Morris County	14.9%	18.6%
Upshur County	9.2%	13.5%
Zone of Interest Total	15.3%	N/A
Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimate)		

2.4.5 Social, Environmental and Environmental Benefits

USACE recognized the importance of Lake O' the Pines and the activities on USACE lands and waters as being an important part of the local economy. Besides the obvious economic savings through flood risk management and development advantages through water supply, businesses can see investment opportunities, and people are drawn to the natural areas surrounding USACE lakes, as is evidenced by the growing number of residents adjacent to USACE properties. Nationally, USACE lakes attract about 335 million recreation visits every year, with direct economic benefits on local economies within a 30 mile radius. Tables 2.18-2.20 describes some of the extended social, environmental, and economic benefits of Lake O' the Pines for surrounding communities for 2016.

Table 2.18 Social Benefits

Facilities in FY 2013	Facilities in FY 2016
<ul style="list-style-type: none"> • 31 recreation areas • 164 picnic sites • 443 camping sites • 4 playgrounds • 7 swimming areas • 1 number of trails • 1 trail mile • 3 fishing docks • 31 boat ramps • 183 marina slips 	<ul style="list-style-type: none"> • 31 recreation areas • 164 picnic sites • 440 camping sites • 4 playgrounds • 7 swimming areas • 3 number of trails • 3 trail miles • 3 fishing docks • 31 boat ramps • 183 marina slips
Visits (person-trips) in FY 2012	Visits (person-trips) in FY 2016
<ul style="list-style-type: none"> • 959,985 in total • 88,307 picnickers • 25,266 campers • 125,005 swimmers • 31,349 water skiers • 248,059 boaters • 527,604 sightseers • 291,258 fishermen • 0 hunters • 52,602 others 	<ul style="list-style-type: none"> • 561,797 in total • 51,679 picnickers • 14,786 campers • 73,155 swimmers • 18,346 water skiers • 204,239 boaters • 335,096 sightseers • 170,448 fishermen • 0 hunters • 30,783 others
Public Outreach in FY 2013	Public Outreach in FY 2016
15,665 public outreach contacts	36,289 public outreach contacts
Benefits in Perspective	
By providing opportunities for active recreation, USACE lakes help combat one of the most significant of the nation's health problems: lack of physical activity.	

Recreational programs and activities at USACE lakes also help strengthen family ties and friendships; provide opportunities for children to develop personal skills, social values, and self-esteem; and increase water safety.

Table 2.19 Economic Benefit

Economic Data in FY2012	Economic Data in FY 2016
<p>Visitation per year resulted in:</p> <ul style="list-style-type: none"> • \$34,357 (thousands) in visitor spending within 30 miles of the USACE lake. • \$24,791 (thousands) in sales within 30 miles of the USACE lake. • 338 jobs within 30 miles of the USACE lake. • \$6,285 (thousands) in labor income within 30 miles of the USACE lake. • \$15,344 (thousands) in value added within 30 miles of the USACE lake. • \$12,137,004 in National Economic Development Benefits. <p>With multiplier effects, visitor trip spending resulted in:</p> <ul style="list-style-type: none"> • \$69,044 (thousands) in total spending. • \$41,676 (thousands) in total sales. • 438 jobs. • \$14,757 (thousands) in labor income. • 25,795 (thousands) in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes). 	<p>Visitation per year resulted in:</p> <ul style="list-style-type: none"> • \$21,034,229 in visitor spending within 30 miles of the USACE lake. • \$14,960,242 in sales within 30 miles of the USACE lake. • 182 jobs within 30 miles of the USACE lake. • \$5,100,831 in labor income within 30 miles of the USACE lake. • \$7,637,850 in value added within 30 miles of the USACE lake. • \$4,666,644 in National Economic Development Benefits. <p>With multiplier effects, visitor trip spending resulted in:</p> <ul style="list-style-type: none"> • \$25,149,480 in total spending. • \$22,775,953 in total sales. • 236 jobs. • \$7,701,217 in labor income. • \$11,949,992 in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes).
Benefits in Perspective	
<p>The money spent by visitors to USACE lakes on trip expenses adds to the local and national economies by supporting jobs and generating income. Visitor spending represents a sizable component of the economy in many communities around USACE lakes.</p>	

Table 2.20 Environmental Benefit

Resources in FY 2013	Resources Data in FY 2016
<ul style="list-style-type: none">• 11,643 land acres• 17,767 water acres• 144 shoreline miles	<ul style="list-style-type: none">• 29,041 land acres• 17,767 water acres• 144 shoreline miles
Benefits in Perspective	
Recreation experiences increase motivation to learn more about the environment; understanding and awareness of environmental issues; and sensitivity to the environment.	

2.5. RECREATION FACILITIES, ACTIVITIES, AND NEEDS

2.5.1 Zone of Influence and Visitation Statistics

The primary area of influence for Lake O' The Pines encompasses portions of six Texas counties and one Louisiana Parish. The Texas counties included in the zone of influence are the three of the counties in which the lake lies, Marion, Morris, and Upshur Counties, as well as the four additional Texas counties that surround Marion County, which are Camp, Cass, Gregg, and Harrison Counties. Caddo Parish in Louisiana, which borders Marion, Harrison, and Cass Counties, is included in the zone of interest since it encompasses the city of Shreveport, which is provided flood protection by Lake O' the Pines.

2.5.2 Visitation Profile

Zip code data from the National Recreation Reservation System (NRRS), the majority of visitors to Lake O' the Pines originate from within a 100-mile radius of the reservoir, with 67% visiting from within a 50 mile radius, which includes 59% visiting from within the zone of influence. These visitors are a diverse group of people with a wide variety of interests. Examples of visitors include campers who use the campgrounds around the reservoir and in the county and federally operated parks; adjacent residents; hunters and anglers who use hunting grounds and participate in fishing tournaments; marina customers who use the marinas on the reservoir; and day users who picnic, hike, bird watch, bicycle and ride horses. Lake O' the Pines is the primary location for water-related recreation, providing the public with a location for boating, sailing, canoeing/kayaking, paddle boarding, and swimming in the area. Lake O' the Pines has consistently provided high quality angling opportunities for multiple fish species and is regarded as a premier fishing destination in Texas.






















On average from 2007 through 2017, Lake O' the Pines has entertained over 600,000 visits per year, with the peak visitation months running from March through September. The NRRS tracks visitor information for parks across the US. The percent of visitors in 2017 by state for six (6) parks at Lake O' the Pines are as follows:

- Texas 82.5%
- Louisiana 8.4%
- Arkansas 1.4%
- Oklahoma 1.0%
- Michigan 0.5%
- Florida 0.5%

2.5.3 Recreation Areas and Facilities

The existing recreational opportunities and future potential of Lake O' the Pines is considered to be of great importance within the project's zone of influence. The project offers many recreational activities such as swimming, boating, water skiing, fishing, hunting, picnicking, camping, as well as hiking, and horseback riding. Table 2.21 lists the various recreational facilities collectively provided at Lake O' the Pines through governmental agencies as well as commercial concessions.

Table 2.21 Recreation Areas and Amenities at Lake O' the Pines

Recreation Area	Camping	Lodging	Showers	Boat Ramps	Marina	Gas	Fishing Facilities	Picnic Area \ Shelter	Playground	Swimming Area	Trails	Golf Course	Amphitheater	Grocery / Snack Bar
														
Alley Creek Campground \$ 	EN GD		X	X					X	BE	I			
Alley Creek Day Use \$ 			X	X				A			I			
Big Cypress Marina	E		X	X	X									GS
Brushy Creek Campground \$ 	EN D		X	X			D		X	BE	I			
Brushy Creek Day Use Area \$ 				X				AGS		BE	I			
Buckhorn Creek Campground \$ 	EN D		X	X					X		I			
Bullfrog Marina	N			X	X									GS
Cedar Springs 				X										
Copeland Creek Ramp 				X										
Hanson's Retreat	N			X										

	Camping	Lodging	Showers	Boat Ramps	Marina	Gas	Fishing Facilities	Picnic Area \ Shelter	Playground	Swimming Area	Trails	Golf Course	Amphitheater	Grocery / Snack Bar
Recreation Area														
Holiday Harbor Ramp				X										
Hurricane Creek				X				A						
Islandview Landing				X										G
Johnson Creek Campground \$	E N G D		X	X					X	BE				
Johnson Creek Day Use Area				X			D	A GS		BE			X	
Johnson Creek Marina	E		X	X	X									G
Lake O The Pines Motel and Marina	E			X	X									
Lakeshore East Ramp				X										
Lakeshore West Ramp				X										
Lakeside Park \$				X				A GS		BE				
Lone Star Ramp				X										
Oak Ridge Ramp				X										
Oak Valley				X										
Outlet Area				X										
Overlook Area \$				X			D	A						
Pine Harbor Ramp				X										
Pine Hill Ramp				X										
Pop's Landing Ramp				X										
Tejas Ramp				X										
Woodie's Ramp				X										
USACE Managed	\$ USACE Fees Collected							Managed by Others in <i>Italics</i>						

X Exists at lake



Legend:

Camping

- E** Electric Campsites
- N** Non-electric Campsites
- T** Pull Through Campsites
- G** Group Camping
- D** Dump Station

Fishing

- C** Fish Cleaning Stations
- D** Fishing Docks
- P** Fishing Piers

Picnic

- A** Picnic Area
- G** Group Picnic
- GS** Group Picnic Shelter

Swimming

- BE** Beach
- P** Swimming Pool

Trails

- B** Bike Trails
- Q** Equestrian Trails
- H** Hiking Trails
- I** Hiking Trails - Interpretive
- R** Off Road Vehicle Trails
- M** Multipurpose Trails

Source: USACE

2.5.4 Recreational Analysis - Trends

Recreational use at Lake O' the Pines continues to evolve. While visitation in USACE managed recreational areas remains strong, there is demand for recreational opportunities not offered in these parks. The 2012 Texas Outdoor Recreation Plan (TORP) published by TPWD is a comprehensive recreational demand study completed by Texas Parks and Wildlife. The TORP pointed out the top five needs within all park systems in the state as identified by professional recreation providers and by Texas citizens. Tables 2.22 through 2.37 and Figure 2.7 are a summary from the TORP and are provided to illustrate general trends in outdoor recreation. Some of the information in the TORP was extracted directly from the National Survey on Recreation and the Environment (NSRE) and reports generated by the USFWS.

As seen in Table 2.22, the top five recreational facilities needs in Texas focus on walking, hiking, biking, and wildlife observations. As population grow and urban environments expand, this trend is expected to continue. Having a regional resource like Lake O' the Pines can provide these amenities to the rapidly expanding populations in Texas, Louisiana, and beyond.

Table 2.22 Top Five Recreation Facilities Needed by Texas Citizens – TORP 2012

Top 5 Facilities Needed Now In Local Parks by Texas Citizens	
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%

Source: NSRE; TORP 2012

Interest in watercraft sports such as boating, canoeing and kayaking continue to hold strong interest in recreation. Table 2.23 illustrates that over 35% of the population surveyed participate in boating activities. Canoeing and Kayaking are seeing an increase in participation amongst those surveyed.

Table 2.23 Percent of Population Participating in Recreational Boating in the U.S.

Percent of Population Participating in Recreational Boating in the U.S.				
	1982-1983	1994-1995	1999-2001	2005-2009
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)

While participation in hunting and fishing show stable growth across those surveyed, there is a large jump in the population of people who are participating in the more passive activity of wildlife watching. As seen in Table 2.24, from 2001 to 2006 almost a million more people reported participating in this activity.

Table 2.24 Participation in Hunting, Fishing, and Wildlife Watching in Texas.

Participation in Hunting, Fishing and Wildlife Watching in Texas (Residents and Non-Residents, 16 years and older)				
Texas	Fishing	Hunting	Wildlife Watching	Total Participants (Fishing + Hunting + Wildlife Watching)
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

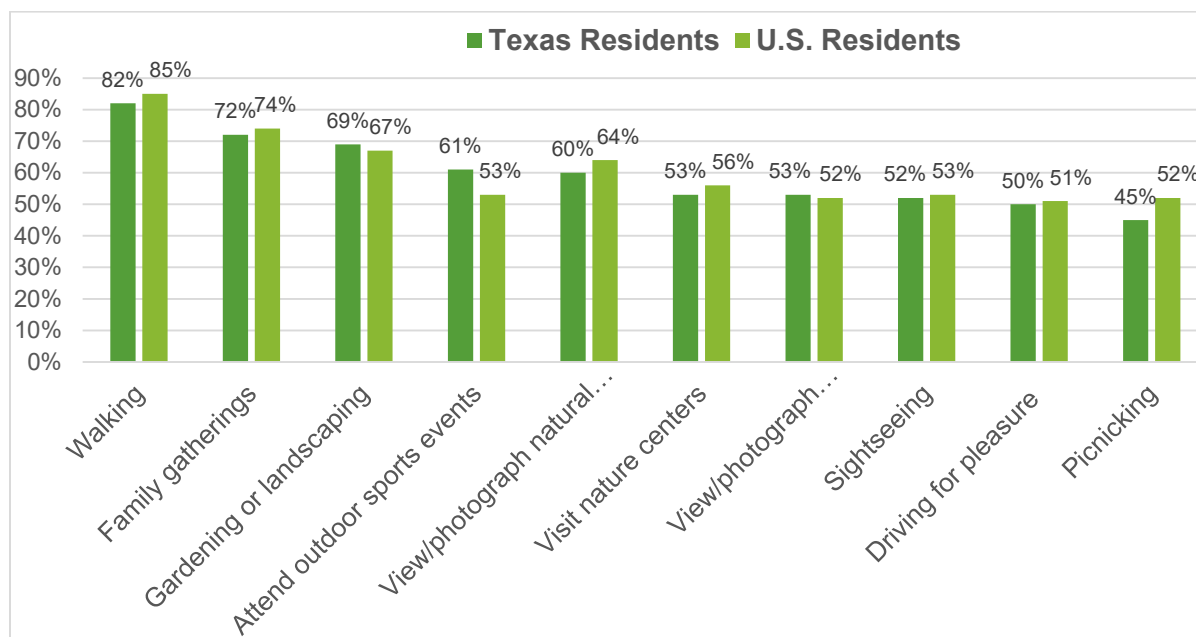


Figure 2.7 Participation Rates of Texas Residents (2006-2009) versus U.S. Residents (2005-2009) in the Top 10 Outdoor Recreation Activities

(Source: NSRE; TORP 2012)

As illustrated in Figure 2.7, Texas and the US are very similar, with more participation in walking and family gatherings, for which the facilities at Lake O' The Pines can and do accommodate. Lake O' the Pines has a diverse culture of visitors. Table 2.25 illustrates a slightly larger population of Hispanic respondents participate in many outdoor recreation activities available at Lake O' the Pines, including walking for pleasure and family gatherings.

Table 2.25 Comparison of Participation Rates of White/Non Hispanics Versus Hispanics in the Top 10 Outdoor Recreation Activities in Texas 2006-2009

ACTIVITY	% Texans Participating 2006-2009	
	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: NSRE; TORP 2012

2.5.5 Recreation Analysis – Needs

Lake O' the Pines recreation areas, natural shoreline, and water add to the attractiveness, vitality, and increased appreciation for the outdoors by users. These areas provide a sense of place and allow a growing urban population to enjoy outdoor recreation opportunities in a rural, natural setting. Outdoor recreation at Lake O' the Pines generally falls within two broad categories; land-based or water-based recreation. Management objectives for each type vary depending on the location and the intensity of use. Recreation management objectives in this Plan project future direction and actions necessary to meet the public's needs for land and/or water based recreation.

The reservoir provides recreational opportunity for swimming, boating, fishing, and other water sports. The area around the reservoir provide picnicking and camping for the casual, overnight, or vacationing visitors. Additionally, hiking and bird watching are encouraged throughout the project lands. Project lands are open for public hunting except in developed recreational area and lands in the vicinity of the dam and other project structures. Increases in these uses are expected, therefore, future development will be directed primarily toward those activities.

Written comments were collected from visitors in USACE parks for the period 2013 - 2014 via the USACE- administered Comment Card program. A summary of customer satisfaction comments received is provided below in Table 2.26 and 2.27. The summary from the Lake O' the Pines visitor comment cards shows that visitors are very satisfied with the current facilities.

Table 2.26 Lake O' the Pines Campsite Area Comment Card, 2013-2014

Customer Satisfaction Item	Response Distribution (Percent)						Mean Response (1-5 Scale)
	Very Good (5)	Good (4)	Neither Good Nor Poor (3)	Poor (2)	Very Poor (1)	Total	
24 total submitted comment cards							
Facilities:							
Suitability of park facilities for my recreational equipment and activities	67%	29%	4%	0%	0%	100%	4.6
Restroom cleanliness and availability of conveniences	43%	43%	9%	4%	0%	100%	4.3
Appearance of park grounds	67%	33%	0%	0%	0%	100%	4.7
Adequacy of signs providing directions and information	67%	33%	0%	0%	0%	100%	4.7
Parking space availability during my visit	74%	26%	0%	0%	0%	100%	4.7
Condition of roads and parking areas in the park	71%	29%	0%	0%	0%	100%	4.7
Employees:							
Availability of park rangers and staff	77%	23%	0%	0%	0%	100%	4.8
Helpfulness of park rangers and staff	77%	23%	0%	0%	0%	100%	4.8
Environmental Setting:							
Attractiveness of surrounding scenery and landscape	63%	38%	0%	0%	0%	100%	4.6
Quality of land and water resources for my activities	61%	39%	0%	0%	0%	100%	4.6
Overall:							
Waiting times needed to access park facilities and services	77%	23%	0%	0%	0%	100%	4.8

Feeling of safety and security in the park	75%	25%	0%	0%	0%	100%	4.8
Value received for any visitor fees paid	82%	14%	5%	0%	0%	100%	4.8
Overall satisfaction with my visit to this area	79%	21%	0%	0%	0%	100%	4.8

Table 2.27 Lake O' the Pines Day Use Area Comment Cards, 2013-2014

Customer Satisfaction Item	Response Distribution (Percent)						Mean Response (1-5 Scale)
	Very Good (5)	Good (4)	Neither Good Nor Poor (3)	Poor (2)	Very Poor (1)	Total	
8 total submitted comment cards							
Facilities:							
Suitability of park facilities for my recreational equipment and activities	38%	63%	0%	0%	0%	100%	4.4
Restroom cleanliness and availability of conveniences	38%	25%	13%	13%	13%	100%	3.6
Appearance of park grounds	57%	43%	0%	0%	0%	100%	4.6
Adequacy of signs providing directions and information	38%	25%	38%	0%	0%	100%	4.0
Parking space availability during my visit	38%	38%	13%	13%	0%	100%	4.0
Condition of roads and parking areas in the park	38%	25%	13%	25%	0%	100%	3.8
Employees:							
Availability of park rangers and staff	33%	50%	17%	0%	0%	100%	4.2
Helpfulness of park rangers and staff	50%	50%	0%	0%	0%	100%	4.5
Environmental Setting:							
Attractiveness of surrounding scenery and landscape	63%	38%	0%	0%	0%	100%	4.6
Quality of land and water resources for my activities	50%	38%	13%	0%	0%	100%	4.4

Overall:							
Waiting times needed to access park facilities and services	75%	25%	0%	0%	0%	100%	4.8
Feeling of safety and security in the park	75%	25%	0%	0%	0%	100%	4.8
Value received for any visitor fees paid	38%	63%	0%	0%	0%	100%	4.4
Overall satisfaction with my visit to this area	50%	50%	0%	0%	0%	100%	4.5

While the comment cards provide some indication of the current recreational needs at Lake O' the Pines, the trends identified in the TORP indicate new and emerging needs and direction for future management. Although the TORP is not specific to Lake O' the Pines recreation areas, the facilities and opportunities offered by USACE and other providers at Lake O' the Pines fall short in some of the recreation categories where need is indicated or participation rates are high. The TORP indicates that trails are in high demand, and Lake O' pines has only 3 official trails.

Public comments concerning future uses at Lake O' the Pines include increasing recreational offerings such as bike paths, zip lines, boat tours, and natural areas for wildlife viewing, which are all reflected as increasing participation in the TORP. Barrier free facilities are in demand, as it allows for more non-motorized watercraft facilities, more parking, and expanded swim beaches. Obviously, these recreational needs will need to be balanced with the lake's primary missions of flood control and water supply, as well as USACE responsibility for environmental stewardship.

2.5.6 Recreational Carrying Capacity

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 Lake O' the Pines 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.

The plan formulated herein proposes to provide a variety of activities and to encourage optimal use of present public use areas, where possible, based on the carrying capability of the land. The carrying capability of the land is determined primarily by the distinct characteristics of the site. These characteristics, both natural and manmade, are development constraints that often determine the type of facilities that should be provided.

Having facilities that cater to a variety of tastes and different members of the family will encourage visitors to enjoy the lake. Presently, USACE manages recreation areas using historic visitation data combined with best professional judgment to address recreation areas considered to be overcrowded, overused, underused, or well balanced.

USACE will continue to identify possible causes and effects of overcrowding and overuse and apply appropriate best management practices including: site management, regulating visitor behavior, and modifying visitor behavior.

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CHAPTER 3: RESOURCE GOALS AND OBJECTIVES

3.1. INTRODUCTION

This chapter sets forth goals and objectives necessary to achieve the USACE vision for the future of Lake O' the Pines. In the context of this Master Plan, "goals" express the overall desired end state of the Master Plan whereas resource "objectives" are specific task-oriented actions necessary to achieve the overall Master Plan goals. The Master Plan resource objectives will be used as the basis for the OMP, which is the master plan strategic implementation plan.

3.2. RESOURCE GOALS

The following statements, paraphrased from *EP 1130-2-550*, Chapter 3, express the goals for the Lake O' the Pines Master Plan:

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

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

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

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

3.3. RESOURCE OBJECTIVES

Resource objectives are clearly written statements that respond to identified issues and that specify measurable and attainable activities for resource development and/or management of the lands and waters under the jurisdiction of the Fort Worth District, Lake O' the Pines Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, USACE Environmental Operating Principles (EOPs), and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and they consider public input. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found in this Master Plan. Regional and State planning documents including TPWD's Texas Conservation Action Plan (TCAP) and TORP.

The objectives in this master plan provide project benefits, meet public needs, and foster environmental sustainability for Lake O' the Pines to the greatest extent possible. They include recreational objectives; natural resource management objectives; visitor information; education and outreach objectives; general management objectives; and cultural resource management objectives. Implementation of these objectives is dependent on personnel and budget availability, as well as partnerships with other agencies.

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, 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, modernize, and implement sustainability measures into 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, tent pads, 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 Lake O' the Pines lands.	*		*		*
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.).	*	*	*	*	
Consider long-term sustainable operational and maintenance costs when planning future new recreational facilities or upgrading and expanding existing facilities.					
Ensure consistency with USACE Recreation Strategic Plan.					*

Recreational Objectives	Goals				
	A	B	C	D	E
Monitor the TCAP, the TORP, 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 Lake O' the Pines.					*

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

Table 3.2 Natural Resource Management Objectives

Recreational Objectives	Goals				
	A	B	B	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.	*	*		*	
Ensure project lands are managed with preservation and conservation of natural habitat and open space as a primary objective in order to maintain the public open space.	*			*	
Actively manage and conserve fish and wildlife resources, with a focus on special status species, by implementing ecosystem management principles. Key among these principles is the use of native species adapted to the 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.		*			*
Conduct forest management activities to produce a sustained yield of timber to the extent compatible with ecosystem management principles and public recreational use. Continue ongoing coordination with TPWD and USFWS to review proposed timber sales.	*	*		*	*
Sustain the Lake O' the Pines 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 public safety relative to proximity and density of adjacent development.	*	*	*	*	*

Recreational Objectives	Goals				
	A	B	B	D	E
Minimize activities that disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Continually evaluate erosion control and sedimentation issues at Lake O' the Pines and develop alternatives to resolve the issues.	*	*			*
Address unauthorized uses of public lands such as off-road vehicle use, trash dumping, unauthorized fires, fireworks, poaching, clearing of vegetation, unauthorized trails and paths, and placement of advertising signs that create negative environmental impacts.	*	*	*	*	*
Monitor lands and waters for invasive, non-native, and aggressively spreading native species and take action to prevent and/or reduce the spread of these species. Potential invasive species of great concern are zebra mussels, and current invasive species with major prevalence are feral hogs, red imported fire ants, giant salvinia, water hyacinth, alligator weed, and hydrilla. Implement prescribed fire as a management tool to control the spread of noxious plants, and to promote the vigor of the piney woods ecoregion.	*	*		*	*
Protect and/or restore important native habitats such as Texas Piney Woods 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.

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 County officials and City Managers, web page).	*			*	*

Visitor Information, Education and Outreach Objectives	Goal				
	A	B	C	D	E
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.	*	*	*	*	*
Enhance network among local, state, and federal agencies in order to exchange lake-related information for public education and management purposes.	*			*	*
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.

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.	*	*			*
Manage project lands and recreational programs to advance broad national climate change mitigation goals in accordance with national USACE policy.					*

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

Table 3.5 Cultural Resources Management Objectives

Cultural Resources Management Objectives	Goal				
	A	B	C	D	E
Monitor and coordinate lake development and the protection of cultural resources with appropriate entities.	*	*		*	*
Complete an inventory of cultural resources.	*	*		*	*
Increase public awareness and education of regional history.		*		*	*
USACE will ensure any future historical preservation is fully integrated into the Lake O' the Pines Master Plan and 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).		*		*	*
Develop partnerships that promote and protect cultural resources at Lake O the Pines.		*	*	*	*
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 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 Lake O' the Pines, the only land allocation category that applies is Operations, which is defined as those lands that are required to operate the project for the primary authorized purposes of flood risk management, hydroelectric power, and water conservation. The remaining allocations of Recreation, Fish and Wildlife, and Mitigation would apply only if lands had been acquired specifically for these purposes. The fee simple federal estate at Lake O' the Pines lying above the conservation pool elevation is 11,643 acres, all of which is allocated to Operations.

4.2. LAND CLASSIFICATION

Previous versions of the Lake O' the Pines 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 plus years since the previous Master Plan was published, wildlife habitat values, surrounding land use, and regional recreation trends have changed giving rise to the need for revised classifications. Refer to Table 8.1 in Chapter 8 for a summary of land classification changes from the prior classifications to the current classifications.

4.2.1 Current Land and Water Surface Classifications

USACE regulations require project lands and waters to be classified in accordance with the primary use for which project lands are managed. There are six 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 Lake O' the Pines 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.

4.2.2 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 risk management. In addition to the operational activities taking place on these lands, limited recreational use may be allowed for activities such as public access to the fishing pier in the tailrace area of the hydroelectric plant. Regardless of any limited recreation use allowed on these lands, the primary classification of Project Operations will take precedent over other uses. There are 290 acres of Project Operations land specifically managed for this purpose.

4.2.3 High Density Recreation (HDR)

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

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

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

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

At Lake O' the Pines, prior land classifications included a 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 Lake O' the Pines there are 1,231 acres classified as High Density Recreation land. Refer to Table 2.18 for a listing of the current High Density Recreation Areas at Lake O' the Pines. Each of the High Density Recreation areas is described briefly in Chapter 5 of this Plan.

4.2.4 Mitigation

This classification is used only for lands allocated for mitigation for the purpose of offsetting losses associated with the development of the project. There are no lands at Lake O' the Pines with this classification.

4.2.5 Environmentally Sensitive Areas (ESA)

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. At Lake O' the Pines several distinct areas have been classified as Environmentally Sensitive Areas (ESA), primarily for the protection of sensitive habitats or cultural resources. Each of these areas is discussed in Chapter 5 of this Plan and illustrated on the maps in Appendix A. There are 4,236 acres classified as ESA at Lake O' the Pines.

4.2.6 Multiple Resource Management Lands (MRML)

This classification is divided into four sub-classifications identified as: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. A given tract of land may be classified using only one of these sub-classifications and should reflect the dominant use of the land, with the understanding that other compatible uses may occur on these lands. 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 5,886 acres of land under this classification at Lake O' the Pines. The following paragraphs list each of the sub-classifications, and the number of acres and primary uses of each.

4.2.6.1 Low Density Recreation (LDR)

These are lands that may support passive public recreational use (e.g., fishing, hunting, wildlife viewing, natural surface trails, hiking, etc.). 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, Vegetative Management or

Wildlife Management. There are 1,782 acres under this classification at Lake O' the Pines.

4.2.6.2 Wildlife Management (WM)

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 1,774 acres of land included in this classification at Lake O' the Pines.

4.2.6.3 Vegetative Management (VM)

These are lands designated for stewardship of forest, prairie, and other native vegetative cover. Passive recreation activities previously described may be allowed in these areas. There are 2,325 acres of land included in this classification at Lake O' the Pines.

4.2.6.4 Future/ Inactive Recreation.

These are lands with site characteristics compatible with High Density Recreation development. These are areas where High Density Recreation development was anticipated in prior land classifications, but the anticipated development either never took place or was minimal. These areas are typically closed to vehicular traffic and will be managed as multiple resource management lands until development takes place. There are 5 acres of land included in this classification at Lake O' the Pines.

4.2.7 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 Water Surface Classification map can be found in Appendix A of this Plan. The four sub-categories of water surface classification include:

4.2.7.1 Restricted.

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety, and security purposes. The areas include the water surface upstream and downstream of the Lake O' the Pines Dam as well as around the five (5) individual swim beaches located at Alley Creek Campground and Day Use areas, Brushy Creek

Campground and Day Use areas, Johnson Creek Campground, and the two (2) swim beaches at Lakeside Park. There are 22 acres of restricted water surface at Lake O' the Pines.

4.2.7.2 Designated No-Wake.

Designated No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. There are 28 boat ramps, fourteen courtesy docks, and three (3) marinas at Lake O' the Pines where no-wake restrictions are in place for reasons of public safety and protection of property. There are 82 acres of designated no-wake water surface at Lake O' the Pines.

4.2.7.3 Fish and Wildlife Sanctuary.

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

4.2.7.4 Open Recreation.

Open Recreation includes all water surface areas available for year round or seasonal water-based recreational use. This classification encompasses the majority of the lake water surface and is open to general recreational boating. Boaters are advised through maps and brochures, or signs at boat ramps and marinas, that navigational hazards may be present at any time and at any location in these areas. Operation of a boat in these areas is at the owner's risk. Specific navigational hazards may or may not be marked with a buoy. There are 17,663 acres of open recreation water surface at Lake O' the Pines.

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.

4.2.8 Recreational Seaplane Operations

Seaplane restrictions are part of Title 36 Code of Federal Regulations. At Lake O' the Pines and other USACE lakes across the nation, areas where recreational seaplane operations are prohibited were established through public meetings and environmental assessments circa 1980. The seaplane policy for USACE Fort Worth District is found in the Notice to Seaplane Pilots (see Appendix F), which lays out the general restrictions as well as lake-specific restrictions for seaplane operation. Seaplane operations at Lake O' the Pines are generally prohibited in several major coves and bays off the main body of the lake and within 500 feet of structures such as bridges and the dam. Once on the water, seaplanes are considered to be water vessels and fall under guidelines for watercraft.

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

Table 4.1 Land Classification Acres at Lake O' the Pines

CLASSIFICATION	ACRES
Project Operations	290
High Density Recreation	1,231
Environmental Sensitive Areas	4,236
Multiple Resource Managed Lands - Low Density Recreation	1,782
Multiple Resource Managed Lands - Wildlife Management	1,774
Multiple Resource Managed Lands - Vegetative Management	2,325
Multiple Resource Managed Lands - Future/Inactive Recreation Areas	5
Water Surface: Restricted	22
Water Surface: Designated No-Wake	82
Water Surface: Fish and Wildlife Sanctuary	0
Water Surface: Open Recreation	17,663

Note: Acreages were measured using GIS technology and may vary from the official land acquisition records. Acreage varies depending on changes in lake levels, sedimentation and shoreline erosion. Total Water Surface: 17,767 acres - Miles of Shoreline: 144 miles

4.3. PROJECT EASEMENT LANDS

Project Easement Lands are primarily lands on which easement interests were acquired. Fee title was not acquired on these lands, but the easement interests convey to the Federal government certain rights to use and/or restrict the use of the land for specific purposes. Easement lands are typically classified as Operations Easement, Flowage Easement, and/or Conservation Easement. At Lake O' the Pines, flowage easement lands exist for one primary purpose. 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 16,063 acres of flowage easements lands at Lake O' the Pines.

CHAPTER 5: RESOURCE PLAN

5.1. MANAGEMENT BY CLASSIFICATION

This chapter describes the management plans for each land use classification within the Master Plan. The classifications that exist at Lake O' the Pines are Project Operations, High Density Recreation, Environmentally Sensitive Areas, and Multiple Resource Management Lands, which consist of Low Density Recreation, Vegetative Management, Wildlife Management, and Future/Inactive Recreation. The Water Surface is divided into classifications of Restricted, No-Wake, and Open Recreation. The management plans describe how these project lands will be managed in broad terms. A more descriptive plan for managing these lands can be found in the Lake O' the Pines OMP.

5.2. PROJECT OPERATIONS

Project Operations is land associated with the dam, spillway, levees, lake office, maintenance facilities, and other areas solely for the operation of the project. There are 290 acres of lands under this classification, all of which are managed by the USACE with the exception of the water intake structures. The water intake structures are managed individually by the Northeast Texas Municipal Water District, the City of Longview, and the Southwestern Electric Power Company. The management plan for the Project Operations area is to continue providing physical security necessary to ensure sustained operations of the dam and related facilities including restricting public access in hazardous locations near the dam and spillway.

5.3. HIGH DENSITY RECREATION

Lake O' the Pines has 1,231 acres classified as High Density Recreation (HDR). These lands are developed for intensive recreational activities for the visiting public including day use and campgrounds. Several of the HDR areas include areas that are not currently developed but are available to be developed if the need arises. National USACE policy set forth in ER 1130-2-550, Chapter 16, limits recreation development on USACE lands to those activities that are dependent on a project's natural resources and typically include water-based activities, overnight use, and day use such as marinas, campgrounds, picnic areas, trails, swimming beaches, boat launching ramps and comprehensive resorts. Examples of activities that are not dependent on a project's natural resources include, theme parks or ride-type attractions, sports or concert stadiums, and stand-alone facilities such as restaurants, bars, motels, hotels, and golf courses.

USACE operates and manages numerous areas designated as HDR areas. The following is a description of each park operated by USACE along with a conceptual management plan for parks by classification groups. Groups include Class A (highly developed listed in section 5.3.1) and Class C (basic facilities listed in section 5.3.2). Maps showing existing parks and facilities managed by USACE can be found in Appendix A. In addition to the USACE managed and operated HDR areas, USACE

leases five (5) HDR areas that are managed by recreation partners. Section 5.3.3 includes a brief description of these parks and notes the recreational partners who manage them. Table 2.25 summarizes each park and associated amenities.

Comments obtained during the public comment period at the onset of the master planning process indicates a desire for an increase in the type and quantity of outdoor recreation at Lake O' the Pines. USACE can only achieve this through partnerships with other agencies and is open to such partnerships to build on the existing recreational opportunities at the Lake.



Photo 5.1 Lake O' the Pines Swim Beach (Source: USACE Photo)

5.3.1 Class A Parks

In accordance with historical visitation rates and recent outdoor recreation trends documented in the 2012 TORP, camping in both highly developed and primitive settings has declined significantly in Texas since 2000. NSRE surveys documented that in the period 2006-2009 only 21.9% of Texans participated in developed camping and only 9.7% participated in primitive camping. These percentages are down significantly from surveys conducted in 2000-2001. As noted in Chapter 2, visitation continues to be strong at Class A parks at Lake O' the Pines. Facilities provided are sufficient in some parks, while at others demand exceeds available resources during peak use periods. USACE intends to continue to operate the Class A campgrounds and day use areas by

maintaining and improving existing facilities, but has no long range plans to add additional campsites. In response to trends documented in the TORP, USACE will endeavor to improve access to some swim beaches and to develop hiking and biking trails in or adjacent to some park areas as funding permits. USACE encourages partnerships with agencies who lease and manage parks to respond to increasing demands and build on the current quality of USACE parks for present and future visitors.

Alley Creek Campground spans 112 acres and features 79 campsites, ranging from more primitive tent sites to RV sites. A boat ramp and playground are provided, as well as a large group campsite is on the site and will accommodate up to 50 guests. Amenities include flush toilets, boat ramp, drinking water, a dump station, playground, and showers. Future plans include maintaining existing infrastructure and sustaining operations.

Brushy Creek Campground has 403 acres and features 76 campsites, ranging from primitive to full RV hookup. Features include a boat ramp, playground, swimming beach, flush toilets, boat ramp, drinking water, dump station, electrical hookups, and showers. Future plans include maintaining existing infrastructure and sustaining operations. There is sufficient room in this HDR area for additional development if the need arises.

Buckhorn Creek Campground has 112 acres and features 77 campsites ranging from primitive to RV hookups. Amenities include a boat ramp, playground, drinking water, showers, flush toilets, trails, and swimming beach. The area is known as a great place for birdwatchers, with species including Brown-headed Nuthatches and rare gulls such as Sabin's, Thayer's, Great Black-backed, and Laughing Gulls. Bald Eagles are also frequent the area. Future plans include maintaining existing infrastructure and sustaining operations.

Johnson Creek Campground has 140 acres and features 54 primitive and full RV hookup campsites. Amenities include a large group campsite that can accommodate up to 200 guests, a boat ramp, boat dock, playground, swimming beach, drinking water, showers, flush toilets, and a dump station. Future plans include maintaining existing infrastructure and sustaining operations.

5.3.2 Day Use Parks

The management plan for all the parks listed below is to continue to operate them as day use areas and access points by maintaining and improving existing facilities. Similar to Class A parks, emphasis will be placed on improvements such as upgrading aging water and electrical infrastructure, repairing or replacing outdated restrooms, paving gravel roads in some parks and installing site amenities such as fire rings, lantern posts and cookers. Trails within parks will be considered.

Alley Creek Day Use Area features 22 acres – The Alley Creek Day Use Area features picnic tables shaded with large pine trees and convenient access to a boat ramp, courtesy dock, and hiking trail. Future plans include maintaining existing infrastructure and sustaining operations.

Johnson Creek Day Use Area contains 36 acres and features a large group picnic shelter with electric hookups that can accommodate up to 100 guests. Amenities include a boat ramp, boat dock, swimming beach, flush toilets, amphitheater, beach access, and trails. Future plans include maintaining existing infrastructure and sustaining operations.

Lakeside Day Use Area contains 231 acres and features a large group picnic shelter with electric hookups that can accommodate up to 100 guests. Amenities include a boat ramp, boat dock, swimming beach, and picnic shelters with grills. Future plans include maintaining existing infrastructure and sustaining operations.

Outlet Park Day Use Area is 5 acres of natural area with restroom facilities. Future plans include maintaining existing natural character and sustaining operations.

Overlook Park Day Use Area has 30 acres and features three picnic sites and a restroom facility. Future plans include maintaining existing infrastructure and sustaining operations.

Shady Grove Day Use Area (Brushy Creek) contains 34 acres and is located near Ferrell's Bridge Dam. It features one large group picnic shelter and 30 smaller shelters, non-reservable picnic sites with tables and grills located in shady areas along the lake shore. Amenities include a boat ramp, dock, swimming beach, basketball court, and flush toilets. Future plans include maintaining existing infrastructure and sustaining operations.

5.3.3 Leased Parks

USACE has five (5) recreational outgrants issued in the form of permits or leases to recreational partners, referred to as lessees. Each lessees is responsible for the operation and maintenance of their leased area, and although USACE does not provide direct maintenance within any of the leased locations, it may occasionally lend support where appropriate. The USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all leased and USACE-operated HDR areas. USACE works with partners to ensure that recreation areas are managed and operated in accordance with the objectives prescribed in Chapter 3. The following are leased areas at Lake O' the Pines.

Big Cypress Marina. Located on the south end of the lake on 22 acres, the marina offers RV camping, boat storage and is home to the Longview Yacht Club. The park area and marina are currently operated as a commercial lease and offer a variety of facilities, and convenience of access to the reservoir. This Park is a lease concession

and provides a full range of waterfront facilities, floating boat slips, camping, RV sites, cabins, swim beach, picnic area, pavilion, and store and restaurant. Future plans of the lessee include maintaining existing infrastructure, upgrade of facilities, and further development of the marina area and lodging facilities.

Marley's Bullfrog Marina. Located on 15 acres on the north side of the lake 15 miles west of Jefferson. The marina has covered boat slips, RV camping, and cabins available for rent. The park area and marina are currently operated as a commercial lease and offer a variety of facilities, and convenience of access to the reservoir. This Park is a lease concession and provides a full range of waterfront facilities, floating boat slips, camping, RV sites, cabins, swim beach, picnic area, pavilion, and store and restaurant. Future plans of the lessee include maintaining existing infrastructure, upgrade of facilities, and further development of the marina area and lodging facilities.

Hanson's Retreat encompasses five (5) acres but is currently closed. It contains one boat ramp.

Islandview Marina features six (6) acres and is located on the south shore. It is closed and no current plans exist for future concessionaires.

Lake O' The Pines Lodge encompasses four (4) acres and contains a boat ramp, camp sites, a hotel, and RV sites. The concessionaire is currently making improvements to enhance visitor recreation experience.

Sunrise Cove/Sunrise Road has been abandoned by the county, who has no plans to renew the lease. When the lease terminates, the boat ramp and dock will be removed. No plans currently exist to lease to another agency.

5.3.4 Boat Ramps

Boating and fishing access to Lake O' the Pines is provided by USACE, Marion County, and private marinas. There are 17 boat ramps operated by USACE and 11 outgranted boat ramps at Lake O' the Pines. Additionally, there are three (3) courtesy fishing docks and nine (9) courtesy loading docks operated by USACE, as well as two (2) courtesy loading docks operated by others. Launch fees are charged at most boat ramps; however, USACE maintains five (5) free ramps in addition to developed park areas. The location of the ramps can be found in the map section of this plan in Appendix A.

USACE works with communities where a new ramp would be beneficial. A new ramp in an unincorporated area/subdivision would require authorization under a license with a county and must be open to the public. New ramps may qualify for funding assistance through TPWD's boating access grants.

5.3.5 Trails

As stated in the TORP, there is a growing demand for trails of all kinds. Lake O' the Pines feature three (3) different trails totaling 3.3 miles for hiking and wildlife viewing use operated by USACE. Following are the location and lengths of these trails.

Alley Creek Campground Hiking Trail – one (1) mile long

Brushy Creek Campground Hiking Trail – 1.3 miles long

Buckhorn Creek Campground Interpretive Trail – one (1) mile long

Trails are a growing part of the outdoor experience across the nation. Future plans include partnering with other agencies as time and funds permit to create additional recreational trails for hiking, cycling, equestrian, and wildlife viewing.

5.4. MITIGATION

The mitigation classification is used for lands that were acquired specifically for the purpose of offsetting losses associated with development of the project. There are no acres at Lake O' the Pines under the mitigation classification.

5.5. ENVIRONMENTALLY SENSITIVE AREAS

ESA's are areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act, or applicable state statutes. These areas must be managed to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration and management. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area. Forest management practices and timber harvest should be consistent with management goals related to these areas and determined to be beneficial to achieve a prescribed outcome for the site.

The results of the Wildlife Habitat Appraisal Procedure (WHAP) conducted in the late summer of 2017 were used, in part, to assist in determining which areas should be classified as ESA. Other factors, including the presence of cultural resources, species of conservation concern, and visual esthetics were also included in the selection of ESA areas. There are 22 ESA's totaling approximately 4,236 acres at Lake O' the Pines that are classified as ESA. Each of these areas are numbered on the land classification maps in Appendix A. Table 5.1 provides a listing of the ESA areas, including habitat type, acreage and WHAP scores.

Table 5.1 ESA Listing

ESA Area Number ¹	Acres	WHAP Scores Per Sample Point Number
ESA 1	2,281	#42 (0.60), #42A (0.82), #43 (0.49), #44A (0.72), #44B (0.78), #44C (0.69), #44D (0.79)
ESA 2	508	#40 (0.71), #41 (0.41)
ESA 3	209	#33 (0.63)
ESA 4	103	#45 (0.71), #46 (0.68), #47 (0.64)
ESA 5	25	#32 (0.52)
ESA 6	55	#30 (0.58), #31 (0.68)
ESA 7	23	#13 (0.81)
ESA 8	5	#16 (0.58), #17 (0.59), #18 (0.43), #19 (0.57)
ESA 9	227	#62 (0.63), #63 (0.67), #64 (0.56), #65 (.60)
ESA 10	40	None
ESA 11	26	None
ESA 12	72	None
ESA 13	185	None
ESA 14	18	None
ESA 15	17	None
ESA 16	85	None
ESA 17	60	None
ESA 18	100	None
ESA 19	81	None
ESA 20	39	None
ESA 21	62	None
ESA 22	15	None

¹Denotes area number shown on land classification maps in Appendix A.

Future management of ESA areas will be designed to protect and improve the resources that qualify these areas for ESA classification. All of these areas are suitable for development of natural surface pedestrian trails unless the areas are critically important as habitat for sensitive species. Hunting is also allowed on these areas taking into consideration public safety and resource protection. Any future ground-disturbing activities would take into account Section 106 of the NHPA and other applicable cultural resource statutes to insure that cultural resources are protected. Specific management measures may include but are not limited to the following:

- Bottomland Hardwood Sites: Selective thinning will be done periodically to favor dominant and desirable mast producers. Supplemental tree and shrub plantings will be done to increase forest diversity. A mature, older timber component will be maintained on all sites.
- Pine - Oak Sites: Selective thinning will be accomplished to maintain forest vigor and a desirable mix of pine and oak. Prescription burning and tree and shrub

plantings will be done to improve stand diversity. A mature, older timber component will be maintained on all sites.

- Cultural Resource Sites: Known sites will be protected from vandalism and/or erosion. Additional reconnaissance surveys will be conducted as needed to determine the extent of cultural resource sites. Tribal coordination will continue to insure proper management and/or protection of known sites.
- Sites supporting Species of Conservation Concern: The site characteristics that cause these areas to be favored by individual species will be protected and improved. Perch and/or nesting sites for the southern bald eagle are examples of site characteristics that need protection.
- Steep Slope Sites: These areas will be monitored to protect their scenic value, wildlife habitat value, and to reduce shoreline erosion.

In addition to the above stated management plan for Lake O' the Pines ESA's, ESA #17 (see map in Appendix A) is bisected by Utility Corridor #4 for HWY 155. This ESA designation takes into account that TXDOT has plans to widen HWY 155 which will require an expanded road easement. Disturbance of the ESA will be avoided as much as possible and any adverse environmental impacts associated with the road widening project will be mitigated.

5.6. MULTIPLE RESOURCE MANAGEMENT LANDS

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

5.6.1 Low Density Recreation.

These lands are generally narrow parcels of land that are adjacent to private residential developments. 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. 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. 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 is strictly limited to designated areas.

Future uses may include additional designated natural surface hike/bike/equestrian trails. There are 1,782 acres zoned Low Density Recreation under this classification.

5.6.2 Wildlife Management.

These are lands designated for the stewardship of fish and wildlife resources and are managed by USACE. There are currently 1,774 acres of land under this classification at Lake O' the Pines, however, areas of low density recreation, ESA's and vegetative management all support wildlife. Management efforts focus on producing native wildlife food and habitat.

There is at least one federally-listed endangered species that could use habitat within the Lake O' the Pines area. Therefore, any work conducted on this project will be in accordance to the Endangered Species Act and will be appropriately coordinated with the USFWS. The species of focus within this area of consideration are animals listed as a threatened or endangered species under the Endangered Species Act. These species (Table 2.5) will continue to receive attention to ensure they are managed in accordance to their habitat needs.

Non-game wildlife is also managed by USACE. Non-game programs, such as song bird nest box construction and installation of bat boxes, are performed on an intermittent basis. The plan is to continue these initiatives in order to provide some form of management for non-game species.

5.6.3 Vegetative Management.

In general, vegetative resources on USACE lands are managed for multiple purposes including wildlife habitat, recreational activities in parks, landscape aesthetics, and timber. Management of forest on USACE lands nationwide is guided, in part, by policy set forth in Public Law 86-717, the Forest Cover Act, which states that "...project lands shall be developed and maintained to assure a future supply of timber through sustained yield programs to the extent that such management is practicable and compatible with other uses of the project." Additional forest management guidance is set forth in USACE regulations ER & EP 1130-2-540 which specifies that stewardship of project land shall be ecosystem based. Meeting the intent of the Forest Cover Act, USACE regulations, and the public interest expressed in the formulation of the Master Plan has resulted in management objectives that are set forth in Chapter 3 of this Plan. Key among these objectives are:

- Perpetuation of forest types reflective of the Pineywoods Ecoregion. The primary forest types include: pine; pine-hardwood uplands; shortleaf pine/little bluestem savannah; bottomland hardwoods. Where the opportunity exists, such as areas adjacent to Cypress Creek, habitat suitable for the black bear will be maintained or restored.

- Implementation of selective harvest systems in pine-hardwood and bottomland hardwood forest types that result in a mix of species and ages as well as a diverse understory.
- Maintenance of a mature, older timber component in all forest types.
- Maintenance of a fully forested, continuous canopy shoreline having a mixture of tree species, ages, and diverse understory.
- Establishing flood tolerant trees, to the extent practicable, in areas that are frequently inundated by stored flood water.
- Maintaining forest vigor to prevent loss of timber to disease and insect infestation, and to reduce the occurrence of hazardous trees in public use areas and along boundary lines in populated areas.

Current recreational use of these lands includes, but is not limited to hunting, bank fishing, and pedestrian access by adjoining landowners. Future uses include all existing uses with the possibility of creating multiuse trail opportunities. Future uses may include additional designated natural surface hike/bike/equestrian trails. There are 2,325 acres of MRML – Vegetation Management at Lake O’ the Pines.

5.6.4 Future/Inactive Recreation Areas.

These are areas with site characteristics compatible with potential future recreational development or recreation are that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources. There are 5 acres classified under this sub-classification at Lake O’ the Pines. As noted under Section 5.3, several HDR areas have considerable undeveloped acreage that could be utilized for recreational development if and when the need arises.

5.7. WATER SURFACE

At conservation pool level of 228.5 feet NGVD29 there are 17,767 acres of surface water. The summer conservation pool level is maintained at 230.0 feet NGVD29, which brings the summer water surface area to be 19,780 acres. Buoys are managed by USACE with close coordination with the TPWD. These buoys help mark hazards, swim beaches, boats keep-out and no-wake areas.

5.7.1 Restricted

Restricted areas are around swim beaches, water intake structures, as well as the dam for project operations, safety, and security purposes. Water surface zoned as restricted total approximately 22 acres.

5.7.2 Designated No-wake

No-wake areas are located near boat launch areas for the safety of launching and loading boat or personal watercraft. During formulation of this Plan, public comment indicated a desire for establishment of passive use boating areas in the

form of paddle trails or no-wake areas where paddle boats would not have to compete with motorized watercraft. USACE is open to this concept and will work with interested parties to fulfill this need. Currently, approximately 82 total acres of Lake O' the Pines is designated for no-wake.

5.7.3 Fish and Wildlife Sanctuary

These areas are managed with annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. There are no water surface acres under this classification at Lake O' the Pines.

5.7.4 Open Recreation

The remaining lake area not in the above classifications is open to recreational use. No specific zoning exists for these areas, but there is a buoy system in place to help aid in public safety. 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. Approximately 17,663 total acres of Lake O' the Pines is zoned for open recreation.

5.8. SUSTAINABILITY

Sustainability is a multi-pronged aspect of responsible stewardship of USACE lands. The outcome of sustainability initiatives is to have a program that; is able to adapt to fiscal challenges, safeguards the environment, and continues to provide high quality recreational opportunities for the public. As the nation's largest provider of outdoor recreation, managing 12 million acres of lands and waters across the county, USACE is committed to implementing initiatives that link people to water.

The recreational mission of USACE is to manage and conserve natural resources, while providing quality public outdoor recreation opportunities to serve the needs of the present and future generations. This is in-line, and indeed the underpinning, of all the goals and objectives for Lake O' the Pines resources and management. The USACE 2011 Recreational Strategic Plan identifies a number of goals and objectives designed to build a more robust environmental and recreational program on USACE managed lands. Many of the goals center specifically on promoting environmental sustainability in all aspects of recreation resources management. This includes integrating environmental operating principles and other environmental regulation and initiatives into day-to-day decision making and long range planning. Other objectives include using Leadership in Energy and Environmental Design (LEED) certified personnel and projects in facility design and maintenance, adopting Sustainable Sites Initiative criteria where applicable on land-based recreation areas, and updating project master plans to include environmental sustainability elements.

Meeting the public's needs and continuing to provide a full range of outdoor recreation opportunities will require collaboration. In support of that, USACE will

maintain and enhance existing relationships while seeking new and innovative types of relationships with federal, state, and local agencies, volunteers, non-government organizations, cooperators and others to provide certain recreation services and opportunities to the public. Besides pursuing and maintaining partnerships, it is important to continue to identify, analyze, and evaluate authorities and policies such as fee collection and retention and increased partnership capabilities. Areas identified for changes to meet the goals and objectives of this Strategy include authorities for fee collection and retention without budgetary offset and policies that pertain to funding schedules for partnership projects.

Through creativity, innovation, strong partnerships, and environmentally sustainable stewardship, quality recreational opportunities will continue to be available to the public. This will be done while simultaneously protecting the water, environment, and cultural resources for current and future generations.

CHAPTER 6: SPECIAL TOPICS/ISSUES/CONSIDERATIONS

6.1. COMPETING INTERESTS ON THE NATURAL RESOURCES

Lake O' the Pines is a large multi-purpose project with numerous authorized purposes. The authorized purposes accommodate the needs of federal, state, and municipal users which have developed over time and have contractual rights that must be honored. The benefits provided by virtue of authorized purposes are critical to the local and regional economies and are of great interest to the public. Aside from operating the reservoir to meet the needs of those entities with contractual rights, there are many competing interests for the utilization of federal lands including recreational users, adjacent landowners, those who own mineral rights, utility providers, and all entities that provide and maintain public roads. Balancing the interests of each of these groups to insure that valid needs are met while at the same time protecting natural and cultural resources is a challenge. The purpose of this Plan is to guide management into the foreseeable future to ensure the responsible stewardship and sustainability of the project's resources for the benefit of 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 Lake O' the Pines. 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 Lake O' the Pines, there is no need for designation of roadway corridors. 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.

The following six utility corridors have been designated across USACE land at Lake O' the Pines with each corridor adjoining and running parallel to an existing highway ROW easement. These utility corridors currently contain primarily electric lines and are shown on map LP18MP-OU-00_GW_2A, provided in Appendix A. Future use of one or more of these shared corridors may require prior approval of those entities with previously secured legal rights to said corridor easement(s).

- Corridors 1, 2, & 3. These corridors include the existing right-of-way of FM 729 on the north side of the road as well as a 50' wide strip of USACE land running parallel to the north side of FM 729 where it crosses Hurricane Creek, Johnson Creek and Alley Creek, respectively. Note that in some locations USACE land lying parallel to FM 729 may not be a full 50 feet in width. Corridor 1 is approximately 3,050 feet long and generally runs from a point on the eastern boundary line of USACE fee Tract B-214 where FM 729 enters said tract, to the western boundary line of USACE fee Tract B-214 where the highway exits

USACE ownership. Corridor 2 is approximately 3,370 feet long and generally runs from a point on the eastern boundary line of USACE fee Tract B-227-3 where FM 729 enters said tract, to the western boundary line of USACE fee Tract C-303 where the highway exits USACE ownership. Corridor 3 generally runs from a point on the eastern boundary line of USACE fee Tract C-338 where FM 729 enters said tract, to the western boundary line of USACE fee Tract C-335 where the highway exits USACE ownership. Between tracts C-338 and C-335, Corridor 3 is approximately 4,090 feet long and crosses USACE fee Tracts C-388, C-389, C-390, C-391 and C-334. The only existing utility within these three corridors is an underground telephone cable within Corridor 3. Future use may include a variety of aerial or underground public and private utilities subject to evaluation by USACE. Any underground utilities must be installed by subsurface boring. Use of the existing right-of-way of FM 729 is subject to approval by the Texas Department of Transportation.

- Corridor 4. This corridor is approximately 5,275 feet long and includes the existing right-of-way of TX Hwy 155 on the west side of the highway as well as a 50' wide strip of USACE land running parallel to the west right-of-way line of TX Hwy 155 at its general crossing of Big Cypress Creek. The corridor generally runs from a point on the eastern line of USACE Tract I-913 where TX Hwy 155 enters said tract, to the western boundary line of USACE fee Tract I-938 where the highway exits USACE ownership. Between tracts I-913 and I-938, Corridor 4 also crosses USACE fee tracts I-910, I-914, I-936 and I-937. No utilities currently exist within this corridor. Plans currently exist to widen Hwy 155, and thus the utility corridor will be expanded accordingly. Future use may include a variety of aerial or underground public and private utilities subject to evaluation by USACE. Any underground utilities must be installed by subsurface boring. Use of the existing right-of-way of TX Hwy 155 is subject to approval by the Texas Department of Transportation.
- Corridor 5. This corridor is approximately 6,000 feet long and includes the existing right-of-way of US Hwy 259 on the west side of the highway as well as a 75' wide strip of USACE land running parallel to west right-of-way line of US Hwy 259 at its general crossing of Big Cypress Creek. The corridor generally runs from a point on the eastern line of USACE Tract K-1137 where US Hwy 259 enters said tract, to the southwestern line of USACE Tract K-1107-1 where the highway exits USACE ownership. Between tracts K-1137 and K-1107-1, Corridor 5 also crosses USACE tracts K-1136, K-1110 and K-1111-1. No utilities currently exist within this corridor. Future use may include a variety of aerial or underground public and private utilities subject to evaluation by USACE. Any underground utilities must be installed by subsurface boring. Use of the existing right-of-way of US HWY 259 is subject to approval by the Texas Department of Transportation.
- Corridor 6. This corridor is approximately 925 feet long and includes the existing right-of-way of FM 726 on the south side of the highway as well as a 50' wide

strip of USACE land running parallel to the south right-of way of FM 726 where it crosses Brushy Creek. The corridor generally runs from a point on the eastern line of USACE Tract E-583-1 where FM 726 enters said tract, to the western line of USACE Tract E-581-1 where the highway exits USACE ownership. Between tracts E-583-1 and E-581-1, Corridor 6 also crosses USACE Tract, E-582-1. The only existing utility within this corridor is a single overhead electric transmission line. Future use may include a variety of aerial or underground public and private utilities subject to evaluation by USACE. Any underground utilities must be installed by subsurface boring. Use of the existing right-of-way of FM 726 is subject to approval by the Texas Department of Transportation.

The following best management practices shall be applied in the future use of the six corridors, described above:

- Use existing easements.
- 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 ER 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, if allowed, 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 PADDLEFISH RECOVERY

The paddlefish, a Texas listed threatened species of fish, relies on the river flow, or “spring pulses” to signal migration to spawning grounds. As part of the flood mitigation mission to protect the town of Jefferson and other areas, releases of off-season water from the lake triggered off-season migration for the paddlefish. Once the flow disappeared the paddlefish would perish. As part of a larger five-year USACE project in 2014 to help the paddlefish flourish, a change to how water is released from Lake O’ the Pines was initiated, in which USACE and the local water provider now allow releases to more closely mimic the watershed’s natural flows while also providing flood risk mitigation.

6.3 ENVIRONMENTAL RESTORATION PROJECT FOR WOOD DUCKS

In the early 1990's, USACE, TPWD, and USFWS worked collaboratively to implement a Section 1135 Environmental Restoration Project to improve wood duck habitat on 5,000 acres at Lake O' the Pines. The project was authorized under Section 1135 of the Water Resources Development Act of 1986 and was cost-shared between USACE and TPWD. The project involved the placement of several hundred wood duck nest boxes in the area between Hwy 155 and Hwy 259. The project also called for a forest inventory north of Hwy 259 to measure basal area, species composition, and the age of dominant trees. Following the inventory, it was determined that wood duck habitat could be improved by killing select tree species (using herbicide injection) to favor mast producing trees and to create two large dead snags per acre to speed up cavity formation for use by wood ducks.

At the time, wood duck populations throughout their range were in a state of serious decline. Following implementation of the project, TPWD performed monitoring to determine if the nest boxes and forest treatments were successful. Overall, the project was a success with benefits that lasted for several years before the nest boxes deteriorated. This project, as well as many other efforts across the wood duck's range, helped to successfully restore wood duck populations to the point where limited hunting has been allowed in Texas for a number of years. The project area has high potential for additional wetland habitat improvements and USACE intends to reach out to potential partners to look for ways to accomplish needed work.



6.4. TREE RISK MANAGEMENT GUIDANCE

In March 2013, USACE, Fort Worth District developed the Tree Risk Management Guidance. This guidance is applicable at all Fort Worth District lakes and was needed following widespread tree mortality resulting from the drought conditions that persisted through 2011 and 2012. The entire guidance document, available at the lake office, must be consulted to understand how the guidance is fully implemented. A brief summary of the three tree risk management zones, and related management guidelines is provided as follows in order of descending priority.

- Public Use Areas: These are areas classified in project Master Plans as High Density Recreation areas such as campgrounds, day use areas, and concession/resort areas, and include the public roadways, parking lots, and designated trails within these areas. Within constraints imposed by available manpower and funds, these areas have the highest priority for tree inspection and remedial action. Tree inspection in these areas shall be a continuous process of visual inspection conducted during other routine activities such as ranger patrols and facility maintenance activities. Visual inspections shall also be conducted following storm events. At a minimum, personnel who are best qualified to perform visual tree inspections shall inspect all USACE-administered public use areas at least one time annually. Lessees are responsible for maintaining safe conditions in their respective areas, although USACE personnel should perform visual, drive-by tree inspections during other routine compliance inspections. There are many undeveloped acres in some public use areas that have virtually no targets, are rarely used by the visiting public, and are therefore a low priority area for conducting tree inspections. When the project determines that a tree is a moderate to high risk, the area surrounding the tree, to include all targets shall be cordoned off from public use as soon as possible until remedial action can be taken.

- Boundary Line Zone Adjacent to Private Development: This is a strip of federal land of variable width lying parallel to USACE property boundary line where the boundary line is adjacent to private development such as homes and businesses. The width of this zone is limited to the height of the tallest trees within the zone that could hit a target on private land if a given tree failed. These areas are not inspected on a routine basis, but when notified of a perceived hazardous tree by an adjacent landowner, or when hazardous trees in the boundary line zone are discovered by the USACE ancillary to other boundary work, the USACE shall follow specific steps prescribed in the Tree Risk Management Guidance document. If the tree is deemed a moderate to high risk, USACE will follow removal options specified in the Tree Management Guidance. Suspect trees that USACE determines to be a low risk shall not be removed if the tree contributes to the wildlife habitat or aesthetic value of the area. If a suspect tree is of low habitat or aesthetic value removal may be authorized.

- All Other Areas: This includes all areas not described above these areas are classified in the project Master Plan as Project Operations (dam, spillway, and other prime facilities), Environmentally Sensitive Areas, and Multiple Resource Management Lands (Low Density Recreation Areas, Wildlife Management Areas, Vegetation Management Areas, Future/Inactive Recreation Areas). These areas shall not be inspected for hazardous trees with the following exceptions:
 - Boundary Line Zone described above
 - Designated primitive campsites
 - Designated Parking Lots
 - Designated Trailheads and Trails

The area traversed by permitted pedestrian paths (via ENG FORM 4264-R) shall not be inspected for the presence of hazardous trees with the exception of that portion of the area that may fall within the Boundary Line Zone.

To further inquire about the Tree Risk Management Guidance at Lake O' the Pines please contact the lake office.

6.5 ENVIRONMENTAL RESTORATION PROJECT

In The early-to-mid 1990's, the Section 1135 Environmental Restoration Project implemented a project to improve wood duck habitat. The project was cost shared with TPWD and involved the placement of 200-300 wood duck nest in the area between HWY 155 and HWY 259. The project also called for a timber inventory north of HWY 259 to measure the basal area, species composition, and the age of dominant trees. Following the inventory, it was determined that wood duck habitat could be improved by injecting select tree species to favor mast producers and to create two large dead snags per acre for nesting habitat. Both the nest boxes and the herbicide injection worked together to achieved the intended result.

CHAPTER 7: PUBLIC AND AGENCY COORDINATION

7.1 . PUBLIC AND AGENCY COORDINATION OVERVIEW

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

The USACE began planning to revise the Lake O' the Pines Master Plan in September 2016. The objectives for the master plan revision were to (1) update land classifications to reflect changes in USACE land management policies since 1989 and (2) update the Master Plan to reflect new agency requirements for master plan documents in accordance with ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013.

7.2 . INITIAL STAKEHOLDER AND PUBLIC MEETINGS

Three scheduled public scoping meetings were held to provide an avenue for public and agency stakeholders to ask questions and provide comments. The public scoping meetings were held in Jefferson and Longview as follows:

- 25 April 2017 City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, TX, 16 non USACE attendees
- 27 April 2017 Longview Public Library, 222 W. Cotton St., Longview, TX 75601, 4 non-USACE attendees
- 16 May 2017 City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, TX, 16 non-USACE attendees

USACE employees hosted the workshops, which were 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 scoping meeting and comment forms. After signing in, participants were directed to be seated in the auditorium and a PowerPoint presentation was presented by the Project Manager for the Master Plan Revision Project Delivery Team (PDT) to convey information about the following topics:

- Public Involvement Process
- Project Overview
- Overview of the NEPA process
- Master Plan and current land classifications
- How to Submit Comments

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

Approximately 36 individuals (16 on 25 April, 4 on 27 April, and 16 on 16 May), not including USACE personnel, attended the public scoping meetings for interest groups, partner agencies, other government agencies, and businesses. Among the attendees were representatives from the Northeast Texas Municipal Water District, Lake O' the Pines Chamber of Commerce, Marion County Chamber of Commerce, Precinct 1 Commissioner, Texas Parks and Wildlife Department, Upshur Rural Electric. A total of three (3) comments were received following this public scoping meeting covering four (4) topics. Most comments received did not relate to the master plan, such as issues of shoreline management (i.e. encroachment and vandalism issues) or management issues (i.e. opening parks, invasive species). While these comments and concerns are very important, they are not within the purview of a master plan. Lake O' the Pines is a Federally-owned and managed public property, and it is USACE goal to be a good neighbor as well as steward of public interest as it concerns Lake O' the Pines. As such, USACE is bound to the equal enforcement of policies and fees for this publically held national assets. Table 7.1 below gives a summary list of the comments during the initial scoping comment period for the master plan, followed by the USACE response.

Table 7.1 Public Comments from Initial Public Scoping Meeting

Category	Comment Description	USACE Response
Shoreline Management	Requests property be included in the limited development area - wants permission to mow 30 ft by 75 ft at end of front yard.	The Master Plan does not address issues of mowing or limited development areas. This issue would be addressed in the Shoreline Management Plan.
Recreation and Facilities	Increase recreational opportunities and concessionaires to include bike paths, zip lines, boat tours, outfitters for canoe, kayak, jet skis, etc. - floating recreation areas, beaches with trampolines, slides, rope swings...	<p>The opportunity exists for other government agencies or entities to lease and operate current parks on USACE projects. It is also possible for commercial entities to lease and operate park areas within the USACE guidelines for such leases. USACE intends to continue to seek partners for recreational opportunities.</p> <p>Future management of high density recreation areas includes upgrades of existing day use and camping facilities as well as new or expanded trails. Upgrades would be implemented based on available funding and personnel or through lease agreements with other entities.</p>
Invasive Species Management	Invasive species - control water hyacinth, arundo donax, chinese tallow, giant salvinia, cressed and yellow floating heart, and other invasive species, including zebra mussels, quagga mussels, and carp that affect water quality.	Preservation of natural areas is of great importance to USACE, as well as other natural resource agencies. The general public also supports natural and cultural resource preservation as documented in the TORP. Land classifications are developed and partnerships pursued as appropriate toward this end. Invasive species is an ongoing

Category	Comment Description	USACE Response
		concern throughout the US, including Lake O' the Pines. USACE will continue to pursue a number of programs and best management practices to help control the establishment or spread of these species, including collaborating with private and public agencies for invasive species control at Lake O' the Pines.
Recreation and Natural Resources Management	Encourage more nature-based tourism: Plant all mowed areas and road right of ways with native wild flowers. Install houses for blue birds, screech owls, and wood duck. Create signage for plant and animal ID. Develop walking trails. Make spillway area desirable for canoeists and kayakers.	Stated objectives in Chapter 3 of the Master Plan call for managing project lands to ensure preservation and conservation of natural habitat and open space as a primary objective in order to maintain public open space. Ecosystem management principles call for the encouragement of native species and the control of exotic species and aggressive native species. Upgrades and additions to areas and signage would be implemented based on available funding and personnel or through lease agreements with other entities and volunteers.

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

The final draft Master Plan and Environmental Assessment was made available for public and agency review at two public workshops held on 10 July and 11 July, 2018 in Jefferson and Longview, Texas respectively. The process of announcing the availability of the draft final master plan and the requirements for submitting comments was identical to the process described above for the initial public scoping workshops held in April and May 2017. Public and agency comments for the draft final master plan

were accepted through 11 August 2018. A total of 53 individuals attended the workshop in Jefferson and a total of 23 attended the workshop in Longview. A total of 13 written comments were received: four (4) written comments were received from agencies: the Cypress Basin Texas Master Naturalist (CBTMN), TPWD, SHPO, and the Marion County Chamber of Commerce, and an additional seven (7) comments were received from the general public. All of the public comments, while extremely valuable, concerned operation of the lake, which are not addressed as part of the Master Plan. A summary of comments received and the USACE response to the comments is provided below (Table 7.2.) 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. The final version will be posted on the District website.

Table 7.2 Public Comments from Final Public Scoping Meeting

Commenter	Comment	USACE Response
CBTMN	Would like to build an organization to facilitate volunteers through Cypress Basin Texas Master Naturalist.	USACE welcome partnerships/volunteers with organizations and other agencies, such as “Friends of the Lake” or Master Naturalists groups.
	Promote diverse forms of recreation at LOP, including paddle, walking and biking trails.	USACE recognizes the need for additional and varied types of outdoor recreation facilities and addresses this need in Chapters 2, 3, and 5 of the Master Plan. Specifically, in Chapter 5 it is noted that future management of high density recreation areas includes upgrades of existing day use and camping facilities as well as new or expanded trails. Chapter 5 also mentions that pedestrian, natural surface trails would be suitable in both High Density Recreation areas, Multiple Resource Management Lands, and with appropriate safeguards, within ESA areas. Upgrades would be implemented based on available funding and personnel or through lease and volunteer agreements with other entities.

Commenter	Comment	USACE Response
TPWD	<p>1) There are a few yellow Ops areas on the old plan (intake structures/pumps for pipelines) that are no longer classified as PO-Project Operations. Are these appropriate for the new land classifications or should they be separately identified as easements or placed in PO? Old plan Ops have become: wildlife management (FID 45 at end of road 2315), LDR (FID 68), veg management (FID 289), LDR (FID 22), and wildlife management (FID 181 at end of Geranium Rd). TPWD recommends the revised plan identify areas at the lake that are currently developed and being used by non-federal project entities and associated with water supply. Because the mission of the lake is to provide flood control and water supply, it seems appropriate to place these land uses in a subcategory of non-federal POs.</p>	<p>No appropriate classification for operations other than USACE operations currently exists in the regulations and guidance. However, USACE is evaluating ways to address these concerns, such as using a cross hatch in order to identify it as an operational area managed by others.</p>
	<p>2) Mims Chapel Ramp/Park – the actual location of the ramp and park (per aerial imagery) are now designated ESA (FID 65). There is a polygon adjacent to the ESA that is LDR and labeled Mims Chapel Ramp (FID 316), but the ramp isn't actually under that polygon. Is this an oversight or is the ramp/park being relocated slightly to the east? Please fix appropriately.</p>	<p>Concur – mapping adjusted</p>

Commenter	Comment	USACE Response
	<p>3) Lakeside Park – This area was high density on the old plan and is now LDR (FID 16). The “From_To” notes for FID 16 indicate REC-LD to LDR. The website says this park has restrooms. Should this be low or high density?</p>	<p>Concur – mapping adjusted</p>
	<p>4) Polygon FID 299 represents Brushy Creek Campground, located west of the dam. It used to be primarily low density with some inactive recreation and high density classifications just at the campground. It is now all HDR. The “From_to” notes indicate NC. It is not clear what NC stands for. This area is a large mostly-wooded area with some development along the northern side of the polygon at the campground, per aerial imagery. Unless there are plans for future development or expansion of the campground, it seems more appropriate to subdivide this area, separating high density from low density. Perhaps a portion of this polygon is better suited to ESA, wildlife management, or vegetation management.</p>	<p>This park is highly used by the public and therefore warrants a High Density Recreation classification throughout the park. This classification would prevent free choice hunting in the area, which is a public safety consideration, and would allow for future expansion of the campground.</p>
	<p>5) FID 0 (Sunrise Cove/Sunrise Road). The majority of this polygon changed from low density to vegetation management. Aerial imagery shows that people along the shore have cleared/mowed next to an RV park. Piers and a ramp are visible at Sunrise Rd/Wisteria Road. I am not sure if the ramp/pier are unpermitted or if it was overlooked. Perhaps there is a need to identify just the ramp as LDR.</p>	<p>The county has abandoned this part of the road and has plans to let the lease for the boat ramp lapse. When that occurs, the boat ramp and dock would be removed, making the appropriate classification for this area Vegetative Management. Issues of encroachment and illegal clearing would be addressed by USACE as needed.</p>

Commenter	Comment	USACE Response
	<p>6) FID 120 just south of State Highway 155. There is a large area of bare ground in the middle of this polygon that looks like a sand/gravel pit or illegal ATV area. Does USACE use this as a source for beach sand or other uses? The polygon changed from ESA-REC to ESA. Is ESA appropriate for the bare ground area if it will continue to be used for sand/gravel or recreational ATVs? Perhaps subdivide the sand pit to PO, if applicable.</p>	<p>This area is an old borrow area that will be part of TXDOT mitigation area for the HWY 155 bridge expansion.</p> <p>The Hwy 155 project includes a new bridge construction, removal of the old bridge, and fill at Lake O' the Pines</p> <p>The Texas Department of Transportation mitigation area includes the borrow pit area near Cedar Springs Park</p> <p>TXDOT proposes to remove fill used for approaches to the old bridge and transport to the old borrow pit where fill was originally taken during original construction of the bridge. Fill will be spread evenly and the area will be planted with short leaf pine using an 8 X 9 spacing or 605 trees per acre.</p>
	<p>7) There are levees/dikes along SH 155 (FID 276 and FID 324) that changed from inactive recreation to ESA. It seems more appropriate that levees/dikes would be placed into a non-federal entity easement subcategory under POs or a new category for Easements.</p>	<p>The Master Plan designates Utility Corridors which includes the Hwy 155 right-of-way. USACE will revise the utility corridor description to state that there are plans to widen Hwy 155 and the utility corridor will be expanded accordingly. USACE will provide a description of ESA 17 making clear that a road easement cuts through it and the easement will be expanded in the future TXDOT bridge expansion. ESA's are subject to existing easements, and the 155 easement will be expanded.</p>

Commenter	Comment	USACE Response
	<p>8) The plan does not recognize areas that would be suitable for future linear easements to accommodate non-federal entity requests for linear easements. TPWD recommends considering future linear development and recommends potentially identifying areas that would take priority for linear easements. A location suitable for future linear easements (pipelines, utility lines, electric lines, road, railway...) could be identified parallel to SH 155 to limit fragmentation in undeveloped areas.</p>	<p>The revised Master Plan includes a section on utility corridors in Chapter 6 (Section 6.2) that includes both current and future utility corridor locations around the lake.</p>
	<p>9) The new plan indicates changes in land classification that reduces the area of wildlife management by half in the upper area of the lake (1/2 remains as wildlife management and the other 1/2 is now ESA); one arm of the lake had wildlife management and is now vegetation management in the vicinity of FID 277; and one arm of the lake changed from low density recreation to wildlife management in the vicinity of FID 293. It is my understanding the areas classified as ESA, veg management, low density recreation, and wildlife management do allow for some hunting. To ensure that hunting opportunity on public land is not reduced, TPWD strongly recommends that the revised plan ensure that the amount of area accessible for hunting is equal to or greater than what was available in the old plan. The LOP website indicates 4,500 acres offers hunting opportunity with an additional 18,700 lake surface acres for waterfowl hunting. The</p>	<p>The land classifications set forth in the Master Plan will not reduce lands that are currently available for public hunting activities. USACE evaluates the public hunting program annually and may make adjustments as needed in response to rules and regulations promulgated by TPWD or by development activity on private land adjacent to public land. USACE cannot guarantee if currently available public hunting lands will always remain available, but there are no foreseeable actions that would cause a reduction in public hunting areas at LOP.</p>

Commenter	Comment	USACE Response
	<p>LOP hunting map (http://www.swf-wc.usace.army.mil/lakeopines/Maps/LOP_Hunting_UPDATED_2012-2013.pdf) identifies areas in which hunting is currently allowed or prohibited. TPWD recommends identifying if any of the hunting areas at LOP will differ under the new plan.</p>	
SHPO	<p>On page 5-7 regarding Environmentally Sensitive Areas (ESA), the master plan states, "All of these areas are suitable for development of natural surface pedestrian trails unless the areas are critically important as habitat for sensitive species. Hunting is also allowed in these areas taking into consideration public safety and resource protection." Would like it more explicitly stated that we will consider the potential for adverse impacts on cultural resources and go through the section 106 process when developing said trails and hunting areas in ESA's.</p>	<p>Concur. The text will be edited to make it more explicit that consideration will be given to the potential for adverse impacts on cultural resources. Page 39 of the EA includes information concerning Section 106 process and requirements.</p>
Marion County Chamber of Commerce	<p>Would like to be contacted with updates so they can keep the community informed.</p>	<p>Concur.</p>
Public Comments	<p>Johnson Creek Campground: move abandoned marina near Crestwood Subdivision to existing small bay with inlet near the Johnson Creek Campground playground.</p> <p>Alley Creek Park boat ramp and parking area: Improve lighting</p>	<p>While all these issues are important to USACE, they are not part of the Master Planning process. USACE will address the abandoned dock within the rules and policy set forth in the Shoreline Management Plan.</p>

Commenter	Comment	USACE Response
	North shore of Johnson Creek: Wave action from boats that fill their bladders to pull surfboards causing property damage, and loud, vulgar music impeding enjoyment of area. Would like a no-wake buoy or not allow the boats to fill bladders on the north side.	No-wake designations require placement and maintenance of buoys as well as enforcement. USACE has no plans to establish a no-wake area on the north shore of Johnson Creek but is willing to discuss this topic with any organization willing to place and maintain buoys as well as TPWD game wardens who would be involved in enforcement. Loud music and vulgar language may be a disturbance of the peace issue that could be addressed by the Marion County Sheriff's office. USACE does enforce quiet hours in developed campgrounds but not over the entire lake area.
	Alley Creek: Large and growing problem with vultures. Need to clean dumpsters and possibly move them to another location not so close to human activity to reduce pests.	
	The bridge side tent area damaged several years ago and never repaired.	
	Will floating dock that used to be on the SW side of the lookout be replaced?	The nuisance of vultures is a recurring problem at many lakes, including LOP. Control measures can include scare devices such as propane cannons, or in severe cases trapping and/or killing nuisance vultures in accordance with permits issued by TPWD and/or USFWS. While the Master Plan does not specifically address this issue, it is addressed within the broad language of the Resource Objectives in Chapter 3.
	Would like more picnic tables on the cove side of Hurricane Creek between the rail and the water.	
	Would like boat ramps to become pay-to-use- ramps.	
	Would like USACE to take over Island View, move the trash out, and clean it up.	
	Problem with maintenance permit process.	Concerning of pay-to-use boat ramps, USACE and others impose fees at numerous ramps, but some ramps receive light use and the effort and expense of fee collections would be inefficient.
		In general, as budget and personnel allow, issues such as improvements to lighting,

Commenter	Comment	USACE Response
		<p>cleaning up trash, and repairing parks and structures will be addressed.</p> <p>Concerning Island View Park, USACE has a policy mandate that does not allow for USACE to develop new parks or to take over operation of park areas/facilities that may be abandoned by lessees. When leased areas are abandoned, USACE will endeavor to find other entities willing to take over management of the area but will not, in most cases, assume direct management of the area.</p>

CHAPTER 8: SUMMARY OF RECOMMENDATIONS

8.1. SUMMARY OVERVIEW

The preparation of the Lake O' the Pines Master Plan followed the new USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated 13 January 2013. Three major requirements set forth in the new guidance include (1) the preparation of contemporary Resource Objectives, (2) Classification of project lands using the newly approved classification standards, and (3) 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 staff levels at Lake O' the Pines. Factors considered in the Plan were identified through public involvement and review of statewide planning documents including TPWD's 2012 TORP and the TCAP – Piney Woods Ecoregion. This Master Plan will ensure the long-term sustainability of the USACE managed recreation program and natural resources associated with Lake O' the Pines.

8.2. LAND CLASSIFICATION PROPOSALS

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to the new land classification standards. During the public involvement process USACE sought public input into whether, besides the simple change in nomenclature, a shift in land classification was desired (for example, should lands with a recreation classification be reclassified to a wildlife classification or vice versa.). Chapter 7 of the Plan describes the public input process.

Although 36 public comments were received as a result of the first public scoping meeting, none of those comments contained a specific request or proposal to demonstrably change prior land classifications. In the absence of public or other agency suggestions/proposals to reclassify project lands, the land classifications presented in the Plan were formulated by the USACE Lake O' the Pines Project staff, Operations Division Staff and Regional Planning and Environmental Center (RPEC) staff assigned to the Master Plan PDT based on first-hand experience, professional training, and best management practices.

There were 38 separate land reclassifications made totaling 4,982 acres. Additionally, the 1989 Plan had dual land classifications in many areas, and 4,993 acres previously grouped together under the Multiple Resource Management Lands were updated to the new land classification name. The Prior Acres were calculated using the 1989 Master Plan classification map to allow for improved comparison of former and proposed acres. All changes reflect historic and projected public use and new guidance

from ER 1130-2-550 and EP 1130-2-550. A summary of acreage changes from prior land classifications to the current classifications is provided in Table 8.1, and key decision points in the reclassification of project lands are presented in Table 8.2.

Table 8.1 Change from Prior Land Classification to New Land Classification

Prior (1989) Land Classifications	Acres	New Land Classifications	Acres
Project Operations	211	Project Operations	290
Recreation	1,596	High Density Recreation	1,231
ESA- Recreation	520		-
Environmentally Sensitive Areas	858	Environmentally Sensitive Areas	4,236
Recreation (Low Density)	3,567	MRML – Low Density Recreation	1,782
Wildlife Management	3,731	MRML – Wildlife Management	1,774
Vegetative Management	800	MRML – Vegetative Management	2,325
Inactive/Future Recreation	175	MRML – Future/Inactive Recreation	5
ESA-Inactive/Future Recreation	185		-
Permanent pool	18,700	Permanent pool	17,767
Flowage Easement	16,054	Flowage Easement	16,063*

*Has an additional 125 acres with permit to flood not included in this number.

Table 8.2 Reclassification Proposals

Proposal	Description	Justification
Project Operations (PO)	<p>Project Operations Lands were increased from 211 acres to 290 acres from the prior classification as follows:</p> <ul style="list-style-type: none"> ○ 4 acres from REC ○ 77 from VM ○ 2 acres to WM <p>These areas include the material storage area/oxidation pond, an incidental parking lot near the dam, and the old road bed behind the project office.</p>	<p>All lands classified as Project Operations are managed and used primarily in support of critical operational requirements related to the primary missions of flood risk management, hydropower, and water conservation. The 290 acres that are now classified as Project Operations is sufficient for current and future operational requirements. The reclassification of 79 acres of Project Operations land will have no effect on current or projected public use.</p>
High Density Recreation (HDR)	<p>Lands under the prior classification of Recreational Areas were converted to the new and similar classification of High Density Recreation, but were reduced from 1,596 to 1,231 acres through the following reclassifications:</p> <ul style="list-style-type: none"> ○ 6 acres from ESA-REC ○ 14 acres from REC-LDR ○ 188 acres to ESA ○ 5 acres to IFR ○ 35 acres to LDR ○ 5 acres to PO ○ 145 acres to VM ○ 7 acres to WM 	<p>In general terms, the amount of land classified for Recreation in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has clearly revealed that numerous reclassifications were needed to reflect actual use, evolving trends and regional priorities. The net reclassification of 365 acres of Recreation areas will not affect current or projected public use.</p>
Environmentally Sensitive Areas (ESA)	<p>Environmentally Sensitive Areas were increased from 858 acres to 4,236 acres as a result of several</p>	<p>Reclassification of 3,378 acres was determined by the study team to be necessary to provide a high level of</p>

	<p>parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 185 acres from ESA-IFR ○ 470 acres from ESA-REC ○ 81 acres from IFR ○ 188 acres from REC ○ 177 acres from REC-LD ○ 2,315 acres from WM ○ 38 acres to MRML-VM <p>In addition to the beginning ESA acres the 1989 Master Plan had ESA's combined with both Recreation and Future/Inactive Recreation, totaling an additional 760 acres.</p>	<p>protection for those areas supporting bottomland hardwood forests, and areas with steep, aesthetic bluffs and ravines. Habitat studies conducted as part of the master plan revision effort support the classification of these lands as ESA. Protection of cultural resources also justifies the classification of some areas as ESA. The ESA areas provide good to excellent habitat for endangered species and numerous Species of Conservation Concern. Classifying these acres as ESA will afford these areas the highest level of protection from disturbance. The reclassification of 3,378 acres to ESA will have no effect on current or projected public use.</p>
MRML – Low Density Recreation (LDR)	<p>The definition of the prior classification of Recreation - Low Intensity is very comparable to the definition of the current classification of MRML – Low Density Recreation (LDR). Land classification changes resulted in a reduction of these acres from 3,567 acres to the current 1,782 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 7 acres from ESA-REC ○ 35 acres from REC ○ 177 acres to ESA ○ 14 acres to HDR 	<p>The net reduction of 1,785 acres of LDR lands was necessary to recognize high ecological and aesthetic value of those areas reclassified to ESA, HDR, VM, and WM. The largest portion of the reduction was a reclassification of lands to MRML- Vegetation Management to recognize that this large area of land has been historically managed to insure healthy, productive forests, and aesthetically pleasing shorelines than for recreational purposes. Those lands remaining as LDR are</p>

	<ul style="list-style-type: none"> ○ 1,035 acres to MRML-VM ○ 603 acres to MRML-WM 	<p>located primarily in shoreline areas where vegetation modification (mowing) permits occur in accordance with the Shoreline Policy. Current LDR lands are also located adjacent to dense residential development.</p> <p>These changes support management actions and recreational trends identified in the TORP. Public use of all areas that were reclassified will not be affected now or in the foreseeable future. Public access in the form of natural surface hiking and biking trails is compatible with these classifications. The conversion of these lands will have no effect on current or projected public use.</p>
MRML – Wildlife Management (WM)	<p>Land classification changes resulted in a reduction of WM acres from 3,731 acres to the current 1,774 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 2 acres from PO ○ 7 acres from REC ○ 601 acres from REC-LD ○ 2,315 to ESA ○ 252 acres to MRML-VM 	<p>The net reduction of 1,957 acres of WM resulted from areas that have historically been managed for recreation or vegetation management. Acres that were converted to the ESA classification are areas of high habitat value as identified by the WHAP. These reclassifications will have no effect on current or projected public use.</p>
MRML – Vegetative Management (VM)	<p>The increase of MRML-VM from 800 acres to 2,325 acres were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 38 acres from ESA 	<p>All parcels that were reclassified to MRML–VM were reclassified to recognize the long term historic management of these lands to provide</p>

	<ul style="list-style-type: none"> ○ 289 acres from WM ○ 97 acres from ESA-REC ○ 145 acres from REC ○ 1,035 from REC-LDR ○ 77 acres to PO 	<p>healthy and productive forests in accordance with directives specified in Public Law 86-717, the Forest Cover Act and to maintain an aesthetically pleasing, fully forested shoreline. This reclassification will have no effect on current or projected public use.</p>
MRML – Future/Inactive Recreation	<p>The decrease on Future/Inactive Rec from 175 acres to 5 were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 81 acres to ESA ○ 94 acres to VM ○ 5 acres from REC 	<p>In general terms, the amount of land classified for Future/Inactive Recreation in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has clearly revealed that these reclassifications were needed to reflect actual use, evolving trends and regional priorities.</p> <p>The parcels classified as Future/Inactive Recreation are undeveloped. Until there is a need to develop these lands, they will be managed as Multiple Resource Management lands. These reclassification changes will have no effect on current or projected public use.</p>

Note: The land classification changes described in this table are the result of changes to 62 individual parcels of land ranging from a few acres to over 100 acres. Acreages were measured using GIS technology. The acreage numbers provided are approximate. Additionally, utility corridors described in chapter 6 are not a land classification and are not a factor in determining the acreages of the above classifications.

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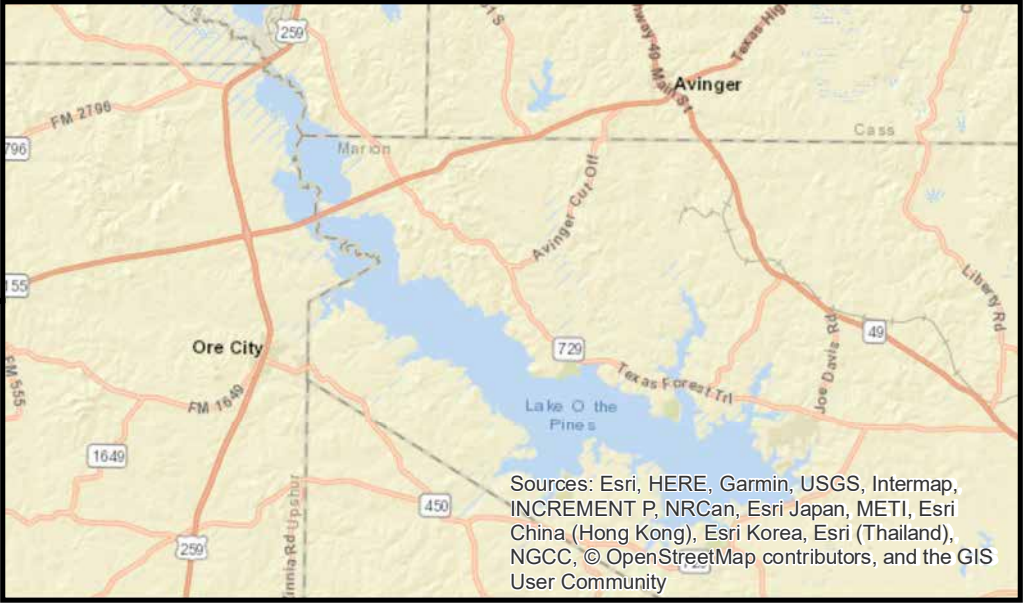
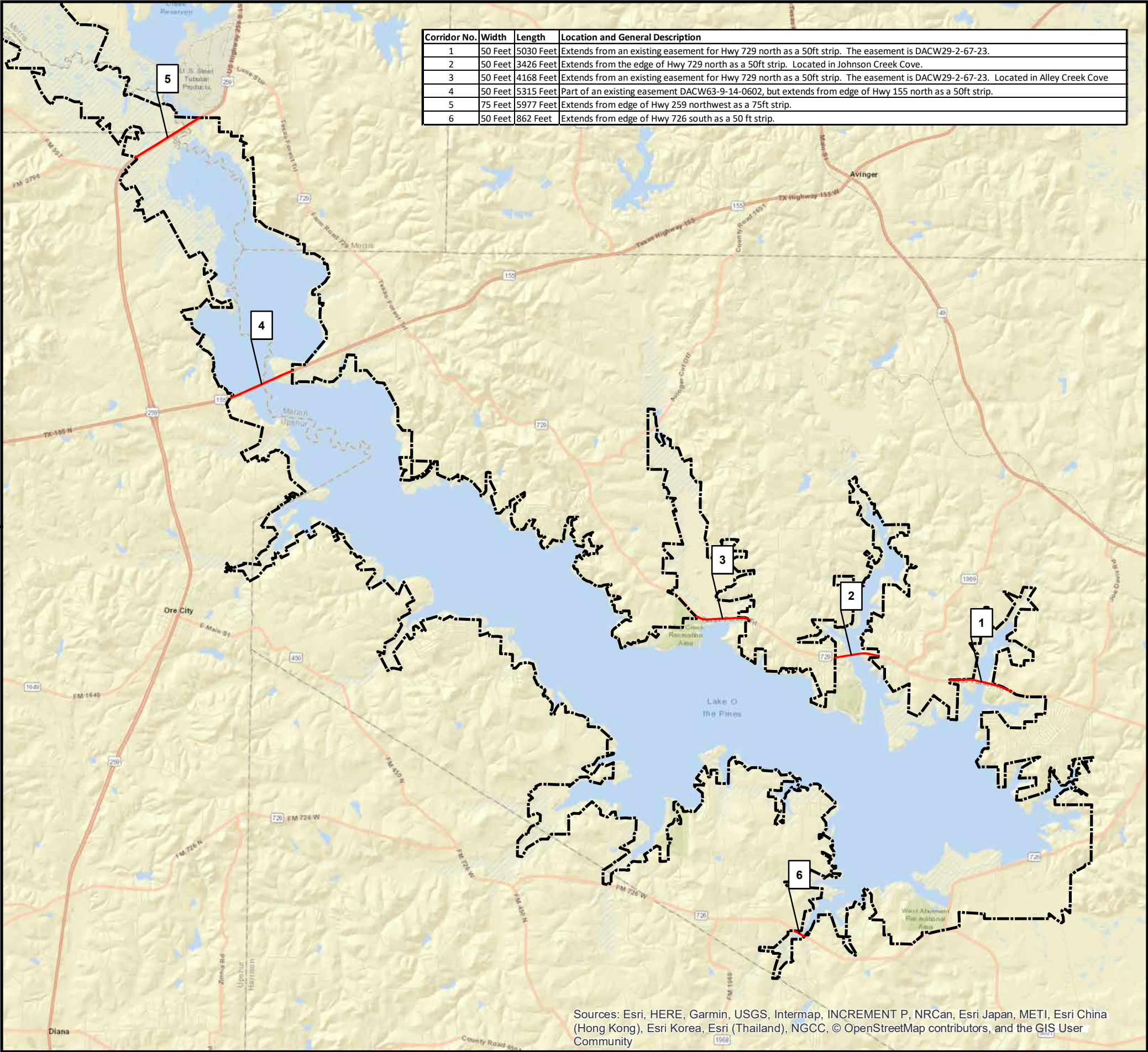
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APPENDIX A - LAND CLASSIFICATION, MANAGING AGENCIES, AND RECREATION MAPS

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 Utility Corridors

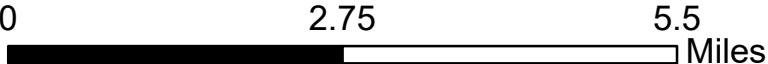

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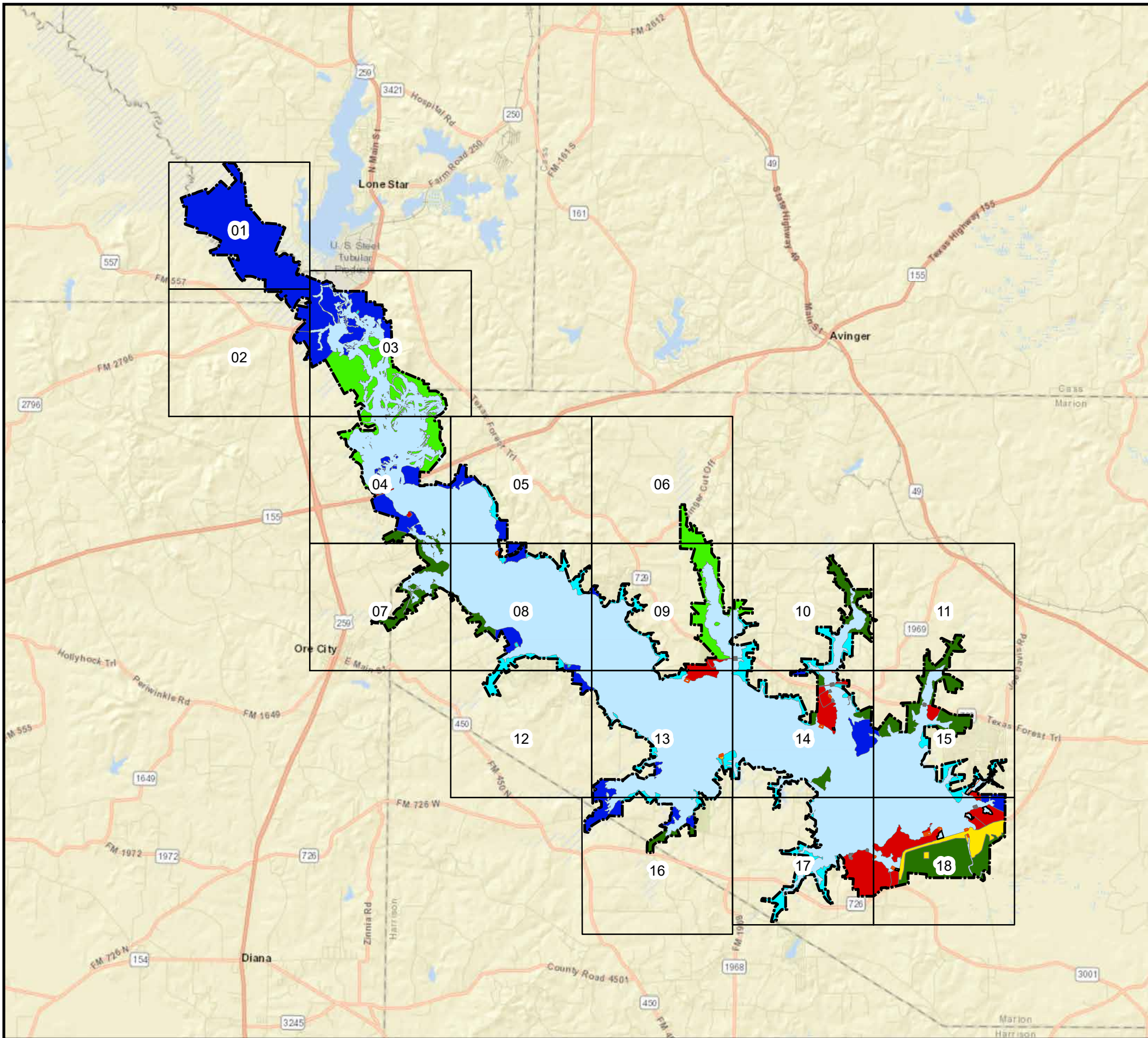
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Utility Corridor Map




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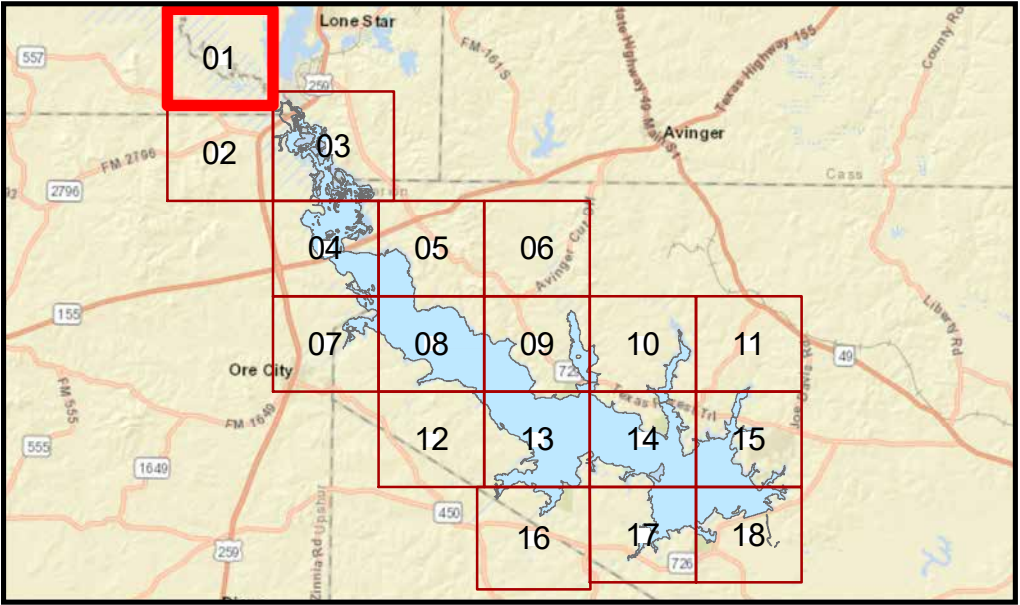
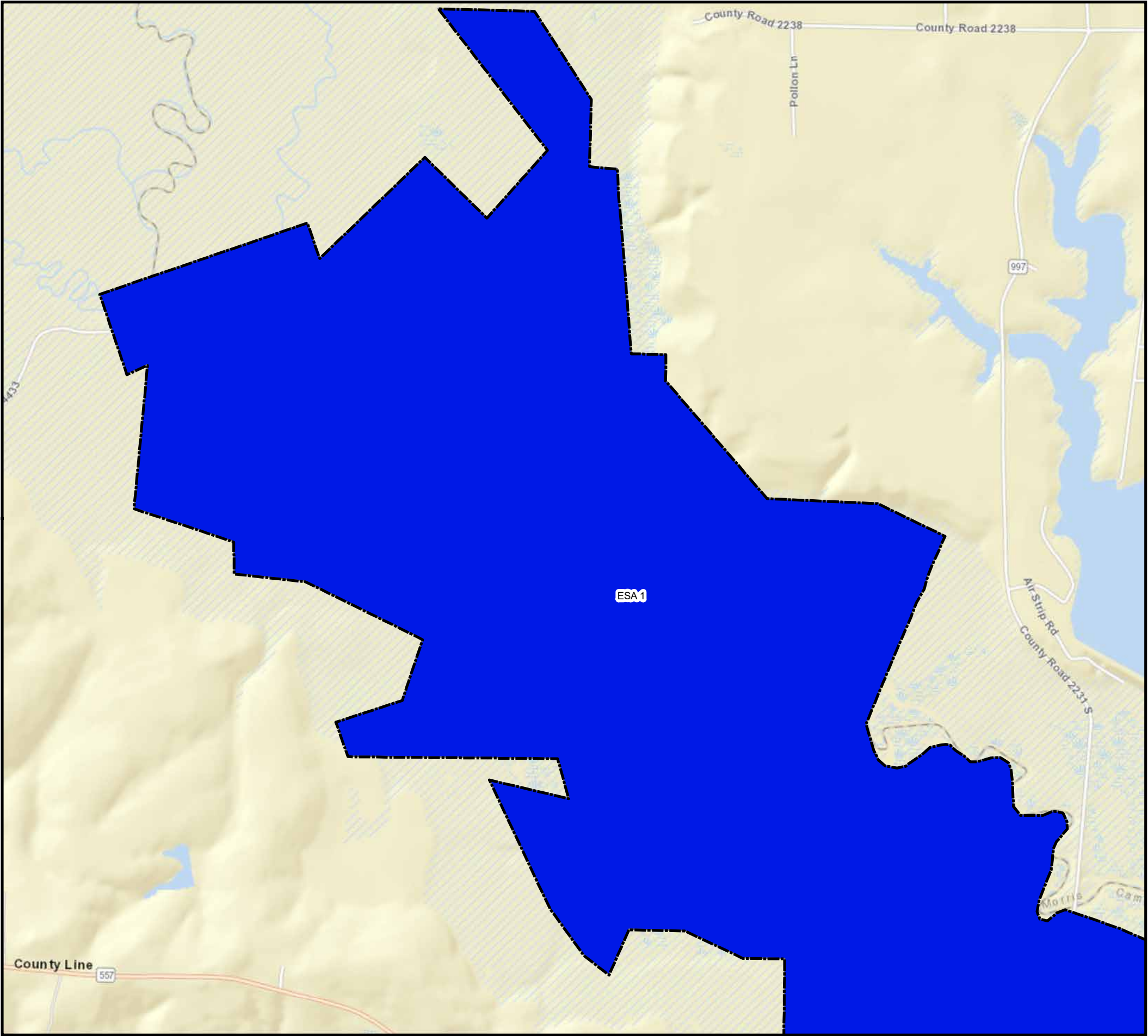


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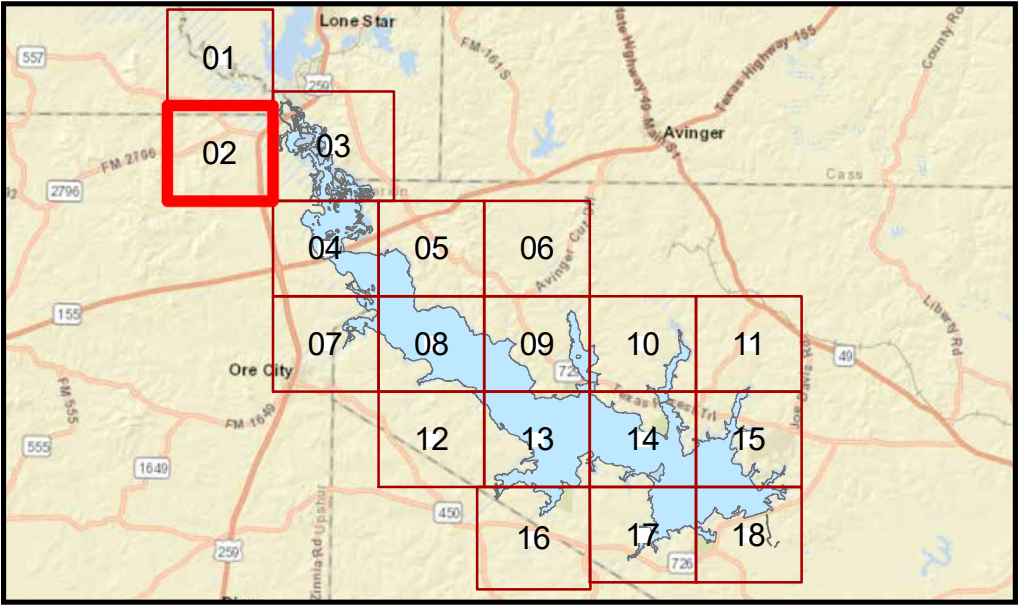
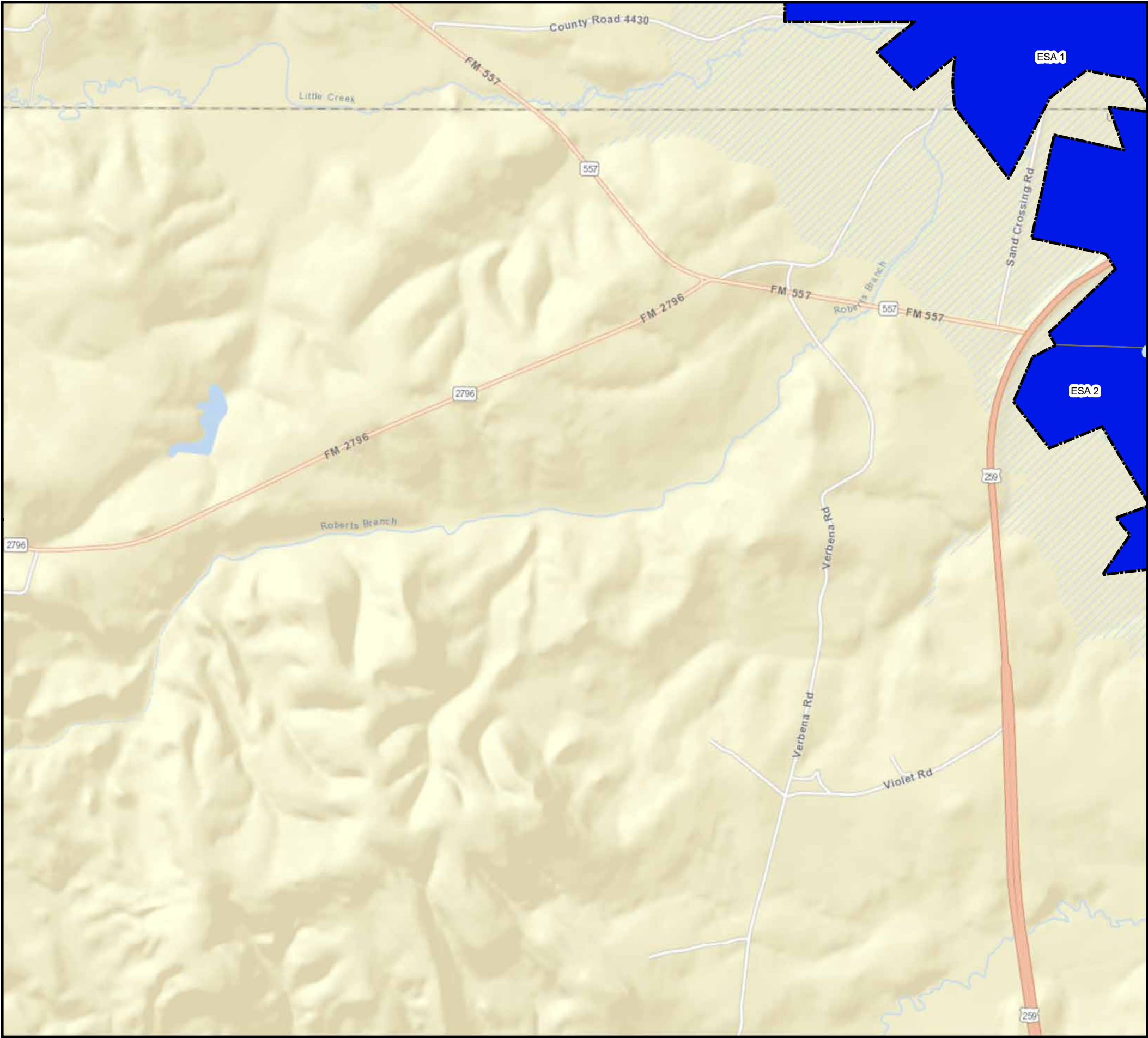


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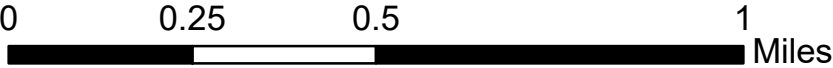


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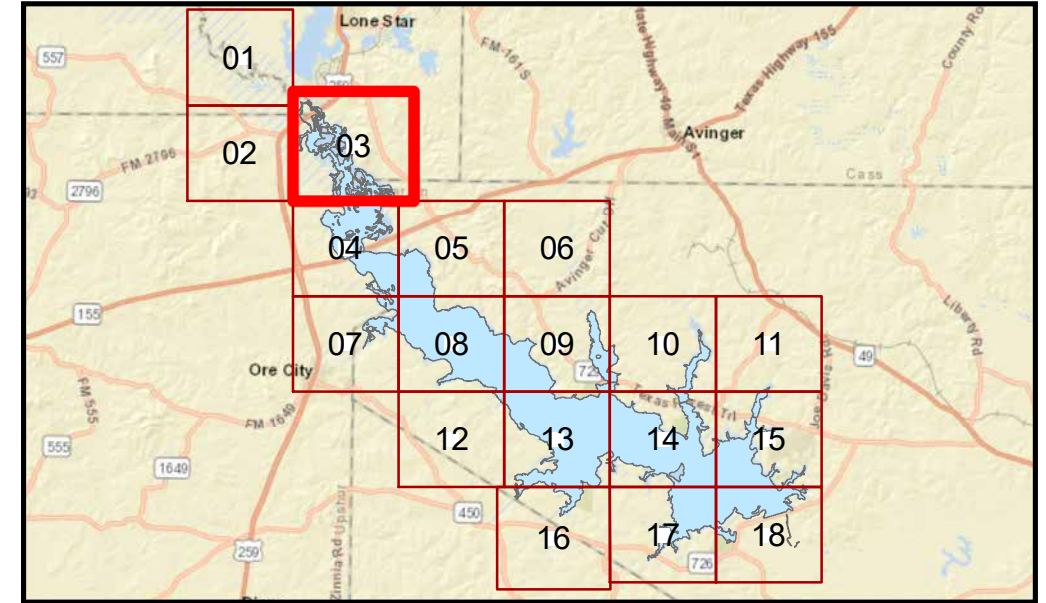
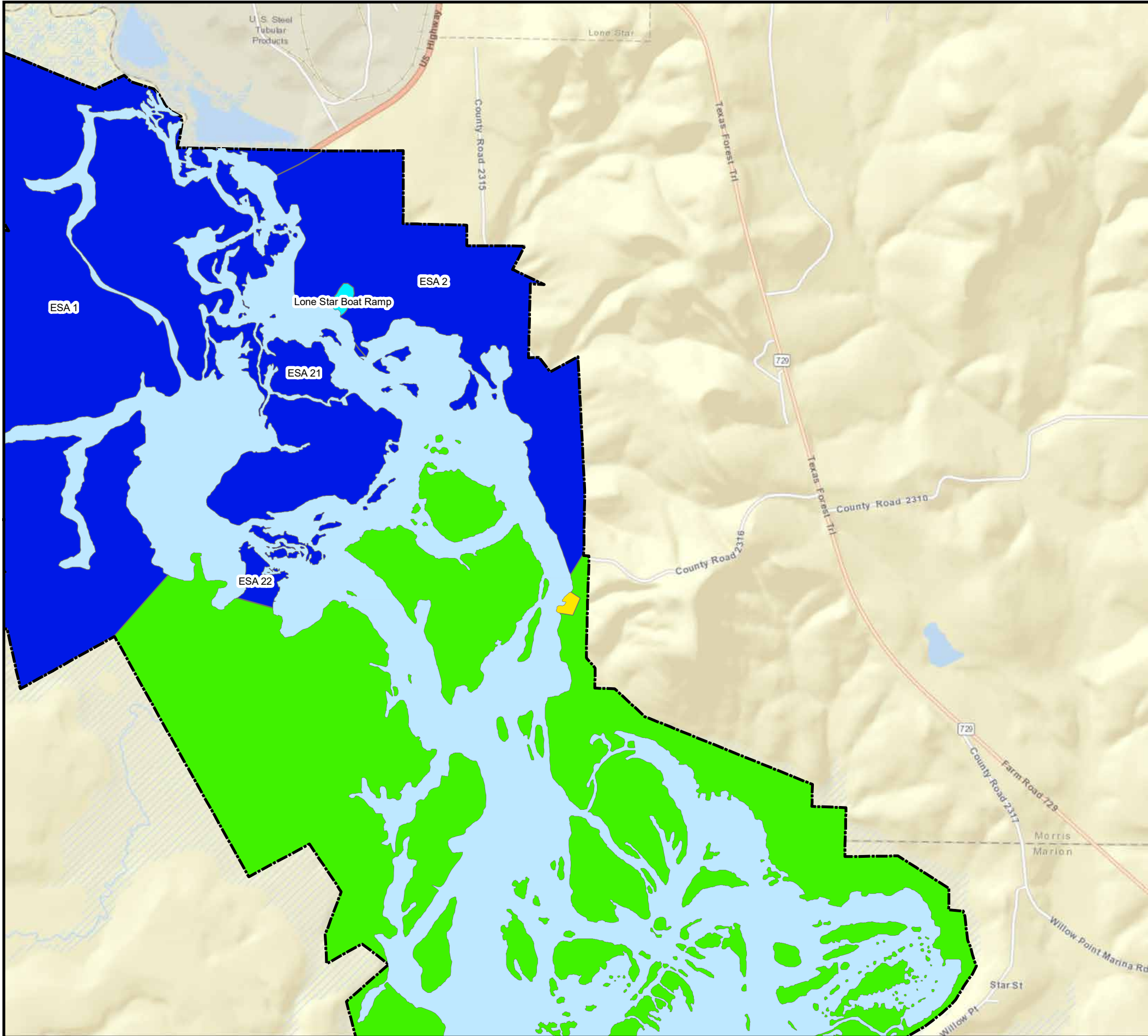
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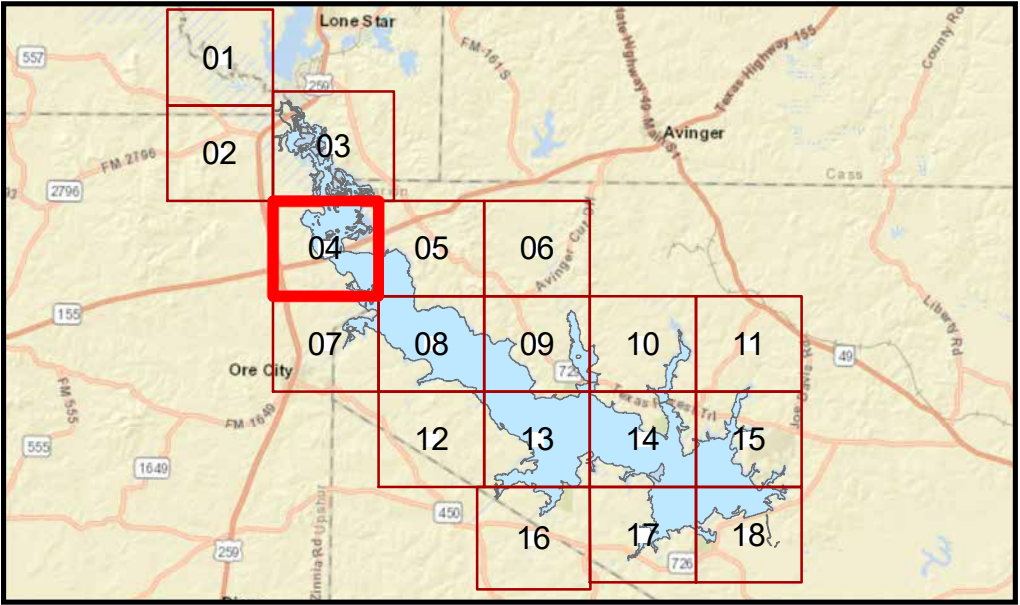
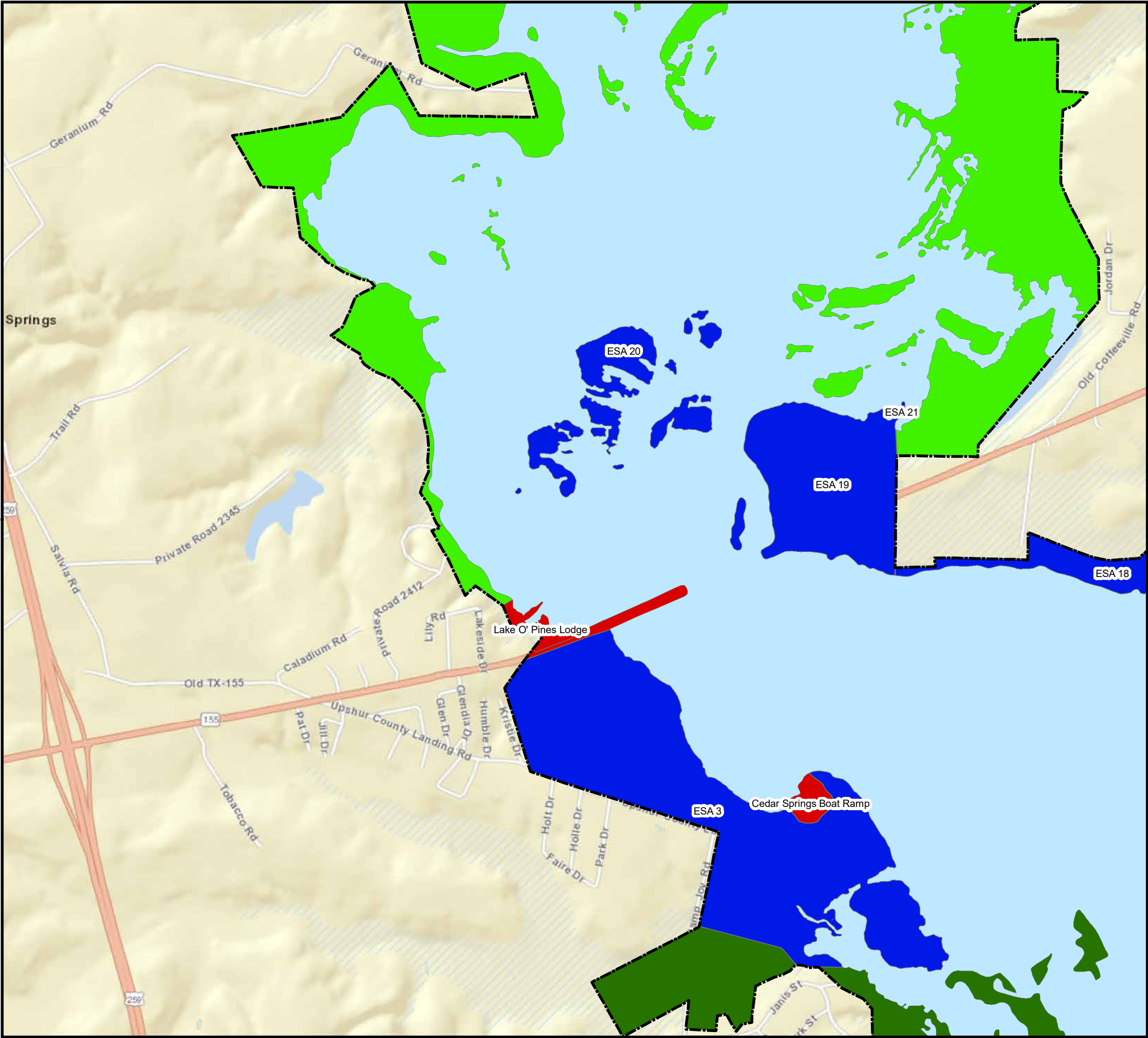


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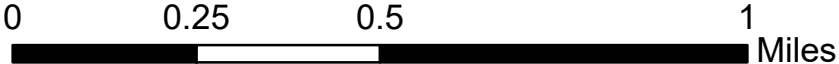



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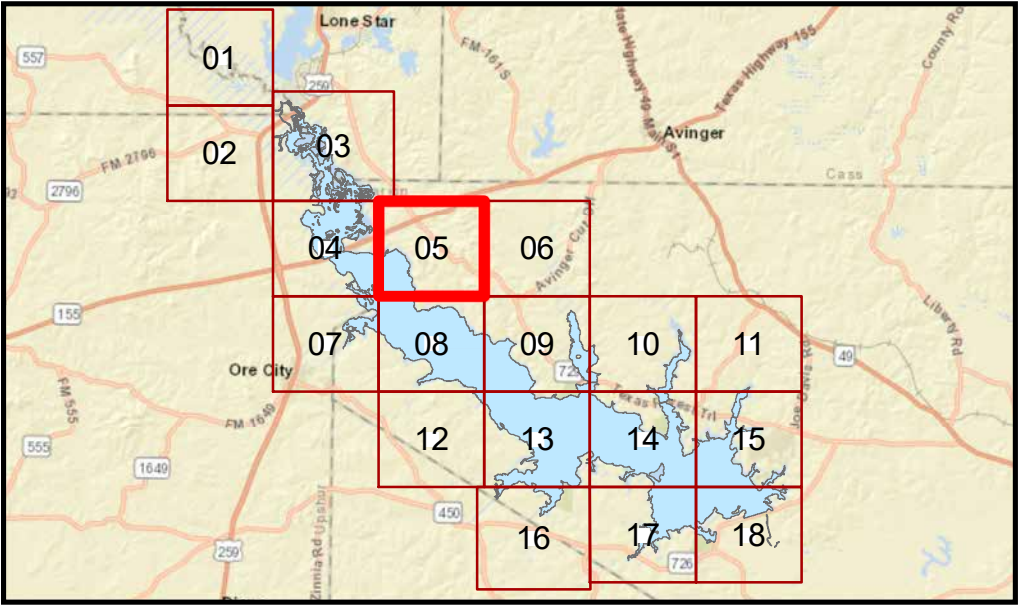
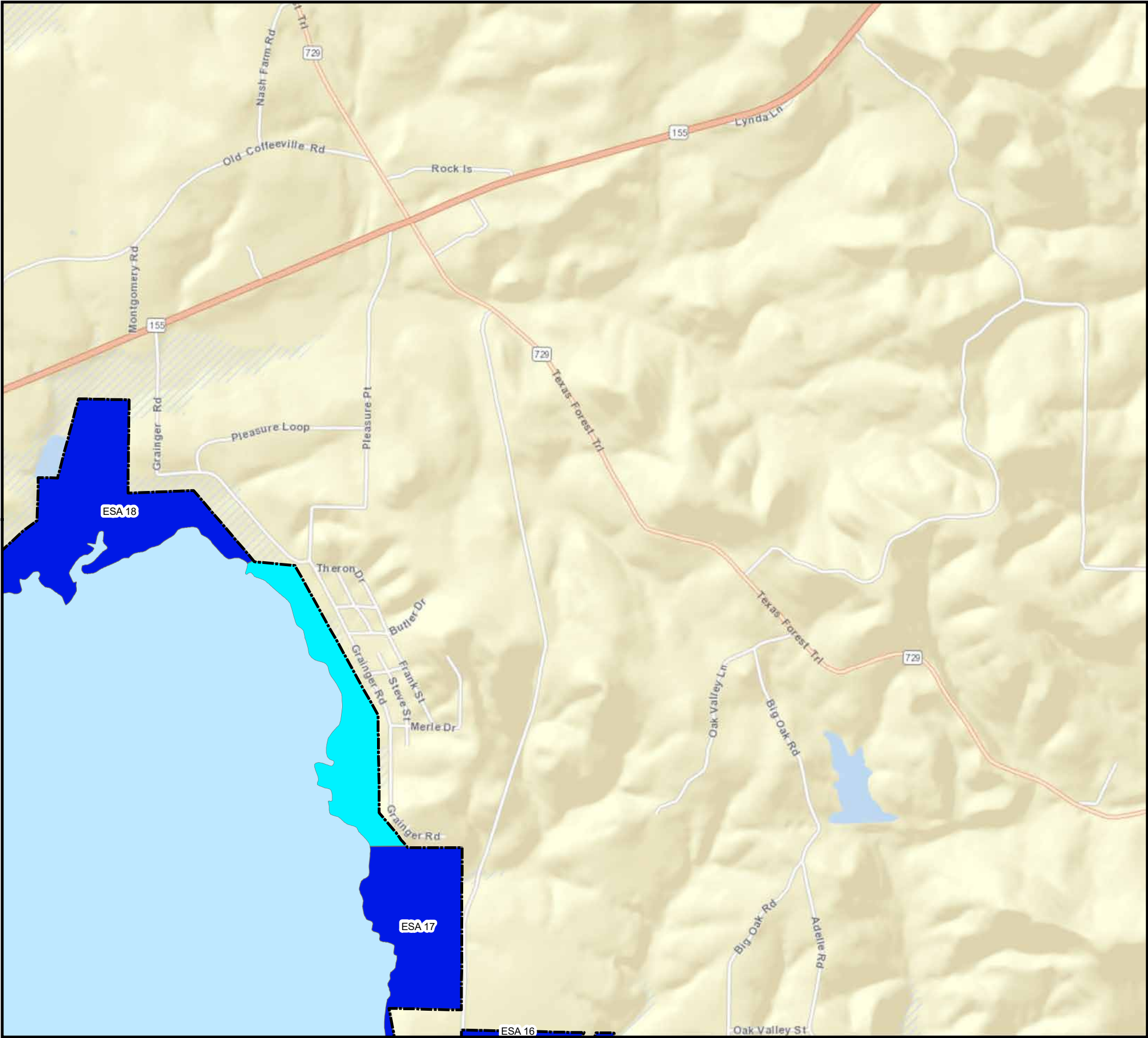


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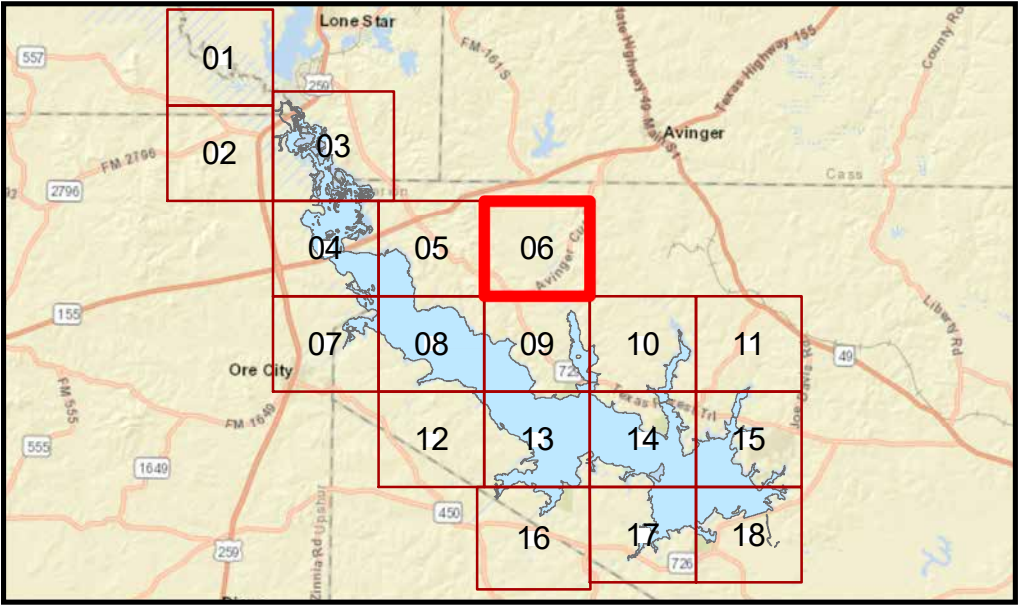
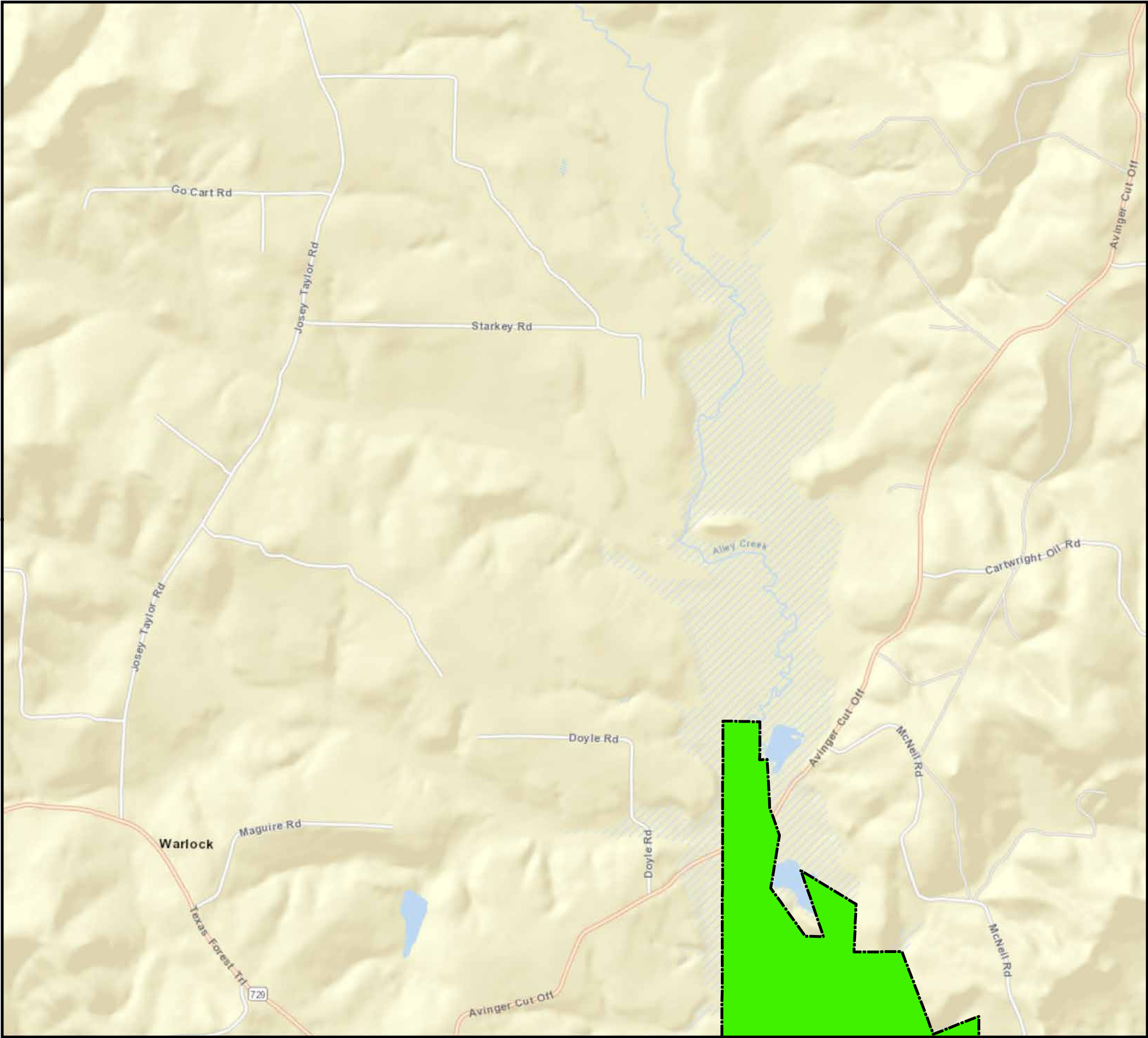
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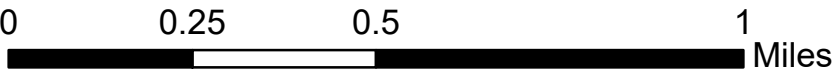


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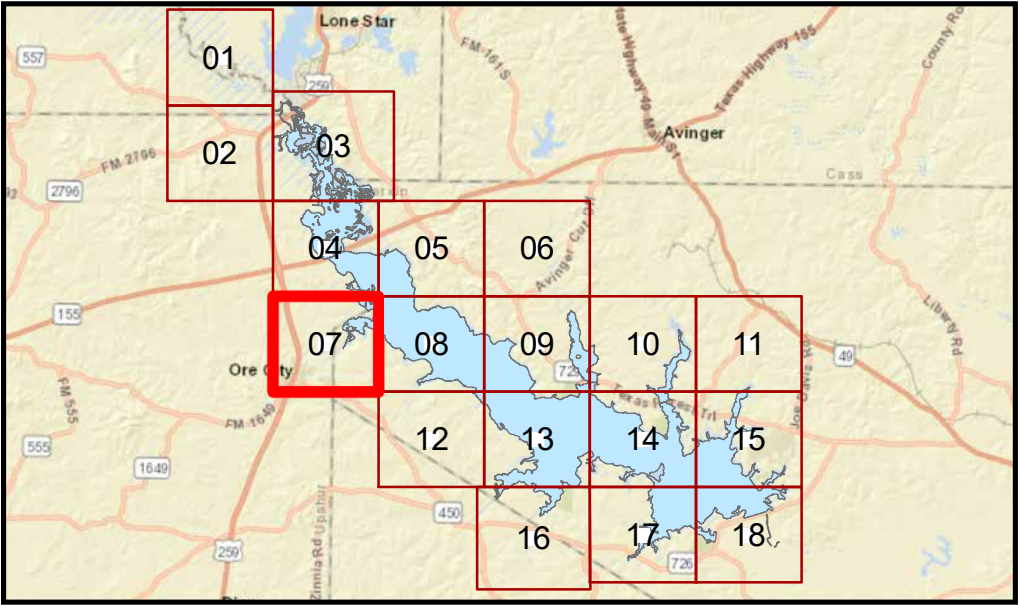
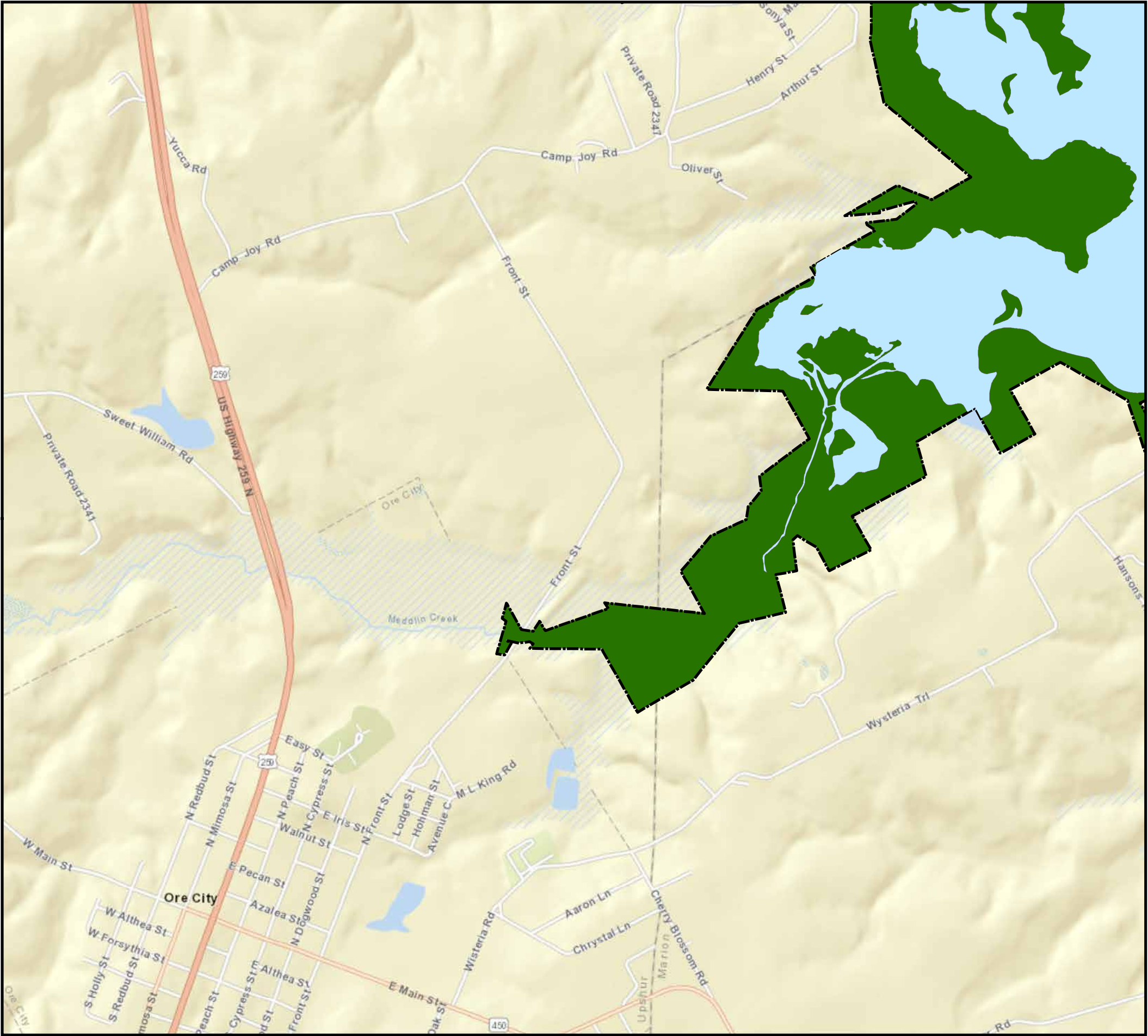
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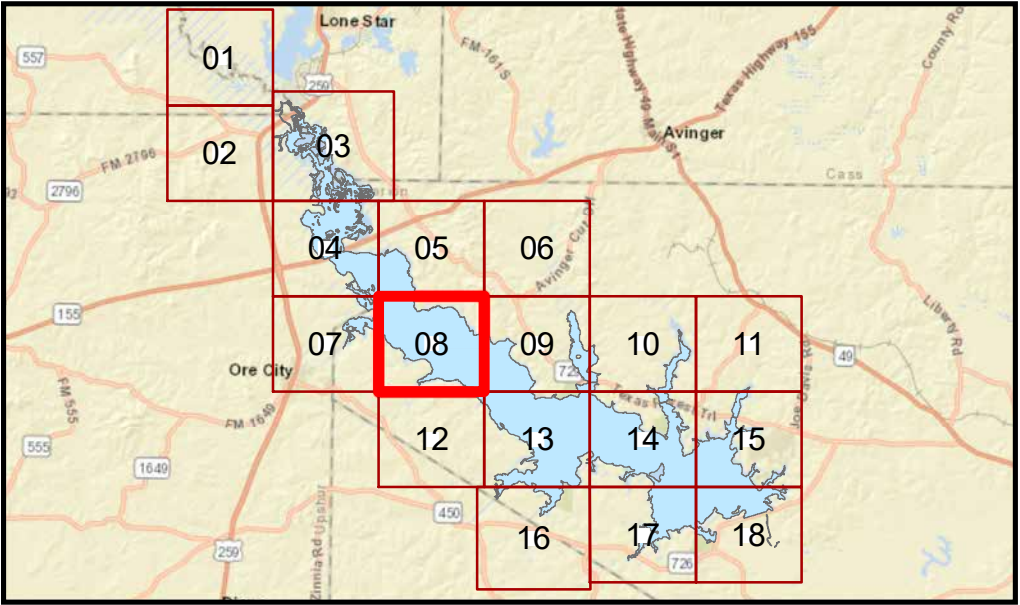
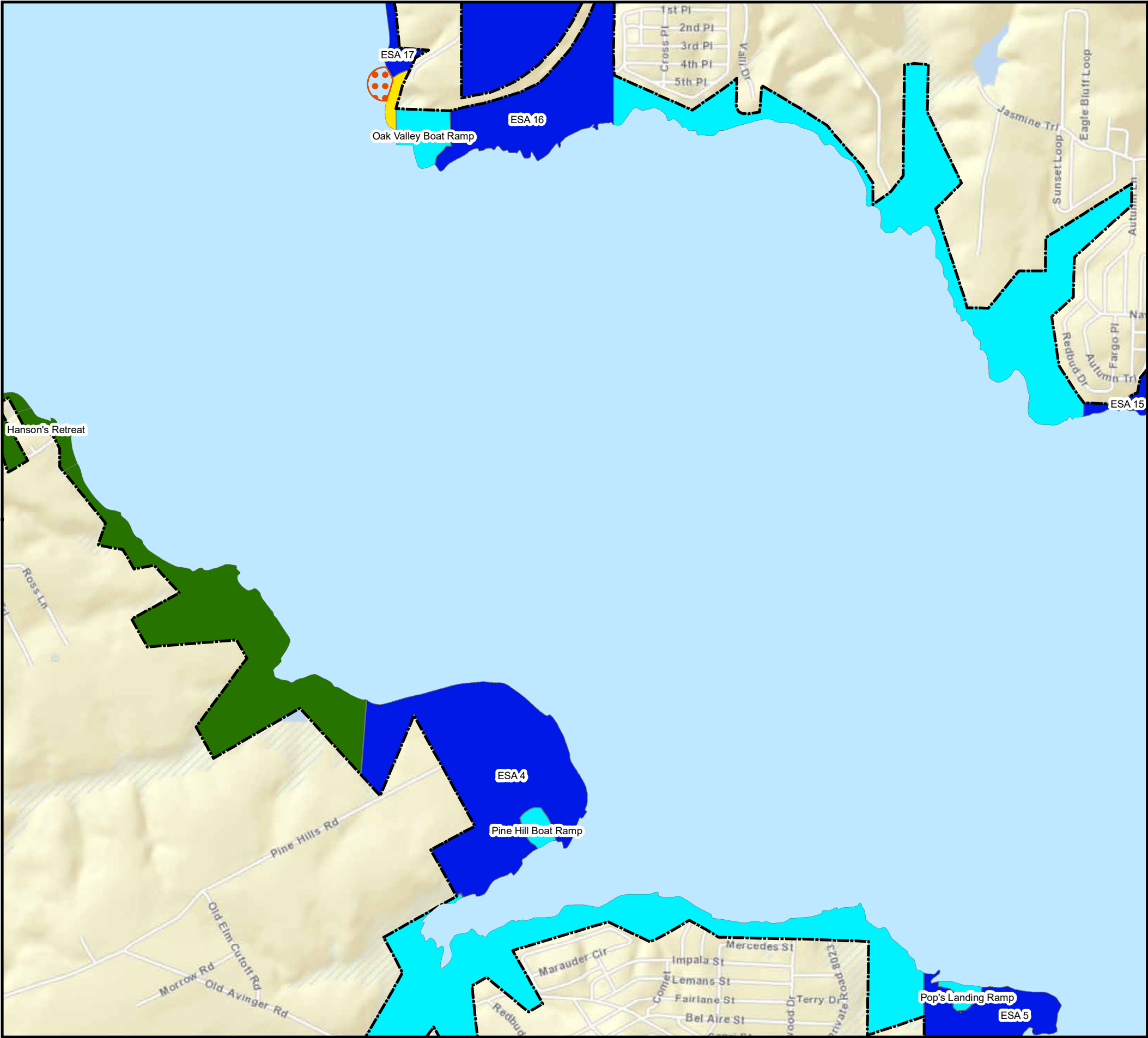
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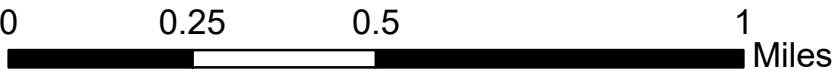


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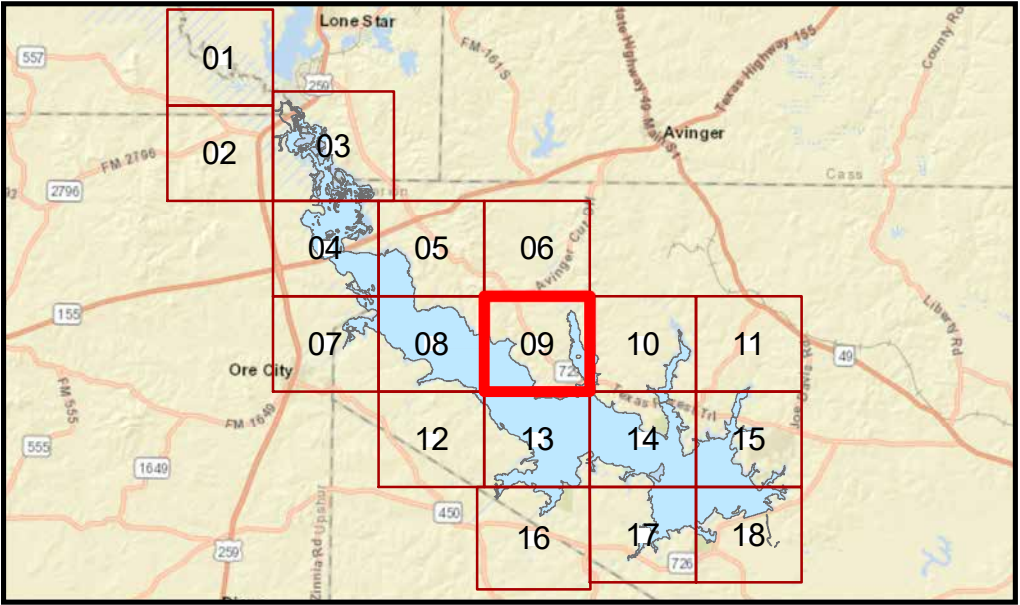
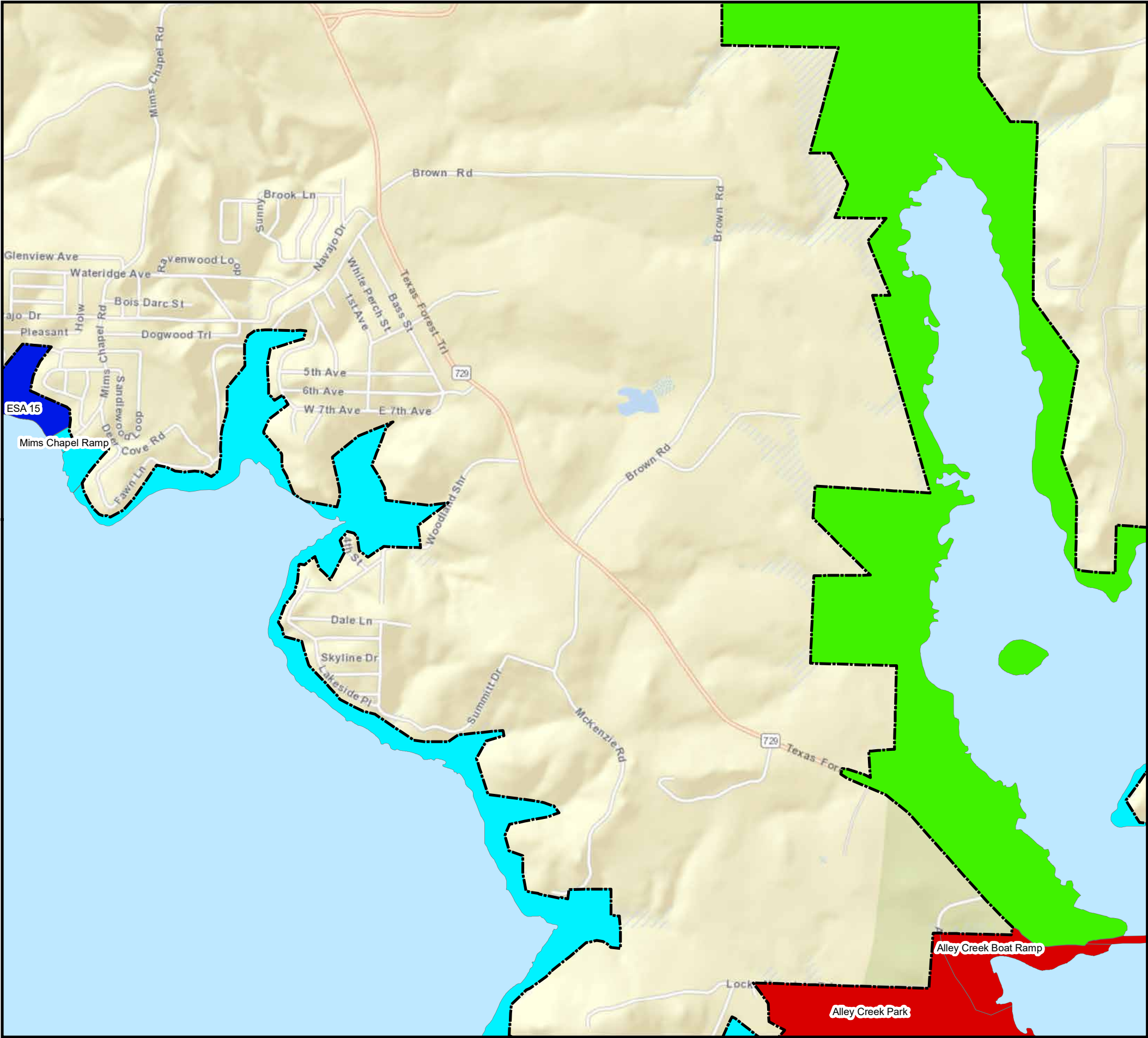
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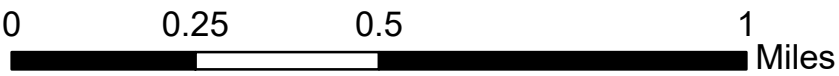


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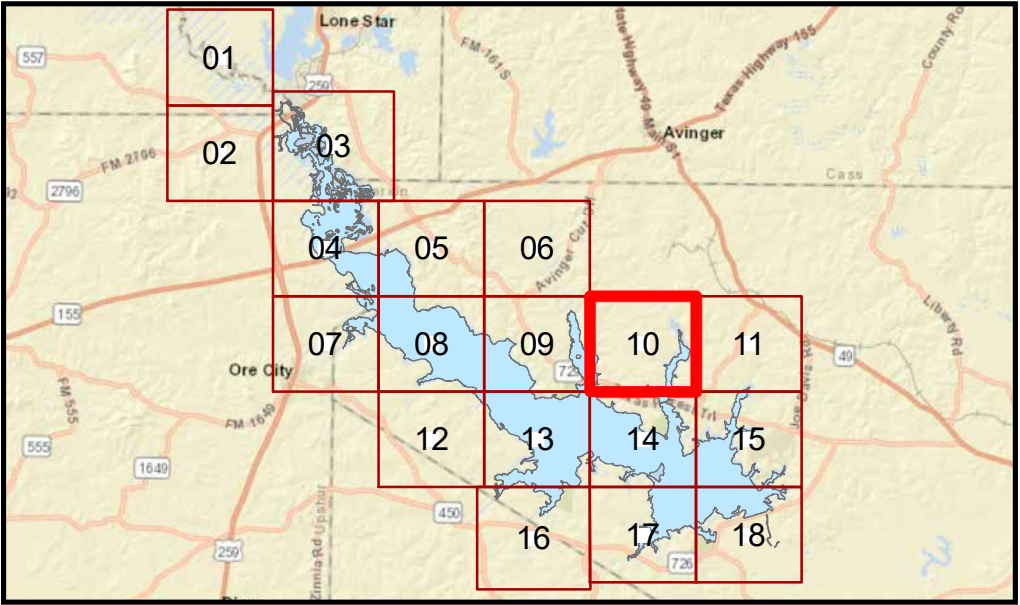
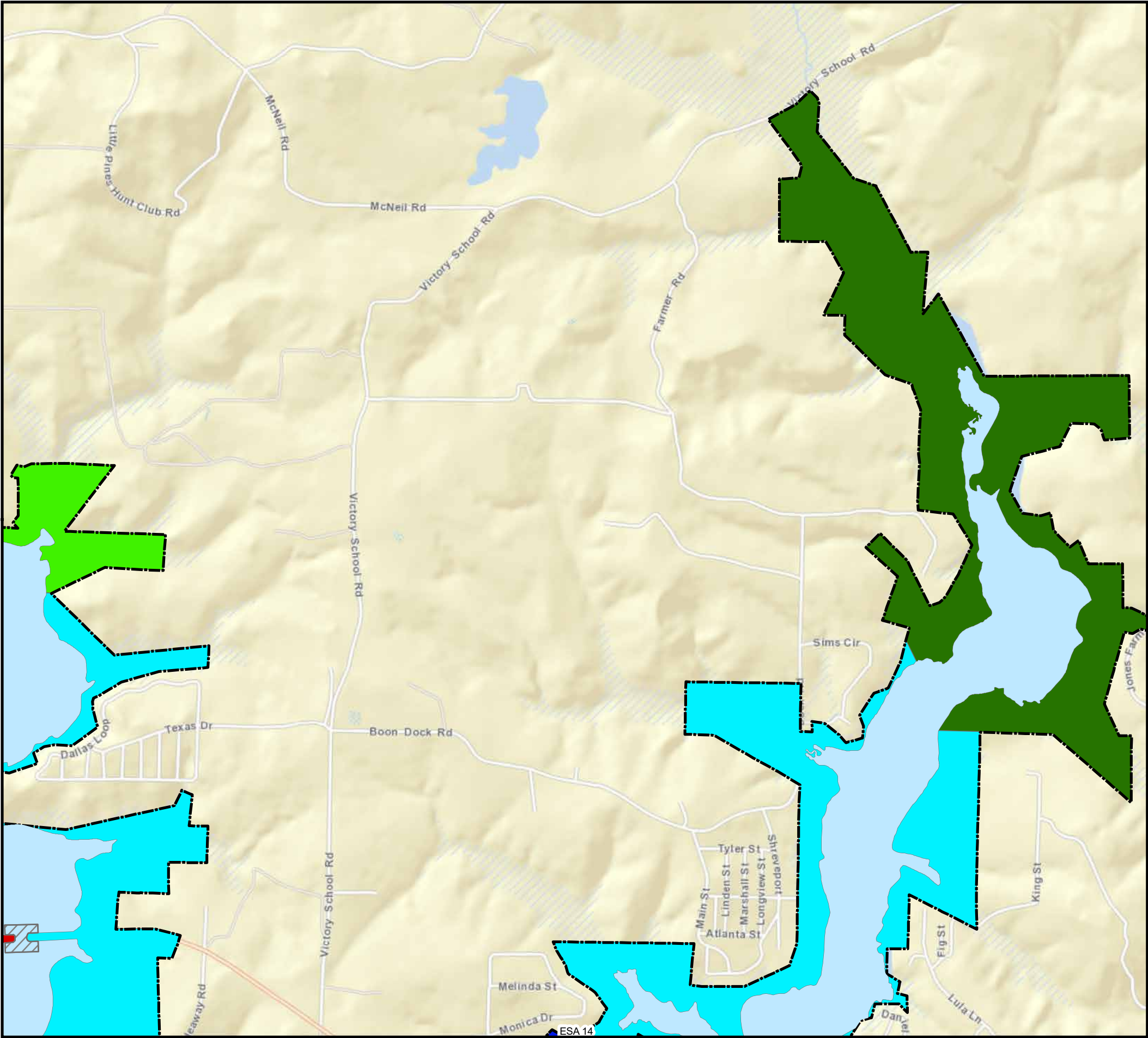
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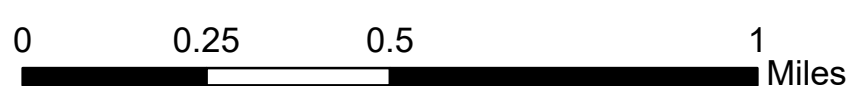



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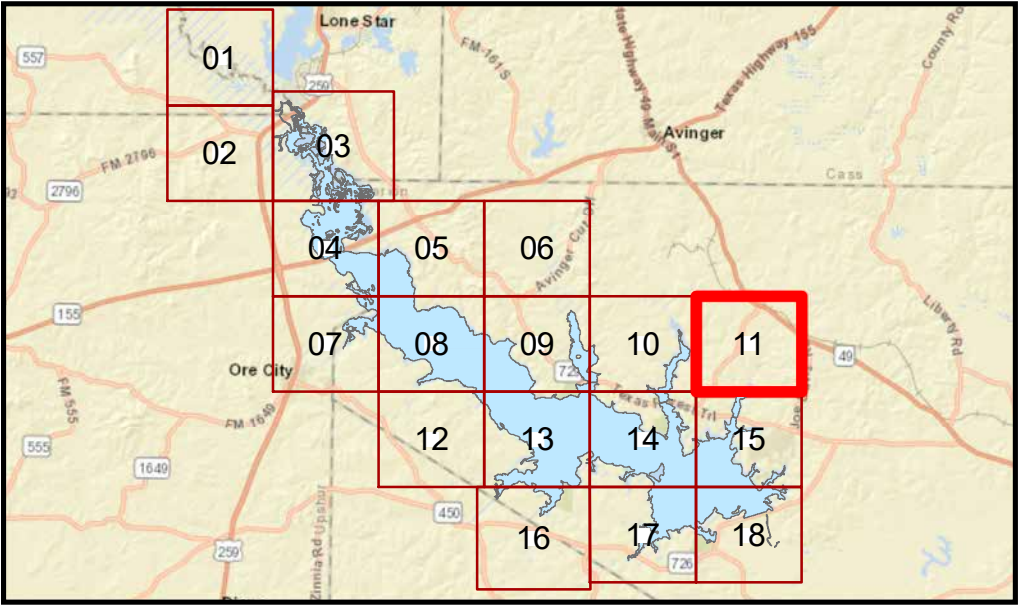
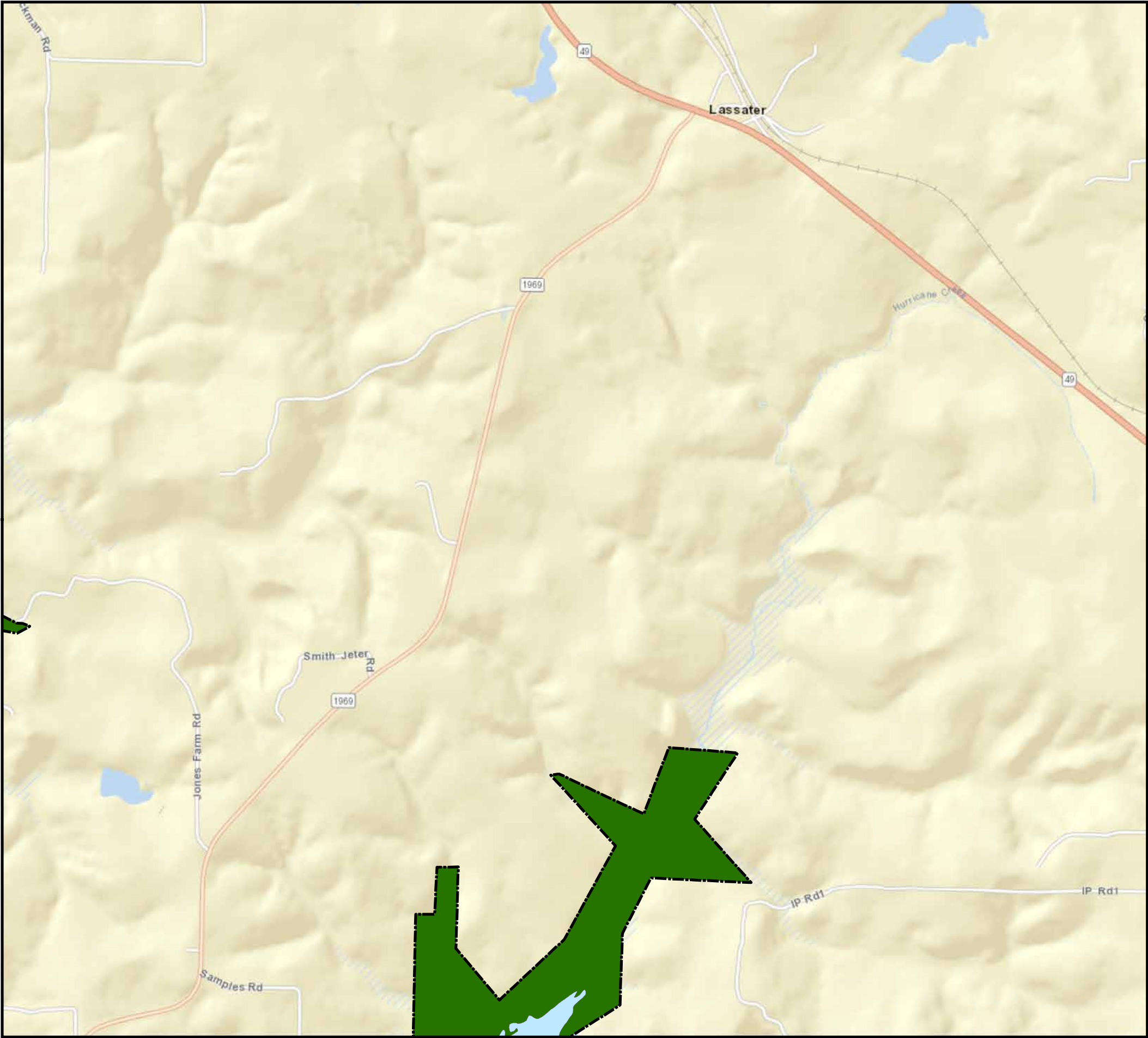


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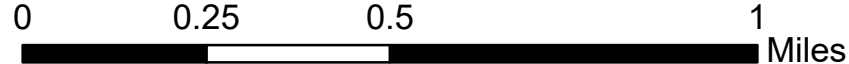



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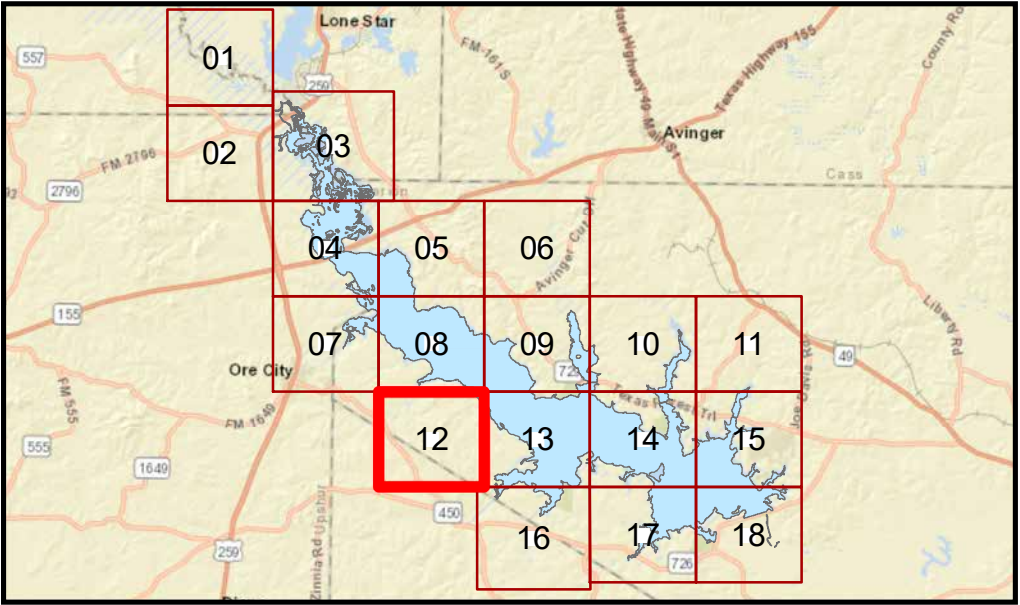
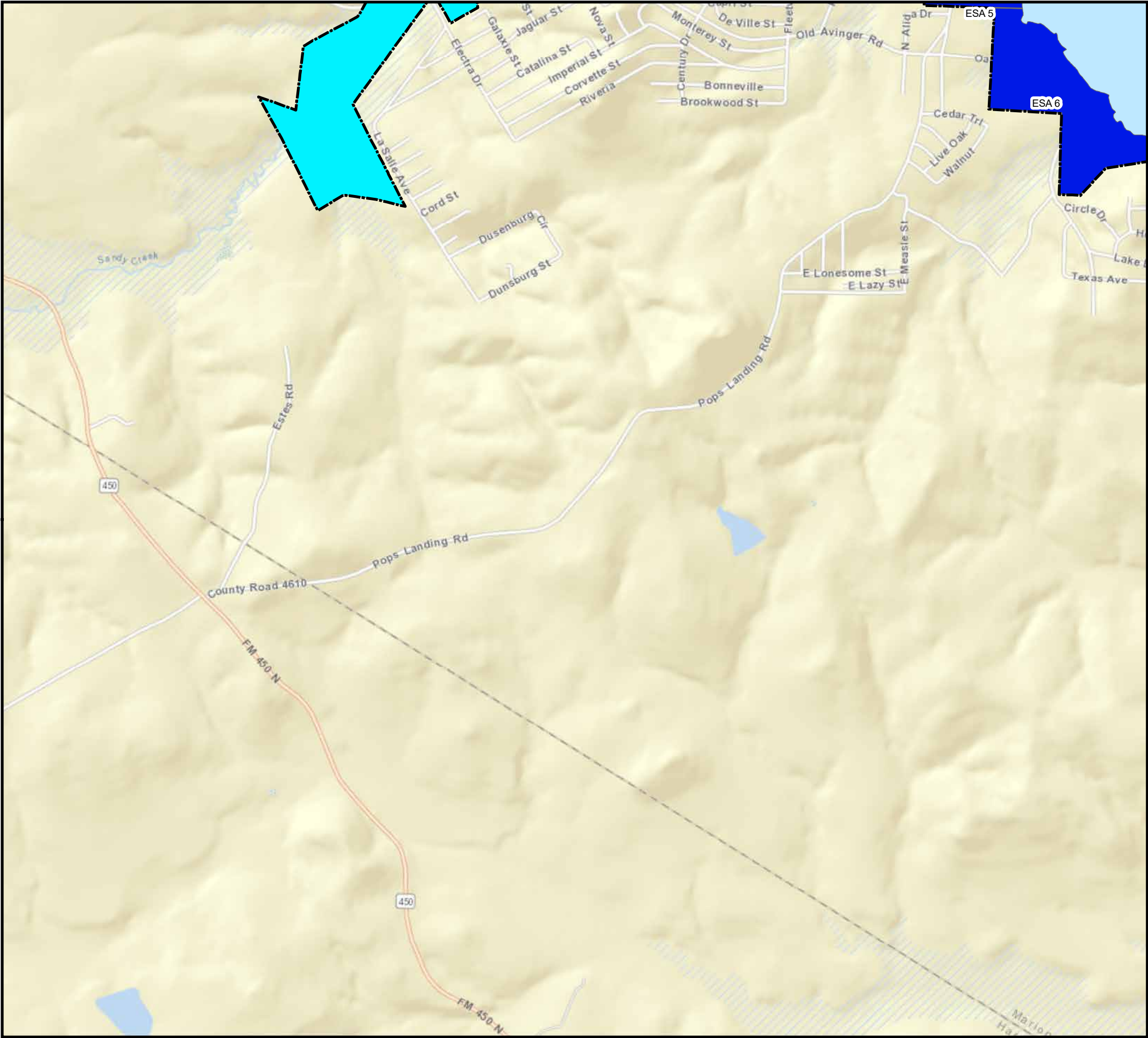


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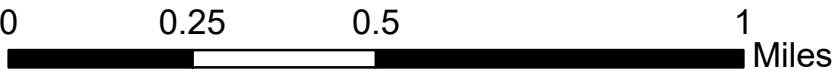


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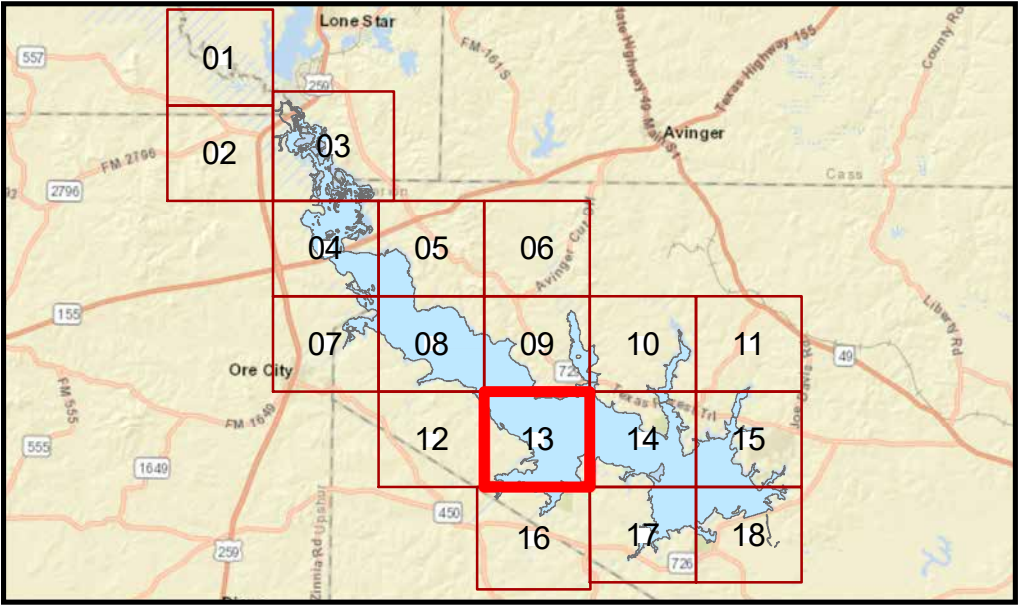
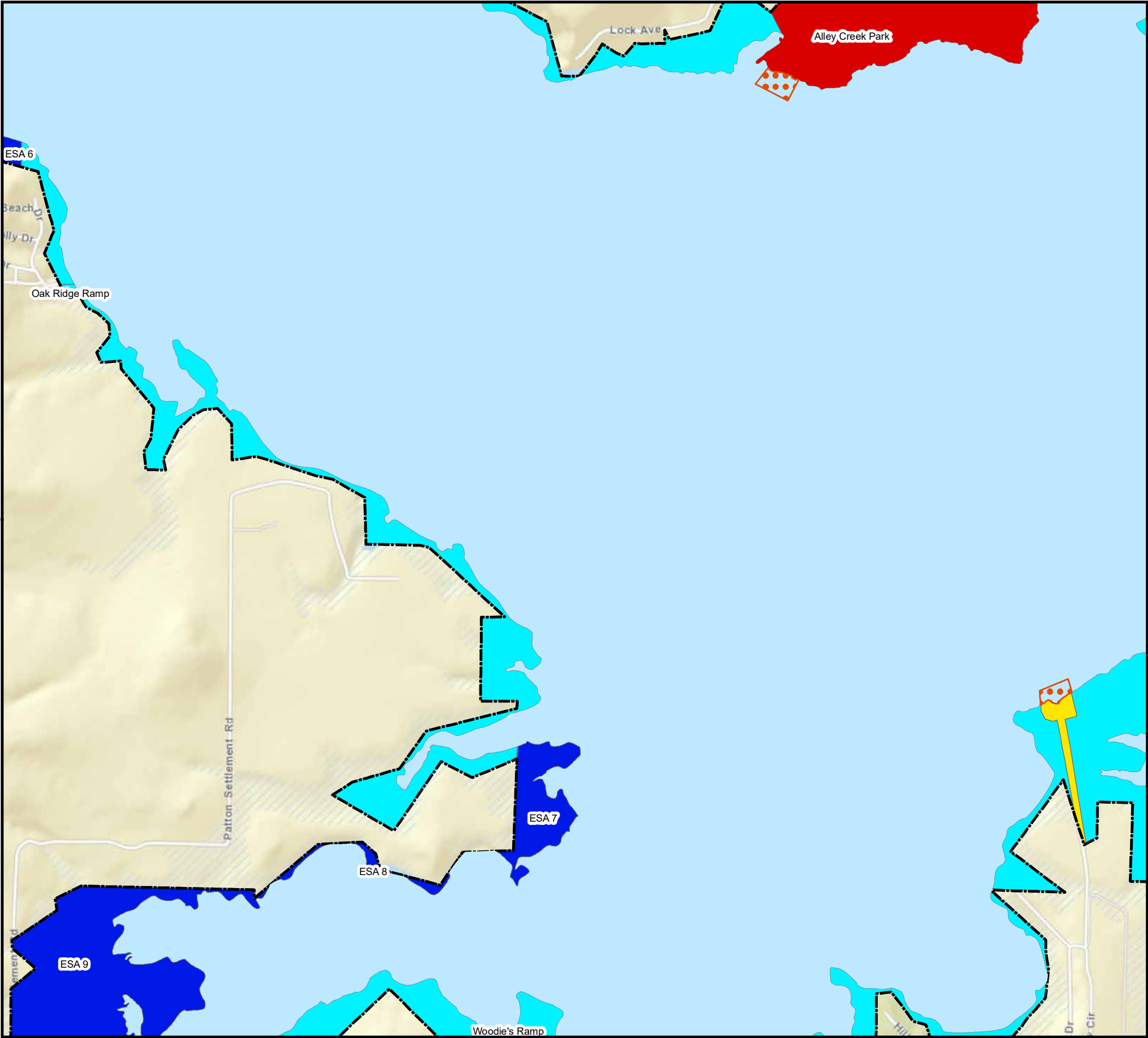
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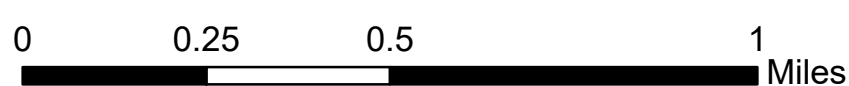



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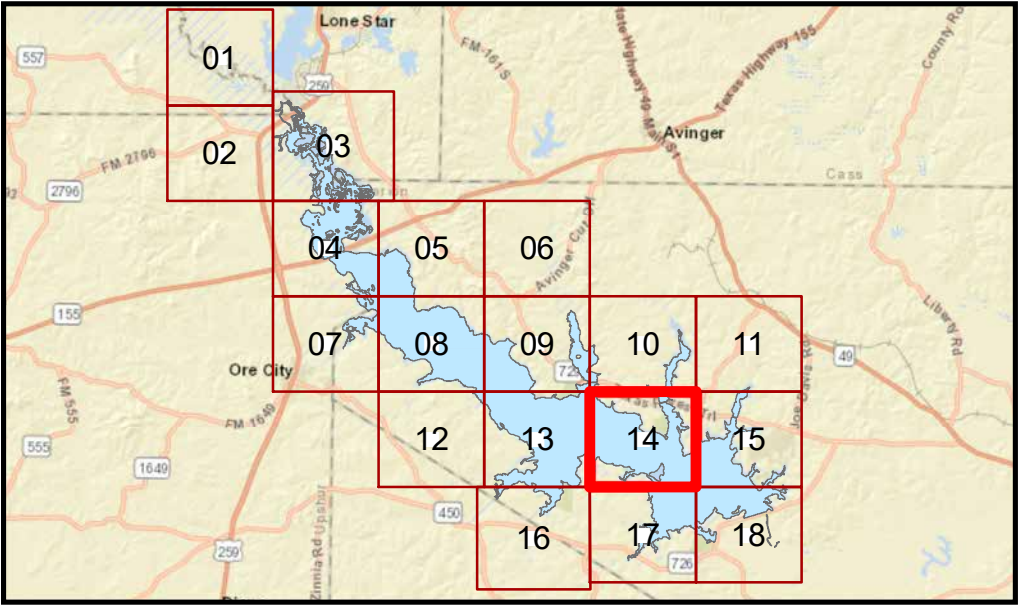
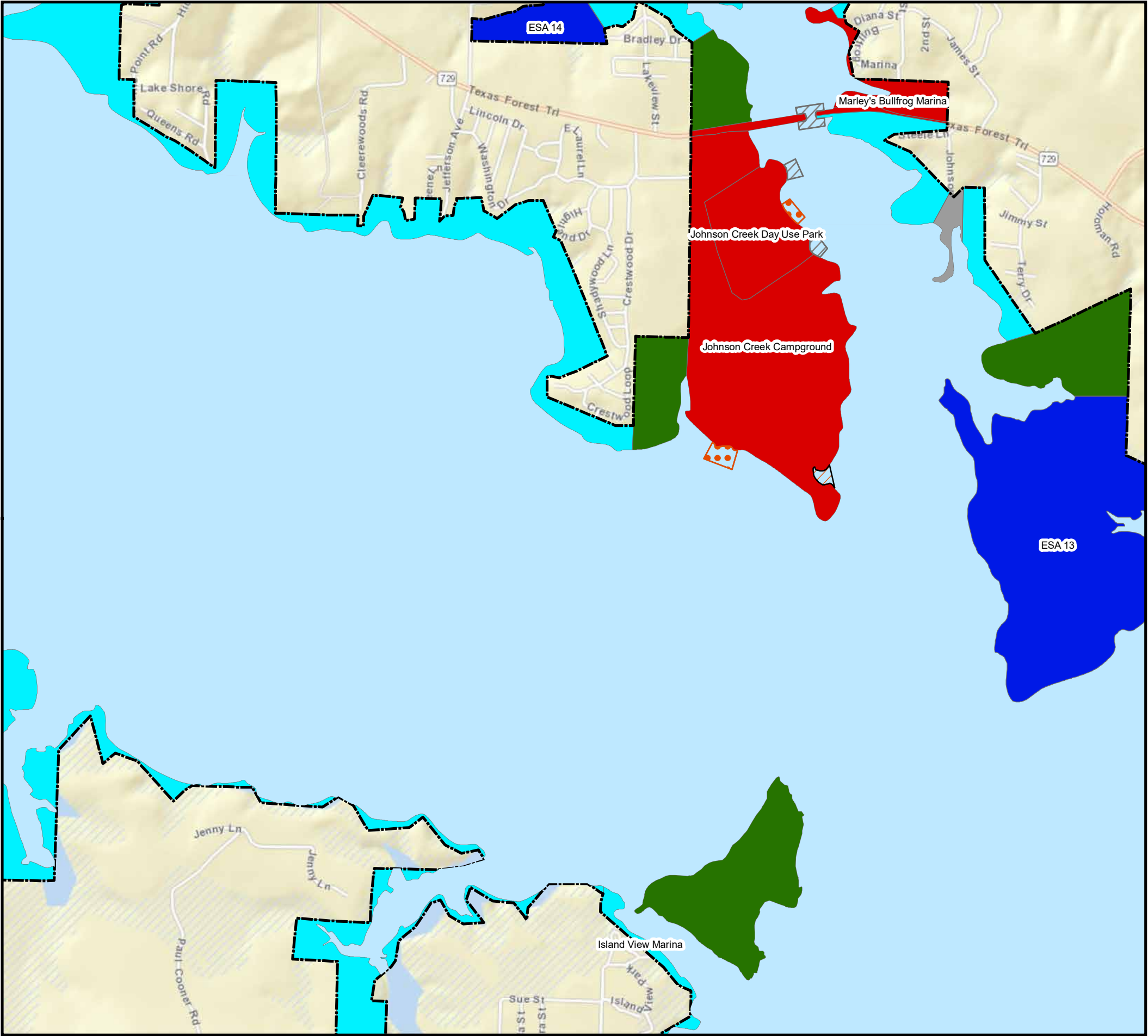


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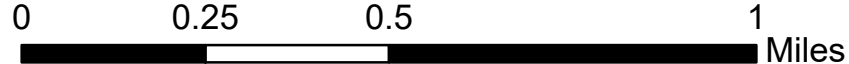



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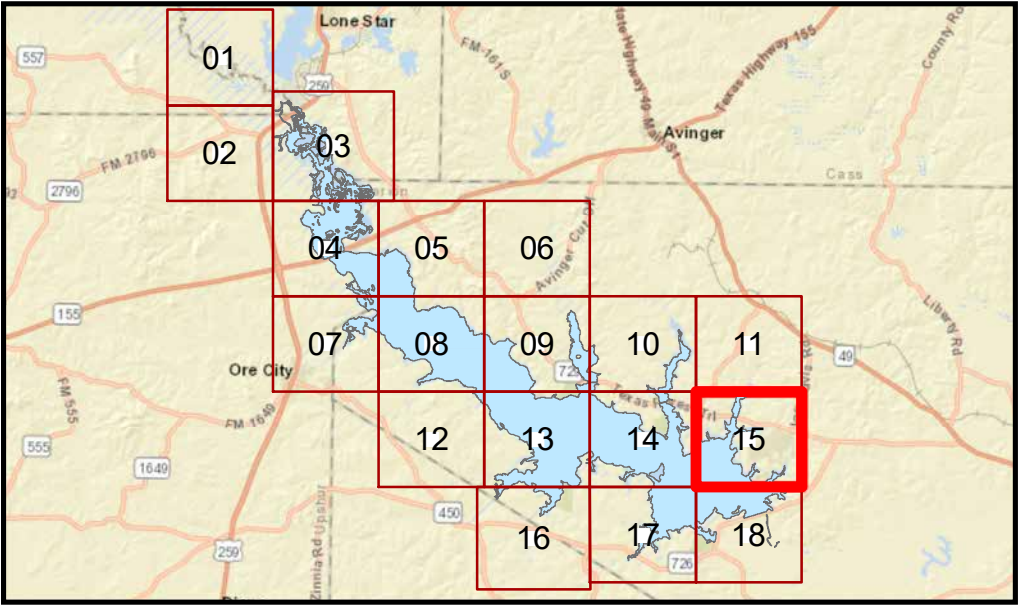
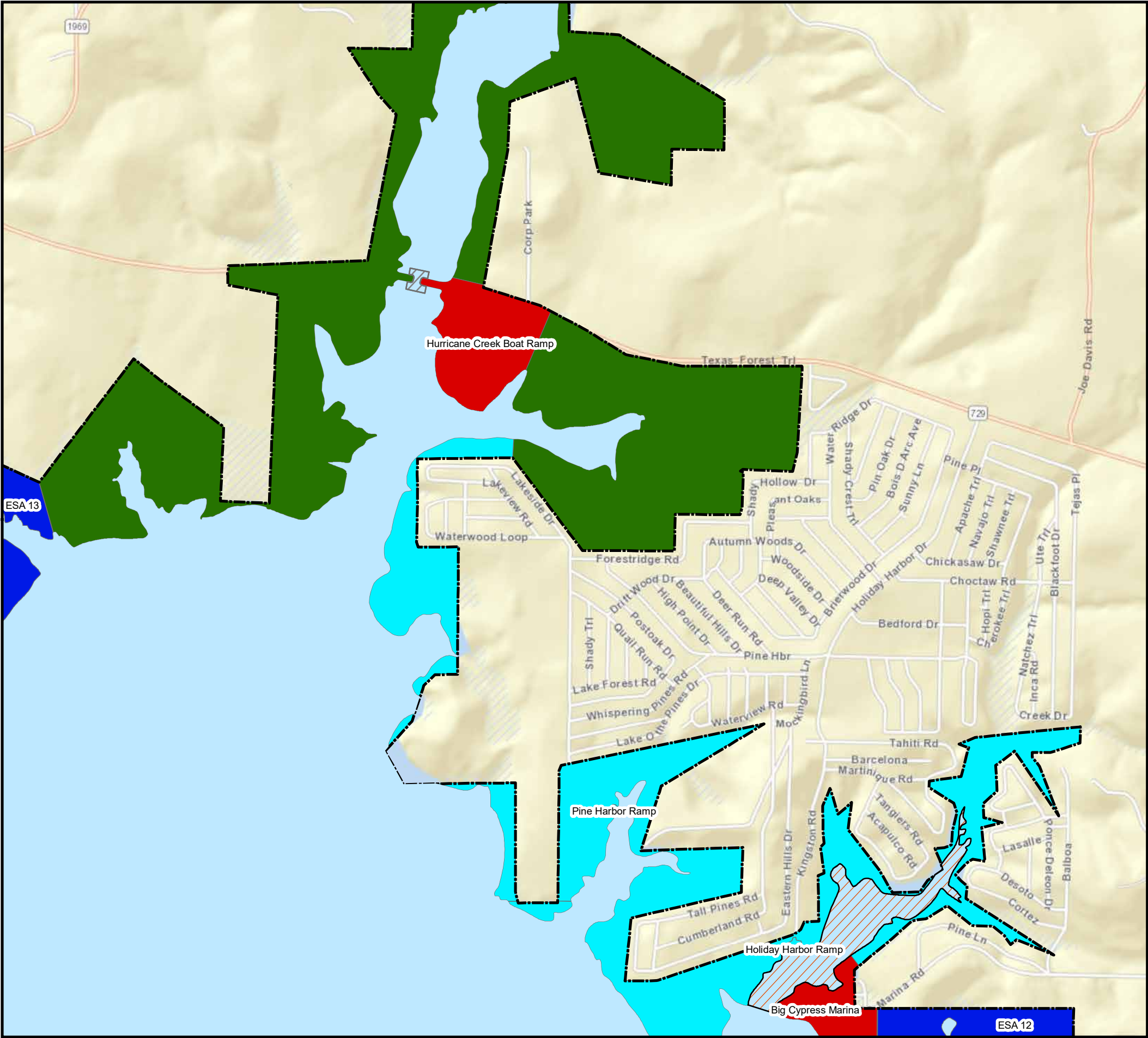


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Lake O' the Pines Master Plan

Land Use and Water Surface Classification

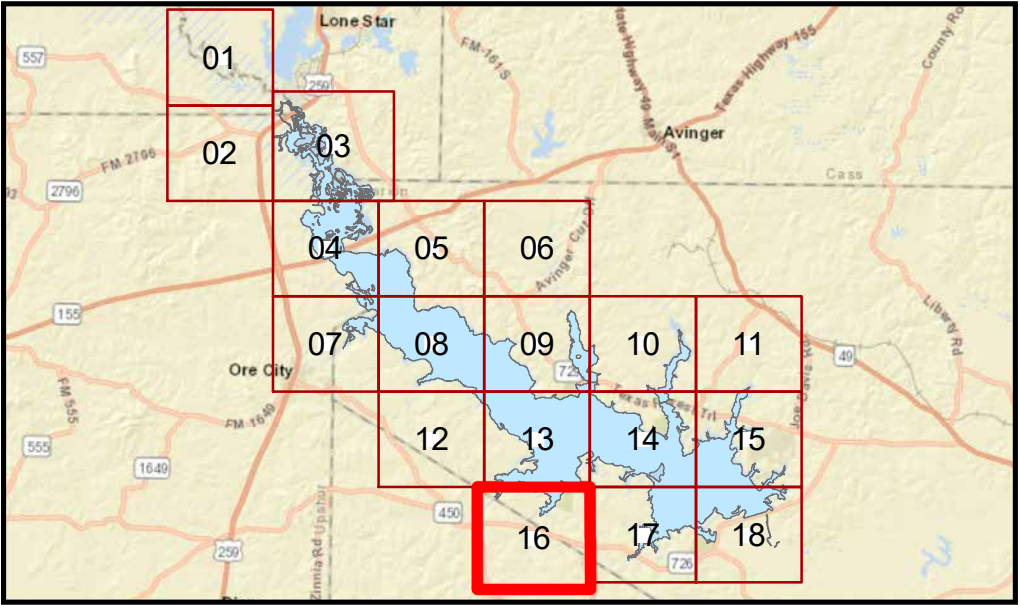
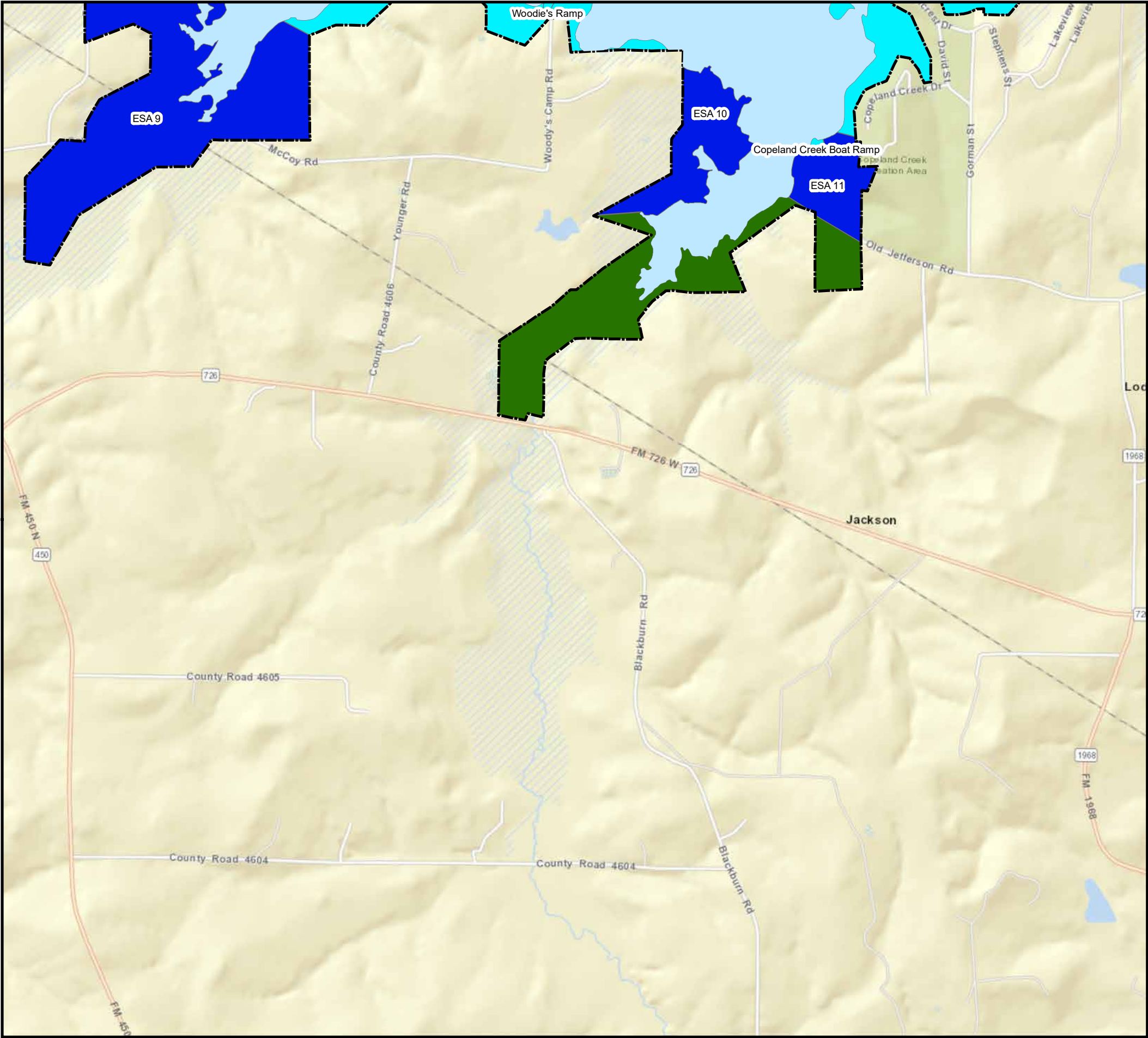
Page - 15



0 0.25 0.5 1 Miles

Date:
July 2018

Map No.
LP18MP-OC-15



- Fee Boundary
- Restricted
- Designated No-Wake
- Proposed Designated No-Wake
- Open Recreation
- Land Classifications**
- Environmentally Sensitive Areas
- Future Recreation
- High Density Recreation
- Low Density Recreation
- Project Operations
- Vegetative Management
- Wildlife Management



U.S. Army Corps of Engineers Fort Worth District

Lake O' the Pines Master Plan

Land Use and Water Surface Classification

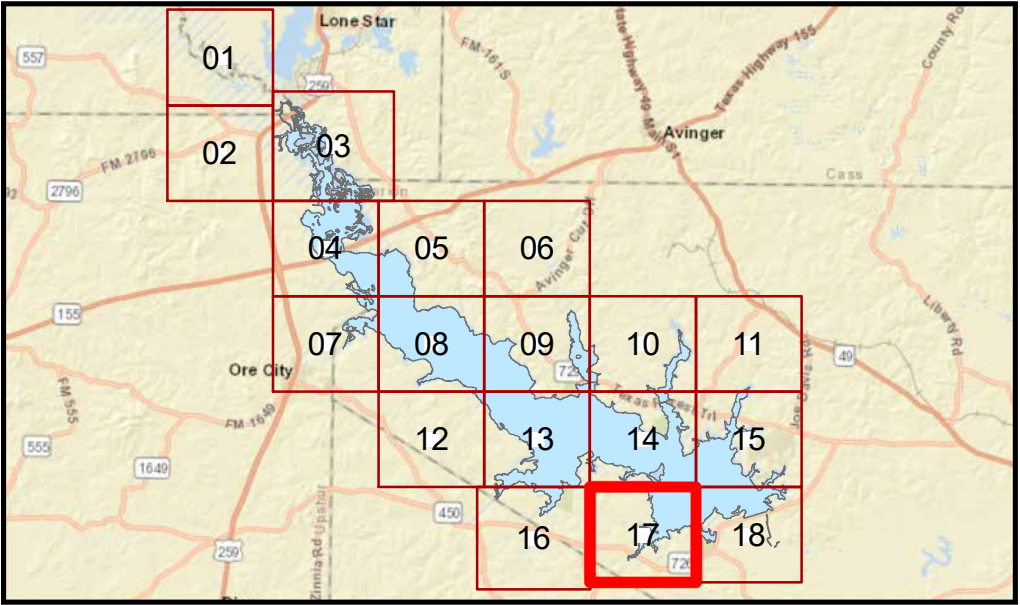
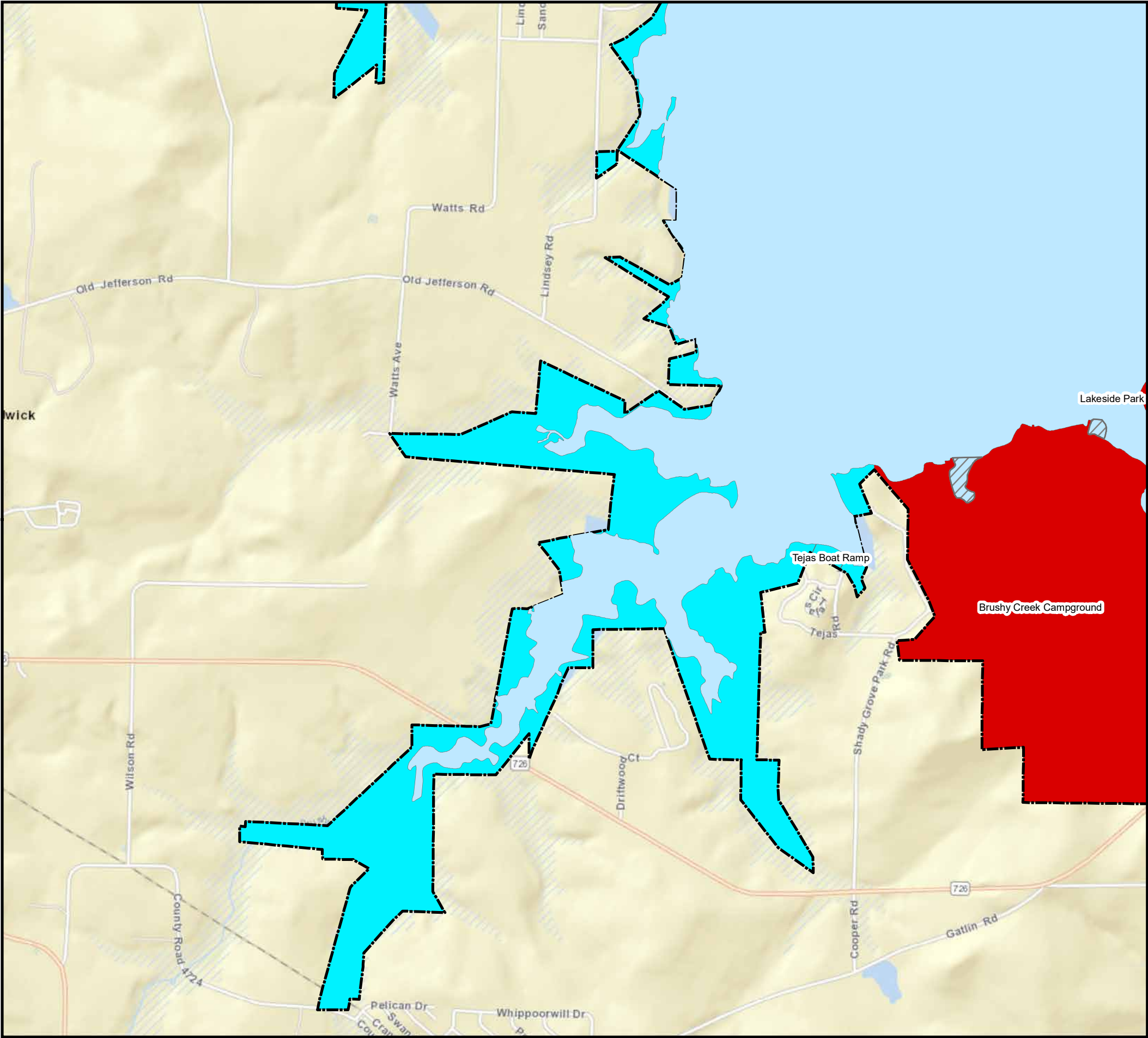
Page - 16



0 0.25 0.5 1 Miles

Date:
July 2018

Map No.
LP18MP-OC-16



- Fee Boundary
- Restricted
- Designated No-Wake
- Proposed Designated No-Wake
- Open Recreation
- Land Classifications**
- Environmentally Sensitive Areas
- Future Recreation
- High Density Recreation
- Low Density Recreation
- Project Operations
- Vegetative Management
- Wildlife Management

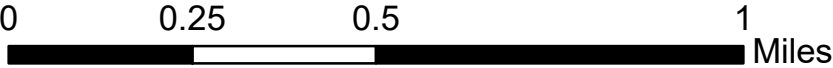


U.S. Army Corps of Engineers Fort Worth District

Lake O' the Pines Master Plan

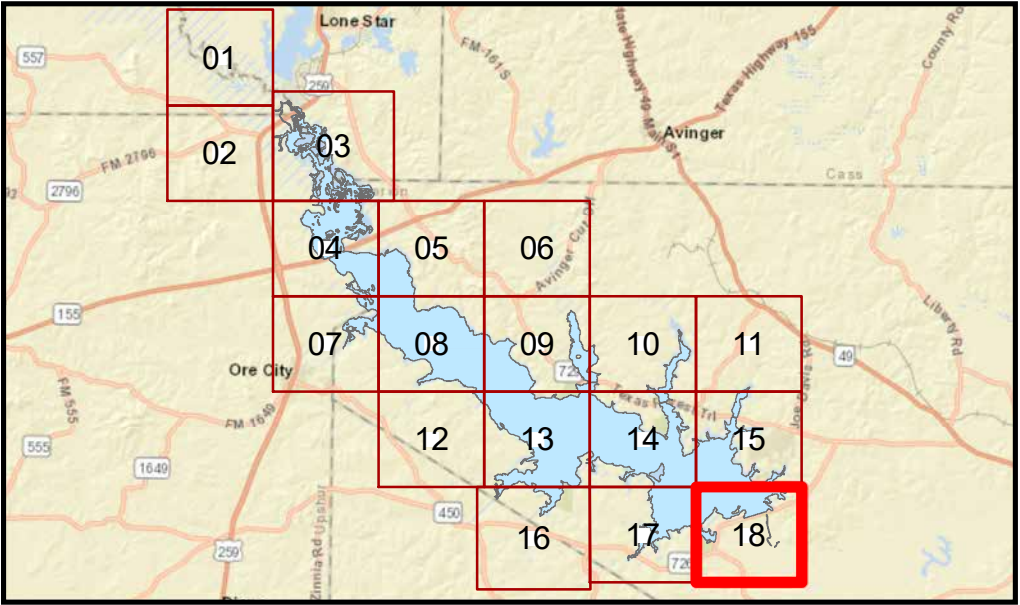
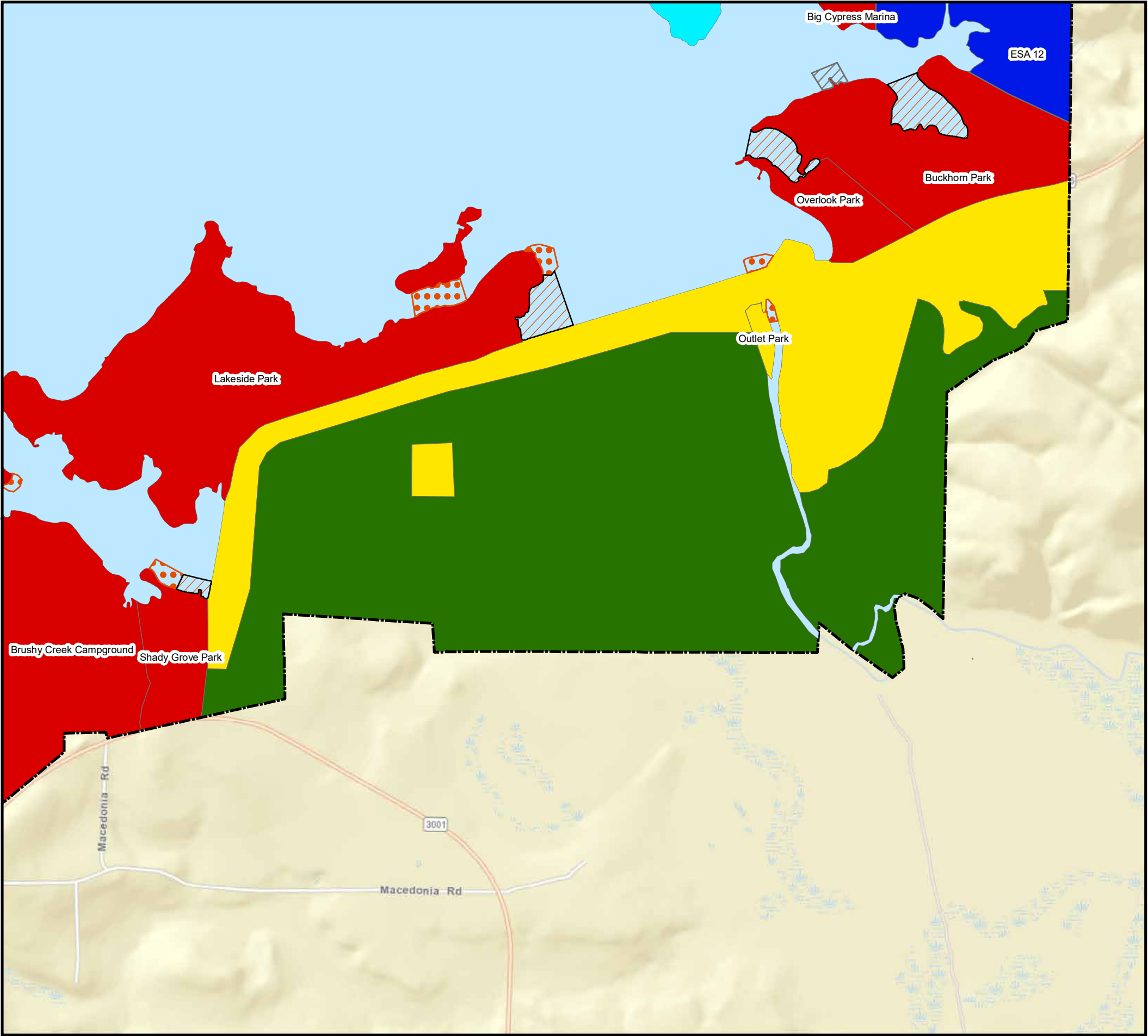
Land Use and Water Surface Classification













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Date:
July 2018

Map No.
LP18MP-OC-17



-  Fee Boundary
-  Restricted
-  Designated No-Wake
-  Proposed Designated No-Wake
-  Open Recreation
- Land Classifications**
-  Environmentally Sensitive Areas
-  Future Recreation
-  High Density Recreation
-  Low Density Recreation
-  Project Operations
-  Vegetative Management
-  Wildlife Management

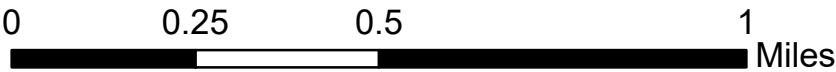


U.S. Army Corps of Engineers Fort Worth District

Lake O' the Pines Master Plan

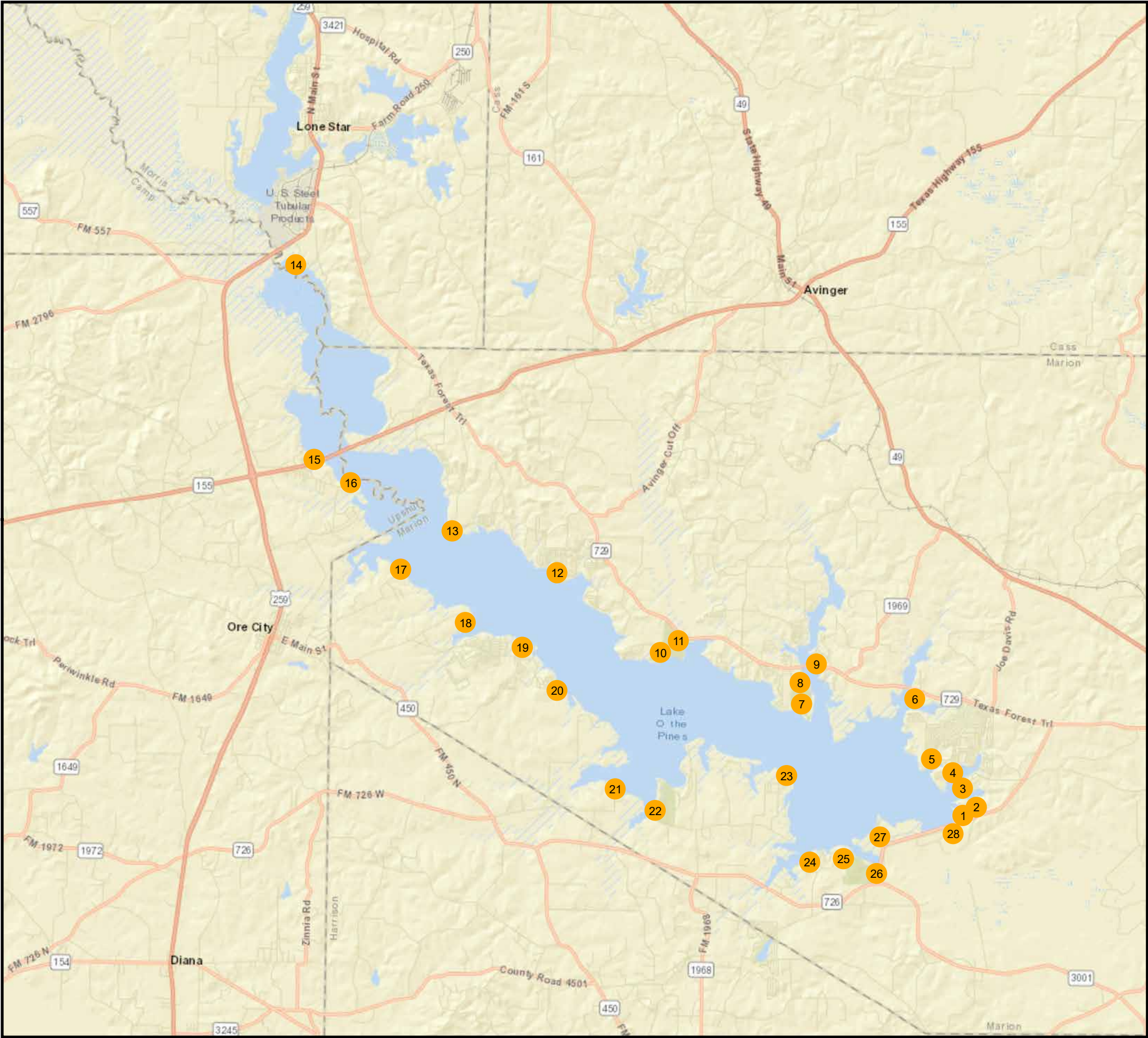
Land Use and Water Surface Classification

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Date:
July 2018

Map No.
LP18MP-OC-18

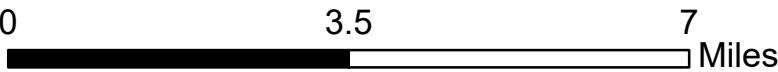


1	Overlook Park	15	Lake O' Pines Lodge
2	Buckhorn Creek Campground	16	Cedar Springs Boat Ramp
3	Big Cypress Marina	17	Hanson's Retreat
4	Holiday Harbor Ramp	18	Pine Hill Boat Ramp
5	Pine Harbor Ramp	19	Pop's Landing Ramp
6	Hurricane Creek Boat Ramp	20	Oak Ridge Ramp
7	Johnson Creek Campground	21	Woodie's Ramp
8	Johnson Creek Day Use Park	22	Copeland Creek Boat Ramp
9	Marley's Bullfrog Marina	23	Island View Marina
10	Alley Creek Park	24	Tejas Boat Ramp
11	Alley Creek Boat Ramp	25	Brushy Creek Campground
12	Mims Chapel Ramp	26	Shady Grove Park
13	Oak Valley Boat Ramp	27	Lakeside Park
14	Lone Star Boat Ramp	28	Outlet Park



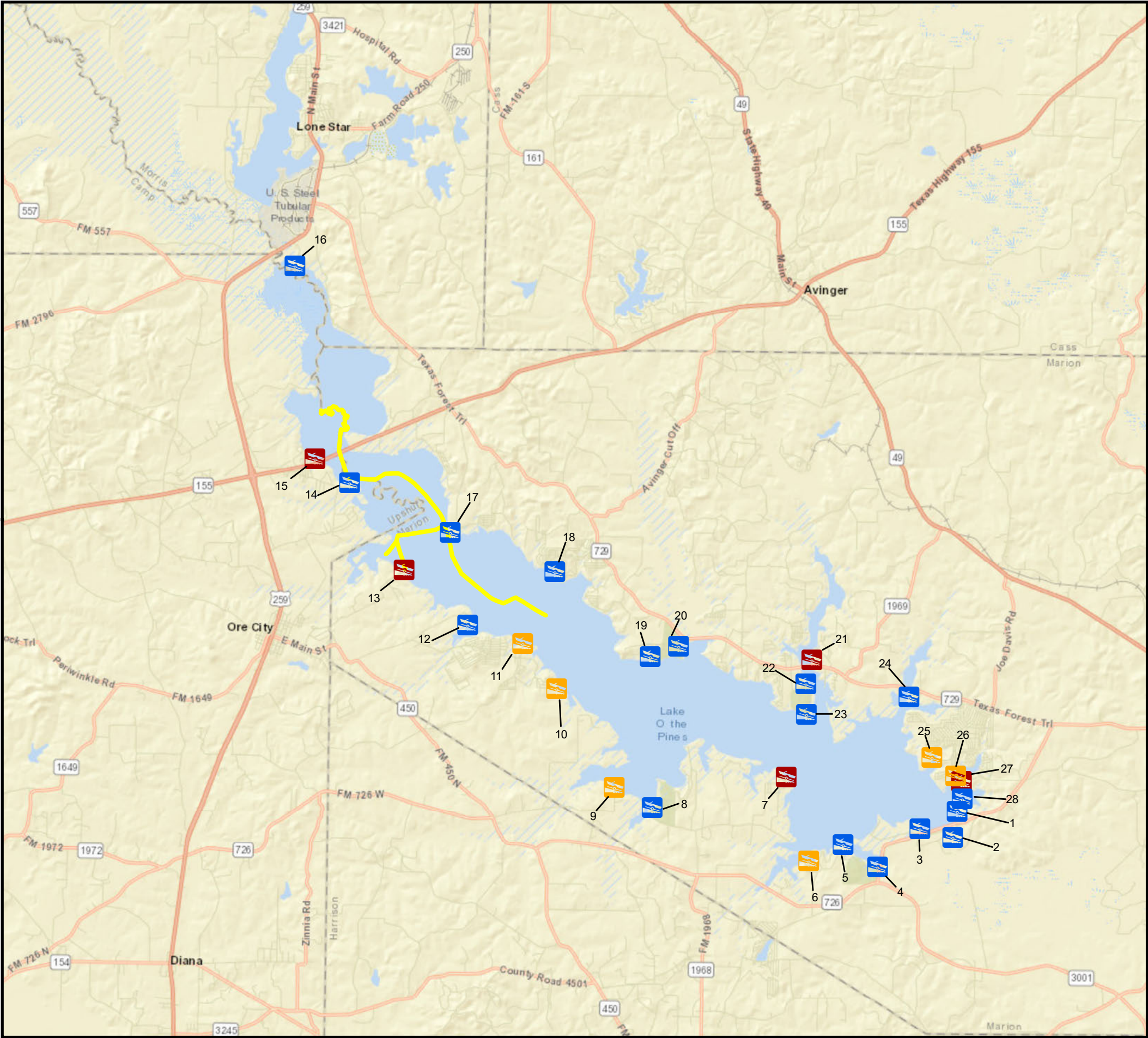
**U.S. Army Corps of Engineers
Fort Worth District**

**Lake O' the Pines Master Plan
Recreation Areas**



Date:
July 2018

Map No.
LP18MP-OR-OA



Ramp No.	Ramp Name	No. of Lanes	Agency
1	Overlook Park	3	USACE
2	Outlet Park	1	USACE
3	Lakeside Park	2	USACE
4	Shady Grove Park	2	USACE
5	Brushy Creek Campground	2	USACE
6	Tejas Boat Ramp	2	County
7	Island View Marina	1	Concessionaire
8	Copeland Creek Boat Ramp	2	USACE
9	Woodie's Ramp	1	County
10	Oak Ridge Ramp	1	County
11	Pop's Landing Ramp	2	County
12	Pine Hill Boat Ramp	2	USACE
13	Hanson's Retreat	1	Concessionaire
14	Cedar Springs Boat Ramp	2	USACE
15	Lake O' Pines Lodge	2	Concessionaire
16	Lone Star Boat Ramp	2	USACE
17	Oak Valley Boat Ramp	2	USACE
18	Mims Chapel Ramp	2	USACE
19	Alley Creek Park	2	USACE
20	Alley Creek Boat Ramp	2	USACE
21	Marley's Bullfrog Marina	2	Concessionaire
22	Johnson Creek Day Use Park	2	USACE
23	Johnson Creek Campground	2	USACE
24	Hurricane Creek Boat Ramp	2	USACE
25	Pine Harbor Ramp	1	County
26	Holiday Harbor Ramp	1	County
27	Big Cypress Marina	1	Concessionaire
28	Buckhorn Park	2	USACE

-  USACE
-  Concessionaire
-  County
-  LOP Boat Runs



U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan
Boat Ramps and Boating Lanes



0 3.5 7 Miles

Date:
July 2018

Map No.
LP18MP-OR-OB



Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	6
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

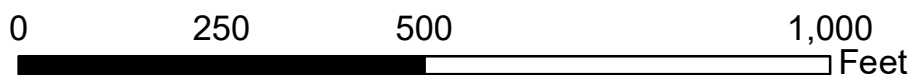


**U.S. Army Corps of Engineers
Fort Worth District**

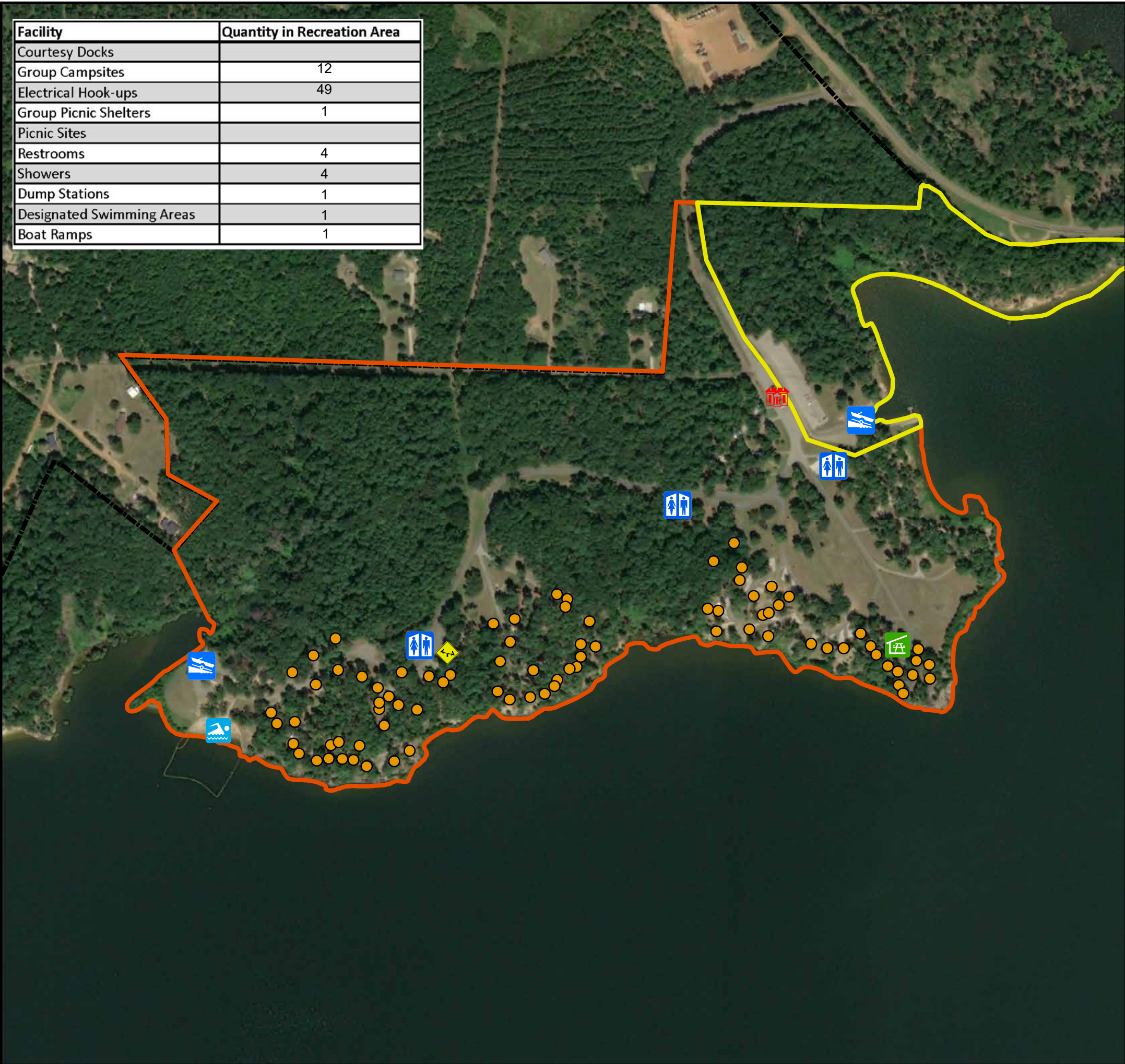
Lake O' the Pines Master Plan

Recreational Areas

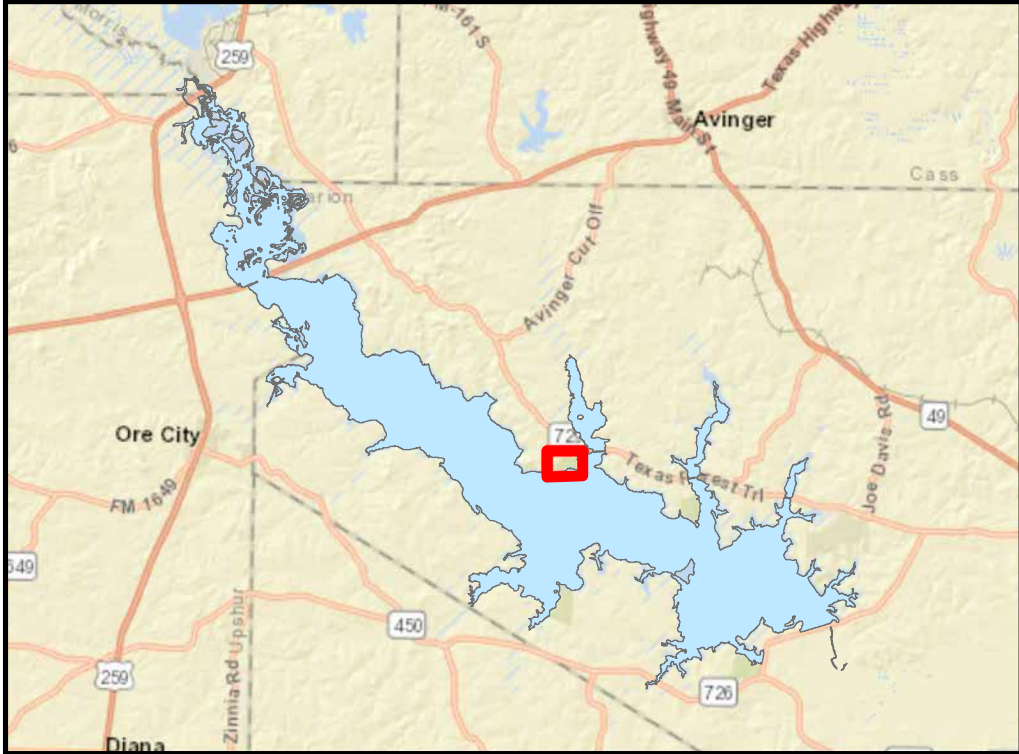
Alley Creek Boat Ramp



Date: July 2018	Map No. LP18MP-OR-01
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Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	12
Electrical Hook-ups	49
Group Picnic Shelters	1
Picnic Sites	
Restrooms	4
Showers	4
Dump Stations	1
Designated Swimming Areas	1
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

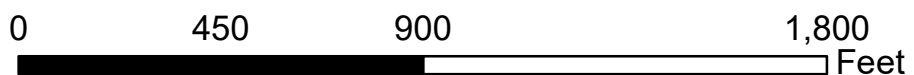


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

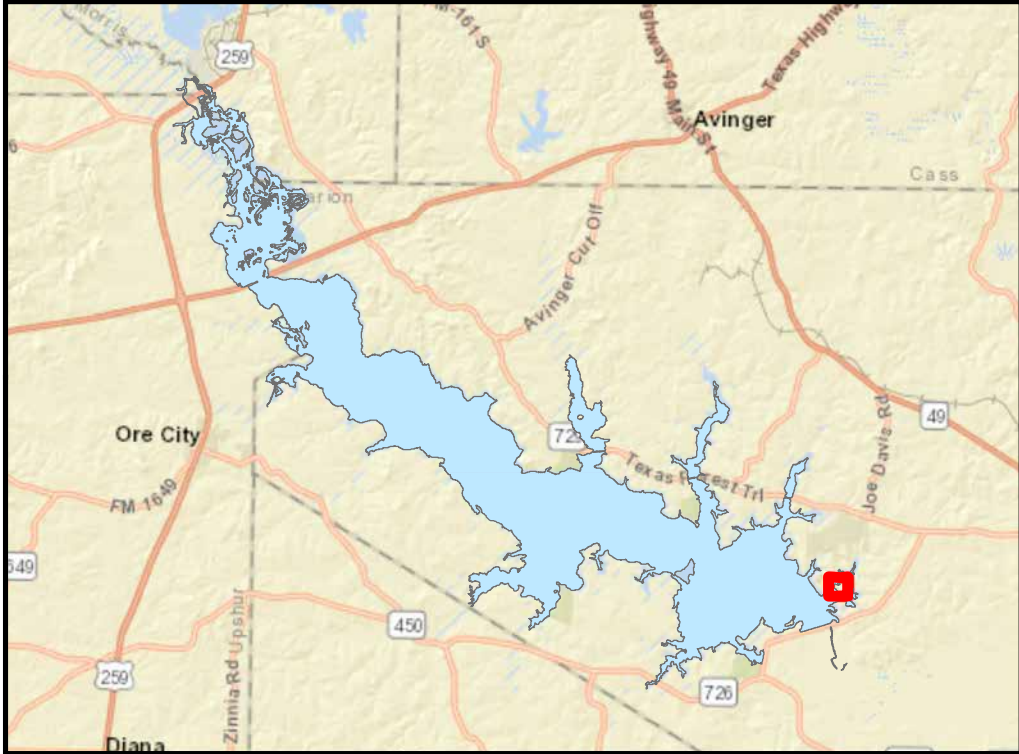
Alley Creek Park



Date: July 2018	Map No. LP18MP-OR-02
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Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	50
Group Picnic Shelters	
Picnic Sites	
Restrooms	1
Showers	1
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

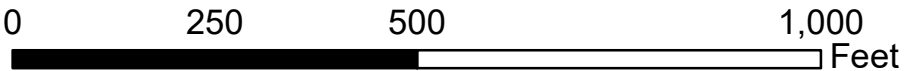


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

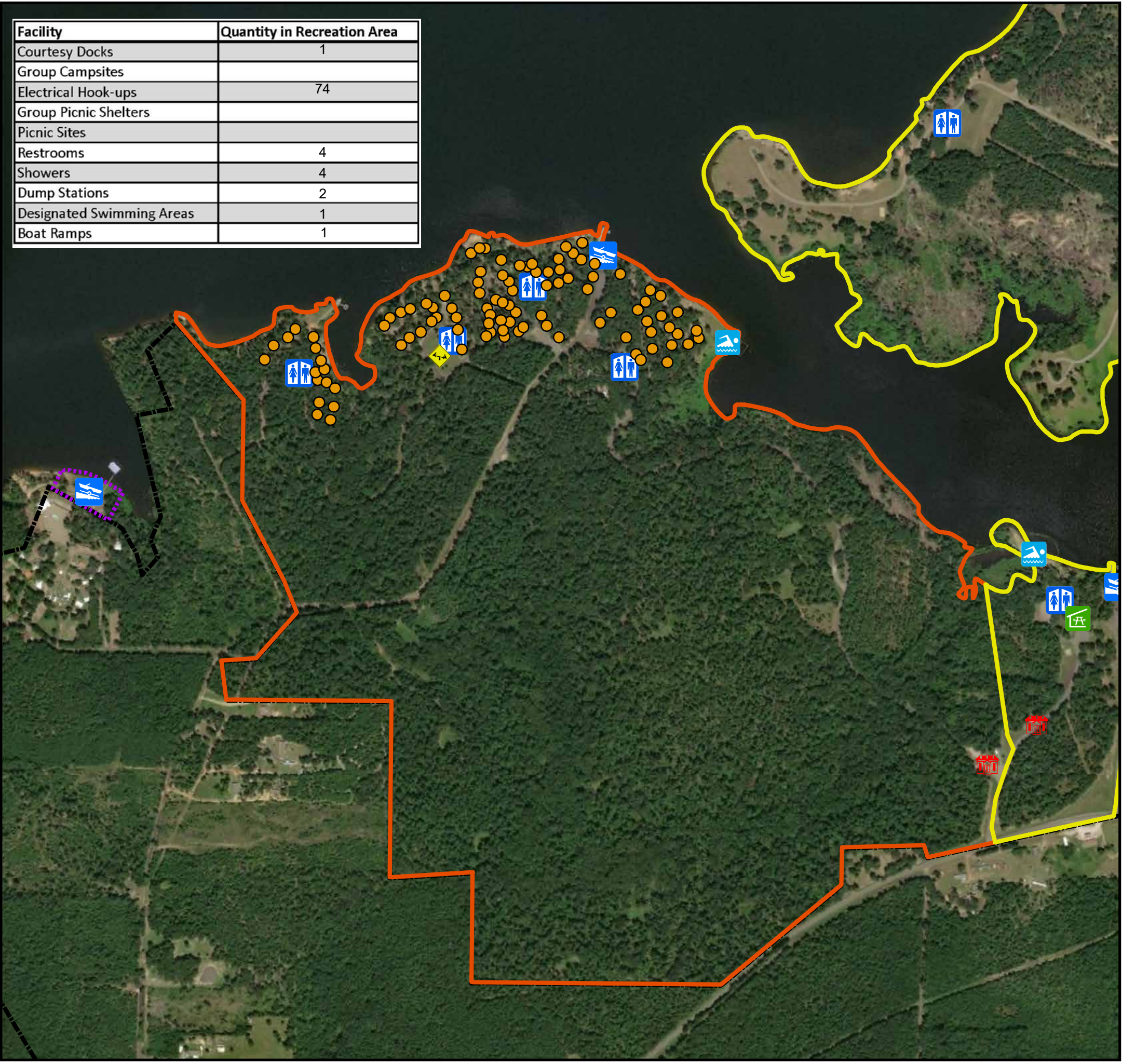
Big Cypress Marina



Date:
July 2018

Map No.
LP18MP-OR-03

Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	74
Group Picnic Shelters	
Picnic Sites	
Restrooms	4
Showers	4
Dump Stations	2
Designated Swimming Areas	1
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

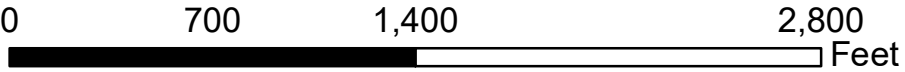


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

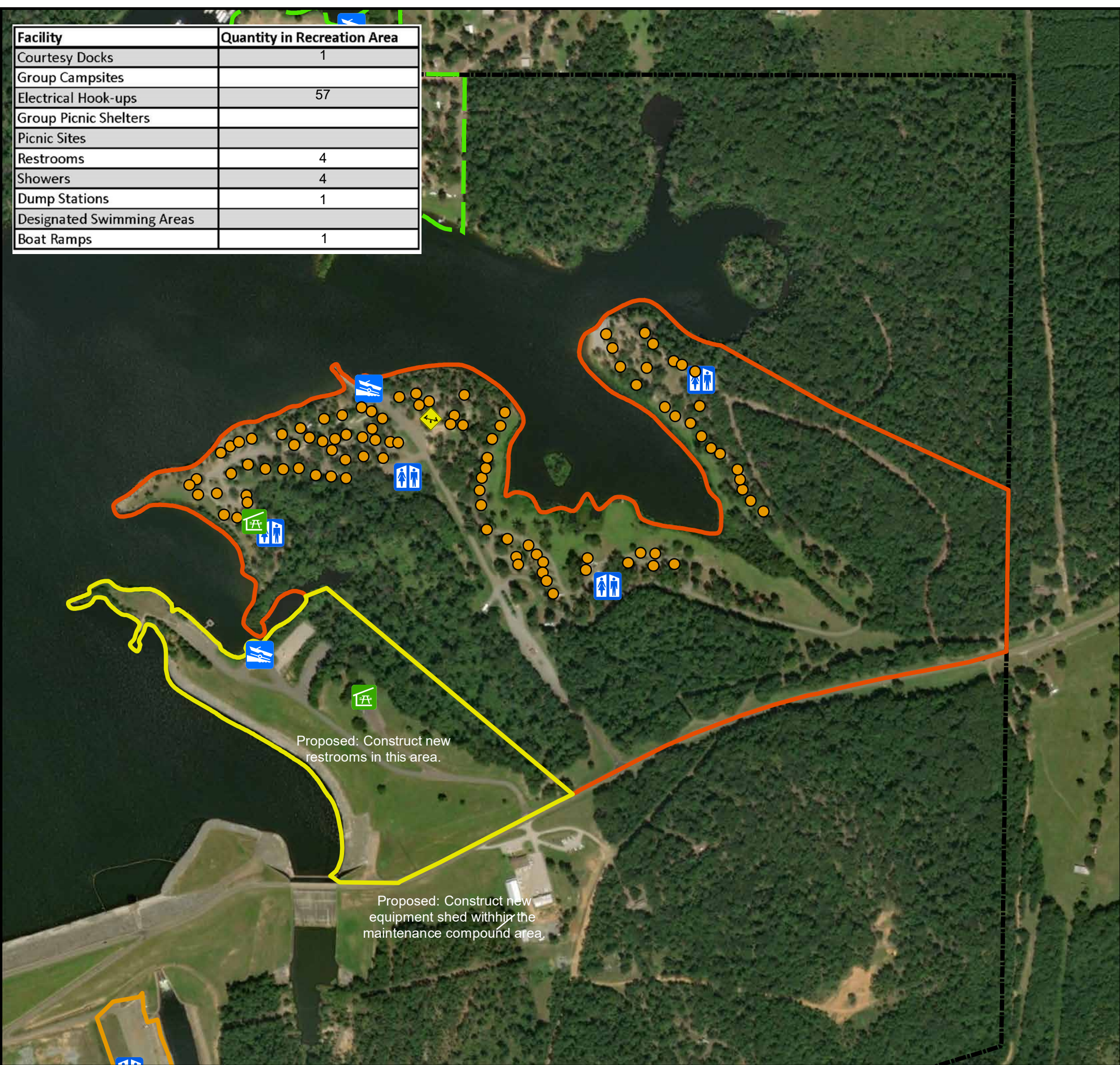
Recreational Areas

Brushy Creek Campground

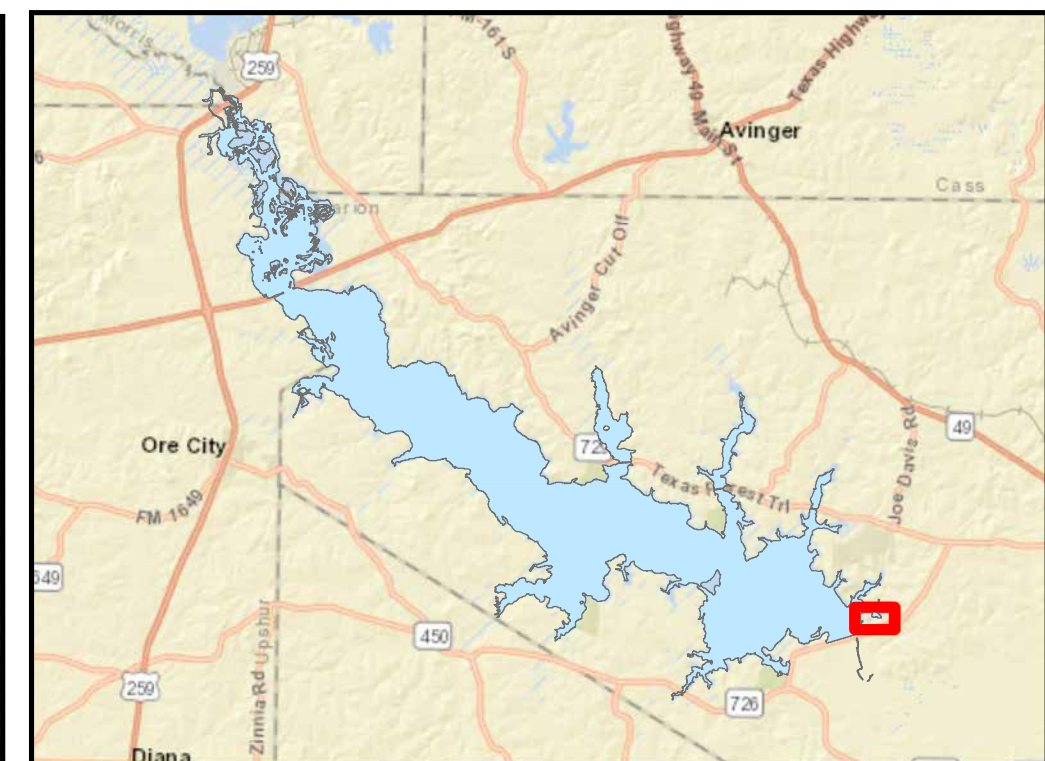


Date:
July 2018


Map No.
LP18MP-OR-04



Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	57
Group Picnic Shelters	
Picnic Sites	
Restrooms	4
Showers	4
Dump Stations	1
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

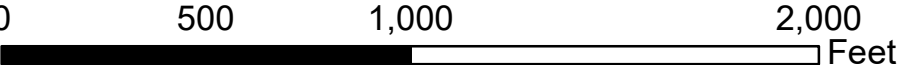



U.S. Army Corps of Engineers Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Buckhorn Creek Campground



Date:
July 2018

Map No.
LP18MP-OR-05

Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	1
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

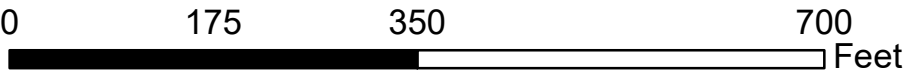


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Cedar Springs Boat Ramp



Date:
July 2018

Map No.
LP18MP-OR-06

Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

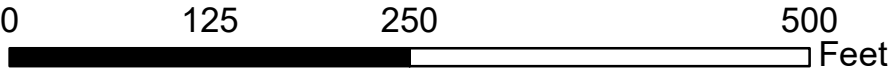


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Copeland Creek Boat Ramp





Date:
July 2018


Map No.
LP18MP-OR-07


Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1





-  Fee Boundary


 USACE Campground



 USACE Day Use Park


 USACE Water Access Point


 County Water Access Point


 Outgrant Campground


 Outgrant Marina


 Gatehouse
-  Pavilion

 Playground

 Designated Swimming Area

 Campsite

 Boat Ramp

 Restroom

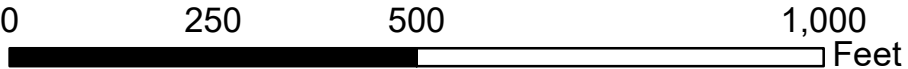


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

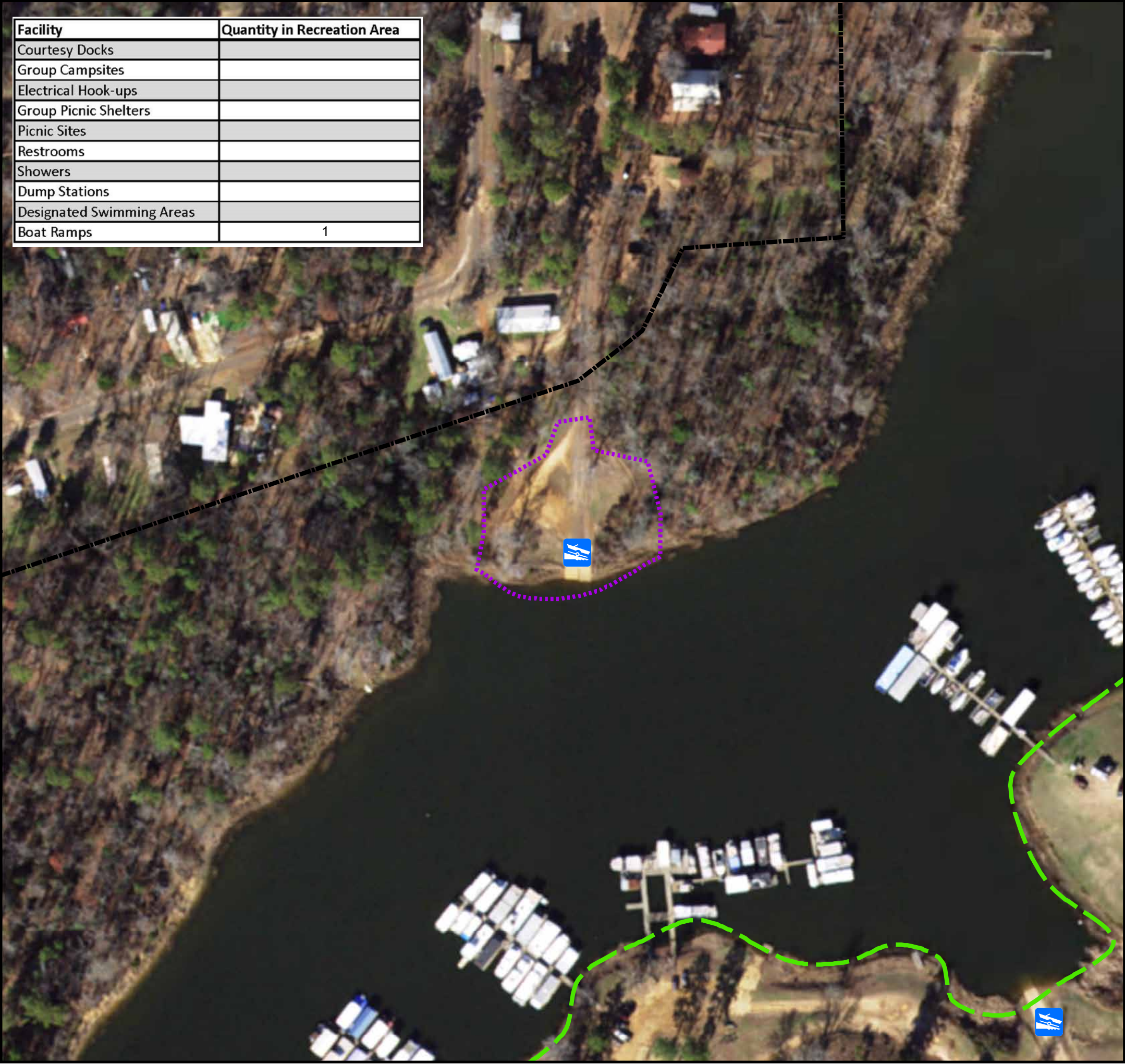
Recreational Areas

Hanson's Retreat



Date:
July 2018

Map No.
LP18MP-OR-08



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
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- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

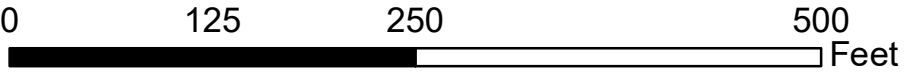


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

Holiday Harbor Ramp

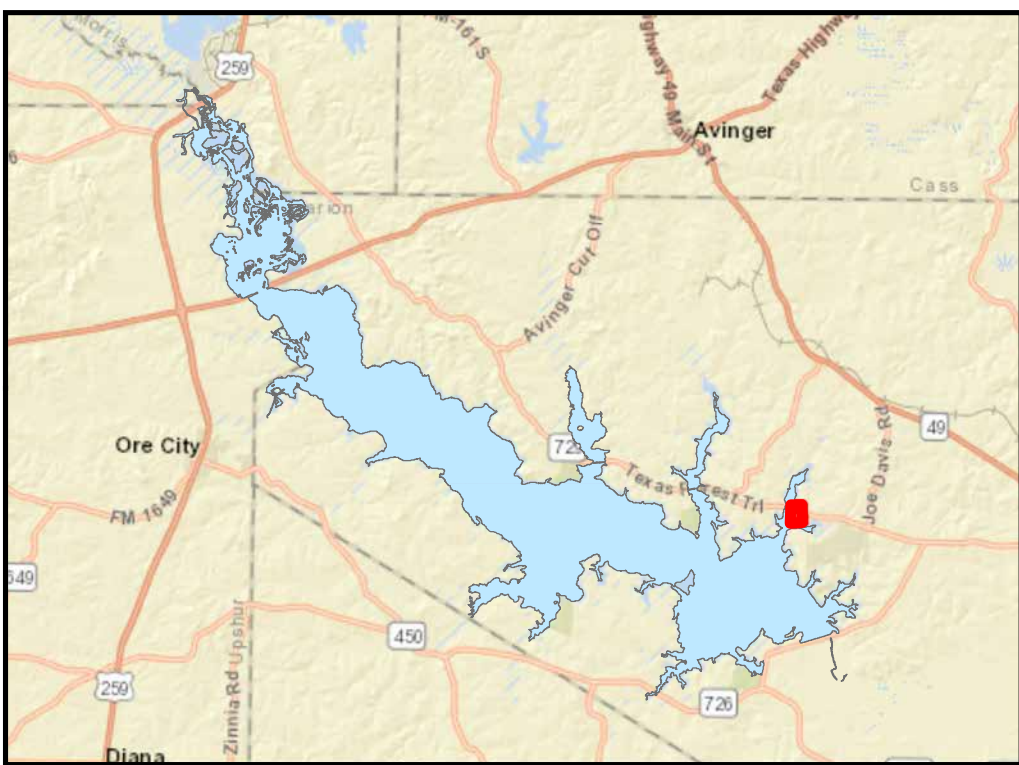


Date:
July 2018

Map No.
LP18MP-OR-09



Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	20
Restrooms	1
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

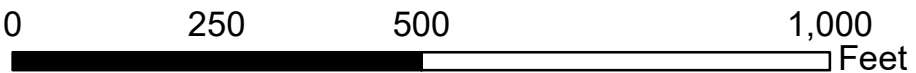


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

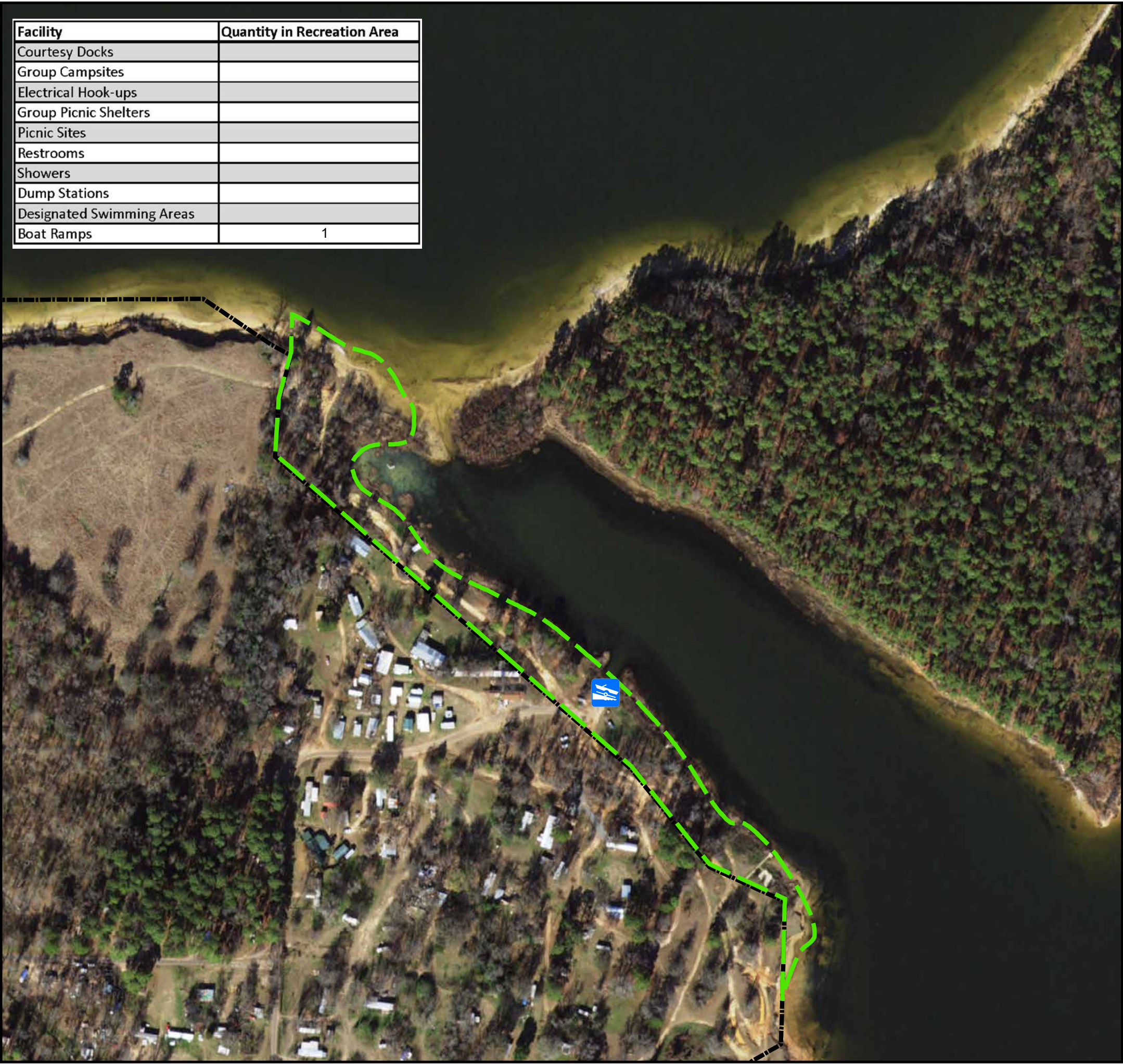
Hurricane Creek Boat Ramp



Date:
July 2018

Map No.
LP18MP-OR-10

Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

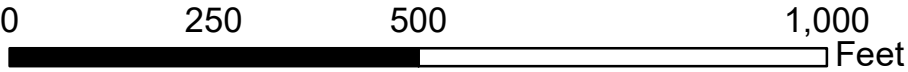


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

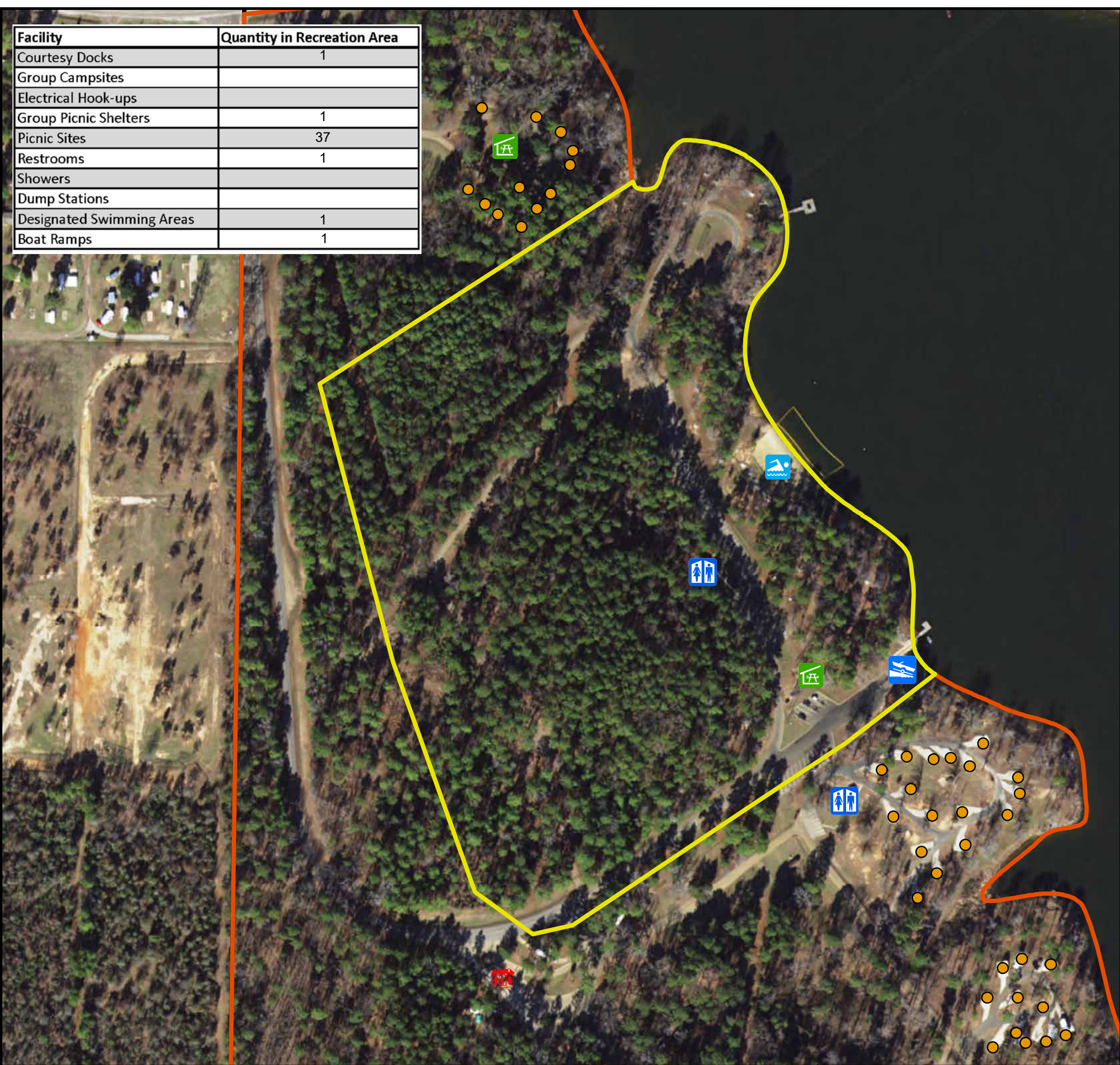
Recreational Areas

Island View Marina

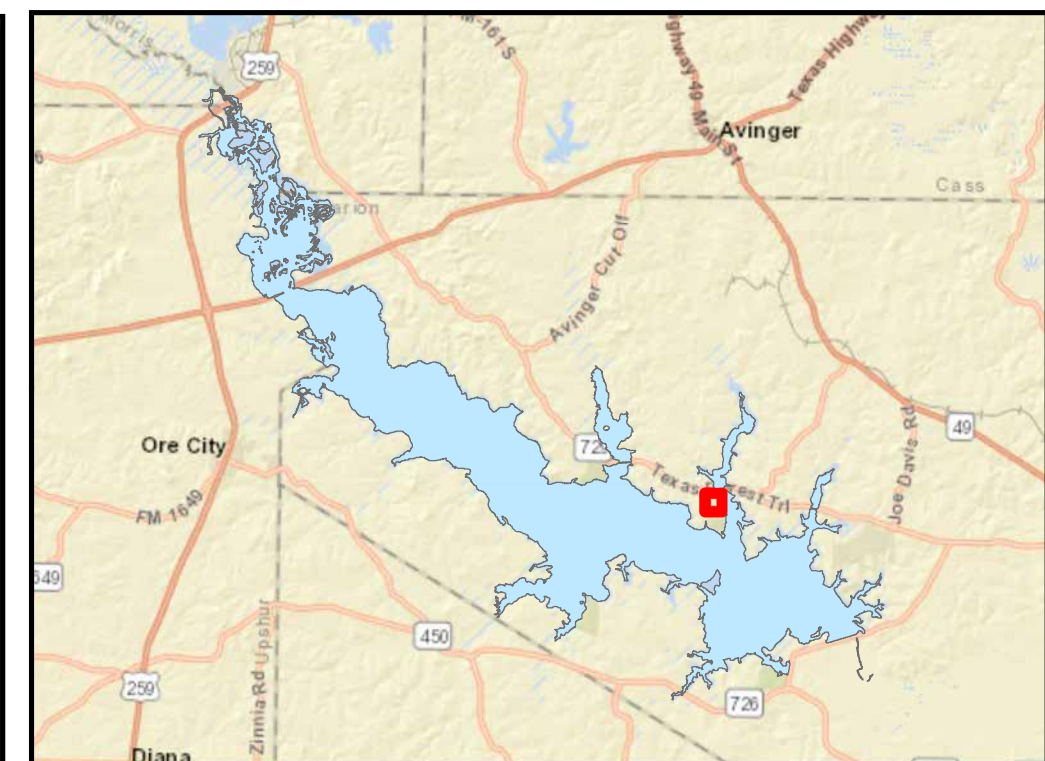


Date:
July 2018

Map No.
LP18MP-OR-11



Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	1
Picnic Sites	37
Restrooms	1
Showers	
Dump Stations	
Designated Swimming Areas	1
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

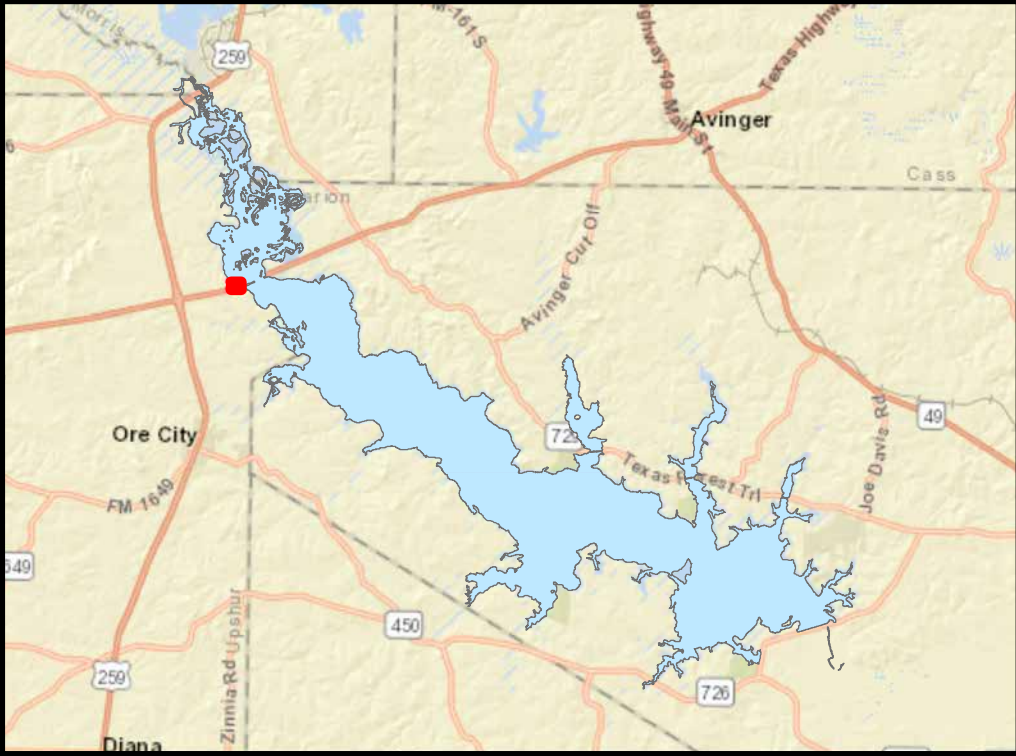
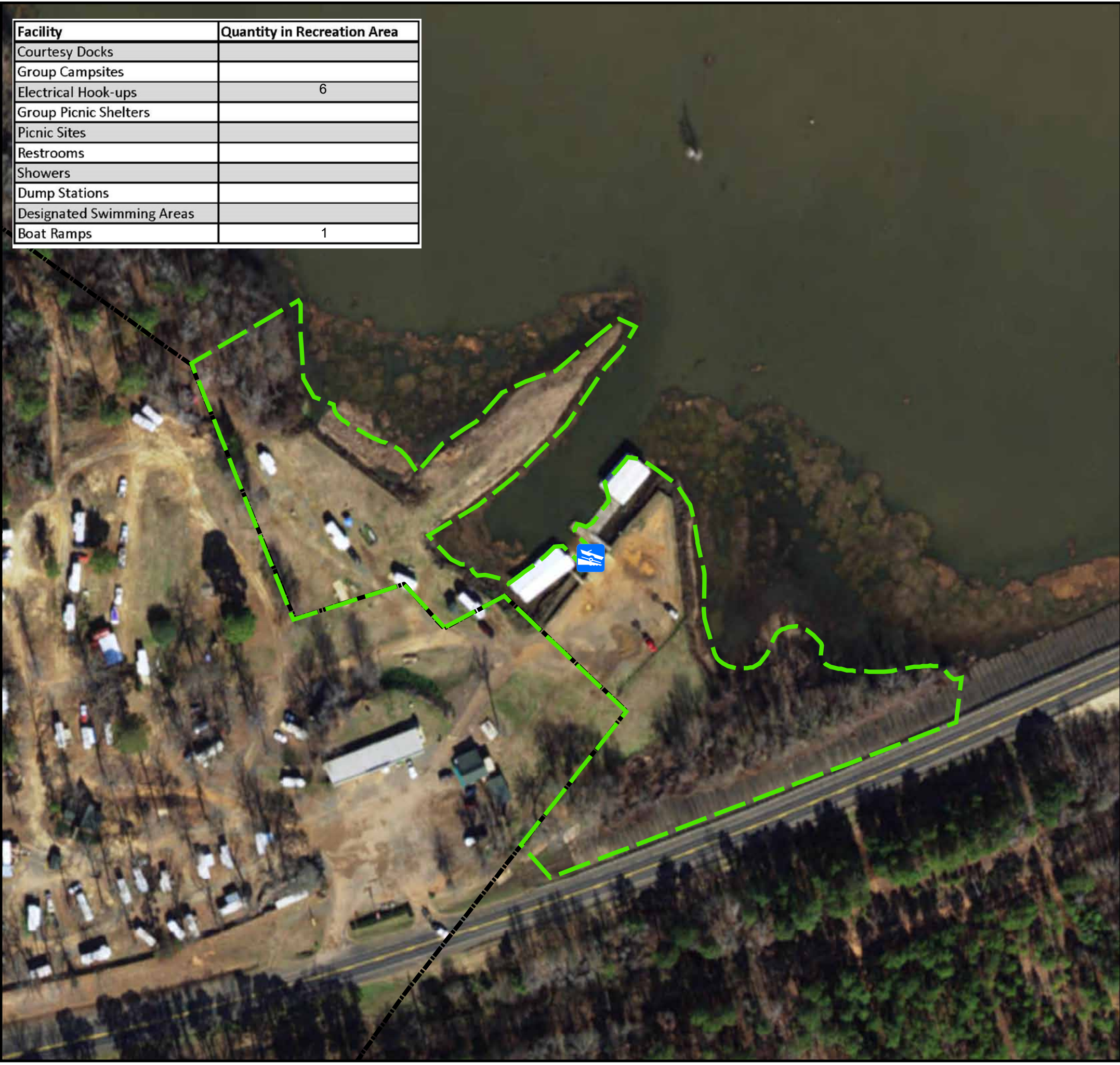
**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan
Recreational Areas
Johnson Creek Day Use Park

Date:
July 2018

Map No.
LP18MP-OR-13

Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	6
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

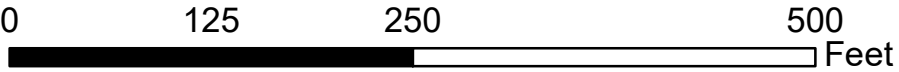


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

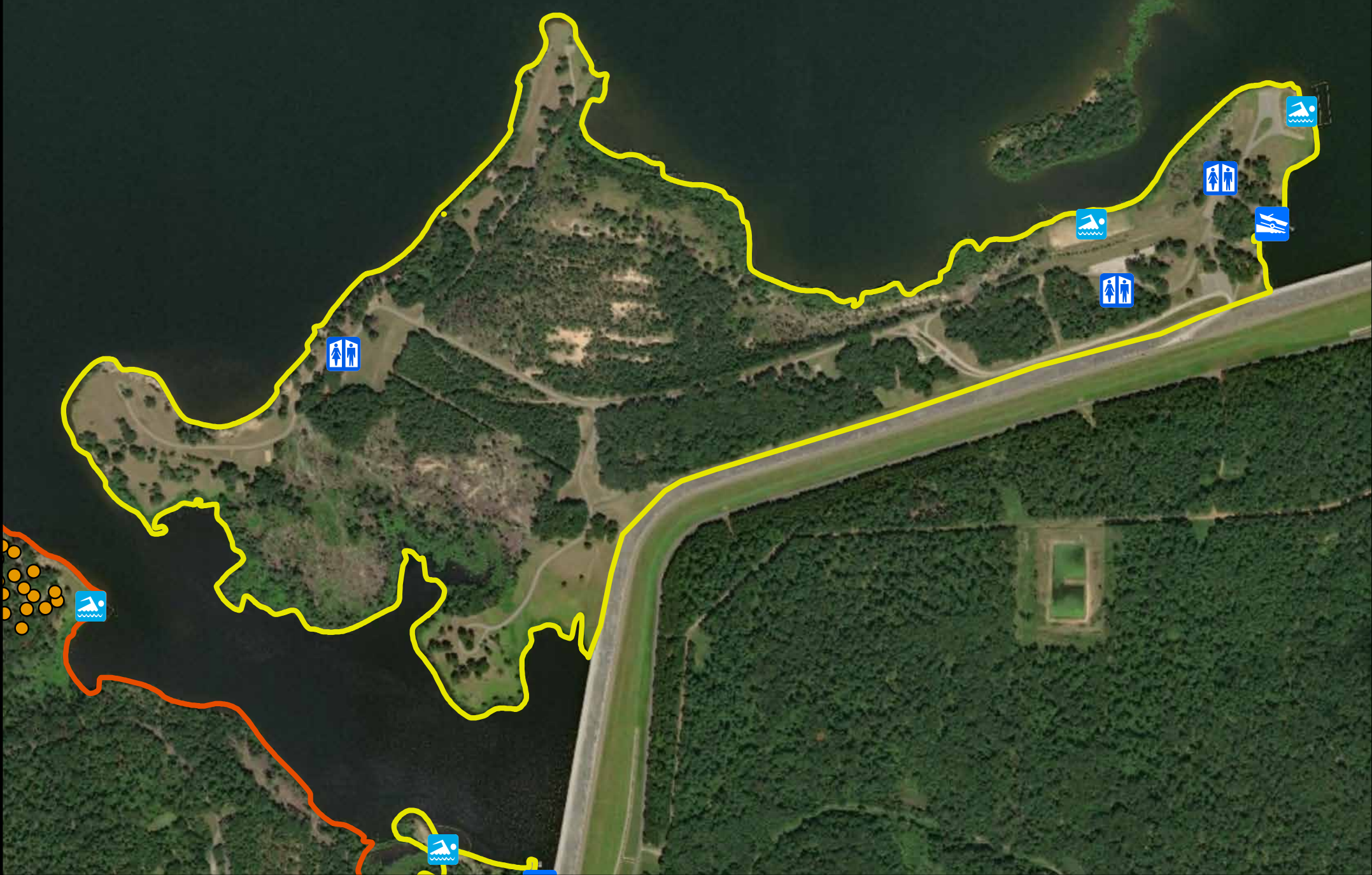
Lake O' Pines Lodge



Date:
July 2018

Map No.
LP18MP-OR-14

Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	1
Picnic Sites	75
Restrooms	3
Showers	
Dump Stations	
Designated Swimming Areas	2
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

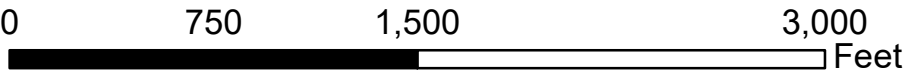


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

Lakeside Park

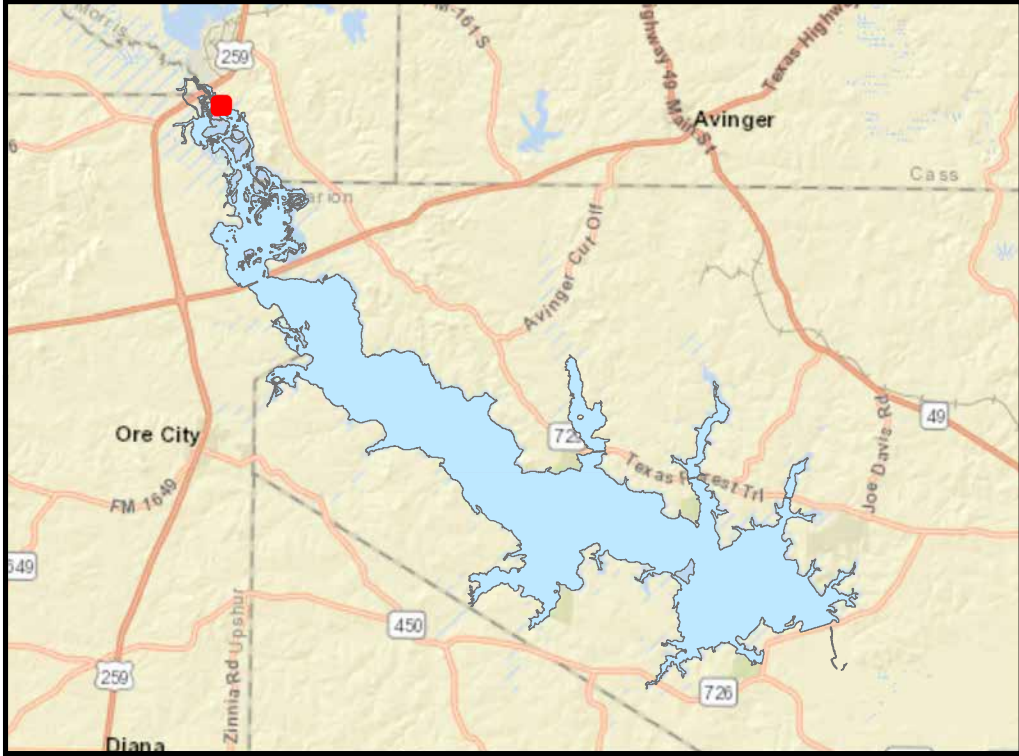


Date:
July 2018

Map No.
LP18MP-OR-15



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

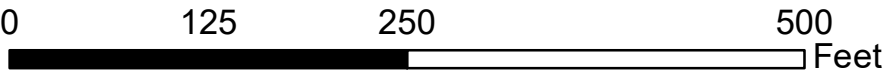


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Lone Star Boat Ramp

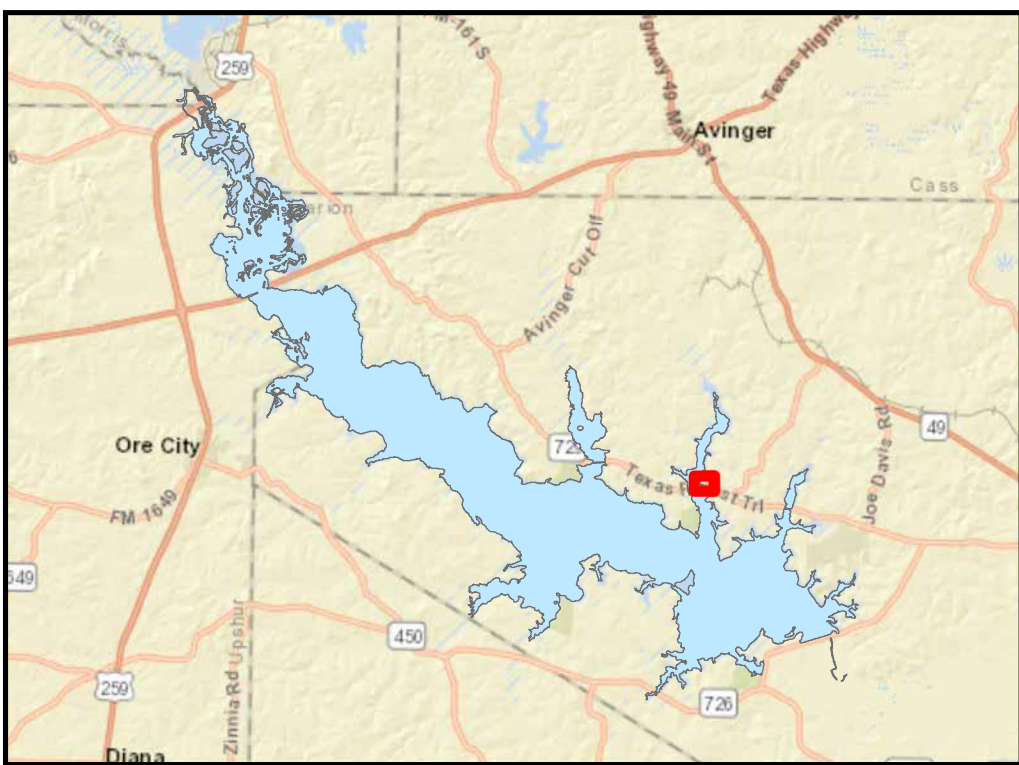


Date:
July 2018

Map No.
LP18MP-OR-16



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

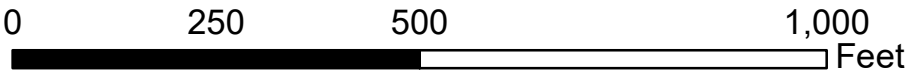


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Marley's Bullfrog Marina



Date:
July 2018

Map No.
LP18MP-OR-17

Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

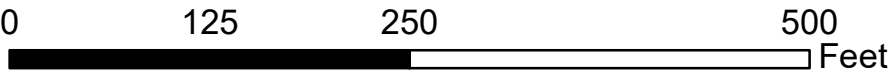


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Mims Chapel Ramp



Date:
July 2018

Map No.
LP18MP-OR-18



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

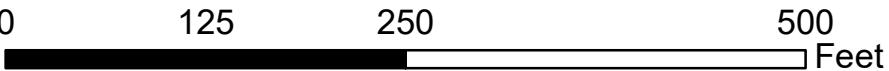


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas


Oak Ridge Ramp





Date: July 2018	Map No. LP18MP-OR-19
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Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1





-  Fee Boundary


 USACE Campground



 USACE Day Use Park


 USACE Water Access Point


 County Water Access Point


 Outgrant Campground


 Outgrant Marina


 Gatehouse
-  Pavilion

 Playground

 Designated Swimming Area

 Campsite

 Boat Ramp

 Restroom

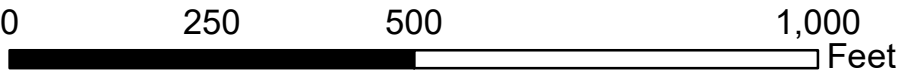


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

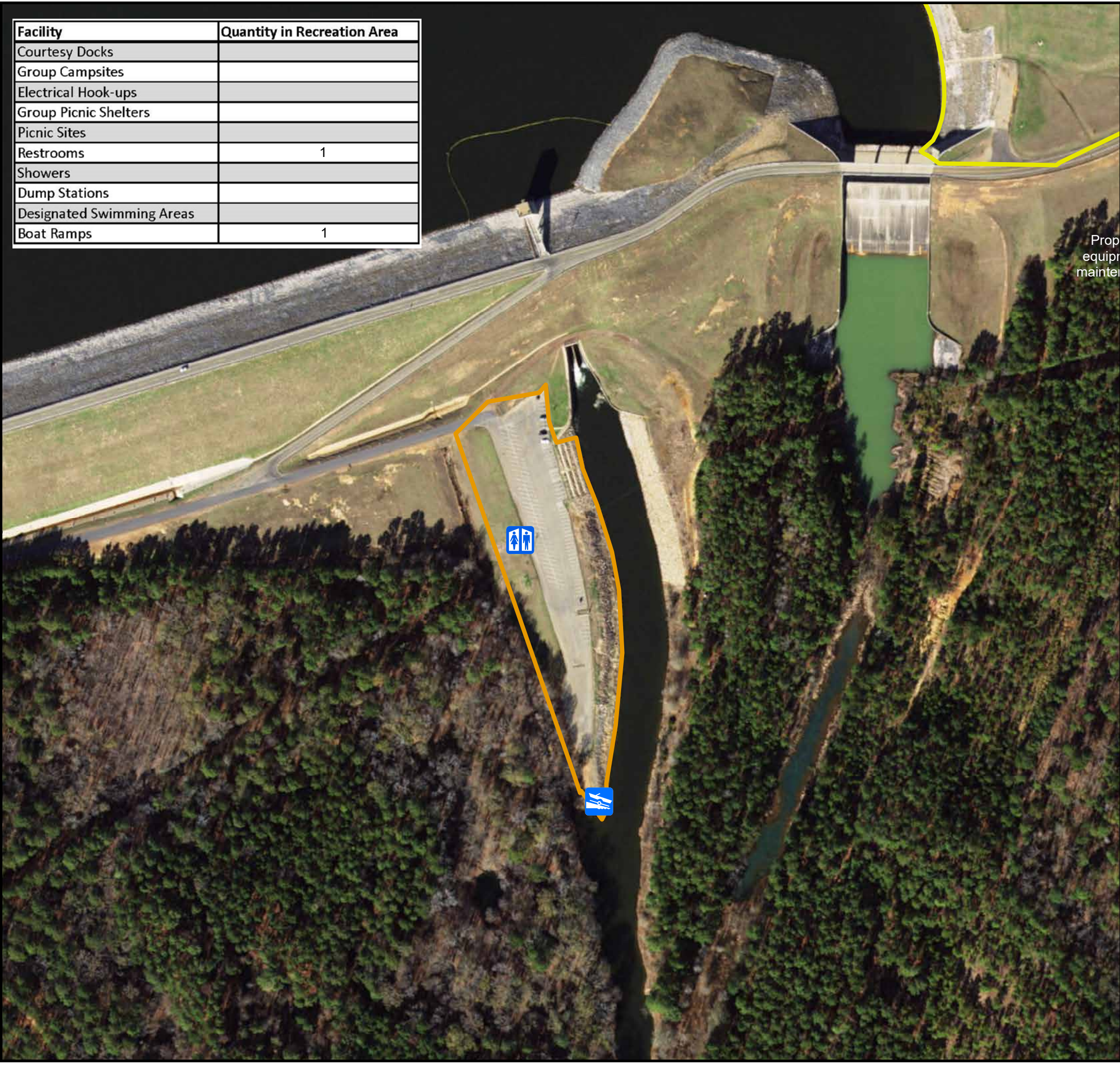
Recreational Areas

Oak Valley Boat Ramp



Date:
July 2018

Map No.
LP18MP-OR-20



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	1
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

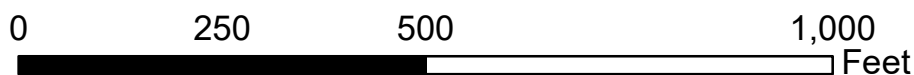


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

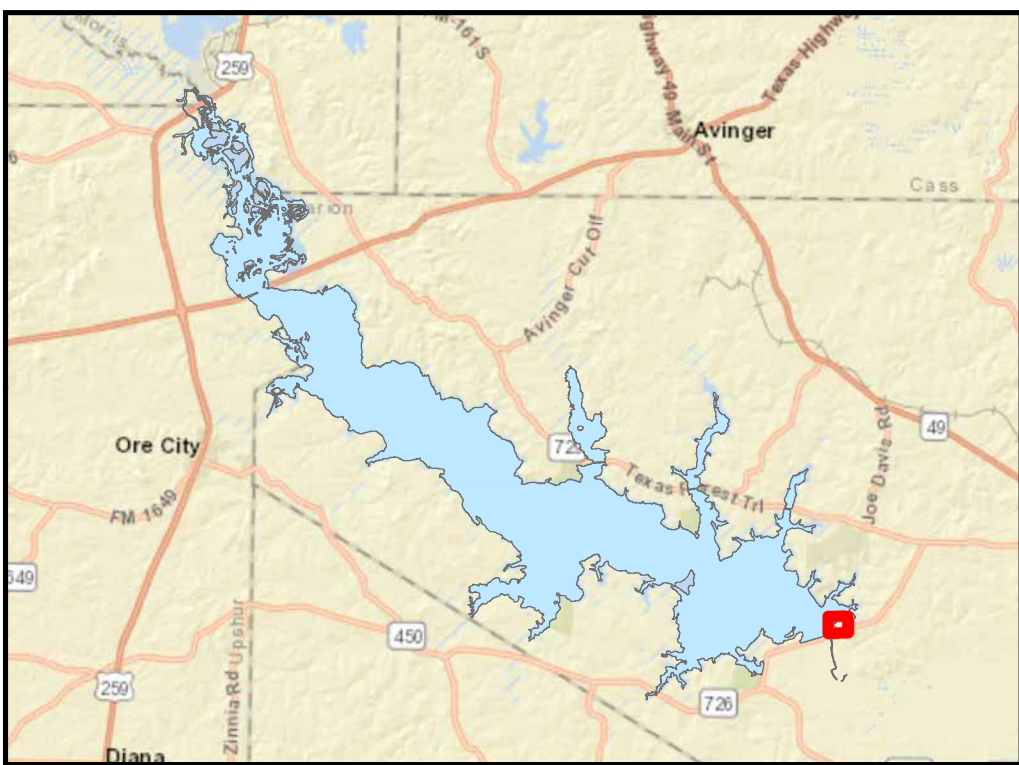
Outlet Park



Date: July 2018	Map No. LP18MP-OR-21
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Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	1
Picnic Sites	3
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

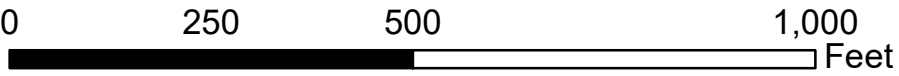


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Fort Worth District**

Lake O' the Pines Master Plan

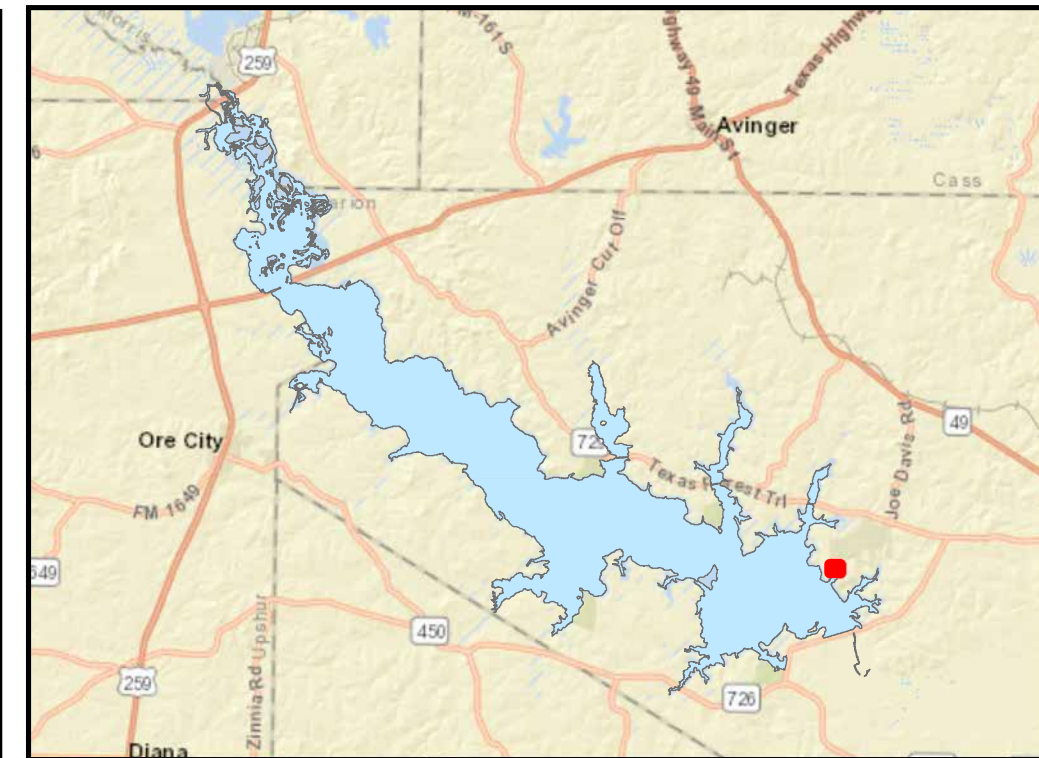
Recreational Areas















Overlook Park



Date: July 2018	Map No. LP18MP-OR-22
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Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- | | | | |
|---|---------------------------|---|--------------------------|
|  | Fee Boundary |  | Pavilion |
|  | USACE Campground |  | Playground |
|  | USACE Day Use Park |  | Designated Swimming Area |
|  | USACE Water Access Point |  | Campsite |
|  | County Water Access Point |  | Boat Ramp |
|  | Outgrant Campground |  | Restroom |
|  | Outgrant Marina | | |
|  | Gatehouse | | |



**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

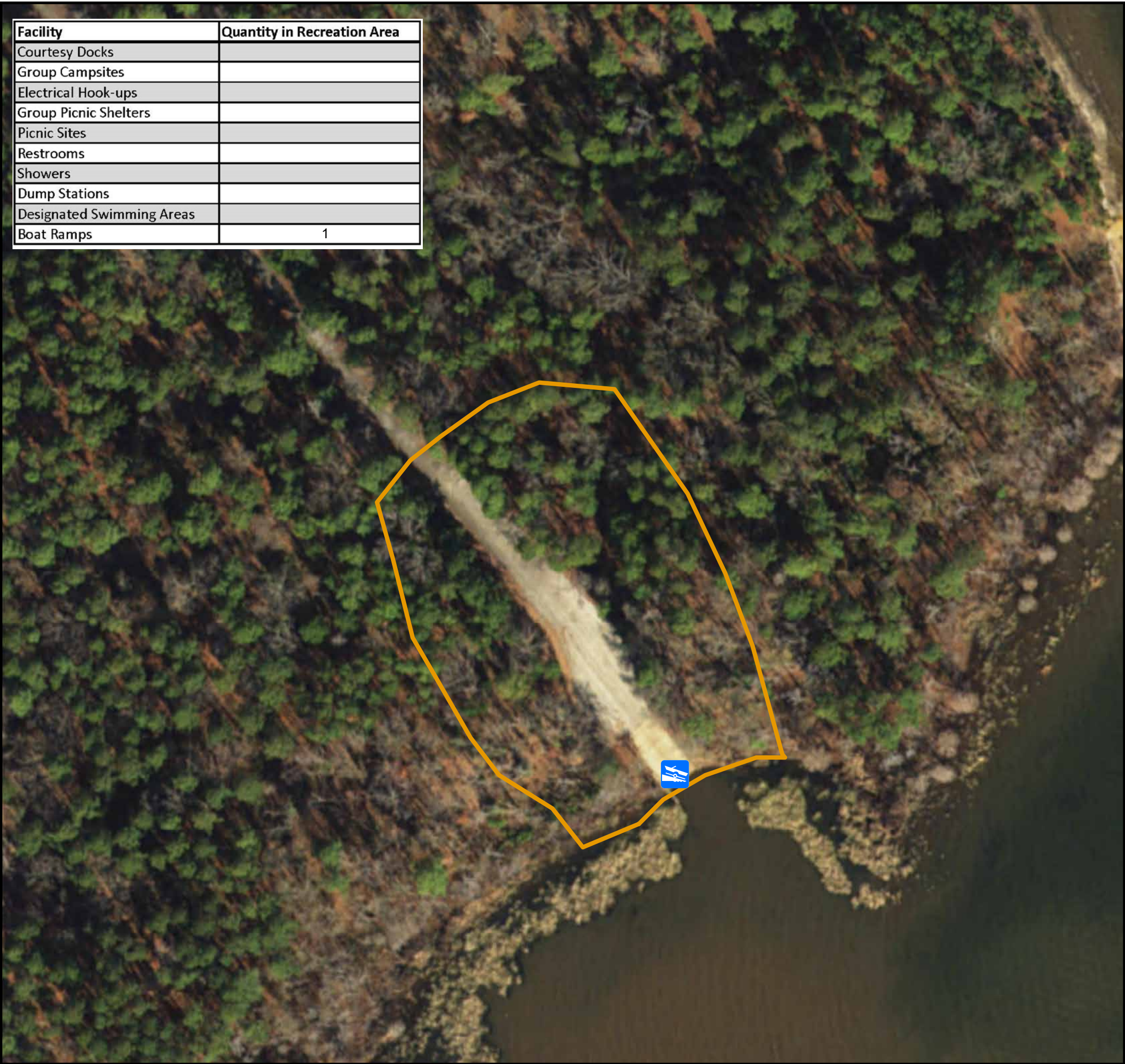
Pine Harbor Ramp



A horizontal number line with tick marks at 0, 125, 250, and 500. The word "Feet" is written at the right end of the line.

Date:
July 2018

Map No.
LP18MP-OR-23



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom



U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

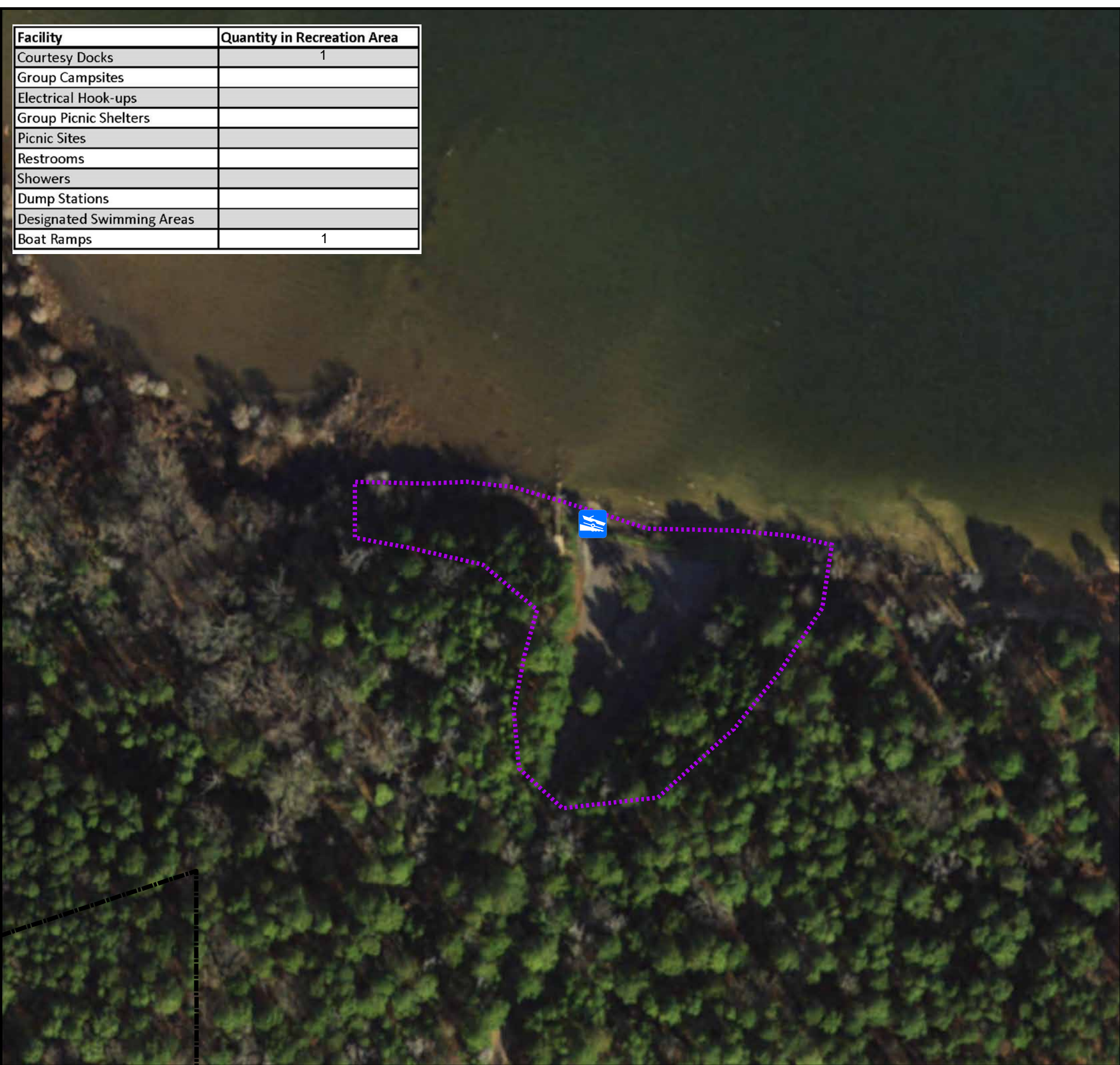
Pine Hill Boat Ramp



0 125 250 500 Feet

Date:
July 2018

Map No.
LP18MP-OR-24



Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary
- USACE Campground
- USACE Day Use Park
- USACE Water Access Point
- County Water Access Point
- Outgrant Campground
- Outgrant Marina
- Gatehouse
- Pavilion
- Playground
- Designated Swimming Area
- Campsite
- Boat Ramp
- Restroom

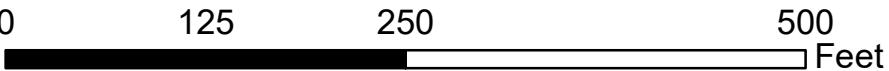


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Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

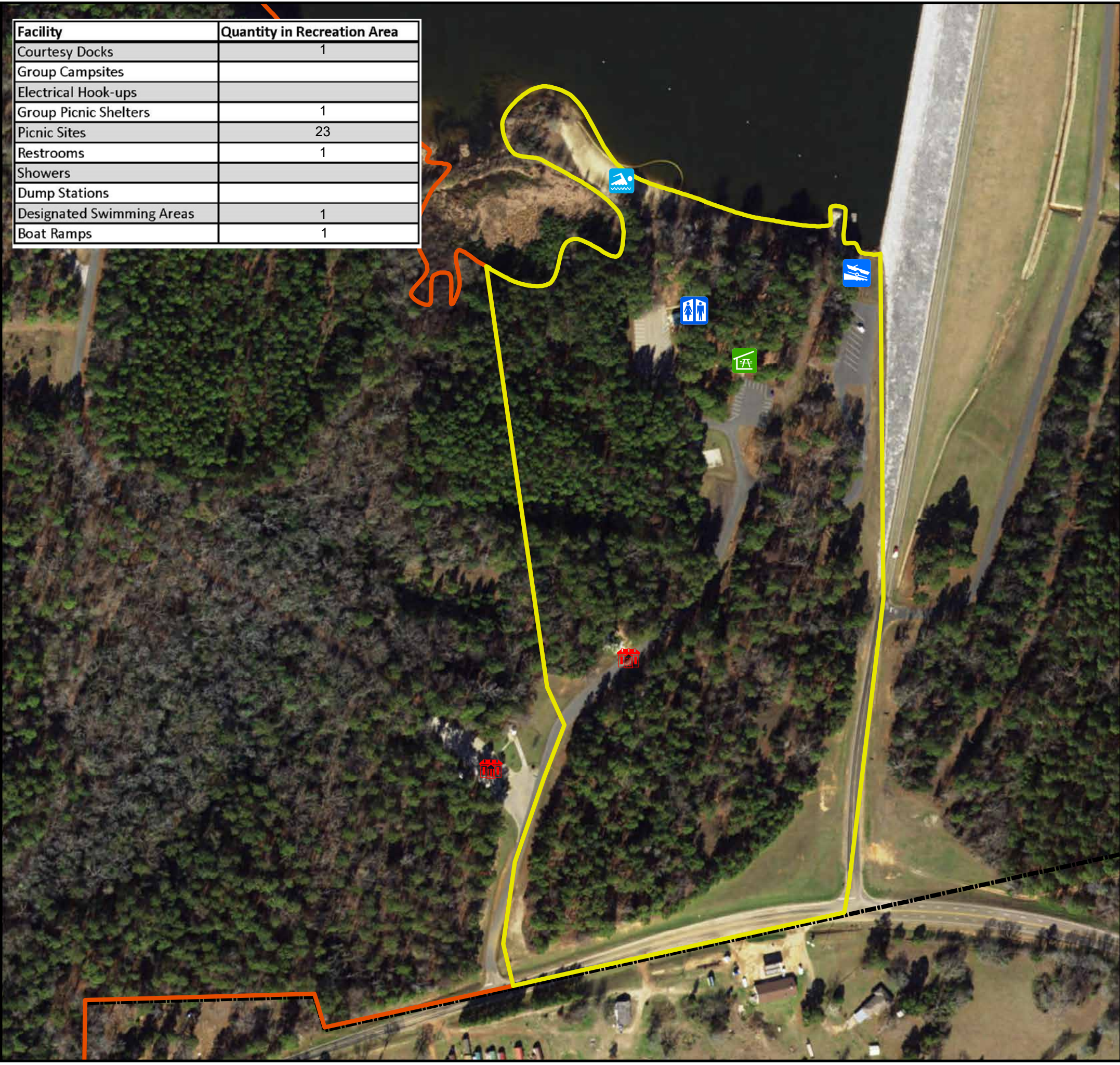
Pop's Landing Ramp



Date:
July 2018

Map No.
LP18MP-OR-25

Facility	Quantity in Recreation Area
Courtesy Docks	1
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	1
Picnic Sites	23
Restrooms	1
Showers	
Dump Stations	
Designated Swimming Areas	1
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

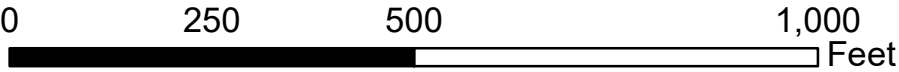


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Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

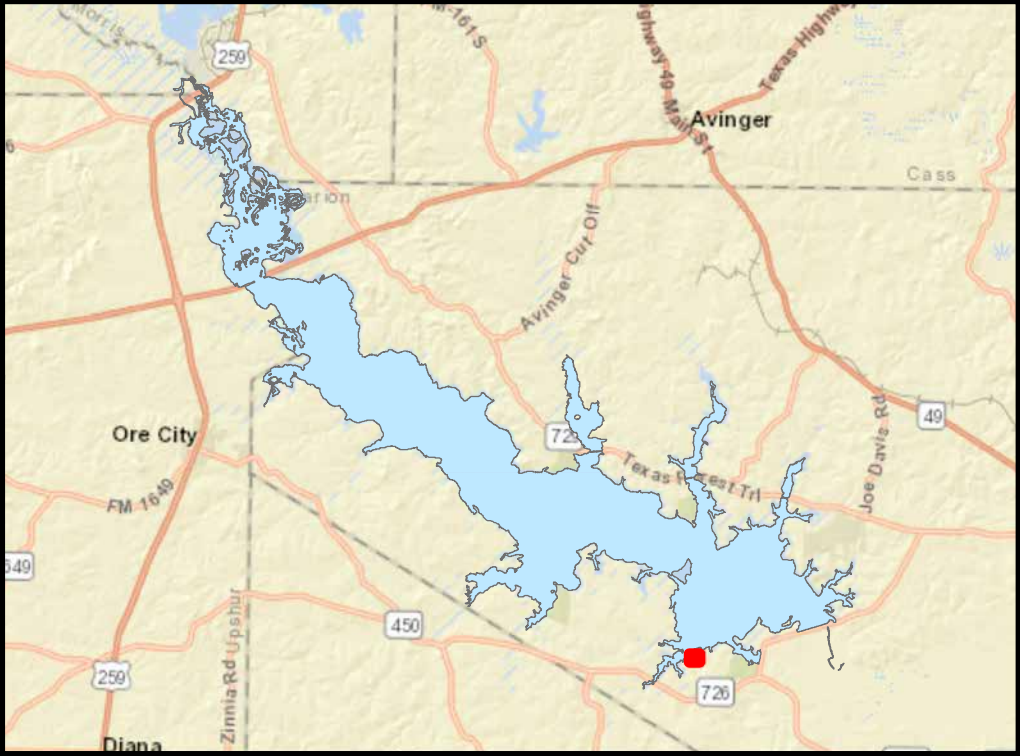
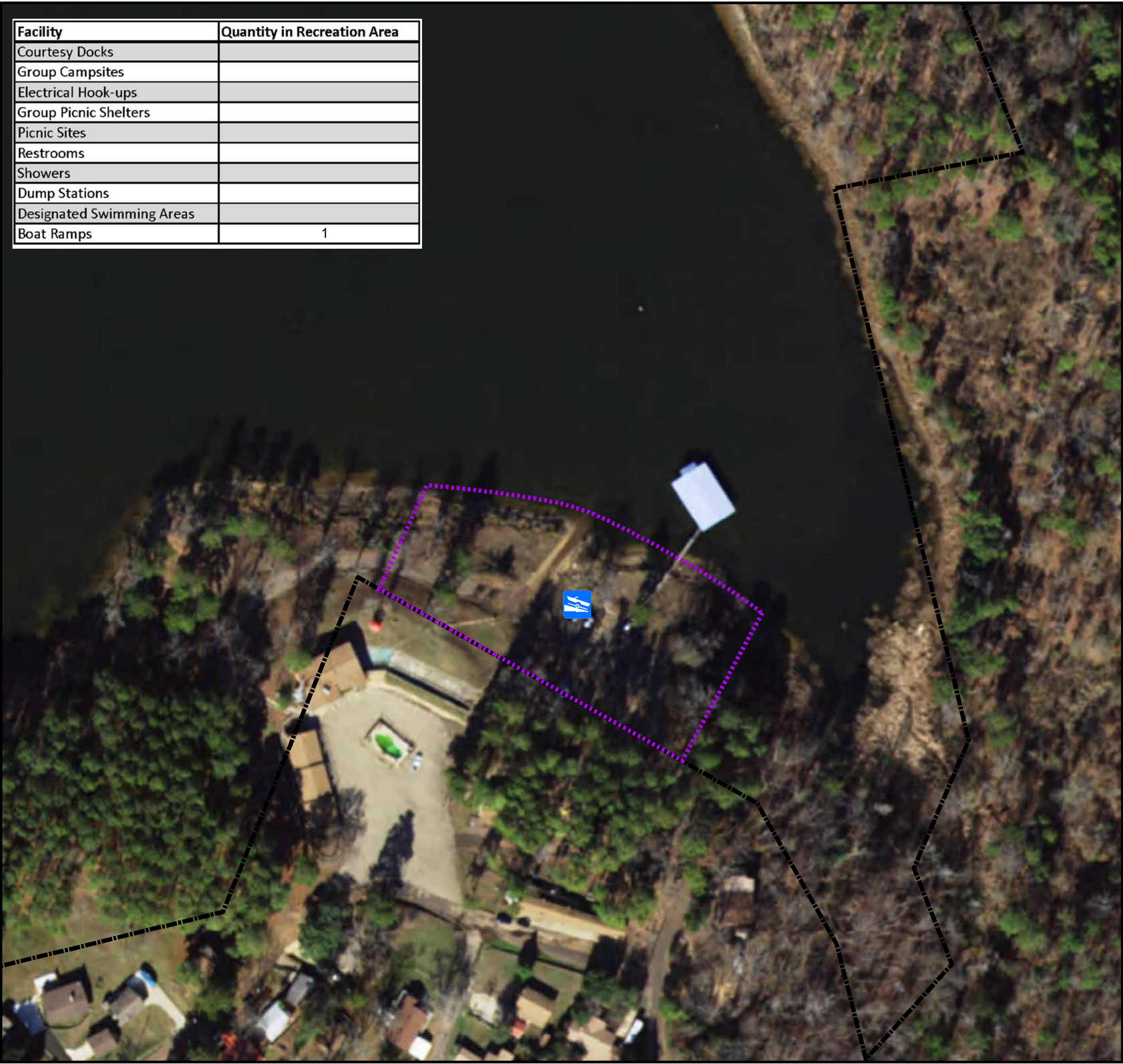
Shady Grove Park





Date:
July 2018


Map No.
LP18MP-OR-26


Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1





-  Fee Boundary


 USACE Campground



 USACE Day Use Park


 USACE Water Access Point


 County Water Access Point


 Outgrant Campground


 Outgrant Marina


 Gatehouse
-  Pavilion

 Playground

 Designated Swimming Area

 Campsite

 Boat Ramp

 Restroom

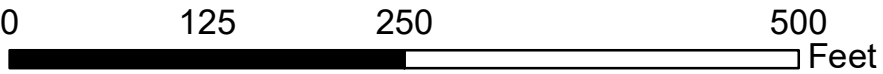


**U.S. Army Corps of Engineers
Fort Worth District**

Lake O' the Pines Master Plan

Recreational Areas

Tejas Boat Ramp



Date:
July 2018

Map No.
LP18MP-OR-27



Facility	Quantity in Recreation Area
Courtesy Docks	
Group Campsites	
Electrical Hook-ups	
Group Picnic Shelters	
Picnic Sites	
Restrooms	
Showers	
Dump Stations	
Designated Swimming Areas	
Boat Ramps	1



- Fee Boundary

USACE Campground

USACE Day Use Park

USACE Water Access Point

County Water Access Point

Outgrant Campground

Outgrant Marina

Gatehouse
- Pavilion

Playground

Designated Swimming Area

Campsite

Boat Ramp

Restroom

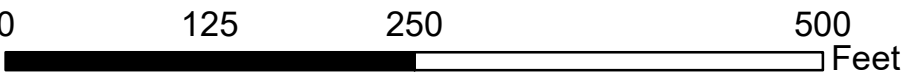


U.S. Army Corps of Engineers
Fort Worth District

Lake O' the Pines Master Plan

Recreational Areas

Woodie's Ramp



Date: July 2018	Map No. LP18MP-OR-28
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APPENDIX B - NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DOCUMENTATION

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Environmental Assessment for the Lake O' the Pines 2018 Master Plan

Cypress River Basin
Marion, Harrison, Upshur, Camp, Titus, and Morris Counties, TX



October 2018



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

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**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT FOR THE
LAKE O' THE PINES MASTER PLAN REVISION
MARION, HARRISON, UPSHUR, CAMP, TITUS, AND MORRIS COUNTIES, TEXAS**

In accordance with the National Environmental Policy Act of 1969, including guidelines in 33 Code of Federal Regulations 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 of the Lake O' the Pines Master Plan revision (2018 Master Plan).

The 2018 Master Plan is a revision of the 1989 Master Plan. The revised Master Plan will provide guidance for stewardship of natural resources and management of long-term public access to, and use of, the natural resources of Lake O' the Pines Reservoir and Dam including the land use classification of the USACE-managed lands. The Master Plan provides a comprehensive description of the project, a discussion of factors influencing resource management and development, new resource management objectives, the resource plan describing how project lands and waters will be managed, an identification and discussion of special topics, a synopsis of public involvement and input into the planning process, and descriptions of existing development.

Under the No Action Alternative, the USACE would take no action, which means the Master Plan would not be revised. With this alternative, no new resources analysis or land use reclassifications would occur. The operation and management of Lake O' the Pines would continue as outlined in the current Master Plan.

The Proposed Action includes Master Plan Revisions, coordination with the public, and updates to comply with the USACE regulation and guidance, and reflects changes in land management and the land uses that have occurred since 1989. 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, recognize outdoor recreation trends, and are responsive to public comments. Required land and water surface classification changes associated with the Proposed Action include the following:

Land Classification	Proposed Action Description	Justification
Project Operations (PO)	<p>Project Operations (PO) Lands were increased from 211 acres to 290 acres from the prior classification.</p> <ul style="list-style-type: none">○ 4 acres from Recreation (REC)○ 77 acres from Multiple Resource Management Lands (MRML) - Vegetation Management (VM)	<p>All lands classified as PO are managed and used primarily in support of critical operational requirements related to the primary missions of flood risk management, hydropower and water conservation. The 290 acres that would be classified as PO are needed for current and future operational requirements. The reclassification of 79 acres</p>

	<ul style="list-style-type: none"> o 2 acres to MRML – Wildlife Management (WM). <p>These conversions were to allow for better management of: a material storage area/oxidation pond, an incidental parking lot near the dam, and the old road bed behind the project office.</p>	of PO land will have no effect on current or projected public use.
High Density Recreation (HDR)	<p>Lands under the prior classification of REC were converted to the new and similar classification of High Density Recreation but were reduced from 1,596 to 1,231 acres through the following reclassifications:</p> <ul style="list-style-type: none"> o 6 acres from Environmentally Sensitive Areas (ESA)-Recreation o 14 acres from Recreation (Low Density) o 188 acres to ESA o 5 acres to MRML Future/Inactive Recreation (IFR) o 35 acres to MRML-Low Density Recreation (LDR) o 5 acres to PO o 145 acres to MRML-VM o 7 acres to MRML-WM 	In general terms, the amount of land classified for Recreation in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has revealed that numerous reclassifications are needed to reflect actual use, evolving trends, and regional priorities. The net reclassification of 365 acres of Recreation will not affect current or projected public use.
Environmentally Sensitive Areas (ESAs)	<p>ESAs were increased from 858 acres to 4,236 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> o 185 acres from ESA-IFR o 470 acres from ESA-REC o 81 acres from Inactive/Future Recreation o 188 acres from Recreation o 177 acres from Recreation (Low Density) o 2,315 acres from MRML-WM o 38 acres to MRML-VM 	Reclassification of the 3,378 acres was determined by the study team to be necessary to provide a high level of protection for those areas supporting bottomland hardwood forests, and areas with steep, aesthetic bluffs and ravines. Habitat studies conducted as part of the 2018 Master Plan revision effort support the reclassification of these lands as ESA. Protection of cultural resources also justifies the classification of some areas as ESA. The ESA areas provide good to excellent habitat for endangered species and numerous Species of Conservation Concern. Classifying these acres as ESA

	<p>In addition, the 1989 Master Plan had ESA's combined with both Recreation and MRML-IFR , totaling an additional 760 acres. With the new master plan, these lands will be reclassified into better land management classes as explained in further detail in the following sections.</p>	<p>will afford these areas the highest level of protection from disturbance. The reclassification of 3,378 acres to ESA will have no effect on current or projected public use.</p>
<p>Multiple Resource Management Lands–Low Density Recreation (MRML-LDR)</p>	<p>The definition of the prior classification of Recreation (Low Density) is very comparable to the definition of the current classification of MRML–LDR. Land classification changes resulted in a reduction of these acres from 3,567 acres to the current 1,782 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 7 acres from ESA-Recreation ○ 35 acres from Recreation ○ 177 acres to ESA ○ 14 acres to HDR ○ 1,035 acres to MRML-VM ○ 603 acres to MRML-WM 	<p>The net reduction of 1,785 acres of LDR lands was necessary to recognize high ecological and aesthetic value of those areas reclassified to ESA, HDR, MRML-VM, and WM. The largest portion of the reduction was a reclassification of lands to MRML-VM to recognize that this large area of land has been historically managed to insure healthy, productive forests, and aesthetically pleasing shorelines than for recreational purposes. Those lands remaining as MRML-LDR are located primarily in shoreline areas where vegetation modification (mowing) permits occur in accordance with the Shoreline Policy. Current MRML-LDR lands are also located adjacent to dense residential development.</p> <p>These changes support management actions and recreational trends identified in the Texas Outdoor Recreation Plan (TORP). Public use of all areas that were reclassified will not be affected now or in the foreseeable future. Public access in the form of natural surface hiking and biking trails is compatible with these classifications. The conversion of these lands will have no effect on current or projected public use.</p>
<p>Multiple Resource Management Lands–Wildlife Management (MRML-WM)</p>	<p>Land classification changes resulted in a reduction of MRML-WM acres from 3,731 acres to the current 1,774 acres as a result of several parcels of land</p>	<p>The net reduction of 1,957 acres of MRML-WM resulted from areas that have historically been managed for recreation or vegetation management. Acres that were converted to the ESA</p>

	<p>under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 2 acres from PO ○ 7 acres from Recreation ○ 601 acres from Recreation (Low Density) ○ 2,315 acres to ESA ○ 252 acres to MRML-VM 	<p>classification are areas of high habitat value as identified by the Wildlife Habitat Appraisal Procedures (WHAP). These reclassifications will have no effect on current or projected public use.</p>
Multiple Resource Management Lands–Vegetative Management (MRML-VM)	<p>The increase of MRML-VM from 800 acres to 2,325 acres were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 38 acres from ESA ○ 289 acres from MRML-VM ○ 97 acres from ESA-Recreation ○ 145 acres from Recreation ○ 1,035 acres from Recreation (Low Density) ○ 77 acres to PO 	<p>All parcels that were reclassified to MRML-VM were reclassified to recognize the long term historic management of these lands to provide healthy and productive forests in accordance with directives specified in Public Law 86-717, the Forest Cover Act and to maintain an aesthetically pleasing, fully forested shoreline. This reclassification will have no effect on current or projected public use.</p>
Multiple Resource Management Lands–Inactive/Future Recreation (MRML-IFR)	<p>The decrease of MRML-IFR Recreation from 175 acres to 5 were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 81 acres to ESA ○ 94 acres to MRML-VM ○ 5 acres from Recreation 	<p>In general terms, the amount of land classified for MRML-IFR in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has revealed that these reclassifications were needed to reflect actual use, evolving trends and regional priorities.</p> <p>The parcels classified as MRML-IFR are undeveloped. Until there is a need to develop these lands, they will be managed as MRML. These reclassification changes will have no effect on current or projected public use.</p>
Utility Corridors	<p>Six utility corridors were identified to serve as preferred locations for future outgrants such as easements for roads and utility lines on USACE lands at Lake O' the Pines. Descriptions of each corridor can be found in Section 6.2 of the 2018 Master Plan.</p>	<p>Utility corridors identify areas for current and future utility use that would also limit further fragmentation of existing habitat at Lake O' the Pines.</p>
Water Surface	<p>There are no proposed changes to the 1989 Master water surface classification. The following is and will continue to be the water classification for Lake O' the Pines:</p>	<p>These classifications are intended to promote public safety, protect resources, or protect project operational features such as the dam and spillway. These areas are</p>

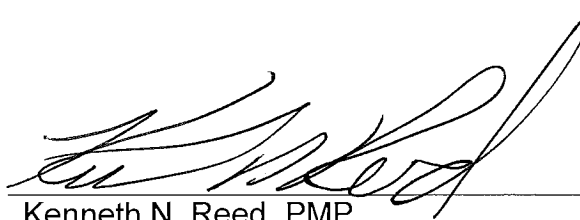
Water Surface	<p>There are no proposed changes to the 1989 Master water surface classification. The following is and will continue to be the water classification for Lake O' the Pines:</p> <ul style="list-style-type: none"> ○ Restricted - 22 acres ○ Designated No-Wake - 82 acres ○ Fish and Wildlife Sanctuary - 0 acres ○ Open Recreation - 17,663 acres 	<p>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.</p>
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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 six 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 Environmental Assessment (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, visual aesthetics, prime farmland, water quality, wild and scenic rivers, wetlands, fish and wildlife, invasive species, migratory birds, recreational fisheries, and threatened and endangered species.

It is my finding, based on the EA, that the revision of the 1989 Master Plan for Lake O' the Pines 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.

14-Feb 19
Date


Kenneth N. Reed, PMP
Colonel, U.S. Army
District Engineer

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ENVIRONMENTAL ASSESSMENT ORGANIZATION

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

- SECTION 1 INTRODUCTION* of the Proposed Action summarizes the purpose of and need for the Proposed Action, provides relevant background information, and describes the scope of the EA.
- SECTION 2 PROPOSED ACTION AND ALTERNATIVES* examines alternatives for implementing the Proposed Action and describes the recommended alternative.
- SECTION 3 AFFECTED ENVIRONMENT* describes the existing environmental and socioeconomic setting.
- ENVIRONMENTAL CONSEQUENCES* identifies the potential environmental and socioeconomic effects of implementing the Proposed Action and alternatives.
- SECTION 4 CUMULATIVE IMPACTS* describes the impact on the environment that may result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.
- SECTION 5 COMPLIANCE WITH ENVIRONMENTAL LAWS* provides a listing of environmental protection statutes and other environmental requirements.
- SECTION 6 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES* identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented.
- SECTION 7 PUBLIC AND AGENCY COORDINATION* provides a listing of individuals and agencies consulted during preparation of the EA.
- SECTION 8 REFERENCES* provides bibliographical information for cited sources.
- SECTION 9 ACRONYMS/ABBREVIATIONS*

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

APPENDICES *A* NEPA Coordination and Scoping

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ENVIRONMENTAL ASSESSMENT

Lake O' the Pines Master Plan Revision

MARION, HARRISON, UPSHUR, CAMP, TITUS, AND MORRIS COUNTIES, TEXAS

SECTION 1: INTRODUCTION

The United States Army Corps of Engineers (USACE) is proposing to adopt and implement the 2018 Lake O' the Pines Master Plan. The 2018 Master Plan is a revision of the 1989 Master Plan. The 2018 Master Plan is the strategic land use management document that guides the efficient, cost-effective, comprehensive management, development, and use of recreation, natural resources, and cultural resources throughout the life of the Lake O' the Pines project. It is a vital tool for responsible stewardship and sustainability of the project's natural and cultural resources, as well as the provision of outdoor recreation facilities and opportunities on federal land associated with Lake O' the Pines for the benefit of present and future generations.

Adoption and implementation of the 2018 Master Plan (Proposed Action) would create potential impacts on the natural and human environments, and as such, this Environmental Assessment (EA), in accordance with the National Environmental Policy Act (NEPA) of 1969, (Public Law 91-190), and 33 Code of Federal Regulations (CFR) Part 230, was prepared.

1.1 PROJECT LOCATION AND SETTING

Lake O' the Pines is located in east Texas approximately 8 miles west of the city of Jefferson, on the Big Cypress Bayou, 18 miles upstream from the confluence of the Bayou with the Red River. The lake is approximately 18 miles long and one mile wide with water extending into eight tributaries. The lake area extends throughout portions of Marion, Harrison, Upshur, Camp, Titus and Morris counties. The lake is formed by the Ferrells Bridge Dam, which was constructed and designated in 1958 for the purpose of flood control and water supply storage. Since impoundment, Lake O' the Pines has prevented flooding on Cypress Creek, Caddo Lake, and Twelve Mile Bayou. An additional benefit accruing from Lake O' The Pines is the utilization of water impounded therein to provide municipal and industrial water supplies to the cities of Longview, Jefferson, Ore City, Daingerfield, Avinger, Lone Star, and Hughes Springs, and Southwestern Electric Power Company (Hallsville, Texas). The Northeast Texas Municipal Water District (NETMWD) is the state agency created by the Texas legislature to administer the water supply features of the project.

Table 1.2 in the 2018 Master Plan outlines information regarding existing reservoir storage capacity at Lake O' the Pines. Detailed descriptions are incorporated herein by reference (USACE, 2018).

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 Lake O' the Pines are in compliance with applicable environmental laws and regulations and to maintain quality lands for future public use. The 2018 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 1989 Master Plan up to date and to reflect ecological, socio-political, and socio-demographic changes that are currently impacting Lake O' the Pines, as well as those changes anticipated to occur through 2040. In particular, changes in: outdoor recreation trends, regional land use, population, current legislative requirements, and USACE management policy have all indicated the need to revise the plan. Additionally, increasing fragmentation of wildlife habitat, national policies related to climate change, growing demand for recreational access, and protection of natural resources are all factors affecting Lake O' the Pines. In response to these continually evolving trends, the USACE determined that a full revision of the 1989 Master Plan would be required.

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

- Changes in national policies or public law mandates
- Operations and maintenance budget allocations
- Recreation area closures
- Facility and infrastructure improvements
- Cooperative agreements with stakeholder agencies (such as Texas Parks and Wildlife Department [TPWD] and the U.S. Fish and Wildlife Service [USFWS]) to operate and maintain public lands
- Outdoor recreation trends identified in the Texas Outdoor Recreation Plan (TORP)
- Ecoregion priorities identified in the Texas Conservation Action Plan (TCAP)
- Evolving public concerns

As part of the master planning process, the project delivery team evaluated public comments and current land uses, determined any necessary changes to land classifications, and formulated proposed alternatives. As a result of public coordination and a public information meeting, alternatives were developed, and this EA was initiated.

1.3 SCOPE OF THE ACTION

This EA was prepared to evaluate existing conditions and potential impacts of proposed alternatives associated with the implementation of the 2018 Master Plan. The alternative considerations were formulated with special attention given to revised land classifications, new resource management objectives, and a conceptual resource plan for each land classification category. This EA was prepared pursuant to NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1517), and the USACE implementing regulations, Policy and Procedures for Implementing NEPA, ER 200-2-2 (USACE, 1988).

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SECTION 2: PROPOSED ACTION AND ALTERNATIVES

The project need is to revise the 1989 Master Plan so that it is compliant with current USACE regulations and guidance, incorporates public needs, and recognizes surrounding land use and recreational trends. As part of this process, which includes public outreach and comment, two alternatives were developed for evaluation including a No Action Alternative. The alternatives were developed using land classifications that indicate the primary use for which project lands would be managed. USACE regulations specify five possible categories of land classification: Project Operations (PO), High Density Recreation (HDR), Mitigation, Environmentally Sensitive Areas (ESA), and Multiple Resource Managed Lands (MRML). The MRML classification is divided into four subcategories: Low Density Recreation (MRML-LDR), Wildlife Management (MRML-WM), Vegetative Management (MRML-VM), and Future/Inactive Recreation (MRML-IFR) Areas.

The USACE guidance recommends the establishment of resource goals and objectives for purposes of development, conservation, and management of natural, cultural, and man-made resources at a project. Goals describe the desired end state of overall management efforts, whereas resource objectives are specific task-oriented actions necessary to achieve the overall 2018 Master Plan goals. Goals and objectives are guidelines for obtaining maximum public benefits while minimizing adverse impacts on the environment and are developed in accordance with 1) authorized project purposes, 2) applicable laws and regulations, 3) resource capabilities and suitabilities, 4) regional needs, 5) other governmental plans and programs, and 6) expressed public desires. The five project-wide management goals established for Lake O' the Pines that were used in determining the Proposed Action, as well as the nationwide USACE Environmental Operating Principles, are discussed in detail in Chapter 3: Resource Goals and Objectives of the 2018 Master Plan and are incorporated herein by reference (USACE, 2018).

The goals for Lake O' the Pines Master Plan include the following:

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

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

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

Specific resource objectives to accomplish these goals can be found in Chapter 3.3 of the 2018 Master Plan.

2.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE

The No Action Alternative serves as a basis for comparison to the anticipated effects of the other action alternatives, and its inclusion in this EA is required by NEPA and CEQ regulations (40 CFR § 1502.14(d)). Under the No Action Alternative, the USACE would not approve the adoption or implementation of the 2018 Master Plan. Instead the USACE would continue to manage Lake O' the Pine's natural resources as set forth in the 1989 Master Plan. The 1989 Master Plan would continue to provide the only source of comprehensive management guidelines and philosophy. However, the 1989 Master Plan is out of date and does not reflect the current ecological, socio-political, or socio-demographic conditions of Lake O' the Pines. 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 2018 Master Plan would be reviewed, coordinated with the public, revised to comply with USACE regulations and guidance, and revised to reflect changes in the land management and land uses that have occurred over time or are desired in the near future. The keys to this alternative would be the revision of land classifications to USACE standards and the preparation of the resource objectives that would reflect current and projected needs and would be compatible with regional goals while sustaining Lake O' the Pines' natural resources and providing recreational experiences for the next 25 years.

The proposed land classification categories are defined as follows:

- Project Operations (PO): Lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas used solely for the operation of Lake O' the Pines.
- High Density Recreation (HDR): Lands developed for the intensive recreational activities for the visiting public including day use and campgrounds. These areas could also be for commercial concessions and quasi-public development.
- Environmentally Sensitive Areas (ESA): Areas where scientific, ecological, cultural, or aesthetic features have been identified.
- Multiple Resource Management Lands (MRML): Allows for the designation of a predominate use with the understanding that other compatible uses may also occur on these lands.
 - MRML Low Density Recreation (MRML-LDR): Lands with minimal development or infrastructure that support passive recreational use (primitive camping, fishing, hunting, trails, wildlife viewing, etc.).
 - MRML Wildlife Management (MRML-WM): Lands designated for stewardship of fish and wildlife resources.
 - Future/Inactive Recreation (MRML-IFR): Lands that are set aside for future High Density Recreation development and use.
 - Vegetative Management (MRML-VM): Lands designated for stewardship of forest, prairie, and other native vegetative cover.
- Water Surface: Allows for surface water zones.
 - Restricted: Water areas restricted for Lake O' the Pines operations, safety, and security.
 - Designated No-Wake: Water areas to protect environmentally sensitive shoreline areas and recreational water access areas from disturbance and areas to protect public safety.
 - Open Recreation: Water areas available for year-round or seasonal water-based recreational use.
 - Fish and Wildlife Sanctuary: Water areas that have either annual or seasonal restrictions to protect fish and wildlife within a designated area.

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

Table 2.2.1 Proposed Lake O' the Pines Land Classifications

1989 Land Classifications	Acres	Proposed New Land Classifications	Acres
PO	211	PO	290
Recreation	1,596	HDR	1,231
ESA- Recreation	520	Classification removed	
ESA	858	ESA	4,236
Recreation (Low Density)	3,567	MRML-LDR	1,782
Wildlife Management	3,731	MRML-WM	1,774
Vegetative Management	800	MRML-VM	2,325
Inactive/Future Recreation	175	MRML - Future/Inactive Recreation	5
ESA - Inactive/Future Recreation	185	Classification removed	
Permanent pool	18,700	Permanent pool	17,767
Flowage Easement	16,054	Flowage Easement	16,063*

* Has an additional 125 acres with permit to flood not included in this number.

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

* Source: USACE 2018

Table 2.2.2 Proposed Lake O' the Pines Water Surface Classifications

Classification	Acres
Water Surface: Restricted	22
Water Surface: Designated No-Wake	82
Water Surface: Open Recreation	17,663
Water Surface: Fish and Wildlife Sanctuary	None

Source: USACE 2018

Table 2.2.3 Justification for the Proposed Reclassification

Land Classification	Proposed Action Description	Justification
Project Operations (PO)	<p>Project Operations (PO) Lands were increased from 211 acres to 290 acres from the prior classification.</p> <ul style="list-style-type: none"> ○ 4 acres from Recreation ○ 77 acres from Multiple Resource Management Lands (MRML)-Vegetation Management (VM) 	<p>All lands classified as PO are managed and used primarily in support of critical operational requirements related to the primary missions of flood risk management, hydropower and water conservation. The 290 acres that would be classified as PO is needed for current and future operational requirements.</p>

	<ul style="list-style-type: none"> o 2 acres to MRML– Wildlife Management (WM). <p>These conversions were to allow for better management of: a material storage area/oxidation pond, an incidental parking lot near the dam, and the old road bed behind the project office.</p>	The reclassification of 79 acres of PO land will have no effect on current or projected public use.
High Density Recreation (HDR)	<p>Lands under the prior classification of REC were converted to the new and similar classification of High Density Recreation but were reduced from 1,596 to 1,231 acres through the following reclassifications:</p> <ul style="list-style-type: none"> o 6 acres from Environmentally Sensitive Areas (ESA)- Recreation o 14 acres from Recreation (Low Density) o 188 acres to ESA o 5 acres to MRML Future/ Inactive Recreation (IFR) o 35 acres to MRML-Low Density Recreation (LDR) o 5 acres to PO o 145 acres to MRML-VM o 7 acres to MRML-WM 	In general terms, the amount of land classified for Recreation in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has revealed that numerous reclassifications are needed to reflect actual use, evolving trends, and regional priorities. The net reclassification of 365 acres of Recreation will not affect current or projected public use.
Environmentally Sensitive Areas (ESAs)	<p>ESAs were increased from 858 acres to 4,236 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> o 185 acres from ESA-IFR o 470 acres from ESA- REC o 81 acres from Inactive/Future Recreation o 188 acres from Recreation o 177 acres from Recreation (Low Density) o 2,315 acres from MRML-WM 	Reclassification of the 3,378 acres was determined by the study team to be necessary to provide a high level of protection for those areas supporting bottomland hardwood forests, and areas with steep, aesthetic bluffs and ravines. Habitat studies conducted as part of the 2018 Master Plan revision effort support the reclassification of these lands as ESA. Protection of cultural resources also justifies the classification of some areas as ESA. The ESA areas provide good to excellent habitat for endangered species and numerous Species of Conservation Concern.

	<ul style="list-style-type: none"> o 38 acres to MRML-VM <p>In addition, the 1989 Master Plan had ESA's combined with both Recreation and MRML-IFR Recreation, totaling an additional 760 acres. With the new master plan, these lands will be reclassified into better land management classes as explained in further detail in the following sections.</p>	<p>Classifying these acres as ESA will afford these areas the highest level of protection from disturbance. The reclassification of 3,378 acres to ESA will have no effect on current or projected public use.</p>
Multiple Resource Management Lands—Low Density Recreation (MRML-LDR)	<p>The definition of the prior classification of Recreation (Low Density) is very comparable to the definition of the current classification of MRML-LDR. Land classification changes resulted in a reduction of these acres from 3,567 acres to the current 1,782 acres as a result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> o 7 acres from ESA-Recreation o 35 acres from Recreation o 177 acres to ESA o 14 acres to HDR o 1,035 acres to MRML-VM o 603 acres to MRML-WM 	<p>The net reduction of 1,785 acres of LDR lands was necessary to recognize high ecological and aesthetic value of those areas reclassified to ESA, HDR, MRML-VM, and WM. The largest portion of the reduction was a reclassification of lands to MRML-VM to recognize that this large area of land has been historically managed to insure healthy, productive forests, and aesthetically pleasing shorelines than for recreational purposes. Those lands remaining as MRML-LDR are located primarily in shoreline areas where vegetation modification (mowing) permits occur in accordance with the Shoreline Policy. Current MRML-LDR lands are also located adjacent to dense residential development.</p> <p>These changes support management actions and recreational trends identified in the Texas Outdoor Recreation Plan (TORP). Public use of all areas that were reclassified will not be affected now or in the foreseeable future. Public access in the form of natural surface hiking and biking trails is compatible with these classifications. The conversion of these lands will have no effect on current or projected public use.</p>
Multiple Resource Management Lands—Wildlife Management (MRML-WM)	<p>Land classification changes resulted in a reduction of MRML-WM acres from 3,731 acres to the current 1,774 acres as a</p>	<p>The net reduction of 1,957 acres of MRML-WM resulted from areas that have historically been managed for recreation or</p>

	<p>result of several parcels of land under the prior classifications as follows:</p> <ul style="list-style-type: none"> ○ 2 acres from PO ○ 7 acres from Recreation ○ 601 acres from Recreation (Low Density) ○ 2,315 acres to ESA ○ 252 acres to MRML-VM 	<p>vegetation management. Acres that were converted to the ESA classification are areas of high habitat value as identified by the Wildlife Habitat Appraisal Procedures (WHAP). These reclassifications will have no effect on current or projected public use.</p>
Multiple Resource Management Lands—Vegetative Management (MRML-VM)	<p>The increase of MRML-VM from 800 acres to 2,325 acres were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 38 acres from ESA ○ 289 acres from MRML-VM ○ 97 acres from ESA-Recreation ○ 145 acres from Recreation ○ 1,035 acres from Recreation (Low Density) ○ 77 acres to PO 	<p>All parcels that were reclassified to MRML-VM were reclassified to recognize the long term historic management of these lands to provide healthy and productive forests in accordance with directives specified in Public Law 86-717, the Forest Cover Act and to maintain an aesthetically pleasing, fully forested shoreline. This reclassification will have no effect on current or projected public use.</p>
Multiple Resource Management Lands—Inactive/Future Recreation (MRML-IFR)	<p>The decrease of MRML-IFR Recreation from 175 acres to 5 were a result of the following land classification changes:</p> <ul style="list-style-type: none"> ○ 5 acres from Recreation ○ 81 acres to ESA ○ 94 acres to MRML-VM ○ 	<p>In general terms, the amount of land classified for MRML-IFR in the 1989 Master Plan was excessive and was based on projected needs at the time. Management experience since 1989 has revealed that these reclassifications were needed to reflect actual use, evolving trends and regional priorities.</p> <p>The parcels classified as MRML-IFR are undeveloped. Until there is a need to develop these lands, they will be managed as MRML. These reclassification changes will have no effect on current or projected public use.</p>
Utility Corridors	<p>Six utility corridors were identified to serve as preferred locations for future outgrants such as easements for roads and utility lines on USACE lands at Lake O' the Pines. Descriptions of each corridor can be found in Section 6.2 of the 2018 Master Plan.</p>	<p>Utility corridors identify areas for current and future utility use that would also limit further fragmentation of existing habitat at Lake O' the Pines.</p>
Water Surface	<p>There are no proposed changes to the 1989 Master water surface classification. The following is and will continue to be the water</p>	<p>These classifications are intended to promote public safety, protect resources, or protect project operational features such as the dam and</p>

	classification for Lake O' the Pines: <ul style="list-style-type: none"> ○ Restricted - 22 acres ○ Designated No-Wake - 82 acres ○ Fish and Wildlife Sanctuary - 0 acres ○ Open Recreation - 17,663 acres 	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.
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* The land classification changes described in this table are the result of changes to several individual parcels of land ranging from a few acres to several hundred acres. Acreages were measured using geographic information system (GIS) technology. The acreage numbers provided are approximate.

*Source: USACE 2018

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 six corridors at Lake O' the Pines (see Chapter 6.2 in the Master Plan). Each corridor is adjoining and/or running parallel to an existing highway right-of-way easement. Future use of one or more of these shared corridors may require prior approval of those entities with previously secured legal rights to said corridor easement(s). 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 50 feet to 75 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 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.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Other alternatives to the Proposed Action were initially considered as part of the scoping process for this EA. However, none met the purpose of and need for the Proposed Action or the current USACE regulations and guidance. Furthermore, no other alternatives addressed public concerns. Therefore, no other alternatives are being carried forward for analysis in this EA.

SECTION 3: AFFECTED ENVIRONMENT AND CONSEQUENCES

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

Lake O' the Pines 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 following the master plan revision), or permanent effects.

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

Ferrells Bridge and Dam was constructed for the purpose of flood control and water supply storage. The project was authorized by the Flood Control Act of 24 July 1946, Public Law No. 526, 79th Congress, 2nd session. The reservoir was designated as Lake O' the Pines on 15 July 1958, Public law 85-522, 85th Congress. The reservoir is part of the plan for flood control on Red River below Denison Dam, Oklahoma- Texas. The drainage area of 850 square miles above the dam site is approximately 24 percent (%) of the drainage area of Cypress Creek and 3% of the drainage area of Red River below Denison Dam, excluding the Ouachita- Black River

Basin. Forestry is and will probably remain the principal land use in this region since the soils of East Texas are better adapted to trees than grass.

The USACE lands presently associated with Lake O' the Pines are listed in the 1989 Master Plan as follows:

- 20 acres of land managed as operations and maintenance
- 8,390 acres of forested areas
- 870 acres of public recreational areas
- 527 acres of land managed as special use areas – natural areas
- 8,390 acres of land managed as wildlife areas – wildlife areas
- 16,063 flowage easement
- 125 acres permitted to flood

The USACE operates and manages numerous areas designated as High Density Recreation (HDR) including Alley Creek Campground, Brushy Creek Park, Buckhorn Creek Park, Johnson Creek Campground, Cedar Ridge Park, Lakeside Park, Overlook Park, and Hurricane Creek Park. The USACE leases five areas to non-federal partners referred to as lessees. Each lessee is responsible for the operation and maintenance of their leased area; USACE does not provide direct maintenance within any of the leased locations, but it may occasionally lend support where appropriate. The USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all leased and USACE-operated HDR areas.

In addition to the parks, three marinas operate on the lake under the concession lease with the USACE: Big Cypress Marina, Lake O' the Pines RV Park and Marina, and Marley's Bullfrog Marina.

Section 5.3 of the 2018 Master Plan further describes recreation areas at Lake O' the Pines.

3.1.1 Alternative 1: No Action Alternative

The No Action Alternative for Lake O' the Pines is defined as the USACE taking no action, which means the 1989 Master Plan would not be revised. No new resource analysis, resources management objectives, or land-use classifications would occur. The operation and maintenance of USACE lands at Lake O' the Pines would continue as outlined in the existing 1989 Master Plan. Although this alternative does not result in a Master Plan that meets current regulations and guidance, there would be no significant negative long-term impacts on land uses on Lake O' the Pines lands.

3.1.2 Alternative 2: Proposed Action

The objectives for revising the Lake O' the Pines 2018 Master Plan were to describe current and foreseeable land uses, taking into account expressed public opinion and USACE policies that have evolved to meet day-to-day operational needs.

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

The changes required for the Proposed Action were developed to help fulfill regional goals associated with good stewardship of land and water resources that would allow for continued use and development of project lands. Therefore, implementation of the Proposed Action would not result in significant negative long-term adverse impacts on land uses on project lands. For example, 3,378 additional acres would be reclassified as ESA compared to the No Action Alternative which contains 858 acres (see Table 2.2.1). The ESA reclassifications would afford protection to and potentially benefit wildlife, wildlife habitats, sensitive species habitat, and cultural resources. The protection and appropriate management of these areas aligns with Resource Goals B, C, D, and E as described in Section 3.2 of the revised Master Plan as well as numerous natural resource objectives listed in Table 3.2 of the revised Master Plan. The reduction of HDR by 365 acres and MRM-LDR by 1,785 acres occurred in areas of parks with little to no recreational development. No decrease in recreational opportunities are expected. Maintaining the HDR and MRML-LDR areas allows for continued outdoor recreation opportunities at Lake O' the Pines. New resource goals A, C, and E and several recreational objectives are supported by these reclassifications as described in Section 3.2 and Table 3.1 of the revised Master Plan. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. ESA classification would allow for appropriate active management and protection for these sites. The designation of utility corridors, as described in Section 6.2 of the 2018 Master Plan, will serve to avoid and minimize impacts of fragmentation on the proposed land uses. Utility corridors provide areas for existing and future infrastructure while minimizing the extent of reoccurring maintenance activities and additional habitat fragmentation.

No changes in land use are expected with the 2018 Master Plan as recreation and project maintenance and operation areas will largely remain the same. As such, no short or long-term, adverse impacts are expected to occur as a result of the 2018 Master Plan.

3.2 WATER RESOURCES

Surface Water

Lake O' the Pines is located on Cypress Creek. Its watershed drains approximately 850 square miles above the dam and spans 6 counties (Marion, Harrison, Upshur, Camp, Titus and Morris) in Northeast Texas. At the maximum water surface, the reservoir contains 1,855,000 surface acres of water. The total maximum storage is 1,855,000 acre-ft. The top of conservation pool capacity is 269,600 acre-ft, and covers the area of 19,000 acres. Waters detained for flood control purpose equal

838,300 acre-ft. Fluctuation within the conservation pool depends upon the rate of withdrawals for water supply by the water district as well as inflows and evaporation.

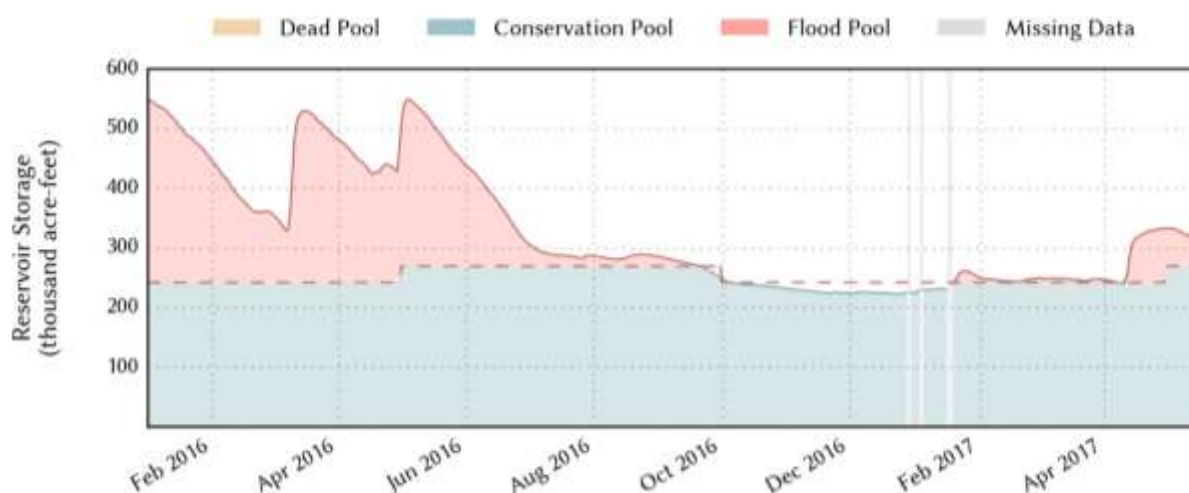
Hydrology and Groundwater

An additional benefit from Lake O' the Pines is the utilization of water impounded to provide municipal and industrial water supplies to the cities of Jefferson, Ore City, Daingerfield, Lone Star, Avinger, Hughes Springs, and Longview, the rural systems of Mims Rural Water Cooperative and Holly Springs Rural Water Cooperative, and Southwestern Electrical Power Company. The Northeast Texas Municipal Water District is the state agency created by the legislature to administer the water supply features of the project.

The dam has an uncontrolled concrete spillway that is 200-ft-wide, located on the east end of the dam. Intake structures are located at various points on the lake and one downstream of the lake. The dam has two discharge gates/conduits that are 10 ft in diameter and are at the elevation of 200.00 ft NGVD located at the southeast side. The flood control pool is regulated by releasing a maximum of 3,000 cubic feet per second (cfs).

The reservoir is operated in accordance with its rule curve. The rule curve is the compilation of operating criteria, guidelines, and specifications that govern the storage and release function of a reservoir (FEMA, 2004). The operating rule curve as displayed in Figure 3.2.1, is used by Lake O' the Pines. It can be found fixed at 230.0 ft NGVD between 20 May and 15 September and is lowered to 228.0 ft NGVD between 1 October and 20 May. When the pool is between 228.5 and 230.0 feet NGV a minimum flow of 25 cfs is released to provide water flow in the downstream channel.

Figure 3.2.1 Recent Water Level Data for Lake O' the Pines



*Source: (TWDB, 2018).

During 1 May through 31 October, and when the stages in the reservoir are below the rule curve, releases in excess of low water for mosquito control takes precedence over the rule curve for reservoir regulation. Then releases may be made in excess of the applicable minimum flow as long as it is not at a rate that lowers the lake level by more than 0.2 feet in any 10 day period.

The main source of ground water in the lake area is the Cypress Aquifer, which consists of four hydraulically connected units: the Wilcox group, the Carrizo Sand, the Reklaw Formation, and Queen City Sand.

Ground water monitoring well in the Carrizo-Wilcox aquifer shows that water level has risen in the past few years. None of the counties spanning Lake O' the Pines is in the groundwater conservation districts. The water from shallow wells generally contains less than 500 mg/l dissolved solids and is excessive only in its iron content (TWDB, January 2009).

Water Quality

Texas Commission on Environmental Quality (TCEQ) sets and implements standards for surface water quality to improve and maintain the quality of water in the state based on various beneficial use categories for the water body. The draft 2016 Texas Integrated Report-Index of Water Quality Impairments, pursuant to the Clean Water Act Sections 305(b) and 303(d), evaluates the quality of surface waters in Texas and identifies those that do not meet uses and criteria defined in the Texas Surface Water Quality Standards. Impaired waters are then identified, along with impairment descriptions, on the 303(d) list.

Lake O' the Pines (Segment ID 0403) has identified water quality impairments for pH within the middle 5,000 acres assessment area of the lake. Below Lake O' the Pines, Big Cypress (Segment ID 0402) has several assessment areas listed as impaired for depressed dissolved oxygen and mercury in edible tissue. Upstream of Lake O' the Pines, Big Cypress Creek (Segment ID 0404) is listed an impaired water body for bacteria and sulfate (Texas Commission on Environmental Quality (TCEQ) 2018).

For more information regarding water quality at Lake O' the Pines, please refer to section 2.2.8 of the 2018 Master Plan.

Wetlands:

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

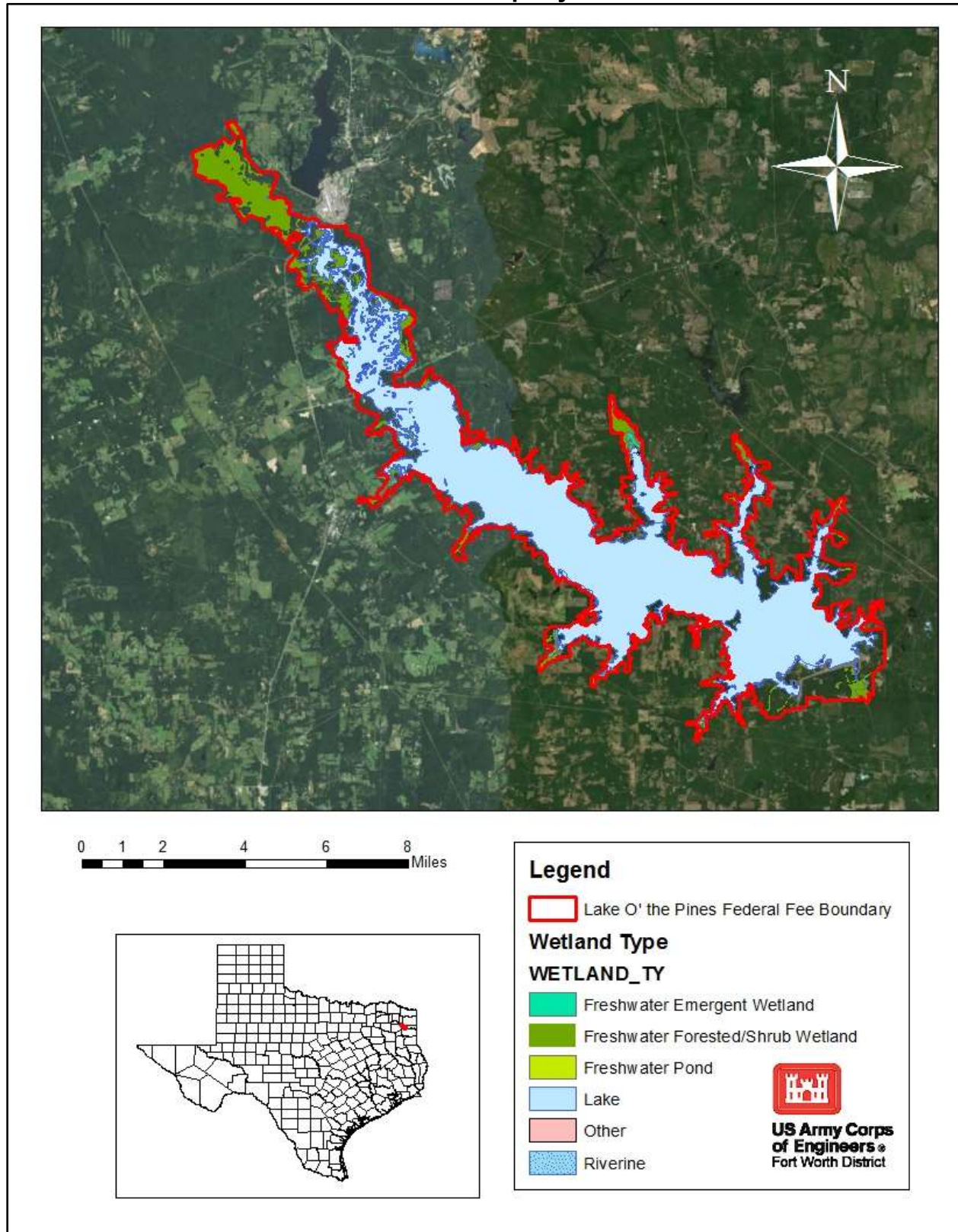
As a result of the topography of the region for Lake O' the Pines, wetlands generally occur near the rivers and within areas with low topographic relief that are primarily located on the western side of the Lake. Table 3.2.2 lists the acreages of various types of wetlands present at Lake O' the Pines. Wetland classifications presented are derived from the USFWS Trust Resource List generated using the Information (USFWS, 2018D), Planning, and Conservation System decision support system.

Table 3.2.2 Wetland Resources

Wetland Types	Total Acres
Freshwater Emergent Wetland	33.94
Freshwater Forested/ Shrub Wetland	3,076.06
Freshwater Pond	29.64
Lake	17,845.61
Riverine	26.63
Other	8.40

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

Figure 3.2.2. Map of Wetlands within USACE Lake O' the Pines Federal Fee-Owned Property.



3.2.1 Alternative 1: No Action Alternative

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

3.2.2 Alternative 2: Proposed Action

The reclassifications included in the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources. Land reclassifications and new resource objectives proposed as part of the Proposed Action would have a potential for minor long-term beneficial impacts on water quality. For example, 3,378 additional acres would be reclassified as ESA compared to the No Action Alternative which allocates only 858 acres to strictly ESA (see Table 2.1.1). This directly supports resource goals B, D, and E and several natural resource management objectives including minimizing activities that disturb the aesthetic value and protect natural habitat, all of which are further described in Chapter 3 of the revised Master Plan. The net reduction of HDR lands from 1,596 acres to 1,231 acres will limit future intensive development, thus reducing the potential for erosion and sedimentation. Natural vegetation communities act as buffers to trap runoff, thus potentially reducing sedimentation. Furthermore, the utility corridors were designated to avoid and minimize impacts on water resources by future actions by requiring future actions to bore under streams and wetlands. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative.

3.3 CLIMATE

Lake O' the Pines lies in a region characterized as warm, moist, humid, and subtropical. The area has hot, humid, long summers, with occasional temperatures of 100 °F, and short, moderate winters. However, sharp extremes are occasionally recorded as short duration freezes can occur throughout the winter. The average annual temperature is 71°F with monthly averages ranging from a maximum of 83°F for July and a minimum of 44°F for January. Extreme temperatures vary from 118°F to -13°F. The average annual rainfall is about 45 inches. For more detailed information please refer to section 2.1.2 of the 2018 Master Plan.

3.3.1 Alternative 1: No Action Alternative

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

3.3.2 Alternative 2: Proposed Action

Revision of the Lake O' the Pines 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 Proposed Action Alternative.

3.4 CLIMATE CHANGE AND GHG

Federal agencies are required to consider Green House Gas (GHG) emissions and climate change in EAs in accordance with NEPA. On August 1, 2016, the CEQ issued final guidance on the consideration of GHG emissions and climate change in NEPA reviews; however, Executive Order 13783 directed the CEQ to rescind that guidance. At the same time, case law in the Ninth Circuit Court still requires climate change analysis: “The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct” (Center for Biological Diversity vs. the National Highway Traffic Safety Administration, 538 F.3d 1172, 1217 (9th Cir., 2008)). Consistent with case law, an analysis of climate change impacts are conducted within EAs/EISs.

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 metric tons or more of carbon dioxide (CO₂)-equivalent (CO₂e) GHG emissions per year, the project should be considered in a qualitative and quantitative manner in NEPA reporting (CEQ, 2015). CEQ proposes this as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ, 2015).

EPA records show that there is only one GHG contributor within Marion County, Wilkes Power Plant, near the city of Avinger, Texas. The total reported emission is 414,124 metric tons CO₂e. The general operations and recreation facilities associated with Lake O’ the Pines does not approach the proposed reportable limits. Lake O’ the Pines Project Office does have management plans in place such as routine equipment maintenance, vegetation management plans, natural resources management plans, and public education and outreach programs to protect regional natural resources. In addition, the Lake O’ the Pines Project Office will continue monitoring programs as required to meet applicable laws and policies.

Two Executive Orders (EOs), EO 13693 and EO 13783, 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. 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 long-term major adverse impacts on climate change or contributions to GHG emissions and climate change as a result of implementing the No Action Alternative.

3.4.2 Alternative 2: Proposed Action

Under the Proposed Action, current Lake O' the Pines 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 2018 Master Plan. In the event that GHG emission issues become significant enough to impact the current operations at Lake O' the Pines, the 2018 Master Plan and all associated documents would be reviewed and revised as necessary.

3.5 AIR QUALITY

The overall air quality condition for Lake O' the Pines is generally of good quality. For further information please refer to section 2.2.10 of the 2018 Master Plan.

In conducting routine operations and maintenance activities at Lake O' the Pines, the 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 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 major adverse long-term impacts on air quality as a result of implementing the No Action Alternative, since there would be no change to the existing 1989 Master Plan.

3.5.2 Alternative 2: Proposed Action

Existing operation and management of Lake O' the Pines is compliant with the Clean Air Act and would not change with implementation of the 2018 Master Plan. Land reclassifications and new resource objectives proposed as part of the Proposed Action would have a potential for negligible long-term beneficial impact on air quality. Seasonal prescribed burning on Lake O' the Pines lands would have minor, negative impacts on air quality through elevated ground-level ozone and particulate matter concentrations; however, these seasonal burns are generally scheduled so that impacts are minimized.

The new resources goals, primarily B and C, along with several recreational and natural resource management objectives regarding sustainability and the conservation of natural areas are supported by the proposed land classifications and are further described in Chapter 3 of the revised Master Plan. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative.

3.6 TOPOGRAPHY, GEOLOGY, AND SOILS

Topography

Lake O' the Pines is situated in the West Gulf Coastal Plain section of the Coastal Plain physiographic province. The topography of land surrounding Lake O' the Pines is generally rolling, hilly upland terrain averaging 200-500 ft, dissected by flat floodplains and terraces. Some of these hills rise to 200 ft above the shoreline.

Geology

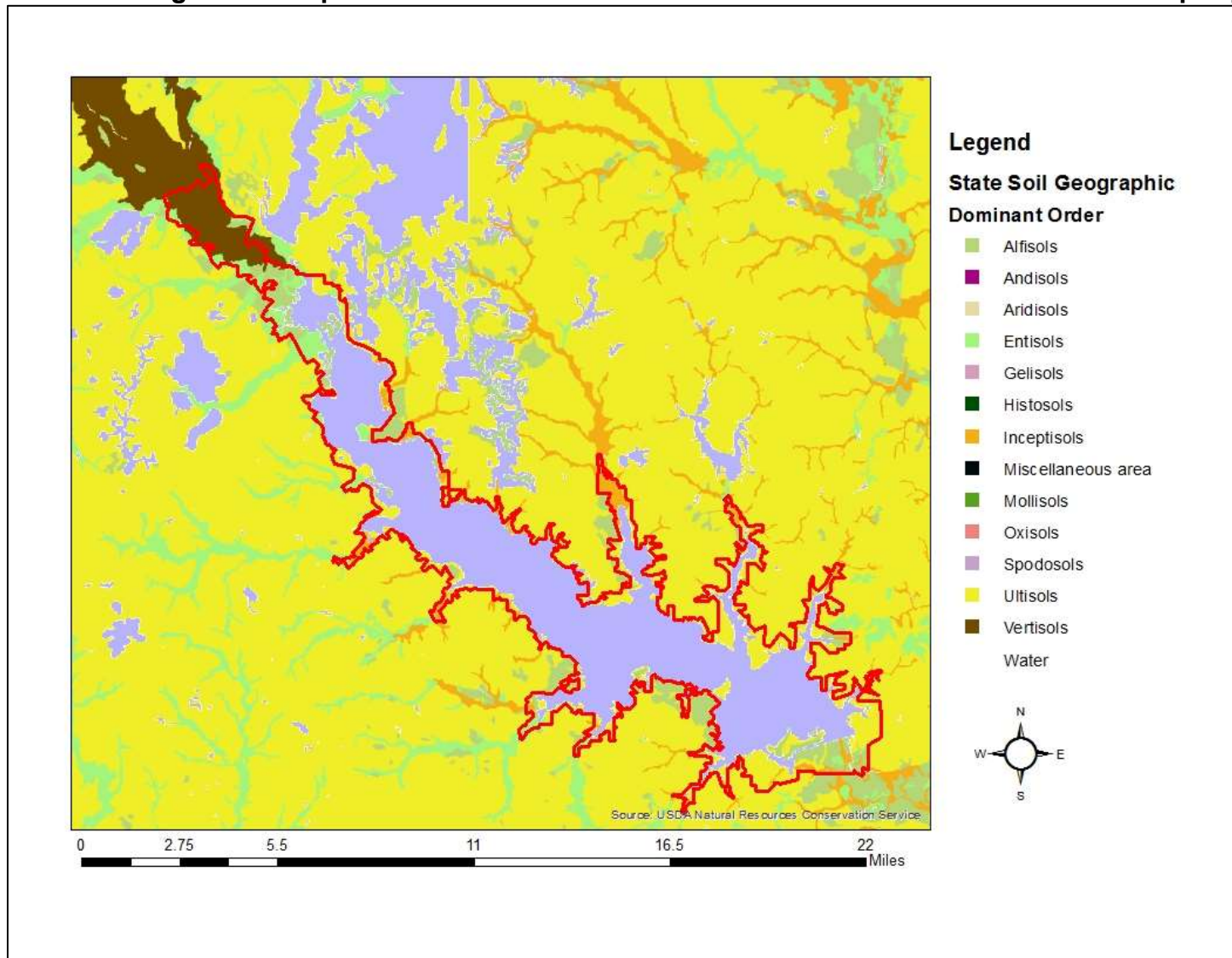
Lake O' the Pines lies within the outcrop belt of the Queen City Formation. The land surface at Lake O' the Pines has developed upon a sequence of sedimentary rock units which dip slightly more steeply toward the Gulf than the land surface, resulting in successively younger formations cropping out gulf-ward. Queen City Formation is composed of a fine-grained quartz sand varying in color from light to brownish gray. It is locally carbonaceous, contains clay, and slightly lignitic. It contains beds of glauconite, quartz green sand, and cross bedding. The thickness ranges from 100-400 ft.

The age of rock units range from Early Cretaceous to Quaternary (Recent Epoch). The lake lies within the East Texas Timber Belt which consists of sandy, wooded, hilly, terrain developed on formations of Eocene (Early Tertiary) age. On the north side of the lake the hills are supported by the erosional resistant Weches Formation, and the higher hills are capped by sands of the Sparta Formation. Surface outcrops in this area are very thin, only few feet in some locations.

Soils

The soils that encompass Lake O' the Pines federal fee-owned property are sandy loam soils that are fertile in quality. For a visual representation of where these soils can be found please see the below Figure 3.6 and for a more detailed discussion see section 2.1.5 in the 2018 Master Plan.

Figure 3.6 Map of Soils within USACE Lake O' the Pines Federal Fee-Owned Property.



3.6.1 Alternative 1: No Action Alternative

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

3.6.2 Alternative 2: Proposed Action

Topography, geology, and soils were considered during the refining process of land reclassifications for the 2018 Master Plan. Total acreage for HDR was reduced from 1,596 acres to 1,231 acres. This net reduction is solely based on the realization that the amount of acreage originally planned for intensive recreation use per the 1989 Master Plan significantly exceeded the amount necessary to meet public needs and was excessive and not being fully utilized. Areas currently developed as park would continue to operate as parks and no change would occur. However, some of the lands designated as Recreation – Intensive Use would be reclassified to various other land use classifications to better reflect historic use patterns and current land management efforts. As such, no additional intensive use facilities would be constructed outside of existing intensive use areas, limited future impacts to soils and prime farmlands.

Land reclassifications and new resource objectives proposed as part of the Proposed Action would have a potential long-term beneficial impact on soil conservation and prime farmlands at Lake O' the Pines. The reduction of Recreation Areas will limit future intensive development, thus reducing the potential impacts of soil erosion and development of prime farmland. The new resources objectives will provide a level of consistency in beneficial management practices that would not occur with the No Action Alternative. As described in Chapter 3 of the revised Master Plan, resource goals B, C, D, and E and several natural resource management objectives, particularly those that concern addressing unauthorized uses of public land and evaluating erosion control and addressing sedimentation issues, are supported by the proposed land classifications. Therefore, under the Proposed Action, there would be no long-term, major adverse impacts on topography, geology, soils or prime farmland as a result of implementing the 2018 Master Plan.

3.7 NATURAL RESOURCES

Operational civil works projects administered by USACE are required, with few exceptions, to prepare an inventory of natural resources. The basic inventory required is referred to within USACE regulations (ER and EP 1130-2-540) as a Level One Inventory. This inventory includes the following: vegetation in accordance with the National Vegetation Classification System through the sub-class level; assessment of the potential presence of special status species including but not limited to federal and state listed endangered and threatened species, migratory species, and birds of conservation concern listed by the USFWS; land (soils) capability classes in accordance with NRCS soil surveys; and wetlands in accordance with the USFWS Classification of Wetlands and Deepwater Habitats of the United States, which are previously discussed in Section 3.2.

Vegetation

Lake O' the Pines is located within the Piney Woods ecological region in Texas. This region is characterized by rolling terrain covered with pines and oaks, and rich bottomlands with tall hardwoods. Using habitat types and descriptions from the Texas Conservation Action Plan (TCAP) and USEPA ecoregion descriptions, the following are the major vegetation types found on USACE lands at Lake O' the Pines. Species listed below are representative of dominant species found in the pineywoods region, which includes a large area of East Texas, but should not be considered a comprehensive list or entirely specific to Lake O' the Pines. For vegetation species present at Lake O' the Pines, refer to Appendix E.

Bottomland Hardwood Forest

This system is associated with the Pleistocene Fluvial Terraces ecoregion in the northern portion of East Texas. This woodland or forest system is often dominated by more mesic species on interior ridges, including Loblolly Pine (*Pinus taeda*), Shortleaf Pine (*Pinus echinata*), Slash Pine (*Pinus elliotii*), Post Oak (*Quercus stellata*), White Oak (*Quercus alba*), Southern Red Oak (*Quercus falcata*), and Black Hickory (*Carya texana*). Within the range of Longleaf Pine (*Pinus palustris*), occurrences that represent West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods may be mapped as this system. On the somewhat wetter sites of the swales, species such as Water Oak (*Quercus nigra*), Willow Oak (*Quercus phellos*), Laurel Oak (*Quercus laurifolia*), Blackgum (*Nyssa sylvatica*), Sweetgum (*Liquidambar styraciflua*), and Green Ash (*Fraxinus pennsylvanica*) may be dominant. Sites that are even wetter would likely be mapped as West Gulf Coastal Plain Nonriverine Wet Hardwood Flatwoods. Chinese Tallow (*Triadica sebifera*) may invade this system. Mid-story species that may be encountered include Red Maple (*Acer rubrum*), American Holly (*Ilex opaca*), Winged Elm (*Ulmus alata*), and small members of the overstory. Wax-Myrtle (*Morella cerifera*), Possumhaw (*Ilex decidua*), and Yaupon (*Ilex vomitoria*) are commonly encountered shrubs. Herbaceous cover is generally sparse, with species such as Woodoats (*Chasmanthium* spp.), Bushy Bluestem (*Andropogon glomeratus*), and Carolina Jessamine (*Gelsemium sempervirens*). Sites dominated by Loblolly Pine (*Pinus taeda*) or Slash Pine (*Pinus elliotii*) may often represent plantations or managed forests.

Emergent Wetlands

This system represents shallow, small (averaging about 6 ha), generally circular, recharge basins receiving moisture from rainfall within internally draining watersheds and lacking significant overland drainage from the basins. They are usually characterized as occupying Vertisols with a clay layer of reduced permeability, and are variably wet and dry depending on local weather conditions. Moisture accumulation occurs through overland flow of rainfall falling on the surrounding, internally draining watershed, and drying results from evaporation, transpiration, and infiltration, with playas representing a significant recharge feature of the Ogallala Aquifer. This system is typically dominated by herbaceous vegetation including species such as Western Wheatgrass (*Pascopyrum smithii*), Buffalo Grass (*Bouteloua dactyloides*), Pale Spikerush (*Eleocharis macrostachya*), Vine Mesquite (*Panicum obtusum*), Blue-Weed (*Helianthus ciliaris*), Common Frog-Fruit (*Phyla nodiflora*), Beakpod Evening Primrose (*Oenothera canescens*), Narrow Leaved Goosefoot (*Chenopodium leptophyllum*),

Woollyleaf Burr Ragweed (*Ambrosia grayi*), Pennsylvania Smartweed (*Polygonum pennsylvanicum*), and Hierba del Marrano (*Symphyotrichum subulatum*). Species such as Buffalo Grass and Western Wheatgrass may occupy drier portions of a playa, or may occupy entire playas when those playas have lacked inundation for extended periods. Wetter portions of the playa may be occupied by marshes if the inundation has been maintained over extended periods. Species richness can vary considerably among individual examples of this system and is especially influenced by hydroperiod and adjacent land use, which is often agriculture. Dynamic processes that affect these depressions are hydrological changes, grazing, and conversion to agricultural use.

In the summer of 2017, USACE biologist, rangers, and foresters conducted habitat assessments at Lake O' the Pines to inform land classifications. Methodology, habitat quality, and vegetation species encountered at Lake O' the Pines is available in Appendix E.

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

Fisheries and Wildlife Resources

Lake O' the Pines provides habitat for an abundance of fish and wildlife species. The lake provides a quality fishery, as well as quality wildlife habitat on public land associated with the project. Some of the most common game fish in the lake for boaters and anglers are: Largemouth Bass (*Micropterus salmoides*), Spotted Bass (*Micropterus punctulatus*), Blue Catfish (*Ictalurus furcatus*), Channel Catfish (*Ictalurus punctatus*), Flathead Catfish (*Pylodictis olivaris*), White Bass (*Morone chrysops*), White Crappie (*Pomoxis annularis*), Black Crappie (*Pomoxis nigromaculatus*), Bluegill Sunfish (*Lepomis macrochirus*), Green Sunfish (*Lepomis cyanellus*), Longear Sunfish (*Lepomis megalotis*), Redbreast Sunfish (*Lepomis auritus*), Redear Sunfish (*Lepomis microlophus*), Warmouth (*Lepomis gulosus*), and Chain Pickerel (*Esox niger*).

While Lake O' the Pines is operated by USACE, the TPWD remains the primary agency in charge of managing the fisheries resources. The fish stocking history shows that the lake has been stocked with Florida largemouth bass (*Micropterus salmoides*) over the last decade every other year, however it was discontinued due to low angler utilization. All fish species except crappie are currently managed under statewide harvest regulations. For crappie, from December until the last day of February, anglers keep the first 25 crappie they catch each day regardless of size to minimize excess mortality due to fish being caught in deep water. Please refer to section 2.2.3.1 of the 2018 Master Plan for more detailed information.

Terrestrial Wildlife Resources

Game wildlife species prevalent at Lake O' the Pines include Southern Short Tailed Shrew (*Blarina carolinensis*), Seminole Bat (*Lasiurus seminolus*), Ringtail Virginia Opossum (*Didelphis virginiana*), Rafinesque Big-Eared Bat (*Corynorhinus rafinesquii*), Eastern Cottontail (*Sylvilagus floridanus*), Common Gray Fox (*Urocyon*

cinereoargenteus), Striped Skunk (*Mephitis mephitis*), Bobcat (*Lynx rufus*), White-Tailed Deer (*Odocoileus virginianus*), Swamp Rabbit (*Sylvilagus aquaticus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Eastern Flying Squirrel (*Glaumois volans*), Attwater's Pocket Gopher (*Geomys attwateri*), Marsh Rice Rat (*Orzomys plaustris*), Eastern Harvest Mouse (*Reithrodonmys humulis*), Cotton Mouse (*Peromyscus gossypinus*), Prairie Vole (*Microtus ochrogaster*), and River Otter (*Lontra canadensis*). Please refer to section 2.2.3.2 of the 2018 Master Plan for more detailed information.

3.7.1 Alternative 1: No Action Alternative

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

3.7.2 Alternative 2: Proposed Action

The proposed net increase of ESA by 3,378 acres and MMRL-VM by 1,525 acres, and net decrease of MRML-WM by 1,957 acres would cause major long-term beneficial impacts to natural resources within these areas. The reclassification of MRML-WM was deemed necessary because these areas are and have been managed for recreation and vegetation management purposes. The ESA classification provides the highest form of protection for natural resources. The increase of MRML-VM acres was deemed necessary so as to promote healthy forests and a beautiful shoreline. These proposed changes would then protect natural resources from various types of adverse impacts such as habitat fragmentation. Furthermore, the utility corridors 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 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 and habitat. In addition, the Proposed Action would be compatible with conservation principles and measures to protect migratory birds as mandated by EO 13186.

3.8 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All federal agencies are required to implement protective measures for designated species and to use their authorities to further the purposes of the Endangered Species Act. The Secretary of the Interior and the Secretary of Commerce (marine species) are responsible for the

identification of threatened or endangered species and development of any potential recovery plan.

USFWS is the primary agency responsible for implementing the Endangered Species Act, and is responsible for birds and other terrestrial and freshwater species. USFWS responsibilities under the Endangered Species Act include (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other federal agencies concerning measures to avoid harm to listed species.

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

The USFWS has identified threatened and endangered species, as well as other trust resources, potentially found at Lake O' the Pines as result of identified threats to their continued existence. The U.S Fish and Wildlife Service's (USFWS) Information, Planning, and Conservation (IPAC) Report Official Species List (USFWS, 2018C) identifies these resources and can be found in Appendix C. No critical habitat or candidate species were identified within the Lake O' the Pines area. Although not afforded protection by the Endangered Species Act, candidate species may be protected under other federal or state laws.

There are 5 federally listed species that could be found within USACE Lake O' the Pines federal fee-owned property (USFWS 2018C). A list of these species is presented in Table 3.8. The species identified as Threatened, Endangered or Candidate Species by TPWD are included in Appendix C of the 2018 Master Plan. The TPWD has also identified Species of Greatest Conservation Need for each ecoregion of Texas. Species of Greatest Conservation Need for the Pineywoods ecoregion can also be found in Appendix C.

Table 3.8. Federally Listed Endangered and Threatened Species with Potential to Occur at Lake O' the Pines

Common Name	Scientific Name	Federal Status	Occurrence
Least Tern	<i>Sterna antillarum</i>	Endangered	Migrant
Piping Plover	<i>Charadrius melodus</i>	Threatened	Rare Occurrence
Geocarpa	<i>Geocarpa minimum</i>	Threatened	Rare Occurrence
Neches River Rose-mallow	<i>Hibiscus dasycalyx</i>	Threatened	Rare Occurrence

The 2018 Master Plan revision does not entail wind energy aspects, therefore the Red Knot (*Calidris canutus rufa*) was intentionally left out in the above table. As such, the Red Knot will not be addressed any further concerning possible impacts to the species.

Least Tern (*Sterna antillarum*) and Piping Plover (*Charadrius melodus*), preferred habitat mostly consists of open waters, rivers, lakes, estuaries, marshes, and swamps. All provide foraging opportunities and cover habitat. Typically nesting occurs on sandy to gravelly substrates including shorelines and sandbars or other areas that are near open water. Nests are usually above the high water line and close to vegetation (USFWS, 2018 A and B). Depending on lake levels, they both may nest along the shorelines or on exposed sandbars at Lake O' the Pines. Because of the availability of desirable habitat and recent unofficial sightings in the surrounding area but not within the USACE Lake O' the Pines federal fee-owned property, the Least Tern is considered to be a migrant to the area. The Piping Plover is considered to be a rare occurrence because the area is not within the typical nesting and migratory range and there have not been many sightings in the surrounding areas.

Geocarpon (*Geocarpo minimum*) is a vascular, flowering annual that is 1-4cm tall. The preferred habitat consists of prairies and glades with shallow saline soils (NatureServe, 2017A). Because of the lack of preferred habitat and rarity of the species, the occurrence within USACE Lake O' the Pines federal fee-owned property is considered rare.

Neches River Rose-mallow (*Hibiscus dasycalyx*) is a vascular, flowering perennial herb that can grow to 7.5 ft tall. The preferred habitat consists of shrub swamps and riparian woodlands. Within these it prefers seasonally wet soils that are not flooded year round (NatureServe, 2017C). Because of the lack of preferred habitat and rarity of the species, the occurrence within Lake O' the Pines federal fee-owned property is considered rare.

3.8.1 Texas Natural Diversity Database

The Texas Natural Diversity Database (TXNDD), administered by TPWD, manages and disseminates occurrence of information on rare species, native plant communities, and animal aggregations in Texas to help guide project planning efforts. An official request via email was made requesting this information for the following USGS quadrangles that the Lake O' the Pines federal fee-owned property falls within: Harleton, Lassater, Kellyvielle, Ore City, and Lone Star. The next few paragraphs summarize the information received.

Within the Lake O' the Pines federal fee-owned property, TXNDD identified two unique plant communities: Panicked Indigobush (*Amorpha paniculata*) and Goldenwave Tickseed (*Coreopsis intermedia*). Both are overlapping each other and occur only in one geographic area. In 1958, the last official recording of Panicked Indigobush (*Amorpha paniculata*) was published. The species is a flowering bush that prefers to live in wet, forested woodlands with acidic soils and it spreads through the use of fire (NatureServe, 2017D). Because of this information and lack of recent sightings, the occurrence of this

species within Lake O' the Pines federal fee-owned property is considered rare. In 1994 the last official recording of Goldenwave Tickseed (*Coreopsis intermedia*) was published. The species is a flowering forb that prefers to live in low quality pine forests, especially in areas that have been clear cut (NatureServe, 2017B). Because of this information and lack of recent sightings, the occurrence of this species within Lake O' the Pines federal fee-owned property is considered rare.

In the vicinity of Lake O' the Pines federal fee-owned property, TXNDD identifies the following unique communities: Smooth Indigobush (*Amorpha laevigata*), Water Oak-Willow Oak (*Quercus nigra-Quercus phellos*), Blackspot Shiner (*Notropis atrocaudalis*), Ironcolor Shiner (*Notropis chalybaeus*), Taillight Shiner (*Notropis maculatus*), Blackside Darter (*Percina maculata*), and Bluehead Shiner (*Pteronotropis hubbsi*) communities. None of these communities overlap one another and some of them are more abundant than others. Among these is the Blackside Darter and Bluehead Shiner that are state listed as threatened and had last reported sightings in 1993.

3.8.2 Alternative 1: No Action Alternative

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

3.8.3 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 2018 Master Plan include 3,378 additional acres as ESA, 1,525 additional acres MRML-VM, largely from the reclassification of 1,957 acres of MRML-WM.

The ESA reclassification recognizes those areas having the highest ecological value and to ensure they are given the highest order of protection among possible land classifications. The high degree of protection for ESA means that any threatened, endangered and rare/unique communities as identified in the TXNDD Database that utilizes these areas will get higher quality habitats and less disturbances. Under the proposed reclassification, areas considered bottomland hardwoods, and areas with steep, aesthetic bluffs and ravines would be classified as ESAs.

MRML-VM and MRML-WM areas are both managed to maintain and improve upon a certain set of resources: MRML-VM are designated to forests, prairies and other native vegetative cover; MRML-WM are designated for fish and wildlife resources. Even though they are not afforded as much protection as areas classed as ESA, they still provide valuable habitats for threatened, endangered, and rare/unique communities as identified in the TXNDD Database.

The reclassification of these lands was supported by recommendations from the USFWS and TPWD. In addition, the establishment of six 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 reclassification will have no effect on current or projected public use. While the occurrence of special status species are limited at Lake O' the Pines, minor to moderate, long-term beneficial impacts on endangered, threatened and rare/unique communities, as identified in the TXNDD Database, would occur as a result of implementing the reclassifications outlined in the 2018 Master Plan. Habitat in ESA, MRLM-WM, and MRLM-VM classified lands would provide valuable resting, stopover, and/or foraging grounds for special status species. Any future activities that could potentially result in impacts on federally listed species will be coordinated with USFWS consistent with requirements found in Section 7 of the Endangered Species Act.

3.9 INVASIVE SPECIES

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

Both USACE and TPWD monitor and enforce aquatic nuisance species regulations in an effort to prevent the expansion/colonization of invasive species at Lake O' the Pines.

Section 2.2.5 and Appendix D of the 2018 Master Plan further describe invasive species at Lake O' the Pines.

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 Lake O' the Pines would continue to be managed according to the existing invasive species management practices. There would be no long-term major adverse impacts from invasive species as a result of implementing the No Action Alternative.

3.9.2 Alternative 2: Proposed Action

The land reclassifications, resource objectives, and resource plan required to revise the Lake O' the Pines Master Plan are compatible with the lake's invasive species management practices. The addition of 3,378 acres classified as ESA may provide long-term benefits as these areas may receive additional invasive species management. The objectives developed under the proposed action as explained in detail in Chapter 3 of the revised Master Plan will result in minor, long-term beneficial impacts in reducing and preventing the spread of invasive species. In summary these objectives are: monitoring for invasive species presence; addressing unauthorized uses of public lands which may spread invasive species; and evaluating erosion control as eroding lands provide colonization opportunities for invasive plant species. All of these would include a public outreach and education emphasis.

3.10 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

Cultural History Sequence

The earliest known Native American civilization to occur within the Lake O' the Pines area is documented to have occurred 12,500 years before present (B.P). From that time period on, various Native American tribes have occupied the area. The first European settlement was in 1542. From that point on the area would eventually be developed into Texas' 2nd largest inland port. However the detour of a major rail line and removal of various natural occurring dams within the Red River, would eventually bring demise to the port industry within the area. Then oil and iron were discovered, these two industries brought a boom to the area. With declining prices in oil and steel, population within the area steadily decreased over time as people were laid off. For more detailed information please see Section 2.3 of the Revised Master Plan.

Cultural Resources Management at Lake O' the Pines

Cultural resources preservation and management is an equal and integral part of all resource management at Civil Works operating projects. The term "cultural resources" is a broad term meant to include anything that is of cultural significance to humans and that has some historical value, and generally includes, but is not limited to, the following categories of resources: archaeological sites (historic and prehistoric), historic standing structures, traditional cultural properties, and sacred sites. To date, 250 archeological sites have been recorded at Lake O' the Pines. None have been formally listed on the National Register of Historic Places (NRHP) and none have received the designation of "eligible" for NRHP inclusion. In some cases, this is due to the fact that the site might be inundated by the reservoir at its conservation pool level. In other cases, it is a result of the fact that limited NRHP eligibility testing has been performed at Lake O' the Pines. The cultural, historical, and archaeological resources are described in detail in Section 2.3 of the 2018 Master Plan and are incorporated herein by reference (USACE 2018).

Numerous cultural resources laws establish the importance of cultural resources to our Nation's heritage. With the passage of these laws, the historical intent of Congress has been to ensure that the Federal government protects cultural resources. Stewardship of cultural resources on USACE Civil Works water resources projects is an important part of the overall Federal responsibility.

3.10.1 Alternative 1: No Action Alternative

There would be no major adverse impacts on cultural resources as a result of implementing the No Action Alternative, as there would be no changes to the existing 1989 Master Plan. However, maintaining existing land classifications would not recognize the presence or importance of cultural resources, which could lead to long-term negative moderate or major impacts as a result of implementing the No Action Alternative.

3.10.2 Alternative 2: Proposed Action

Impacts on cultural, historical, and archaeological resources were considered during the refinement processes of land reclassifications. Based on previous surveys at Lake O' the Pines, 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. The Proposed Action would potentially result in long-term and moderate beneficial impacts with the reclassification of additional 3,378 acres to ESA as those lands afford more protection against development and ground disturbing activities. Therefore, no significant adverse impacts on cultural, historical, and archaeological resources would occur as a result of implementing revisions to Lake O' the Pines Master Plan. Any future ground-disturbing activities would take into account Section 106 of the NHPA and other applicable cultural resource statutes to insure that cultural resources are protected. Also, several cultural resources management objectives were developed to promote the protection of Lake O' the Pines cultural resources and are described in Chapter 3 of the revised Master Plan.

3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The zone of interest for this socioeconomic analysis includes Marion, Morris, Upshur, Camp, Cass, Gregg, and Harrison Counties and Caddo Parish with additional economic influence extending up to a 30 mile radius of Lake O' the Pines. This east Texas-county region, where the most impacts would be expected, has been utilized as the basis in summarizing the population characteristics of Lake O' the Pines. The population, education level, employment rates, income, and household characteristics of the area are discussed in detail in Section 2.4 of the 2018 Master Plan and are incorporated herein by reference (USACE, 2018).

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by President Clinton on 11 February 1994. It was intended to ensure that proposed federal actions do not have disproportionately high and adverse human health and environmental effects on minority and low-income populations and to ensure greater public participation by minority and low-income populations. It required each agency to develop an agency-wide environmental justice strategy. A Presidential Transmittal Memorandum issued with the EO states that "each federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321, et seq."

EO 12898 does not provide guidelines as to how to determine concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the Proposed Actions. The U.S. Census American Community Survey provides the most recent estimates available for race, ethnicity, and poverty. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or Other (section 2.4.2 of the 2018 Master Plan). Poverty status is used to define low-income. Poverty is defined as the number of people with income below poverty level, which was \$24,588

for a family of four in 2017 with two children under 18 (US Census Bureau, 2018). A potential disproportionate impact may occur when the minority in the study area exceeds 50 percent or when the percent minority and/or low-income in the study area are meaningfully greater than those in the region.

Protection of Children

EO 13045 requires each federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas. Please refer to Figure 2.5 in section 2.4.2 of the 2018 Master Plan for a graphical representation for the percentage of total population that are children in the study area.

3.11.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no changes to the existing Master Plan, with the USACE continuing to manage Lake O’ the Pines natural resources as set forth in the 1989 Master Plan. There would be no major adverse long-term impacts on socioeconomic resources. Beneficial socioeconomic impacts existing as a result of the implementation of the 1989 Master Plan would continue, as visitors would continue to come to the lake from surrounding areas. In addition to camping in USACE-operated campgrounds, many visitors purchase goods such as groceries, fuel, and camping supplies locally, eat in local restaurants, stay in local hotels and resorts, play golf at local golf courses, and shop in local retail establishments. These activities would continue to bring revenues to local companies, provide jobs for local residents, and generate local and state tax revenues. There would be no disproportionately high or adverse impacts on minority or low-income populations or children with the implementation of the No Action Alternative.

3.11.2 Alternative 2: Proposed Action

Lake O’ the Pines is beneficial to the local economy through indirect job creation and local spending by visitors, and also offers a variety of recreation opportunities and uses innovative maintenance and planning programs to minimize usage fees. The 1,231 acres of HDR and 1,782 acres of MRML-LDR will continue to provide recreation opportunities. The 4,236 acres of ESA land will also allow minimally invasive recreation activities such as wildlife viewing and hiking.

Since recreational opportunities remain abundant, and the revised Master Plan recognizes and reinforces projected recreational trends there would be negligible, long-term beneficial impacts on area economic stability and environmental justice populations resulting from the revision of the 1989 Master Plan.

In Chapter 3 of the revised 2018 Master Plan, recreational objectives support improving and modernizing recreation opportunities at Lake O' the Pines that promote continued visitation and related spending.

3.12 RECREATION

The majority of visitors to Lake O' the Pines come from a 100-mile radius of the reservoir. These visitors are a diverse group of people with a wide variety of interests. Examples of visitors include campers who utilize the county and federally operated campgrounds around the reservoir; adjacent residents; hunters and anglers who utilize public hunting areas and participate in fishing tournaments; marina customers who utilize the marinas on the reservoir; and day users who picnic, hike, bird watch, bicycle, and ride horses. Recreational facilities, activities, and needs are discussed in detail in Section 2.5 of the 2018 Master Plan.

3.12.1 Alternative 1: No Action Alternative

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

3.12.2 Alternative 2: Proposed Action

The primary objective for revising the Lake O' the Pines 1989 Master Plan is to capture current land use and management that has evolved to meet day-to-day operational needs. Under the Proposed Action, the required revisions to the Lake O' the Pines Master Plan would be compatible with current recreation management plans and recognizes regional and national outdoor recreation trends. The reclassification changes required for the Proposed Action were developed to enhance regional goals associated with good stewardship of land and water resources that would allow for continued recreational use and development of project lands. The 1,231 acres of HDR and 1,782 acres of MRML-LDR will continue to provide recreation opportunities. The 4,236 acres of ESA land will also allow minimally invasive recreation activities such as wildlife viewing and hiking. Since recreational opportunities remain abundant, and the revised Master Plan recognizes and reinforces projected recreational trends there would be negligible, long-term beneficial impacts on recreation resulting from the revision of the Master Plan from the Proposed Action.

3.13 AESTHETIC RESOURCES

Lake O' the Pines is best known for the mature pine and pine-hardwood forests that surround the lake, as well as the excellent hunting, fishing, and camping opportunities. Lake O' the Pines proper and surrounding federal lands also offers public, open space value and scenic vistas that are unique in the region.

3.13.1 Alternative 1: No Action Alternative

There would be no major adverse impacts on visual resources as a result of implementing the No Action Alternative, as there would be no changes to the existing 1989 Master Plan.

3.13.2 Alternative 2: Proposed Action

Lake O' the Pines currently plays a pivotal role in availability of parks and open space in Marion, Harrison, Upshur, Camp, Titus and Morris Counties. Even though the amount of acreage available for HDR reduces from 1,596 acres to 1,231 acres and MRML-LDR reduces from 3,567 acres to 1,782 with implementation of the 2018 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1989 at Lake O' the Pines. The conversion of these lands would have no effect on current or projected public use or visual aesthetics.

Furthermore, the net increase in the acreage of land classified as ESAs by 3,378 acres and MRML-VM by 1,525 acres would protect lands that are aesthetically pleasing at Lake O' the Pines and limit future development. Natural Resources Management Objectives for the lake will continue to minimize activities which will disturb the scenic beauty and aesthetics of the lake.

The establishment of utility corridors would further limit habitat fragmentation and potential impacts to aesthetics areas at Lake O' the Pines. Long-term, minor benefits to aesthetics resources would occur as a result of the 2018 Master Plan.

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

3.14 HAZARDOUS MATERIALS AND SOLID WASTE

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

3.14.1 Alternative 1: No Action Alternative

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

3.14.2 Alternative 2: Proposed Action

The land reclassifications required to revise the Master Plan would be compatible with Lake O' the Pines hazardous and toxic waste and solid waste management practices. Therefore, no major, adverse, long-term impacts due to hazardous, toxic, radioactive, or solid wastes would occur as a result of implementing the 2018 Master Plan.

3.15 HEALTH AND SAFETY

As mentioned earlier in this document, Lake O' the Pines authorized purposes include flood risk management, water conservation, and recreation. Compatible uses incorporated in project operation management plans include programs that establish recreation management practices to protect the public, such as water safety education, safe boating and swimming regulations, safe hunting regulations, and speed limit and

pedestrian signs for park roads. The staff of Lake O' the Pines are in place to enforce these policies, rules, and regulations during normal park hours.

3.15.1 Alternative 1: No Action Alternative

Under the No Action Alternative, the 2018 Master Plan would not be revised. No major, adverse, long-term impacts on human health or safety would be anticipated.

3.15.2 Alternative 2: Proposed Action

Under the Proposed Action, the required revisions to the Lake O' the Pines 1989 Master Plan would be compatible with project safety management plans. The project would continue to have reporting guidelines in place should water quality become a threat to public health. No wake areas were designated in front of every boat ramp and marina. Restricted areas were established upstream and downstream of Lake O' the Pines Dam, around all designated swim beaches, and around municipal water intake structures. Overall there are no land class reclassifications that would have any impact on human health or safety. Several new recreational, education, and outreach objectives were developed to support ongoing efforts that provide for public health and safety and can be found in Chapter 3 of the revised Master Plan. Existing regulations and safety programs throughout the Lake O' the Pines area would continue to be enforced to ensure public safety. Therefore, there would be no major, adverse, long-term impacts on public health and safety as a result of implementing the Proposed Action.

3.16 SUMMARY OF CONSEQUENCES AND BENEFITS

Table 3.16 provides a tabular summary of the consequences and benefits for the No Action and Proposed Action alternatives for each of the 13 assessed resource categories.

Table 3.16. Summary of Consequences and Benefits

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Land Use	No effect on private lands. Minor to moderate benefit from placing emphasis on protection of wildlife and environmental values on USACE land and maintaining current level of developed recreation facilities.	Fails to recognize recreation trends and regional natural resource priorities.	Recognizes recreation trends and regional natural resource priorities identified by TPWD, and public comment.	Land classification changes and new resource objectives fully recognize passive use recreation trends and regional environmental values.
Water Resources Including Groundwater, Wetlands, and Water Quality	Minor change with benefits to recognize value of wetlands.	Fails to recognize the water quality benefits of good land stewardship and need to protect wetlands.	Promotes restoration and protection of wetlands and good land stewardship.	Specific resource objective promotes restoration and protection of wetlands.
Climate	Minor change to recognize need for sustainable, energy efficient design.	Fails to promote sustainable, energy efficient design.	Promotes land management practices and design standards that promote sustainability.	Specific resource objectives promote national climate change mitigation goal. Leadership in Energy and Environmental Design (LEED) standards for green design, construction, and operation activities will be employed to the extent practicable.
Climate Change and Greenhouse Gases	Same as for Climate	Same as for Climate	Same as for Climate	Same as for Climate
Air Quality	Negligible change to help reduce air emissions.	No effect	Promotes activities and goals that will help to reduce emissions.	Reduces HDR and MRML-LDR acres, which in turn reduces the motor vehicle exhaust that is produced. New resource objectives also help to reduce emissions.

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Topography, Geology and Soils	Beneficial change to place emphasis on good stewardship of land and water resources.	Fails to specifically recognize known and potential soil erosion problems.	Encourages good stewardship that would reduce existing and potential erosion.	Specific resource objectives call for stopping erosion from overuse and land disturbing activities.
Natural Resources	Major benefits through land reclassification and resource objectives.	Fails to recognize ESAs, and regional priorities calling for protection of wildlife habitat.	Gives full recognition of sensitive resources and regional trends and priorities related to natural resources.	Reclassification of lands included 3,378 additional acres of ESA and a net increase in lands emphasizing wildlife management.
Threatened & Endangered Species and rare/unique communities as identified in the TXNDD Database	Moderate benefits from land reclassifications and utility corridors for recognizing both federal and state-listed species.	Fails to recognize current federal and state-listed species.	Fully recognizes federal and state-listed species as well as the TXNDD Database listed by TPWD.	The master plan sets forth the most recent listing of federal and state-listed species and addresses on-going commitments associated with USFWS Biological Opinions.
Invasive Species	Minor change to recognize several recent and potentially aggressive invasive species.	Fails to recognize current invasive species and associated problems.	Fully recognizes current species and the need to be vigilant as new species may occur.	Specific resource objectives specify that invasive species shall be monitored and controlled as needed.
Cultural, Historical and Archaeological Resources	Minor change to recognize current status of cultural resource.	Included cursory information about cultural resources that is inadequate for future management and protection.	Recognizes the presence of cultural resources and places emphasis on protection and management.	Reclassification of lands and specific resource objectives were included for protection of cultural resources.
Socioeconomics and Environmental Justice	No change	No effect	No effect	No added benefit
Recreation	Negligible benefits to outdoor recreation programs.	Fails to recognize current outdoor recreation trends.	Fully recognizes current outdoor recreation trends and places special emphasis on trails.	Specific management objectives focused on outdoor recreation opportunities and trends are included.

Resource	Change Resulting from Revised Master Plan	Environmental Consequences		Benefits Summary
		No Action Alternative	Proposed Action	
Aesthetic Resources	Minor benefits through land reclassification, utility corridors, and resource objectives.	Fails to minimize activities that disturb the scenic beauty and aesthetics of the lake.	Promotes activities that limit disturbance to the scenic beauty and aesthetics of the lake.	Specific management objectives to minimize activities that disturb the scenic beauty and aesthetics of the lake.
Hazardous Materials and Solid Waste	No change	No effect	No effect	No added benefit
Health and Safety	Minor change to promote public safety awareness.	Fails to emphasize public safety programs.	Recognizes the need for public safety programs.	Includes specific management objectives to increase water safety outreach efforts. Also, classifies 104 acres of water surface as restricted and designated no-wake for public safety purposes.

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SECTION 4: CUMULATIVE IMPACTS

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

By Memorandum dated June 24, 2005, from the Chairman of the CEQ to the Heads of Federal Agencies, entitled "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis", CEQ made clear its interpretation that "...generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions..." and that the "...CEQ regulations do not require agencies to catalogue or exhaustively list and analyze all individual past actions." This cumulative impacts analysis summarizes expected environmental impacts from the combined impacts of past, current, and reasonably foreseeable future activities affecting any part of the human or natural environments impacted by the Proposed Action.

4.1 Past Impacts within the zone of interest.

Lake O' the Pines was originally authorized by the Flood Control Acts of 1941 and late in 1944. Construction of the Ferrells Bridge Dam in January 1955 and was completed in December 1959. Lake O' The Pines encompasses 11,644 acres of land and 17,767 acres of surface water.

Completed in 2013, under Section 1135 of the USACE Continuing Authorities Program, the Big Cypress Bayou Fish and Wildlife Restoration project restored several habitat types in and near Jefferson, Texas. With TPWD being the local sponsor, bottomland hardwood and bald cypress habitats were improved or restored, spawning habitat for paddlefish was created through the placement of gravel beds, along with roosting habitat for bats. Environmental education and interpretative access was also created with a riverside boardwalk trail.

4.2 Current And Reasonably Foreseeable Projects Within And Near The Zone Of Interest

Future management of the 16,063 acres of Flowage Easement Lands at Lake O' the Pines includes routine inspection of these areas to ensure that the Government's rights specified in the easement deeds are protected. In almost all cases, the Government acquired the right to prevent placement of fill material or habitable structures on the easement area. Placement of any structure that may interfere with the

USACE flood risk management and water conservation missions may also be prohibited.

Regional and county mobility plans call for general roadway improvements of some existing roadways within the surrounding vicinity of USACE lands. No local road expansion or construction projects planned or anticipated to take place within the zone of interest during the planning horizon of the 2018 Master Plan.

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 Lake O' the Pines. 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, 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.

Private mineral owners are anticipated to continue exploration and production activities within their respective mineral deposits that underlie the majority of USACE lands. The rate at which exploration and production activity may occur is unpredictable as it is governed by numerous factors such as the value of the deposits in relation to national and international markets. Through the use of mineral subordination rights acquired by USACE on private minerals, basic resource protection measures can be required when mineral exploration and production activities are proposed, to the extent that private mineral owners cannot be denied reasonable access to their minerals. Federal ownership of minerals underlying USACE lands is very limited, but such minerals could be proposed for lease to private entities, provided USACE determines that the leasing would not interfere with operation of the project for its intended purposes, there is no threat to public health and safety, and natural resources are not harmed. If leasing of federal minerals would occur in the future, BLM would execute the lease and seek public input prior to the lease. It is anticipated that USACE would require BLM to stipulate "No Surface Occupancy" of federal land as a condition of the lease. Coordination with BLM during Plan preparation indicated there are currently no active or proposed leases of federally-owned minerals underlying USACE lands.

The Resource Plan in Chapter 5 of the 2018 Master Plan does not list any specific actions that may occur in the future.

4.3 Analysis Of Cumulative Impacts

Impacts on each resource were analyzed according to how other actions and projects within the zone of interest might be affected by the No Action Alternative and Proposed Action. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis the

intensity of impacts will be classified as negligible, minor, moderate, or major. These intensity thresholds were previously defined in Section 3.0. Moderate growth and development are expected to continue in the vicinity of Lake O' the Pines and cumulative adverse impacts on resources would not be expected when added to the impacts of activities associated with the Proposed Action or No Action Alternative. A summary of the anticipated cumulative impacts on each resource is presented below.

4.3.1 Land Use

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

4.3.2 Water Resources

Lake O' the Pines was developed for flood control, water supply, fish and wildlife management, and recreation purposes. A major impact would occur if any action is inconsistent with adopted surface water classifications or water use plans, or if an action would substantially alter those resources required for, supporting, or benefiting the current use. The reclassifications required for the Proposed Action would allow land management and land uses to be compatible with the goals of good stewardship of water resources.

Other activities surrounding Lake O' the Pines, 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. However, the cumulative impacts on water quality from the Proposed Action at Lake O' the Pines are anticipated to be negligible when combined with past and proposed actions in the area.

4.3.3 Climate

The implementation of the revised land use classifications in the 2018 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 Lake O' the Pines 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 Lake O' the Pines, the

2018 Master Plan and all associated documents would be reviewed and revised as necessary. Therefore, implementation of the 2018 Master Plan, when combined with other existing and proposed projects in the region, would not result in major cumulative impacts on climate change and GHG emissions.

4.3.5 Air Quality

For the area surrounding Lake O' the Pines, activities that could add to air emissions in the area are likely few and minor in nature. Vehicle traffic along park and area roadways and routine daily activities in nearby communities contribute to current and future emission sources. Seasonal prescribed burning on Lake O' the Pines lands would have minor, negative impacts on air quality through elevated ground-level ozone and particulate matter concentrations; however, these seasonal burns are generally scheduled so that impacts are minimized. Minor improvements to the communities in the Lake O' the Pines area, such as construction of new business buildings and highway improvement projects could also contribute to minor future emissions. Implementation of the 2018 Master Plan will not contribute to major cumulative impacts in the region.

4.3.6 Topography, Geology, and Soils

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

Land use around Lake O' the Pines has changed in the past several years. Given the projected population growth and vast acreage of Prime Farmland in the area, there could be cumulative impacts on Prime Farmland in the Project area. However, the cumulative impacts on Prime Farmland from the Proposed Action at Lake O' the Pines are anticipated to be negligible when combined with past and proposed actions in the area.

4.3.7 Natural Resources

The significance threshold for natural resources would include a substantial reduction in ecological processes, communities, or populations that would threaten the long-term viability of a species or result in the substantial loss of a sensitive community that could not be offset or otherwise compensated. Past, present, and future projects are not anticipated to impact the viability of any plant species or community, rare or sensitive habitats, or wildlife. The establishment of ESA, MRML-WM, and MRML-VM areas, as well as resource objectives that favor protection and restoration of valuable natural resources will have beneficial cumulative impacts. No identified projects would threaten the viability of natural resources. Therefore, there would be long-term beneficial impacts to natural resources resulting from the revision of the 2018 Lake O'

the Pines Master Plan, including the establishment of utility corridors, when combined with past and proposed actions in the area.

4.3.8 Threatened and Endangered Species

The Proposed Action and No Action Alternative would not adversely impact threatened, endangered and special status species within the area. Should federally listed species change in the future (e.g., delisting of the Least Tern or other species or listing of new species), associated requirements will be reflected in revised land management practices in coordination with the USFWS. The USACE would continue cooperative management plans with the USFWS and TPWD to preserve, enhance, and protect critical wildlife habitat resources. One such example of this cooperation can be found in how USACE is actively working with USFWS, TPWD and various other agencies to maintain and restore the Paddlefish (*Polyodon spathula*) population in Big Cypress Bayou by releasing additional water when the species is spawning and creating habitat.

Projects proposed within the Lake O' the Pines project area, as well as past, present projects, are not anticipated to impact threatened and endangered species as they will be coordinated with the appropriate resource agencies. The land reclassifications as explained in detail in the above section 3.8.3 will allow for further protection of threatened, endangered and other unique/rare communities found within the TXNDD database. The reclassifications will also allow future land management practices that would maintain and enhance habitats for these species. The proposed utility corridors would limit further fragmentation of habitat and confine ongoing maintenance disturbances. Therefore, there would be major long-term beneficial impacts on threatened and endangered species resulting from the revision of the Lake O' the Pines 1989 Master Plan when combined with past and proposed actions in the area.

4.3.9 Invasive Species

To the extent that funding will allow, USACE will continue its proactive, cooperative herbicide treatments with TPWD to control these species that affect not only the natural biological resources, but also recreational opportunities. Pesticide treatment for invasive ants will also continue. The USACE will also continue to monitor for zebra mussels and take all practicable measures to prevent them from becoming introduced to Lake O' the Pines.

Invasive species control has and will continue to be conducted on various areas across the project lands. Implementing Best Management Practices (BMP) will help reduce the introduction and distribution of invasive species, ensuring that proposed actions in the region will not contribute to the overall cumulative impacts related to invasive species. The land reclassifications required to revise the 1989 Master Plan are compatible with Lake O' the Pines invasive species management practices. Therefore, there would be minor long-term beneficial impacts on reducing and preventing invasive species within the area surrounding Lake O' the Pines.

4.3.10 Cultural, Historical, and Archaeological Resources

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

4.3.11 Socioeconomics and Environmental Justice

The Proposed Action would not result in the displacement of persons (minority, low-income, children, or otherwise) and decrease in people recreating at Lake O' the Pines as a result of implementing the revised land classifications. The creation of jobs, increase of visitor spending and relative decrease of usage fees results in a positive impact to the local economy. Therefore, the effects of the Proposed Action on environmental justice and the protection of children, when combined with other ongoing and proposed projects in the Lake O' the Pines area, are anticipated to have negligible long-term beneficial impacts.

4.3.12 Recreation

Lake O' the Pines is beneficial to the local visitors and also offers a variety of free recreation opportunities. Some of the popular recreation activities at Lake O' the Pines are, on a national basis, either static or declining in participation. For example, developed camping activity, power boating, hunting, and fishing have experienced small to moderate declines in recent years. In contrast to these declines, significant increases in hiking, walking, sightseeing, wildlife viewing and canoeing/kayaking have occurred in recent years. Even though the amount of acreage available for HDR and MRML-LDR would decrease overall with implementation of the 2018 Master Plan, these land reclassifications reflect changes in land management and land uses that have occurred since 1989 at Lake O' the Pines. The lands that remain in the HDR classification include undeveloped acreage that could be used for future outdoor recreation development, and all MRML lands that are available for passive recreation uses characteristic of MRML-LDR lands. The conversion of these lands would have no effect on current or projected public use. Therefore, the effects of the Proposed Action, when combined with other existing and proposed projects in the region, would result in negligible long-term beneficial impacts on the area recreation.

4.3.13 Aesthetic Resources

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

4.3.14 Hazardous Materials and Solid Waste

No hazardous material or solid waste concerns would be expected with implementation of the 2018 Master Plan; therefore, when combined with other ongoing

and proposed projects in Lake O' the Pines, there would be no major long-term adverse impacts on hazardous materials and solid waste.

4.3.15 Health and Safety

No health or safety risks would be created by the Proposed Action. The effects of implementing the 2018 Master Plan, when combined with other ongoing and proposed projects in the Lake O' the Pines area, would result in no major long-term adverse impacts on health and safety for the area.

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SECTION 5: COMPLIANCE WITH ENVIRONMENTAL LAWS

This EA has been prepared to satisfy the requirements of all applicable environmental laws and regulations, and has been prepared in accordance with the CEQ's implementing regulations for NEPA, 40 CFR Parts 1500 – 1508, and the USACE ER 200-2-2, *Environmental Quality: Procedures for Implementing NEPA*. The revision of the 2018 Master Plan is consistent with the USACE's Environmental Operating Principles. The following is a list of applicable environmental laws and regulations that were considered in the planning of this project and the status of compliance with each:

Fish and Wildlife Coordination Act of 1958, as amended – The USACE initiated public involvement and agency scoping activities to solicit input on the 2018 Master Plan revision process, as well as identify reclassification proposals, and identify significant issues related to the Proposed Action. Information provided by USFWS and TPWD on fish and wildlife resources has been utilized in the development of the 2018 Master Plan.

Endangered Species Act of 1973, as amended – Current lists of threatened or endangered species were compiled for the revision of the 2018 Master Plan. There would be no adverse long-term impacts on threatened or endangered species resulting from the revision of the 2018 Master Plan. However, major long-term beneficial impacts, such as habitat protection, could occur as a result of the revision of the 2018 Master Plan.

Executive Order 13186 (Migratory Bird Habitat Protection) – Sections 3a and 3e of EO 13186 directs federal agencies to evaluate the impacts of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative impacts on migratory birds. The 2018 Master Plan revision will not result in adverse impacts on migratory birds or their habitat. Beneficial impacts could occur through protection of habitat as a result of the 2018 Master Plan revision.

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

Clean Water Act (CWA) of 1977 – The Proposed Action is in compliance with all state and federal CWA regulations and requirements and is regularly monitored by the USACE and TCEQ for water quality. A state water quality certification pursuant to Section 401 of the CWA is not required for the 2018 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.

National Historic Preservation Act (NHPA) of 1966, as amended – Compliance with the NHPA of 1966, as amended, requires identification of all properties in the project area listed in, or eligible for listing in, the NRHP. All previous surveys and site salvages were coordinated with the Texas State Historic Preservation Officer. Known sites are mapped and avoided by maintenance activities. Areas that have not undergone cultural resources surveys or evaluations will need to do so prior to any earthmoving or other potentially impacting activities.

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 2018 Master Plan revision.

Farmland Protection Policy Act (FPPA) of 1980 and 1995 – The FPPA's purpose is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. Prime Farmland is present within and adjacent to Lake O' the Pines. The 2018 Master Plan would not impact Prime Farmland present on Lake O' the Pines.

Executive Order 11990, Protection of Wetlands – EO 11990 requires federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in executing federal projects. The 2018 Master Plan complies with EO 11990.

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

CEQ Memorandum dated August 11, 1980, Prime or Unique Farmlands – Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The 2018 Master Plan would not impact Prime Farmland present on Lake O' the Pines project lands.

Executive Order 12898, Environmental Justice – This EO directs federal agencies to achieve environmental justice to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review. Agencies are required to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The revision of the 2018 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 for this project from the reclassification of land would not be considered an irreversible commitment because subsequent Master Plan revisions could result in some lands being reclassified to a prior, similar land classification. An irretrievable commitment of resources is typically associated with the loss of productivity or use of a natural resource (e.g., loss of production or harvest). No irreversible or irretrievable impacts on federally protected species or their habitat is anticipated from implementing revisions to the Lake O’ the Pines 2018 Master Plan.

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SECTION 7: PUBLIC AND AGENCY COORDINATION

In accordance with 40 CFR §§1501.7, 1503, and 1506.6, the USACE initiated public involvement and agency scoping activities to solicit input on the 2018 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. There were 3 public scoping meetings, the first one was held on 25 April 2017 in Jefferson, Texas, the second one was held on 27 April 2017 in Longview, TX and the third one was held on 16 May 2017 in Jefferson, Texas. The Fort Worth District, placed advertisements on the USACE webpage, provided news releases to media prior to the public scoping meetings. The fourth and fifth public meetings were held on July 10, 2018 in Jefferson, TX and July 11, 2018 in Longview, TX. These meetings introduced the public to the Draft Master Plan and EA and began the 30-day public review period of the Draft Master Plan and EA. For the fourth and fifth public meetings, USACE, Fort Worth District, placed advertisements on the USACE webpage, provided news releases for media, and placed printed publications in local media. Attachment A includes the ads published in the local newspaper, USACE News Releases, The Notice of Availability, comments received from agencies, and the agency and stakeholders distribution list. The EA was coordinated with agencies having legislative and administrative responsibilities for environmental protection. Please refer to Section 7.1 of the 2018 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

%	Percent
°	Degrees
BMP	Best Management Practice
BP	Before Present
CAP	Climate Action Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	CO ₂ -equivalent
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EP	Engineer Pamphlet
ER	Engineer Regulation
ERS	Environmental Radiation Surveillance
ESA	Environmentally Sensitive Area
ESA-IFR	Inactive/Future Recreation
F	Fahrenheit
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GCWA	Golden-cheeked Warbler
HDR	High Density Recreation
IFR	Inactive/Future Recreation
LEED	Leadership in Energy & Environmental Design
MRML-IFR	Future/Inactive Recreation
MRML	Multiple Resource Management Lands
MRML-LDR	Low Density Recreation
MRML-WM	Wildlife Management
MRML-VM	Vegetative Management
msl	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NO	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRRS	National Recreation Reservation Service
O ₃	Ozone
OAQPS	Office of Air Quality Planning and Standards

Pb	Lead
PCB	Polychlorinated Biphenyls
PCPI	Per Capita Personal Incomes
PM _{2.5}	Particulate Matter Less than 2.5 Microns
PM ₁₀	Particulate Matter Less than 10 Microns
PO	Project Operations
REC	Recreational Areas
ROD	Record of Decision
RPEC	Regional Planning and Environmental Center
SGCN	Species of Greatest Conservation Need
SO ₂	Sulfur Dioxide
SUPER	USACE Suite of Computer Programs
TCAP	Texas Conservation Action Plan
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds
WHAP	Wildlife Habitat Appraisal Procedures
WM	Wildlife Management
VM	Vegetative Management

SECTION 10: LIST OF PREPARERS

Mandy McGuire – Compliance Section Chief, Regional Planning and Environmental Center; 8 years of USACE experience.

Zia Burns – Biologist, Regional Planning and Environmental Center, 6 years of USACE experience.

Paul E. Roberts - Biologist, Regional Planning and Environmental Center, 4 years of USACE experience.

Brandon Wadlington – Biologist, Regional Planning and Environmental Center, 3 years of USACE experience.

Justyss Watson – Biologist, Regional Planning and Environmental Center, 4 years of USACE experience.

Shelby Klein – Biologist, Regional Planning and Environmental Center, 1 year of USACE experience.

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ATTACHMENT A: PUBLIC AND AGENCY COORDINATION

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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
LAKE O' THE PINES PROJECT OFFICE
2669 FM 726
JEFFERSON, TX 75657

April 17, 2017

The Fort Worth District, U.S. Army Corps of Engineers (USACE) will host two separate meetings, one on 25 April 2017 and another on 27 April 2017 to gain public input as it prepares to revise the Master Plan for Lake O' the Pines.

The first meeting will be held on April 25th at the **City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, TX 75657**. The second meeting will be held on April 27th at the **Longview Public Library, 222 W. Cotton St., Longview, TX 75601**. Both meetings will have a brief presentation beginning at 6:00 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. 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 flood risk management, water supply, or shoreline management permitting missions of the project. The Master Plan study area will include Lake O' the Pines proper and all adjacent recreational and natural resources properties under federal control.

Lake O' the Pines, originally Ferrell's Bridge Dam, was constructed as a flood mitigation project. After a record-breaking drought in Texas during the 1950s, there was an emphasis on reservoirs serving the secondary purpose of water storage facilities for Texas residents, communities, businesses, agriculture, and others. The current Master Plan dated May of 1989 is an update to the 1975 Master Plan, and is in need of revision to address changes in regional land use, population, outdoor recreation trends, and USACE management policy.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as invasive species management and threatened and endangered species habitat. Public participation is critical to the successful revision of the Master Plan.

Questions pertaining to the proposed revision can be addressed to: Matthew Like, Lake Manager, U.S. Army Corps of Engineers, 2669 FM 726, Jefferson, Texas 75657, (903) 665-2336, ext. 33, and Ms. Rhonda Fields, Project Manager, CESWF-PEC-TM, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1681.

Sincerely

Matthew Like
Natural Resources Manager
Lake O' the Pines Project Office
USACE, Piney Woods Region

LAKE O' THE PINES - LIST OF STAKEHOLDERS & AGENCIES

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Northeast Texas Municipal Water District

- rspeightnetmwd@aol.com and netmwd@aol.com

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Marion County Chamber of Commerce

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LAKE O' THE PINES - LIST OF STAKEHOLDERS & AGENCIES

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Lake O The Pines Master Plan Revision

General Information

The Army Corps of Engineers (USACE), Fort Worth District, is revising the Lake O' the Pines Master Plan. The Master Plan is intended to serve as a comprehensive land and recreational management plan with a life span of 25 years. It guides the stewardship of natural and cultural resources and the provision of outdoor recreation facilities and opportunities to ensure sustainability of federal land associated with Lake O' the Pines.

About Lake O' the Pines

Lake O' the Pines was created by the construction of the Ferrell's Bridge Dam on the Big Cypress Bayou approximately 81 miles upstream from the Red River. The reservoir was authorized by the Flood Control Act of 1946 and created as part of the overall plan for flood control in the Red River Basin below Denison Dam in Oklahoma. Additional purposes of both recreation and water supply were added during construction. The current Master Plan is an update to the 1975 Master Plan dated May of 1989 and is in need of revision to address changes in regional land use, population, outdoor recreation trends and USACE management policy.



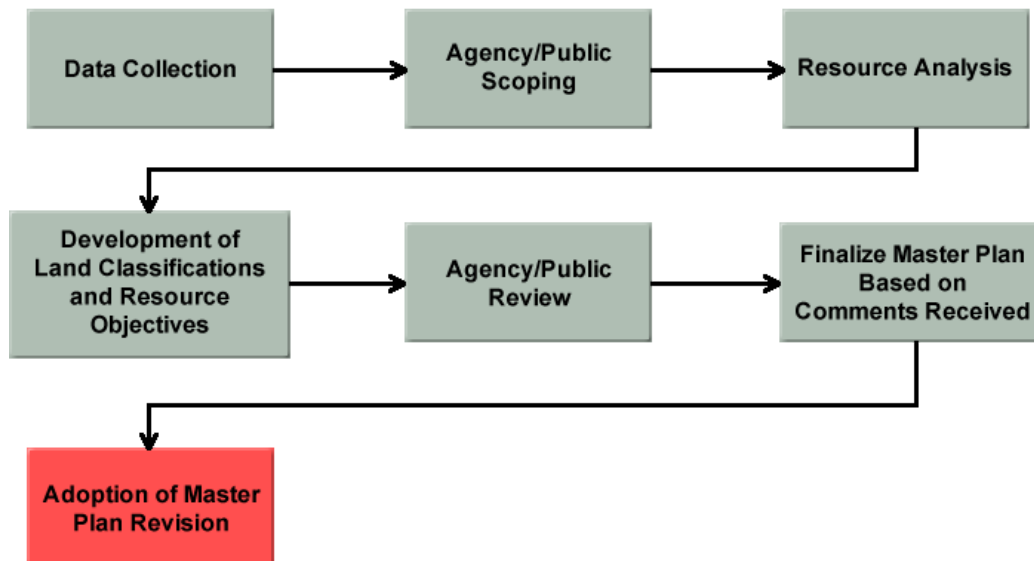
What is a Master Plan?

The Master Plan is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resources project.

Why Revise the Lake O' the Pines Master Plan?

The current Master Plan for Lake O' the Pines was prepared in 1989 as an update to the 1975 Master Plan. The Plan and the land classifications are in need of revision to address changes in regional land use, population, outdoor recreation trends and USACE management policy. Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as invasive species management and threatened and endangered species habitat. Public participation is critical to the successful revision of the Master Plan.

The Master Planning Process







Related Files






July 11 and 12, 2018 Public Meetings

- Comment Form with Instructions
- Public Notice for Public Meeting
- Public Meeting - Meeting Presentation
- Draft Master Plan and Environmental Assessment (90.2 MB)
- News Release NR18-039

April 25 and 27, 2017 Public Meetings

-  [Comment Form with Instructions](#)
-  [Public Notice for Public Meeting](#)
-  [Public Meeting - Meeting Presentation \(2.6 MB\)](#)
-  [Public Meeting - Map of Lake O The Pines \(6.5 MB\)](#)

Master Plan for Resource Use - September 1988

-  [Master Plan - 1 of 5 \(7.9 MB\)](#)
-  [Master Plan - 2 of 5 \(9.8 MB\)](#)
-  [Master Plan - 3 of 5 \(8.3 MB\)](#)
-  [Master Plan - 4 of 5 \(10.4 MB\)](#)
-  [Master Plan - 5 of 5 \(11.6 MB\)](#)



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Valedictorian - Taylor Fuquay

Taylor Fuquay is the daughter of Shanna and Tom Solomon and Sean and Melinda Fuquay. Taylor has been a member of varsity softball, cheer, cross country, and volleyball over her high school career. She has also been involved in the National Honor Society as Treasurer, National Technical Honor Society, Student Council, HOSA as Parliamentarian, Student Health Advisory Committee, and the Spanish Club as President. She was awarded \$21,400 in scholarships that she will use to help pay for her college. Taylor will be graduating with a GPA of a 4.45, distinguished, and as the Valedictorian of her class, which allows her tuition to be paid in full for her year. She will be attending Texas A&M University in College Station to major in biomedical sciences. After college her plan is to attend medical school to pursue her dream of becoming a dermatologist.



Salutatorian – Hope Humphrey

Hope Humphrey, daughter of Seth and Jennifer Humphrey and sister to Billy James Humphrey, is graduating distinguished with a 4.43 GPA as Salutatorian. She is an active member of Band as Section Leader, National Honor Society, Color Guard as Captain, National Technical Honor Society as Treasurer, HOSA- Future Health Professionals as President, Student Council, and Spanish Club. Hope has earned \$109,220 in scholarships to further her education. She plans to use this money at Baylor University where she will attend during the fall semester of 2017. There, she will major in Anthropology on the Pre-Medical track. Hope then wishes to attend medical school and hopes to become a regenerative Stem Cell Doctor.

Txdot urges drivers to ‘share the road’ and help curb statewide increase in motorcycle fatalities

Austin - As more motorcycles take to the road, fatalities were up 6 percent last year.

In an effort to curb an increase in motorcycle fatalities on Texas roads, the Texas Department of Transportation is launching its “Share the Road: Look Twice for Motorcycles” campaign as part of Motorcycle Safety Awareness Month in May. The campaign implores drivers to watch closely for motorcycles, especially at intersections and when changing lanes.

“Part of our responsibility as motorists is to always be aware of other vehicles on the road and to give them plenty of space,” said TxDOT Executive Director James Bass. “Motorcycles are particularly vulnerable because they can be difficult to see and don’t have the standard safety features found in cars and trucks. On a motorcycle, even a relatively minor collision can be fatal, so we’re urging drivers to please keep an eye out for their fellow motorists.”

Motorcyclists are nearly 5 times more likely to be injured and 29 times more likely to be killed in a crash than car or truck occupants.[i] More than half (54 percent) of fatal motorcycle crashes result from a collision with a car or truck.[ii] From 2015 to 2016, Texas motorcycle fatalities increased from 464 to 493 (6 percent), and



crashes resulting in seriously injured motorcyclists increased from 1,902 to 2,006 (5 percent). The summer months have the highest incidences of motorcycle crashes.[iii] TxDOT’s “Share the Road: Look Twice for Motorcycles” campaign reminds drivers to:

- Always use turn signals.
- Give motorcycles plenty of space and don’t fol-

low too closely.

- Check mirrors before changing lanes.
- Give motorcyclists a full lane.

This year’s “Share the Road: Look Twice for Motorcycles” campaign will conduct outreach events inviting visitors to participate in activities that highlight motorcycle safety. Campaign tour stops are:

- o April 27 – Austin (statewide launch)
- o April 29 – San Antonio
- o April 30 – Houston
- o May 6 – Waco
- o May 18 – El Paso
- o May 27 – Dallas

To learn more about the campaign, visit LookTwiceTexas.com or visit TxDOT’s website at txdot.gov. You can also follow us on Facebook at facebook.com/TxDOT and on Twitter at twitter.com/txdot.

Lake O’ the Pines Master Plan revision

Press Release - U.S. Army Corps of Engineers - Lake O’ the Pines

The Lake O’ the Pines Master Plan update is underway and the Corps is soliciting written input from the public, and the initial comment period ends June 14. Submit comments by June 14.

For more information on the Master Plan including the revision process, and public comment instructions and forms please visit the web site: <http://www.swf.usace.army.mil/About/LakesandRecreation->

Information/MasterPlanUpdates/LakeOThePines.aspx

The Lake O’ the Pines Master Plan is the strategic land management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of a Corps project.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as inva-

sive species management. Public participation is critical to the successful revision of the Master Plan.

Questions pertaining to the proposed revision can be addressed to: Matthew Like, Lake Manager, U.S. Army Corps of Engineers, 2669 FM 726, Jefferson, Texas 75657, CESWF-OD-LP@USACE.ARMY.MIL, (903) 665-2336, ext. 33, and Ms. Rhonda Fields, Project Manager, CESWF-PEC-TP, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1681.

NOVELIST

From Page 1

it anyway. And it seems to have had an impact; when McClain met the acclaimed Pat Conroy and told him she was an author with his imprint, Story River Books, he didn’t recognize her name at first. But when she told him the book’s title, he screamed, “The cow!”

McClain is the type of writer who says dialogue aloud as she writes and lets the characters emerge on their own. For example, the ending wasn’t something that made her very happy to document.

“Oh my gosh, I saw it in my mind and I screamed, ‘No!’” she said. “But I kept writing it. I couldn’t do a Hollywood ending; you have to play the hand you’re dealt. You have to have the courage to go there.”

McClain, who has been traveling on her book tour for 13 weeks, says she’s having a great time.

“I’m living my dream,” she told the crowd. “Who gets to do that? I’m a 27-year overnight success.”

The book tour has been peppered with many special moments, she said. At a nursing home in Memphis, for example, a woman gave her a painting of cows from 1892, saying, “My kids don’t want this, Bren. You take it.”

The event in Jefferson was cohosted by the Friends of the Library and the Pulpwood Queens of Northeast Texas. All of the food served, such as biscuits and meatballs, had tie-ins to the novel, as did the Southern décor.

“You folks honor me,” said McClain, fighting back tears. “I’m deeply, deeply moved.”

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Sun Spots

MONDAY

SENIOR EXERCISE PROGRAM classes meet from 9:15 to 10:15 a.m. every Monday at the Mary Daughety Senior Center, 507 S. Kaufman in Linden. Classes are free. For more info, call 903-756-3907.

TUESDAY

LINDEN CHAMBER OF COMMERCE meets at 6 p.m. the first Tuesday of the month at the Linden Garden Club Building, which is located at 300 E Houston St. in Linden. For more info, call 903-756-8017.

CASS COUNTY RETIRED SCHOOL EMPLOYEES ASSOCIATION meets at 2 p.m. the second Tuesday of each month at the Mary Daughety Senior Citizen Center, 507 S. Kaufman in Linden.

DIABETES SUPPORT GROUP meets at 1 p.m. every third Tuesday in the Conference Center inside the Medical Plaza Building at CHRISTUS St. Michael Hospital-Atlanta. The hospital is located at

1007 S. William St. in Atlanta; the Medical Plaza is accessible via Pinecrest Drive. For more info, call 903-799-3004.

MARY DAUGHETY SENIOR CENTER hosts a 42 Tournament the fourth Tuesday of each month. Registration starts at 1 p.m. The venue is located at 507 S. Kaufman in Linden. For more info, call 903-756-3907.

CADDO WILDFLOWER CHAPTER OF THE NATIVE PLANT SOCIETY OF TEXAS meets at 6:30 p.m. the fourth Tuesday of the month at the Mary Daughety Senior Citizen Center at 507 S. Kaufman in Linden.

OAK GROVE QUILTING CLUB meets from 8:30 a.m. to 2:30 p.m. every Tuesday. The venue is on CR 2328, 1 mile from Hwy 43 South of Atlanta. Call 903-846-5192.

WEDNESDAY

LINDEN GARDEN CLUB FUNDRAISING LUNCHEON is at 11:30 a.m. the third Wednesday of every month. Dine-in, take-out or delivery, includes main dish, side

dish, dessert and a drink. Menu varies each month. Location is 300 E Houston St. in Linden. For more info, or to schedule a delivery or take-out order, call 903-601-1394.

SENIOR EXERCISE PROGRAM classes meet from 9:15 to 10:15 a.m. every Wednesday at the Mary Daughety Senior Center, 507 S. Kaufman in Linden. Classes are free. For more info, call 903-756-3907.

THURSDAY

CASS COUNTY MASTER GARDENERS meet at 6:30 p.m. the first Thursday of each month in the Conference Room at CHRISTUS St. Michael Hospital-Atlanta, which is located at 1102 S. William Street in Atlanta.

LINDEN GARDEN CLUB meets the first Thursday of the month at 11:30 a.m., a guest presentation and a meeting to follow. Location is 300 E Houston St. in Linden.

MARY DAUGHETY SENIOR CENTER hosts a 42 Tournament the second Thursday of each month. Registration starts at 1 p.m.

FRIDAY

SENIOR EXERCISE PROGRAM classes meet from 9:15 to 10:15 a.m. every Friday at the Mary Daughety Senior Center, 507 S. Kaufman in Linden. Classes are free. For info, call 903-756-3907.

SATURDAY

BURLESONS OF NORTHEAST TEXAS REUNION will be at 11 a.m. June 3 at the First Baptist Church Fellowship Hall at 306 Baker St. in Atlanta. Bring photo albums and memorabilia.

For info, contact delores.mccright@gmail.com.

THE CASEY COUSINS (descendant of William and LeNora Steed Casey) will host a reunion at 10 a.m. June 3 at the Bivins Community Center. Bring a covered dish to share. The venue is located at 143 Morse Road at FM 1841 in Bivins. For info or directions, call 214-476-6747 or 903-796-7884.

LINDARE BAPTIST CHURCH will host a singin' at 7 p.m. every first Saturday. The church is located at 1756 CR 1899, behind L-K High School in Linden.

SUNDAY

NEW COLONY CEMETERY ASSOCIATION will meet at 1:30 p.m. May 28, at the New Colony Baptist Church, which is located at 3086 Hwy. 59 North between Atlanta and Linden. For more info, call 903-490-5995.

Events for Sun Spots may be submitted at production@casscountynow.com. Notices are not guaranteed to run, according to space available. Please send at least one week ahead of the event. Deadline is 3 p.m. Thursday.

NOTICE Master Plan Revision U.S. Army Corps of Engineers Lake O' the Pines Submit Comments by June 14

The Lake O' the Pines Master Plan update is underway and the Corps is soliciting written input from the public, and the initial comment period ends June 14. For more information on the Master Plan including the revision process, and public comment instructions and forms please visit the web site:

<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates/LakeOThePines.aspx>

The Lake O' the Pines Master Plan is the strategic land management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of a Corps project.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as invasive species management. Public participation is critical to the successful revision of the Master Plan.

Questions pertaining to the proposed revision can be addressed to: Matthew Like, Lake Manager, U.S. Army Corps of Engineers, 2669 FM 726, Jefferson, Texas 75657, CESWF-OD-LP@USACE.ARM.Y.MIL, (903) 665-2336, ext. 33, and Ms. Rhonda Fields, Project Manager, CESWF-PEC-TP, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1681.

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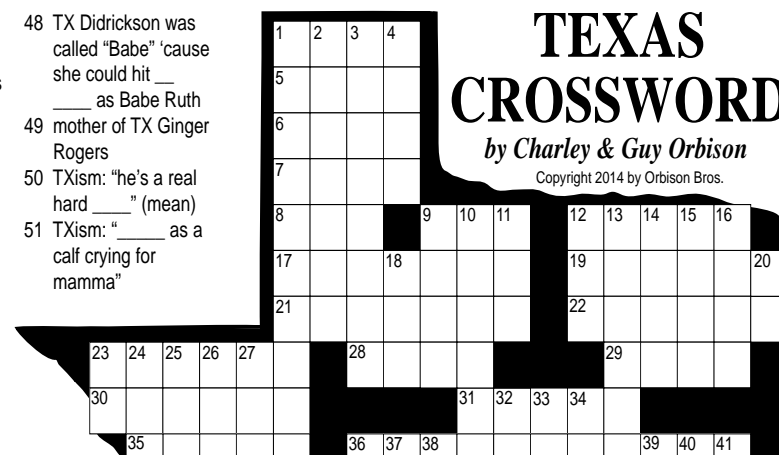
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ACROSS

1 swindle

5 TX-bred Fulghum's "___ Really Need to Know I Learned in Kindergarten"

6 "___ in peace"

7 Astro or Ranger lumber (2 wds.)

8 Dallas-based Pizza ___, Inc.

9 TXism: "she could sell ___ cubes to Eskimos"

12 TX atheist Madalyn Murray

17 vivid red

19 in Aransas Co. on hwy. 35

21 TXism: "as far as an outhouse ___ morning"

22 TXism: "loose as ___"

23 country shirt trim

28 weather-affecting current: "El ___"

29 TXism: "roosters crow, ___ deliver"

30 Pres. ___ Polk pushed for annexation of TX

31 Sam Bass: "Texas ___ Hood"

35 the first doctor in TX: ___ Jalot

36 in San Antonio: "___ Garden"

42 in TX, convicted are ___ by lethal injection

44 TX Kristofferson band: Border ___

46 Anahuac: "___ Capital of TX"

48 TX Didrickson was called "Babe" 'cause she could hit ___ as Babe Ruth

49 mother of TX Ginger Rogers

50 TXism: "he's a real hard ___" (mean)

51 TXism: "___ as a calf crying for mamma"

52 Tyler TV station

53 TX Gary Morris' "The Love She Found ___"

54 Cincinnati baseball team

56 stat for Astros' Scott Feldman

57 N.Y. time zone

58 golf peg

11 TXism: "I'm at the ___ of my rope!"

12 TXism: "at the drop ___ hat" (impulsive)

13 TX bandit singer: Willie ___

14 Valley medicine plant

15 TXism: "put ___ the back burner"

16 TX Perot

18 1101 in old Rome

20 dir. to Paris, TX from Dallas

23 "coffin nail" maker ___ Reynolds

24 TX Lyle Lovett's "Here ___"

25 county coroner (abbr.)

26 distribute the poker hands again

27 TXism: "as unnecessary ___ grease on a jackrabbit"

32 TXism: "dab it ___"

33 TXism: "let it ___"

34 TX Charley Pride sang "___ Anybody Goin' to San Antone?"

36 moonshine jar

37 TXism: "sharp as ___"

38 bluebonnet part

39 TXism: "can't hold a candle ___"

40 TXism: "wipe the slate clean"

41 TXism: "sounds like ___ axle" (bad singer)

43 TX George H.W. was director of this intelligence agcy. in 1976

45 this TX Duval was in film "The Shining" (init.)

47 back-up gear

48 groove-billed birds in the Valley

55 social outing

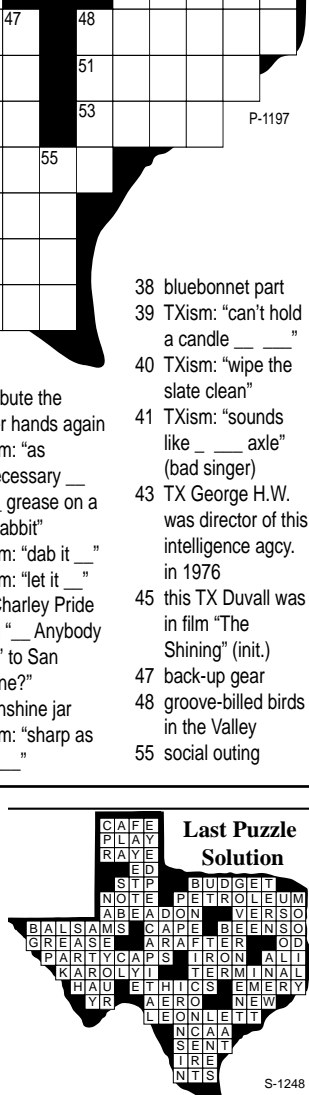
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News Release

U.S. ARMY CORPS OF ENGINEERS

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For Immediate Release:
April 17, 2017

Contact: Denisha Braxton 817-886-1435
denisha.l.braxton@usace.army.mil

Corps to host public meeting for the Lake O' the Pines Master Plan revision

FORT WORTH, Texas – The Fort Worth District, U.S. Army Corps of Engineers (USACE) will host two public meetings on April 25th and 27th to provide information and receive public input as it prepares to revise the Master Plan for Lake O' The Pines.

The two meetings will be identical and are being held at two separate locations for the convenience of the public. The meeting on **April 25th will be held at the City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, TX 75657.**

The meeting on **April 27th will be at the Longview Public Library, 222 W. Cotton St., Longview, TX 75601.** Both meetings will have a brief presentation at 6:00 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.

USACE defines the Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project.

The Master Plan study area will include Lake O' the Pines proper and all adjacent recreational and natural resources properties under USACE administration. Revision of the Master Plan **will not** address in detail the technical operational aspects of the reservoir related to the water supply or flood risk management missions of the project. Lake O' the Pines is a multi-purpose reservoir constructed and managed for flood risk management, water supply, fish and wildlife, and recreation.

The current Master Plan for Lake O' the Pines was prepared as an update to the 1975 Master Plan in May of 1989 and is in need of revision to address changes in regional land use, population, outdoor recreation trends and USACE management policy.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs and special topics such as invasive species management. Public participation is critical to the successful revision of the Master Plan.

Questions pertaining to the proposed revision can be addressed to: Matthew Like, Lake Manager, U.S. Army Corps of Engineers, 2669 FM 726, Jefferson, Texas 75657, (903) 665-2336, ext. 33.

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 and SWF Facebook at: <http://www.facebook.com/pages/Fort-Worth-District-US-Army-Corps-of-Engineers/188083711219308>.

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

819 TAYLOR STREET
FORT WORTH, TX 76102

<http://www.swf.usace.army.mil/About/Lakes-and-Recreation-Information/>



NEWS RELEASE

U.S. ARMY CORPS OF ENGINEERS

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For Immediate Release: NR 18-039
June 27, 2018

Contact: Clay Church, 817-886-1314
clayton.a.church@usace.army.mil

U.S. Army Corps of Engineers to host public meetings for Lake O' the Pines Master Plan revision

FORT WORTH, Texas – The Fort Worth District, U.S. Army Corps of Engineers will be hosting two public meetings at 6:00 p.m on July 10 and 11 to provide information and receive public input toward the final draft revision of the Master Plan for Lake O' the Pines.

The July 10 meeting will be held at the City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, Texas 75657.

The July 11 meeting will be held at the Longview Public Library, 222 W. Cotton St., Longview, Texas 75601.

At the conclusion of the presentation there will be an opportunity for the public to view maps, ask questions and provide comments about the Lake O' the Pines Master Plan.

USACE defines the Master Plan as the strategic land use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the water resource development project. Public participation is critical to the successful revision of the Master Plan.

The Master Plan study area will include Lake O' the Pines proper and all adjacent recreational and natural resources properties under USACE administration. Lake O' the Pines is a multi-purpose reservoir constructed and managed for flood risk management, water supply, fish and wildlife, and recreation. The current Master Plan for Lake O' the Pines dated May of 1989 was prepared as an update to the 1975 Master Plan and is in need of revision to address changes in regional land use, population, outdoor recreation trends, and USACE management policy.

Key topics to be addressed in the revised Master Plan include revised land classifications, new natural and recreational resource management objectives, recreation facility needs, and special topics such as invasive species and threatened and endangered species management. Revision of the Master Plan will not address in detail the technical operational aspects of the reservoir related to the water supply, flood risk management, or shoreline management permitting missions of the project.

Questions pertaining to the proposed revision can be addressed to: Matthew Seavey, Lake Manager, U.S. Army Corps of Engineers, 2669 FM 726, Jefferson, Texas 75657, (903) 665-2336, ext. 33, and Ms. Rhonda Fields, Project Manager, CESWF-PEC-TP, U.S. Army Corps of Engineers, Fort Worth District, P.O. Box 17300, Fort Worth, TX 76102-0300, (817) 886-1681.

-30-

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 and SWF Facebook at: <https://www.facebook.com/usacefortworth/>.

U.S. ARMY CORPS OF ENGINEERS – FORT WORTH DISTRICT
819 TAYLOR STREET
FORT WORTH, TX 76102
WWW.SWF.USACE.ARMY.MIL



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

July 3, 2018

NOTICE OF AVAILABILITY

DRAFT MASTER PLAN AND ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED U.S. ARMY CORPS OF ENGINEERS 2018 LAKE O' THE PINES MASTER PLAN MARION, HARRISON, UPSHUR, CAMP, TITUS, AND MORRIS COUNTIES, TEXAS

The U.S. Army Corps of Engineers (USACE) Fort Worth District hereby informs the public of the release of the draft 2018 Lake O' the Pines Master Plan (hereafter Plan), draft Finding of No Significant Impact (FONSI), and Environmental Assessment (EA).

The Plan is a vital tool produced and used by USACE to guide the responsible stewardship of USACE-administered lands and 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 manmade resources at Lake O' the Pines. The Plan presents an inventory and analysis of land resources, resource management objectives, land use classifications, 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. Prior to this proposed Plan revision, the current Plan for Lake O' the Pines was approved in May 1989.

The draft Plan, draft FONSI, and EA will be available for download starting July 10, 2018 at the following Fort Worth District website:

<http://www.swf.usace.army.mil/About/LakesandRecreationInformation/MasterPlanUpdates.aspx>

A hard copy of the report will be available for review at the following location:

Lake O' the Pines Project Office, 2669 FM 726, Jefferson, TX 75657

A public meeting will be held on July 10, 2018 at the City of Jefferson Office of Tourism, 305 E. Austin St., Jefferson, TX 75657 and on July 11, 2018 at the Longview Public Library, 222 W. Cotton St., Longview, TX 75601. A brief overview of proposed changes will be presented at 6 p.m., followed by an opportunity to view maps, ask questions, and provide written comments about the project. The USACE will accept written public comments on the draft Plan, draft FONSI, and EA for a 30-day public comment period beginning on July 10, 2018 and running through August 8, 2018. Comments on the report must be postmarked by August 8, 2018.

You may send written comments or questions to Mr. Matthew Seavey, USACE Fort Worth District, 2669 FM 726, Jefferson, TX 75657, or drop off comments at the Lake O' the Pines Project Office, 2669 FM 726, Jefferson, TX 75657. Comments or questions may also be emailed to ceswf-od-lp@usace.army.mil.

A handwritten signature in black ink, appearing to read "Arnold Newman", with a stylized, cursive script.

Arnold Newman
Director, Regional Planning and Environmental
Center
Regional Planning and Environmental Center

TEXAS HISTORICAL COMMISSION
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August 2, 2018

Matthew Seavey
United States Army Corps of Engineers, Fort Worth District
2669 FM 726
Jefferson, TX 75657

Re: Project review under Section 106 of the National Historic Preservation Act of 1966
Draft Master Plan and Environmental Assessment for the Proposed 2018 Lake O' the Pines
Master Plan, Marion, Harrison, Upshur, Camp, Titus, and Morris Counties (USACE-Fort Worth
District, Tracking No. 201811272)

Dear Mr. Seavey:

Thank you for allowing us to review the above referenced document. This letter serves as comment on the proposed federal undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Maggie Moore and Caitlin Brashear, have reviewed the draft master plan. With regard to archeological resources, we have one comment. On page 5-7 regarding Environmentally Sensitive Areas (ESA), the master plan states, "All of these areas are suitable for development of natural surface pedestrian trails unless the areas are critically important as habitat for sensitive species. Hunting is also allowed on these areas take into consideration public safety and resource protection." Please note that placing pedestrian trails near archeological sites or opening ESAs to hunting is likely to increase the visibility of archeological sites, and lead to an increase in illegal looting and artifact collecting, which is a major concern at Lake O' the Pines. While we do not think these activities need to be prohibited in ESAs entirely, we request a slight modification to the language recognizing the potential impact of these activities and a statement that consultation with the THC will occur during the design phase to ensure that cultural resources will be protected wherever trails will be constructed or hunting will be allowed. With regard to above-ground resources, the Texas Historical Commission concurs with the long-term cultural resources objectives as laid out in the above-referenced master plan.

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 concerning our review or if we can be of further assistance, please contact Maggie Moore at (512) 463-6508 or Caitlin Brashear at (512) 463-5851.**

Sincerely,



for
Mark Wolfe, State Historic Preservation Officer

MW/wam



From: [Karen Hardin](#)
To: [Wadlington, Brandon E CIV USARMY CESWF \(US\)](#)
Cc: [Rusty Wood](#)
Subject: [Non-DoD Source] TPWD review of Lake O' Pines Master Plan Revision DRAFT, TPWD Project 39991
Date: Monday, June 25, 2018 2:27:52 PM

Hi Brandon,

I took a look at the reclassification areas and am providing my comments and recommendations via this email.

Generally working from the upstream area then along the northern shore and clockwise around the lake, I see the following:

- 1) There are a few yellow Ops areas on the old plan (intake structures/pumps for pipelines) that are no longer classified as PO-Project Operations. Are these appropriate for the new land classifications or should they be separately identified as easements or placed in PO? Old plan Ops have become: wildlife management (FID 45 at end of road 2315), LDR (FID 68), veg management (FID 289), LDR (FID 22), and wildlife management (FID 181 at end of Geranium Rd). TPWD recommends the revised plan identify areas at the lake that are currently developed and being used by non-federal project entities and associated with water supply. Because the mission of the lake is to provide flood control and water supply, it seems appropriate to place these land uses in a subcategory of non-federal POs.
- 2) Mims Chapel Ramp/Park – the actual location of the ramp and park (per aerial imagery) are now designated ESA (FID 65). There is a polygon adjacent to the ESA that is LDR and labeled Mims Chapel Ramp (FID 316), but the ramp isn't actually under that polygon. Is this an oversight or is the ramp/park being relocated slightly to the east? Please fix appropriately.
- 3) Lakeside Park – This area was high density on the old plan and is now LDR (FID 16). The "From_To" notes for FID 16 indicate REC-LD to LDR. The website says this park has restrooms. Should this be low or high density?
- 4) Polygon FID 299 represents Brushy Creek Campground, located west of the dam. It used to be primarily low density with some inactive recreation and high density classifications just at the campground. It is now all HDR. The "From_to" notes indicate NC. It is not clear what NC stands for. This area is a large mostly-wooded area with some development along the northern side of the polygon at the campground, per aerial imagery. Unless there are plans for future development or expansion of the campground, it seems more appropriate to subdivide this area, separating high density from low density. Perhaps a portion of this polygon is better suited to ESA, wildlife management, or vegetation management.
- 5) FID 0 (Sunrise Cove/Sunrise Road). The majority of this polygon changed from low density to vegetation management. Aerial imagery shows that people along the shore have cleared/mowed next to an RV park. Piers and a ramp are visible at Sunrise Rd/Wisteria Road. I am not sure if the ramp/pier are unpermitted or if it was overlooked. Perhaps there is a need to identify just the ramp as LDR.
- 6) FID 120 just south of State Highway 155. There is a large area of bare ground in the middle of this polygon that looks like a sand/gravel pit or illegal ATV area. Does USACE use this as a source for beach sand or other uses? The polygon changed from ESA-REC to ESA. Is ESA appropriate for the bare ground area if it will continue to be used for sand/gravel or recreational ATVs? Perhaps subdivide the sand pit to PO, if applicable.

7) There are levees/dikes along SH 155 (FID 276 and FID 324) that changed from inactive recreation to ESA. It seems more appropriate that levees/dikes would be placed into a non-federal entity easement subcategory under POs or a new category for Easements.

8) The plan does not recognize areas that would be suitable for future linear easements to accommodate non-federal entity requests for linear easements. TPWD recommends considering future linear development and recommends potentially identifying areas that would take priority for linear easements. A location suitable for future linear easements (pipelines, utility lines, electric lines, road, railway) could be identified parallel to SH 155 to limit fragmentation in undeveloped areas.

9) The new plan indicates changes in land classification that reduces the area of wildlife management by half in the upper area of the lake (1/2 remains as wildlife management and the other 1/2 is now ESA); one arm of the lake had wildlife management and is now vegetation management in the vicinity of FID 277; and one arm of the lake changed from low density recreation to wildlife management in the vicinity of FID 293. It is my understanding the areas classified as ESA, veg management, low density recreation, and wildlife management do allow for some hunting. To ensure that hunting opportunity on public land is not reduced, TPWD strongly recommends that the revised plan ensure that the amount of area accessible for hunting is equal to or greater than what was available in the old plan. The LOP website indicates 4,500 acres offers hunting opportunity with an additional 18,700 lake surface acres for waterfowl hunting. The LOP hunting map (Blockedhttp://www.swf-wc.usace.army.mil/lakeopines/Maps/LOP_Hunting_UPDATED_2012-2013.pdf) identifies areas in which hunting is currently allowed or prohibited. TPWD recommends identifying if any of the hunting areas at LOP will differ under the new plan.

Sincerely,

Karen Hardin

Natural Resource Specialist

Wildlife Habitat Assessment Program

Texas Parks and Wildlife Department

4200 Smith School Road

Austin, TX 78744

(903)322-5001

APPENDIX C – SPECIAL STATUS AND TRUST RESOURCES – USFWS AND TPWD

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

Phone: (817) 277-1100 Fax: (817) 277-1129

<http://www.fws.gov/southwest/es/arlingtontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

October 22, 2018

Consultation Code: 02ETAR00-2018-SLI-0769

Event Code: 02ETAR00-2019-E-00288

Project Name: Lake O' the Pines Master Plan Revision

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (<http://www.fws.gov/windenergy/>)

[eagle_guidance.html](#)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2018-SLI-0769

Event Code: 02ETAR00-2019-E-00288

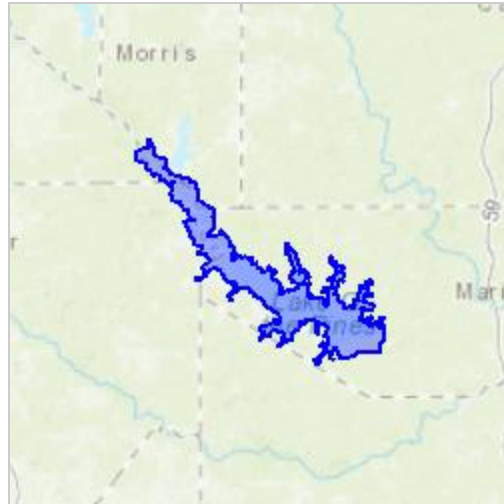
Project Name: Lake O' the Pines Master Plan Revision

Project Type: LAND - MANAGEMENT PLANS

Project Description: The Lake O' the Pines Master Plan (Lake O' the Pines, Harrison, Camp, Marion, and Upshur Counties, Texas) is the long-term strategic land use management document that guides the comprehensive management and development of all the project's recreational, natural, and cultural resources within the federal fee boundary. Under the guidance of ER-1130-2-550 Change 7, the Plan guides the efficient and cost-effective development, management, and use of project lands. It is a dynamic tool that provides for the responsible stewardship and sustainability of the project's resources for the benefit of present and future generations. The Plan works in tandem with the Operational Management Plan (OMP), which is the implementation tool for the resource objectives and development needs identified in the Master Plan. The Master Plan guides and articulates the USACE responsibilities pursuant to federal laws. Efforts are under way to revise the current Lake Master Plan, last revised in 1989. The Master Plan revision will update land classifications, plan for the modernization of existing parks, and inform the management of wildlife and other resource lands within USACE managed property at Lake O' the Pines for the next 25 years.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/32.83437966600013N94.6791276873951W>



Counties: Camp, TX | Harrison, TX | Marion, TX | Morris, TX | Upshur, TX

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 3 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Least Tern <i>Sterna antillarum</i> Population: interior pop. No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location is outside the critical habitat. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Flowering Plants

NAME	STATUS
Geocarpon minimum No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7699	Threatened
Neches River Rose-mallow <i>Hibiscus dasycalyx</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1441	Threatened

Critical habitats

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

HARRISON COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

HARRISON COUNTY

BIRDS

		Federal Status	State Status
Wood Stork	<i>Mycteria americana</i>		T
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			

FISHES

		Federal Status	State Status
Blackside darter	<i>Percina maculata</i>		T
Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles			
Bluehead shiner	<i>Pteronotropis hubbsi</i>		T
Big Cypress Bayou; quiet, backwater areas of small to medium-sized, sluggish streams and oxbow lakes having mud or mud-sand bottom; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation often present			
Creek chubsucker	<i>Erimyzon oblongus</i>		T
tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks			
Ironcolor shiner	<i>Notropis chalybaeus</i>		
Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested			
Orangebelly darter	<i>Etheostoma radiosum</i>		
Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas			
Paddlefish	<i>Polyodon spathula</i>		T
prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir			
Taillight shiner	<i>Notropis maculatus</i>		
Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae			
Western sand darter	<i>Ammocrypta clara</i>		

HARRISON COUNTY

FISHES

Federal Status

State Status

Red and Sabine River basins; clear to slightly turbid water of medium to large rivers that have moderate to swift currents, primarily over extensive areas of sandy substrate

MAMMALS

Federal Status

State Status

Black bear

Ursus americanus

T

bottomland hardwoods and large tracts of inaccessible forested areas

Louisiana black bear

Ursus americanus luteolus

DL

T

possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas

Plains spotted skunk

Spilogale putorius interrupta

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Rafinesque's big-eared bat

Corynorhinus rafinesquii

T

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

Red wolf

Canis rufus

LE

E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southeastern myotis bat

Myotis austroriparius

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

MOLLUSKS

Federal Status

State Status

Louisiana pigtoe

Pleurobema riddellii

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

Sandbank pocketbook

Lampsilis satura

T

small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River

Southern hickorynut

Obovaria jacksoniana

T

medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins

Texas heelsplitter

Potamilus amphichaenus

T

quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins

Texas pigtoe

Fusconaia askewi

T

rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River

HARRISON COUNTY

REPTILES

		Federal Status	State Status
Alligator snapping turtle	<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			
Northern scarlet snake	<i>Cemophora coccinea copei</i>		T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September			
Timber rattlesnake	<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			

PLANTS

		Federal Status	State Status
Earth fruit (Tinytim)	<i>Geocarpon minimum</i>	LT	T
in Texas, found on vegetated edges of slick spots in saline barren complex just above floodplain of Neches River, soils are claypan, hold late winter rains, with a spongy feel to the soil, drying quickly into hardened cement; topography includes pimple mounds with micro highs/lows; elsewhere, occurs in open, sparingly vegetated glades on shallow soils over sandstone outcrops; sometimes in shallow depressions within such areas and saline prairies; these soils are very thin and high in magnesium or sodium; mostly found on the cryptogamic lip along slick spot perimeter; flowering late February-March			
Goldenwave tickseed	<i>Coreopsis intermedia</i>		
GLOBAL RANK: G3; In deep sandy soils of sandhills in openings in or along margins of post oak woodlands and pine-oak forests of east Texas; Perennial; Flowering/Fruiting May-Aug			
Neches River rose-mallow	<i>Hibiscus dasycalyx</i>	T	
Texas endemic; open marshy habitats in seasonally wet alluvial soils, most often near standing rather than flowing water; flowering June-August			
Panicled indigobush	<i>Amorpha paniculata</i>		
A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other Amorpha species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer			
Texas trillium	<i>Trillium texanum</i>		
in or along the margins of hardwood forests on wet acid soils of bottoms and lower slopes, strongly associated with forested seeps and baygalls; flowering March-May			

CAMP COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

CAMP COUNTY

BIRDS

		Federal Status	State Status
Wood Stork	<i>Mycteria americana</i>		T
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			

FISHES

		Federal Status	State Status
Blackside darter	<i>Percina maculata</i>		T
Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles			
Creek chubsucker	<i>Erimyzon oblongus</i>		T
tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks			
Ironcolor shiner	<i>Notropis chalybaeus</i>		
Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested			
Orangebelly darter	<i>Etheostoma radiosum</i>		
Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas			
Paddlefish	<i>Polyodon spathula</i>		T
prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir			
Taillight shiner	<i>Notropis maculatus</i>		
Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae			

MAMMALS

		Federal Status	State Status
Black bear	<i>Ursus americanus</i>		T
bottomland hardwoods and large tracts of inaccessible forested areas			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie			

CAMP COUNTY

MAMMALS

		Federal Status	State Status
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			
Southeastern myotis bat	<i>Myotis austroriparius</i>		
roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures			

MOLLUSKS

		Federal Status	State Status
Louisiana pigtoe	<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			
Southern hickorynut	<i>Obovaria jacksoniana</i>		T
medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Alligator snapping turtle	<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			
Northern scarlet snake	<i>Cemophora coccinea copei</i>		T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September			
Texas horned lizard	<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			
Timber rattlesnake	<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			

CAMP COUNTY

PLANTS

Federal Status

State Status

Goldenwave tickseed

Coreopsis intermedia

GLOBAL RANK: G3; In deep sandy soils of sandhills in openings in or along margins of post oak woodlands and pine-oak forests of east Texas; Perennial; Flowering/Fruiting May-Aug

Panicked indigobush

Amorpha paniculata

A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other *Amorpha* species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer

MARION COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

MARION COUNTY

BIRDS

		Federal Status	State Status
Wood Stork	<i>Mycteria americana</i>		T
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			

FISHES

		Federal Status	State Status
Blackside darter	<i>Percina maculata</i>		T
Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles			
Bluehead shiner	<i>Pteronotropis hubbsi</i>		T
Big Cypress Bayou; quiet, backwater areas of small to medium-sized, sluggish streams and oxbow lakes having mud or mud-sand bottom; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation often present			
Creek chubsucker	<i>Erimyzon oblongus</i>		T
tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks			
Ironcolor shiner	<i>Notropis chalybaeus</i>		
Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested			
Orangebelly darter	<i>Etheostoma radiosum</i>		
Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas			
Paddlefish	<i>Polyodon spathula</i>		T
prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir			
Taillight shiner	<i>Notropis maculatus</i>		
Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae			

MARION COUNTY

MAMMALS

		Federal Status	State Status
Black bear	<i>Ursus americanus</i>		T
bottomland hardwoods and large tracts of inaccessible forested areas			
Louisiana black bear	<i>Ursus americanus luteolus</i>	DL	T
possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie			
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>		T
roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures			
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			
Southeastern myotis bat	<i>Myotis austroriparius</i>		
roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures			

MOLLUSKS

		Federal Status	State Status
Louisiana pigtoe	<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			
Southern hickorynut	<i>Obovaria jacksoniana</i>		T
medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Alligator snapping turtle	<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			
Northern scarlet snake	<i>Cemophora coccinea copei</i>		T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September			

MARION COUNTY

REPTILES

		Federal Status	State Status
Timber rattlesnake	<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			

PLANTS

		Federal Status	State Status
Cypress knee sedge	<i>Carex decomposita</i>		
GLOBAL RANK: G3G4; Occurs in shallow water or on baldcypress stumps and logs in wooded ponds or swamps; Perennial; Flowering/Fruiting April-May			
Goldenwave tickseed	<i>Coreopsis intermedia</i>		
GLOBAL RANK: G3; In deep sandy soils of sandhills in openings in or along margins of post oak woodlands and pine-oak forests of east Texas; Perennial; Flowering/Fruiting May-Aug			
Nixon's dwarf hawthorn	<i>Crataegus nananixonii</i>		
Found in open upland post oak-bluejack oak, scrubby woodland, or shortleaf pine-oak woodland on the Carrizo Sands and other formations.			
Panicled indigobush	<i>Amorpha paniculata</i>		
A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other <i>Amorpha</i> species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer			
Texas trillium	<i>Trillium texanum</i>		
in or along the margins of hardwood forests on wet acid soils of bottoms and lower slopes, strongly associated with forested seeps and baygalls; flowering March-May			

MORRIS COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

MORRIS COUNTY

BIRDS

Federal Status

State Status

Wood Stork

Mycteria americana

T

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

FISHES

Federal Status

State Status

Blackside darter

Percina maculata

T

Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles

Bluehead shiner

Pteronotropis hubbsi

T

Big Cypress Bayou; quiet, backwater areas of small to medium-sized, sluggish streams and oxbow lakes having mud or mud-sand bottom; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation often present

Creek chubsucker

Erimyzon oblongus

T

tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks

Ironcolor shiner

Notropis chalybaeus

Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested

Orangebelly darter

Etheostoma radiosum

Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas

Paddlefish

Polyodon spathula

T

prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir

Taillight shiner

Notropis maculatus

Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae

MORRIS COUNTY

MAMMALS

		Federal Status	State Status
Black bear	<i>Ursus americanus</i>		T
bottomland hardwoods and large tracts of inaccessible forested areas			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie			
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>		T
roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures			
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			
Southeastern myotis bat	<i>Myotis austroriparius</i>		
roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures			

MOLLUSKS

		Federal Status	State Status
Louisiana pigtoe	<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			
Southern hickorynut	<i>Obovaria jacksoniana</i>		T
medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Alligator snapping turtle	<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			
Northern scarlet snake	<i>Cemophora coccinea copei</i>		T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September			
Timber rattlesnake	<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			

MORRIS COUNTY

PLANTS

Federal Status

State Status

Goldenwave tickseed

Coreopsis intermedia

GLOBAL RANK: G3; In deep sandy soils of sandhills in openings in or along margins of post oak woodlands and pine-oak forests of east Texas; Perennial; Flowering/Fruiting May-Aug

Mohlenbrock's sedge

Cyperus grayioides

GLOBAL RANK: G3; Deep sand and sandy loam in dry, almost barren openings in upland longleaf pine savannas, mixed pine-oak forests, and post oak woodlands; Occurs primarily in deep, periodically disturbed sandy soils in open areas maintained by factors such as wind, erosion, or fire. This species does not occur in shaded areas or in areas of high competition with other herbaceous species. Habitats include remnant sand prairies, sandy fields, sand "blow outs", sandhill woodlands, pine barrens, and open barrens in which the slope is sufficient to produce sand erosion. May also occur in areas where the soils have been disturbed by logging or road construction; Perennial

Panicled indigobush

Amorpha paniculata

A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other *Amorpha* species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer

Warner's hawthorn

Crataegus warneri

GLOBAL RANK: G3Q; Found along margins of upland oak-hickory and oak-hickory-pine woodlands or forests, mostly on sandy soils; Perennial

TITUS COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

TITUS COUNTY

BIRDS

		Federal Status	State Status
Wood Stork	<i>Mycteria americana</i>		T
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			

FISHES

		Federal Status	State Status
Blackside darter	<i>Percina maculata</i>		T
Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles			
Creek chubsucker	<i>Erimyzon oblongus</i>		T
tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks			
Ironcolor shiner	<i>Notropis chalybaeus</i>		
Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested			
Orangebelly darter	<i>Etheostoma radiosum</i>		
Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas			
Paddlefish	<i>Polyodon spathula</i>		T
prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir			
Taillight shiner	<i>Notropis maculatus</i>		
Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae			

MAMMALS

		Federal Status	State Status
Black bear	<i>Ursus americanus</i>		T
bottomland hardwoods and large tracts of inaccessible forested areas			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie			

TITUS COUNTY

MAMMALS

		Federal Status	State Status
Red wolf	<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
Louisiana pigtoe	<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			
Southern hickorynut	<i>Obovaria jacksoniana</i>		T
medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Alligator snapping turtle	<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			
Northern scarlet snake	<i>Cemophora coccinea copei</i>		T
mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September			
Texas horned lizard	<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			
Timber rattlesnake	<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			

PLANTS

		Federal Status	State Status
Panicled indigobush	<i>Amorpha paniculata</i>		
A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other <i>Amorpha</i> species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer			

TITUS COUNTY
PLANTS

Federal Status State Status

Soxman's milkvetch *Astragalus soxmaniorum*

GLOBAL RANK: G3; Primarily in deep sandy soils of sandhills, fallow fields, and open scrub oak-pine woodlands; Perennial; Flowering March-June; Fruiting April-June

UPSHUR COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<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.			
Arctic Peregrine Falcon	<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.			
Bachman's Sparrow	<i>Aimophila aestivalis</i>		T
open pine woods with scattered bushes and grassy understory in Pineywoods region, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards; remnant grasslands in Post Oak Savannah region; nests on ground against grass tuft or under low shrub			
Bald Eagle	<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			
Henslow's Sparrow	<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			
Interior Least Tern	<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			
Peregrine Falcon	<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.			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Sprague's Pipit	<i>Anthus spragueii</i>		
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.			

UPSHUR COUNTY

BIRDS

		Federal Status	State Status
Wood Stork	<i>Mycteria americana</i>		T
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			

CRUSTACEANS

		Federal Status	State Status
A crayfish	<i>Orconectes maletae</i>		
streams of varying sizes and bottoms, almost always with leaf litter			

FISHES

		Federal Status	State Status
Blackside darter	<i>Percina maculata</i>		T
Red, Sulfur and Cypress River basins; clear, gravelly streams; prefers pools with some current, or even quiet pools, to swift riffles			
Bluehead shiner	<i>Pteronotropis hubbsi</i>		T
Big Cypress Bayou; quiet, backwater areas of small to medium-sized, sluggish streams and oxbow lakes having mud or mud-sand bottom; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation often present			
Creek chubsucker	<i>Erimyzon oblongus</i>		T
tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks			
Ironcolor shiner	<i>Notropis chalybaeus</i>		
Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested			
Orangebelly darter	<i>Etheostoma radiosum</i>		
Red through Angelina River basins; just headwaters ranging from high gradient streams to more sluggish lowland streams, gravel and rubble riffles preferred; eggs buried in gravel and riffle raceways, post-larvae live in quiet water, move into progressively faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late February through mid-April in eastern Texas			
Paddlefish	<i>Polyodon spathula</i>		T
prefers large, free-flowing rivers, but will frequent impoundments with access to spawning sites; spawns in fast, shallow water over gravel bars; larvae may drift from reservoir to reservoir			

UPSHUR COUNTY

FISHES

Federal Status

State Status

Taillight shiner

Notropis maculatus

Sulfur River and Big Cypress Bayou; mostly headwaters, typically large sluggish, mud-bottomed small to large streams and lakes, usually with some aquatic vegetation; spawns March-October in backwaters and pools; feeds mainly on insect larva and cladocerans, also algae

MAMMALS

Federal Status

State Status

Black bear

Ursus americanus

T

bottomland hardwoods and large tracts of inaccessible forested areas

Louisiana black bear

Ursus americanus luteolus

DL

T

possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas

Plains spotted skunk

Spilogale putorius interrupta

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Rafinesque's big-eared bat

Corynorhinus rafinesquii

T

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

Red wolf

Canis rufus

LE

E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southeastern myotis bat

Myotis austroriparius

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

MOLLUSKS

Federal Status

State Status

Louisiana pigtoe

Pleurobema riddellii

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

Sandbank pocketbook

Lampsilis satura

T

small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River

Southern hickorynut

Obovaria jacksoniana

T

medium sized gravel substrates with low to moderate current; Neches, Sabine, and Cypress river basins

Texas heelsplitter

Potamilus amphichaenus

T

quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins

Texas pigtoe

Fusconaia askewi

T

UPSHUR COUNTY

MOLLUSKS

Federal Status

State Status

rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River

REPTILES

Federal Status

State Status

Alligator snapping turtle

Macrochelys temminckii

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

Northern scarlet snake

Cemophora coccinea copei

T

mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September

Texas horned lizard

Phrynosoma cornutum

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

Timber rattlesnake

Crotalus horridus

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

PLANTS

Federal Status

State Status

Goldenwave tickseed

Coreopsis intermedia

GLOBAL RANK: G3; In deep sandy soils of sandhills in openings in or along margins of post oak woodlands and pine-oak forests of east Texas; Perennial; Flowering/Fruiting May-Aug

Mohlenbrock's sedge

Cyperus grayioides

GLOBAL RANK: G3; Deep sand and sandy loam in dry, almost barren openings in upland longleaf pine savannas, mixed pine-oak forests, and post oak woodlands; Occurs primarily in deep, periodically disturbed sandy soils in open areas maintained by factors such as wind, erosion, or fire. This species does not occur in shaded areas or in areas of high competition with other herbaceous species. Habitats include remnant sand prairies, sandy fields, sand "blow outs", sandhill woodlands, pine barrens, and open barrens in which the slope is sufficient to produce sand erosion. May also occur in areas where the soils have been disturbed by logging or road construction; Perennial

Nixon's dwarf hawthorn

Crataegus nananixonii

Found in open upland post oak-bluejack oak, scrubby woodland, or shortleaf pine-oak woodland on the Carrizo Sands and other formations.

UPSHUR COUNTY

PLANTS

Federal Status State Status

Panicled indigobush *Amorpha paniculata*

A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other *Amorpha* species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. Perennial; Flowering summer

Warner's hawthorn *Crataegus warneri*

GLOBAL RANK: G3Q; Found along margins of upland oak-hickory and oak-hickory-pine woodlands or forests, mostly on sandy soils; Perennial

Last login October 22, 2018 05:28 AM MDT

IPaC resource list

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

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

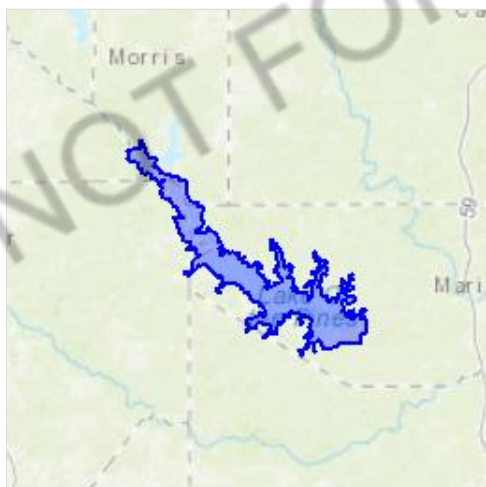
Project information

NAME

Lake O' the Pines Master Plan Revision

LOCATION

Texas



DESCRIPTION

The Lake O' the Pines Master Plan (Lake O' the Pines, Harrison, Camp, Marion, and Upshur Counties, Texas) is the long-term strategic land use management document that guides the comprehensive management and development of all the project's recreational, natural, and cultural resources within the federal fee boundary. Under the guidance of ER-1130-2-550 Change 7, the Plan guides the efficient and cost-effective development, management, and use of project lands. It is a dynamic tool that provides for the responsible stewardship and sustainability of the

project's resources for the benefit of present and future generations. The Plan works in tandem with the Operational Management Plan (OMP), which is the implementation tool for the resource objectives and development needs identified in the Master Plan. The Master Plan guides and articulates the USACE responsibilities pursuant to federal laws. Efforts are under way to revise the current Lake Master Plan, last revised in 1989. The Master Plan revision will update land classifications, plan for the modernization of existing parks, and inform the management of wildlife and other resource lands within USACE managed property at Lake O' the Pines for the next 25 years.

Local office

Arlington Ecological Services Field Office

☎ (817) 277-1100

📠 (817) 277-1129

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

<http://www.fws.gov/southwest/es/arlingtontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

Endangered species

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

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

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

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

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

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Birds

NAME

STATUS

Least Tern *Sterna antillarum*

Endangered

This species only needs to be considered if the following condition applies:

- Wind Energy Projects

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/8505>

Piping Plover *Charadrius melodus*

Threatened

This species only needs to be considered if the following condition applies:

- Wind Energy Projects

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6039>

Red Knot *Calidris canutus rufa*

Threatened

This species only needs to be considered if the following condition applies:

- Wind Energy Projects

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1864>

Flowering Plants

NAME	STATUS
Geocarpon minimum No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7699	Threatened
Neches River Rose-mallow <i>Hibiscus dasycalyx</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1441	Threatened

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

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

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A
BREEDING SEASON IS INDICATED
FOR A BIRD ON YOUR LIST, THE
BIRD MAY BREED IN YOUR
PROJECT AREA SOMETIME WITHIN
THE TIMEFRAME SPECIFIED,
WHICH IS A VERY LIBERAL
ESTIMATE OF THE DATES INSIDE
WHICH THE BIRD BREEDS ACROSS
ITS ENTIRE RANGE. "BREEDS
ELSEWHERE" INDICATES THAT THE

BIRD DOES NOT LIKELY BREED IN
YOUR PROJECT AREA.)

American Kestrel *Falco sparverius paulus*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 1 to Aug 31

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

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

Breeds Sep 1 to Jul 31

Eastern Whip-poor-will *Antrostomus vociferus*

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

Breeds May 1 to Aug 20

Henslow's Sparrow *Ammodramus henslowii*

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

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

Breeds elsewhere

Kentucky Warbler *Oporornis formosus*

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

Breeds Apr 20 to Aug 20

Lesser Yellowlegs *Tringa flavipes*

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

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

Breeds elsewhere

Prairie Warbler *Dendroica discolor*

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

Breeds May 1 to Jul 31

Prothonotary Warbler *Protonotaria citrea*

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

Breeds Apr 1 to Jul 31

Red-headed Woodpecker *Melanerpes erythrocephalus*

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

Breeds May 10 to Sep 10

Semipalmated Sandpiper *Calidris pusilla*

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

Breeds elsewhere

Wood Thrush *Hylocichla mustelina*

Breeds May 10 to Aug 31

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

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

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

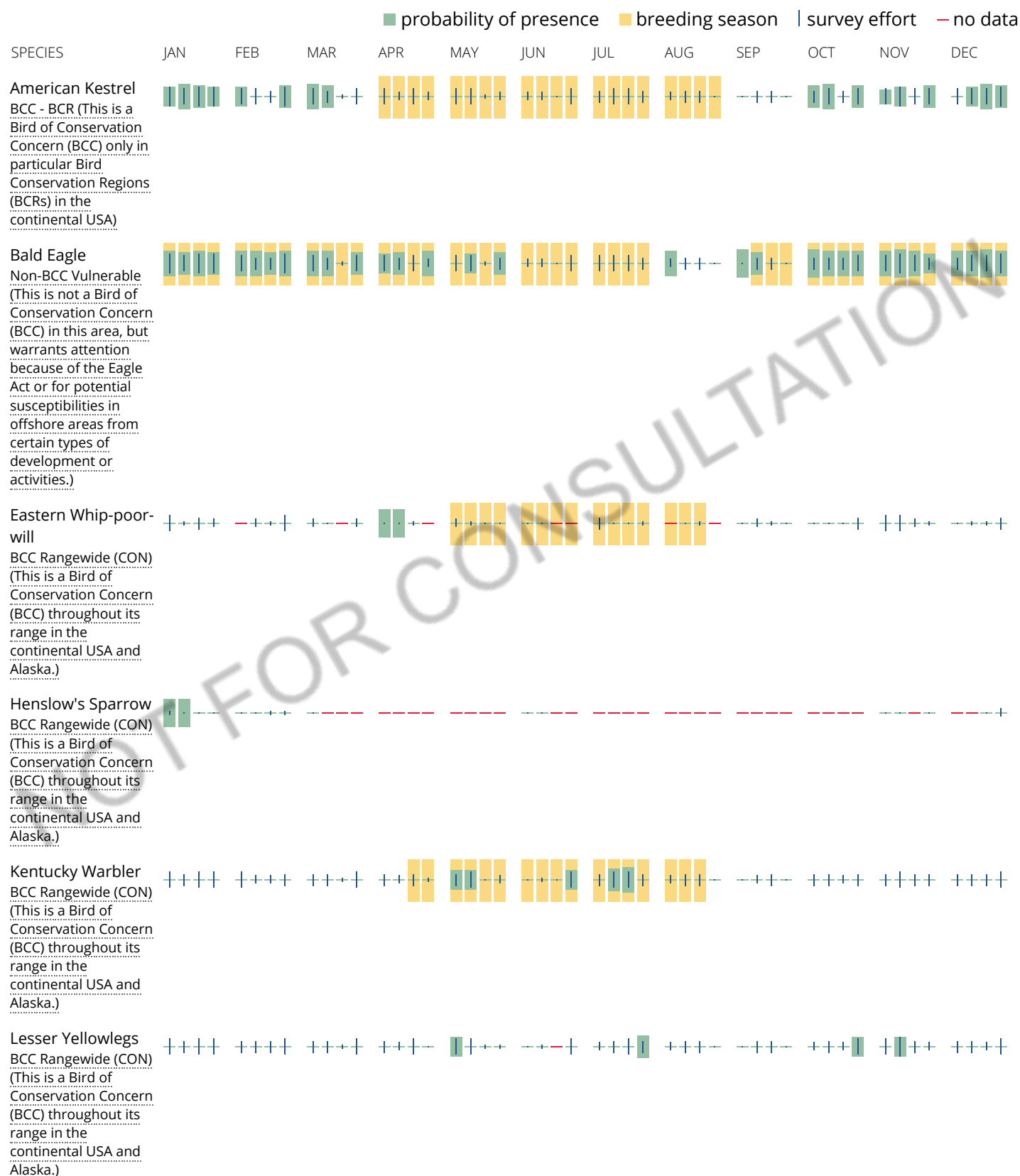
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

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

Survey Timeframe

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





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects,

and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1Fh](#)
[PEM1Ch](#)
[PEM1F](#)
[PEM5Ch](#)
[PEM5Fh](#)
[PEM1C](#)
[PEM1/SS1Fh](#)
[PEM1Ah](#)
[PEM5C](#)
[PEM1A](#)
[PEM5/ABF](#)
[PEM1/SS1Ch](#)
[PEM5F](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PFO1A](#)
[PSS1Ch](#)
[PFO1C](#)
[PSS1/UBFh](#)
[PFO1Ah](#)
[PSS1/EM5Fh](#)
[PSS1F](#)
[PFO6F](#)
[PFO1Ch](#)
[PSS6/UBFh](#)
[PSS1A](#)
[PFO1/SS1Ch](#)
[PSS1C](#)
[PFO1/SS1Fh](#)
[PFO6/UBF](#)
[PFO1/SS1A](#)
[PSS1/EM5Ch](#)
[PSS1Ah](#)
[PSS6/EM5Fh](#)
[PSS1/FO1A](#)
[PSS1/FO1C](#)

[PFO6/SS1F](#)
[PFO1/EM1C](#)
[PSS1Fh](#)
[PFO6/SS6C](#)
[PSS2Fh](#)
[PSS1/USCh](#)
[PFO5F](#)
[PFO5Fh](#)

FRESHWATER POND

[PUSAh](#)
[PUBH](#)
[PAB3F](#)
[PUB/EM1F](#)
[PAB3/UBF](#)
[PUB/AB3Fh](#)
[PAB3Fh](#)
[PUBF](#)
[PUSC](#)
[PUB/AB3F](#)
[PUBFx](#)
[PUBKx](#)
[PUBFh](#)

LAKE

[L1UBHh](#)
[L2UBFh](#)
[L2AB4Fh](#)
[L2USAh](#)
[L2ABH](#)
[L2ABFh](#)
[L2AB3Fh](#)

RIVERINE

[R2UBH](#)
[R4SBC](#)
[R5UBH](#)

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

Data limitations

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

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

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

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or 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.

NOT FOR CONSULTATION

WESTERN GULF COASTAL PLAINS (PINEYWOODS, EAST TEXAS) 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
		Federal	State	Global	State	
MAMMALS						
<i>Blarina carolinensis</i>	Southern short-tailed shrew			G5N5	S4	Forest, Woodland, Grassland
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat		T	G3G4	S3	Forest, Artificial Refugia
<i>Lutra canadensis</i>	River otter			G5	S4	Riparian
<i>Mustela frenata</i>	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland
<i>Myotis austroriparius</i>	Southeastern myotis			G3G4	S3	Caves/Karst, Forest, Riparian
<i>Puma concolor</i>	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian
<i>Spilogale putorius</i>	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland
<i>Sylvilagus aquaticus</i>	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia
<i>Ursus americanus luteolus</i>	Louisiana black bear	LT	T	G5T3	SNA	Forest, Woodland, Savanna/Open Woodland,Shrubland, Riparian
BIRDS						
<i>Anas acuta</i>	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine
<i>Colinus virginianus</i>	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
<i>Meleagris gallopavo</i>	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural
<i>Ixobrychus exilis</i>	Least Bittern			G5	S4B	Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary
<i>Egretta thula</i>	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
<i>Egretta caerulea</i>	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
<i>Egretta tricolor</i>	Tricolored Heron			G5	S5B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
<i>Butorides virescens</i>	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic
<i>Plegadis chihi</i>	White-faced Ibis		T	G5	S4B	Lacustrine, Freshwater Wetland, Agricultural
<i>Mycteria americana</i>	Wood Stork		T	G4	SHB,S2N	Riverine, Freshwater wetland
<i>Elanoides forficatus</i>	Swallow-tailed Kite		T	G5	S2B	Woodland, Forest, Riparian
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed:Urban/Suburban/Rural
<i>Haliaeetus leucocephalus</i>	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland
<i>Circus cyaneus</i>	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland
<i>Buteo lineatus</i>	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland
<i>Falco sparverius</i>	American Kestrel			G5	S4B	Grassland, Savanna/Open Woodland
<i>Rallus elegans</i>	King Rail			G4	S3B	Lacustrine, Freshwater Wetland
<i>Pluvialis dominica</i>	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural
<i>Scolopax minor</i>	American Woodcock			G5	S2B,S3N	Woodland, Forest, Riparian
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE	E	G3	S2B	Savanna/Open Woodland, Woodland, Forest
<i>Dryocopus pileatus</i>	Pileated Woodpecker			G5	S4B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed
<i>Lanius ludovicianus</i>	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed
<i>Poecile carolinensis</i>	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
<i>Thryomanes bewickii (bewickii)</i>	Bewick's Wren			G5	S5B	Shrubland, Savanna/Open Woodland, Woodland, Developed: Urban/Suburban/Rural
<i>Cistothorus platensis</i>	Sedge Wren			G5	S4	Grassland, Freshwater Wetland
<i>Hylocichla mustelina</i>	Wood Thrush			G5	S4B	Woodland, Forest, Riparian

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		Federal	State	Global	State	
<i>Dendroica dominica</i>	Yellow-throated Warbler			G5	S4B	Woodland, Forest, Riparian
<i>Protonotaria citrea</i>	Prothonotary Warbler			G5	S3B	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland
<i>Helmitheros vermivorum</i>	Worm-eating Warbler			G5	S3B	Woodland, Forest
<i>Limnothlypis swainsonii</i>	Swainson's Warbler			G4	S3B	Woodland, Forest, Riparian
<i>Seiurus motacilla</i>	Louisiana Waterthrush			G5	S3B	Woodland, Forest, Riparian
<i>Oporornis formosus</i>	Kentucky Warbler			G5	S3B	Woodland, Forest
<i>Aimophila aestivalis</i>	Bachman's Sparrow		T	G3	S3B	Savanna/Open Woodland
<i>Spizella pusilla</i>	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland
<i>Ammodramus savannarum</i>	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural
<i>Chondestes grammacus</i>	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
<i>Ammodramus henslowii</i>	Henslow's Sparrow			G4	S2S3N,SXB	Grassland, Savanna/Open Woodland
<i>Ammodramus leconteii</i>	Le Conte's Sparrow					Grassland
<i>Piranga rubra</i>	Summer Tanager			G5	S5B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
<i>Passerina ciris</i>	Painted Bunting			G5	S4B	Shrubland, Agricultural
<i>Spiza americana</i>	Dickcissel			G5	S4B	Grassland, Agricultural
<i>Sturnella magna</i>	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland
<i>Euphagus carolinus</i>	Rusty Blackbird			G4	S3	Woodland, Forest, Riparian, Lacustrine, Freshwater Wetland
<i>Icterus spurius</i>	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian
REPTILES AND AMPHIBIANS						
<i>Apalone mutica</i>	smooth softshell turtle					riparian, riverine, lacustrine, freshwater wetland
<i>Apalone spinifera</i>	spiny softshell turtle					riparian, riverine, lacustrine, freshwater wetland
<i>Cemophora coccinea copei</i>	Northern Scarlet Snake		T	G5T5	S3	forest, woodlands, grassland, riparian, barren, sparse vegetation
<i>Cheilydra serpentina</i>	Common snapping turtle					riparina, riverine
<i>Crotalus horridus</i>	Timber (Canebrake) Rattlesnake		T	G4	S4	woodland, forest, riparian
<i>Desmognathus auriculatus</i>	Southern dusky salamander				S1	forest, freshwater wetland
<i>Lithobates areolatus (Rana areolata)</i>	Crawfish frog				SU	forest, grassland, freshwater wetlands, woodland
<i>Macrochelys temminckii</i>	alligator snapping turtle		T	G3G4	S3	riparian, riverine, cultural aquatic
<i>Ophisaurus attenuatus</i>	western slender glass lizard					grassland, savanna
<i>Pituophis ruthveni</i>	Louisiana pine snake	C	T	G5T3		forest, woodland, savanna
<i>Pseudacris fouquettei (triseriata/feriarum)</i>	Cajun chorus frog				SU	forest, woodland, riparian, cultural aquatic, freshwater wetland, savanna
<i>Pseudacris streckeri</i>	Strecker's Chorus Frog			G5	S3	grassland, savanna, woodland, riparian, cultural aquatic, freshwater wetland
<i>Terrapene carolina</i>	Eastern box turtle			G5	S3	grasslands, savanna, woodland
<i>Terrapene ornata</i>	Ornate box turtle			G5	S3	grassland, barren/sparse vegetation, deset scrub, savanna, woodland
<i>Trachemys scripta</i>	Red-eared slider					riparian, riverine, lacustrine, freshwater wetland, cultural aquatic
FRESHWATER FISHES						
<i>Ammocrypta clara</i>	Western sand darter					over sandy substrata
<i>Anguilla rostrata</i>	American eel			G4	S5	streams and reservoirs in drainages connected to marine environments
<i>Atractosteus spatula</i>	alligator gar					channel snag, pool-snag complex, pool-edge, and pool-vegetation habitat
<i>Cycleptus elongatus</i>	Blue sucker		T	G3G4	S3	large, deep rivers, and deeper zones of lakes
<i>Erimyzon oblongus</i>	Creek chubsucker		T	G5	S2S3	vegetation depending somewhat on age and stage of reproductive cycle; declines due to siltation
<i>Etheostoma radiosum</i>	Orangebelly darter					preferring riffle areas of gravel-bottoms streams with moderate to high currents
<i>Hiodon alosoides</i>	Goldeye					of large lakes; backwaters
<i>Notropis atrocaudalis</i>	Blackspot shiner					backwater and swiftest currents
<i>Notropis bairdi</i>	Red River shiner					streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation,
<i>Notropis chalybaeus</i>	Ironcolor shiner					Plain streams and rivers of low to moderate gradient; often at the upstream ends of pools, with a moderate

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<i>Notropis maculatus</i>	Taillight shiner					Quiet, usually vegetated oxbow lakes, ponds, or backwaters; mud bottom
<i>Notropis potteri</i>	Chub shiner		T	G4	S3	turbid, flowing water with silt or sand substrate; tolerant of high salinities
<i>Notropis sabinae</i>	Sabine shiner					Small creeks and rivers having slight to moderate current, primarily sand bottom
<i>Notropis shumardi</i>	Silverband shiner					channel with moderate to swift current velocities and moderate to deep depths; associated with turbid
<i>Percina maculata</i>	Blackside darter		T	G5	S1	variable in location; mostly in clear waters, with gravel and boulder substrates
<i>Polyodon spathula</i>	Paddlefish		T	G4	S3	sized rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if
<i>Pteronotropis hubbsi</i>	Bluehead shiner		T	G3	S1	substrate; water typically tannin-stained, and heavy growth of submergent or semi-emergent vegetation
<i>Scaphirhynchus platyrhynchus</i>	Shovelnose sturgeon		T	G4	S2	Bottom of main channels and embayments of large, turbid rivers
INVERTEBRATES						
<i>Arkansia wheeleri</i>	Ouachita rock pocketbook	LE		G1	SH*	Riverine
<i>Bombus pensylvanicus</i>	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland
<i>Cheumatopsyche morsei</i>	A caddisfly			G1G3	S1	Riparian, Riverine
<i>Chimarra holzenthali</i>	Holzenthali's Philopotamid caddisfly			G1G2	S1	Riparian, Riverine
<i>Cisthene conjuncta</i>	A lichen moth			G1Q	S1Q*	Forest, Savanna/Open Woodland
<i>Fallicambarus houstonensis</i>	Houston burrowing crayfish			G2G3*	S2S3*	Freshwater Wetland, Grassland
<i>Fallicambarus kountzeae</i>	Big Thicket burrowing crayfish			G2	S2*	Freshwater Wetland, Grassland
<i>Faxonella blairi</i>	Blair's fencing crayfish			G2	S2*	Freshwater Wetland
<i>Fusconaia askewi</i>	Texas pigtoe		T	G2G3	S2S3*	Riverine
<i>Fusconaia lananensis</i>	Triangle pigtoe		T	G1Q	S1	Riverine
<i>Hydroptila ouachita</i>	A caddisfly			G1G2	S1	Riparian, Riverine
<i>Isoperla sagittata</i>	Arrowhead Stripetail			G1	S1*	Riparian, Riverine
<i>Lampsilis satura</i>	Sandbank pocketbook		T	G2	S1	Riverine
<i>Neotrichia mobilensis</i>	A caddisfly			G1G2	S1?*	Riparian, Riverine
<i>Obovaria jacksoniana</i>	Southern hickorynut		T	G2	S1*	Riverine
<i>Orconectes maletae</i>	Kisatchie painted crayfish			G2	S2*	Riparian, Riverine
<i>Phylocentropus harrisi</i>	A caddisfly			G1G2	S1	Riparian, Riverine
<i>Pleurobema riddellii</i>	Louisiana pigtoe		T	G1G2	S1	Riverine
<i>Pogonomyrmex comanche</i>	Comanche harvester ant			G2G3*	S2*	Barren/Sparse Vegetation
<i>Potamilus amphichaenus</i>	Texas heelsplitter		T	G1G2	S1	Riverine
<i>Procambarus brazoriensis</i>	Brazoria crayfish			G1	S1	Riverine, Riparian
<i>Procambarus nechesae</i>	Neches crayfish			G2	S1S2	Riverine, Riparian
<i>Procambarus nigrocinctus</i>	Blackbelted crayfish			G1G2	S1	Riverine, Riparian
<i>Somatochlora magarita</i>	Texas emerald			G2	S2	Freshwater Wetland
<i>Sparbarus couchatta</i>	A mayfly			G1G2	S1?*	Riverine, Riparian
<i>Tricorythodes curvatus</i>	A mayfly			G1G3	S2?*	Riparian, Riverine
PLANTS						
<i>Agalinis navasotensis</i>	Navasota false foxglove			G1	S1	Savanna/Open Woodland (sandstone outcrops)
<i>Agrimonia incisa</i>	incised groovebur			G3	S3	Forest; Savanna/Open Woodland (Longleaf Pine)
<i>Amorpha laevigata</i>	smooth indigobush			G3	S1	Savanna/Open Woodland
<i>Amorpha paniculata</i>	panicled indigobush			G2G3	S2	Freshwater Wetland
<i>Astragalus reflexus</i>	Texas milk vetch			G3	S3	Savanna/Open Woodland
<i>Bartonia texana</i>	Texas screwstem			G2	S2	Freshwater Wetland
<i>Calopogon oklahomensis</i>	Oklahoma grass pink			G3	S1S2	Savanna/Open Woodland; Grassland; Freshwater Wetland
<i>Carex decomposita</i>	cypress knee sedge			G3	S1	Freshwater Wetland
<i>Clematis carrizoanus</i>	Carrizo sands leather-flower			G2	S2	Savanna/Open Woodland
<i>Coreopsis intermedia</i>	goldenwave tickseed			G3	S3	Savanna/Open Woodland

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<i>Crataegus anamesa</i>	Fort Bend hawthorn			G3Q	S3	Grasslands; woodlands?
<i>Crataegus nananixonii</i>	Nixon's dwarf hawthorn			G1	S1	Savanna/Open Woodland; Forest (Shortleaf Pine)
<i>Crataegus stenosepala</i>	narrow-sepal hawthorn			G3Q	S3	Woodland? Riparian?
<i>Crataegus warneri</i>	Warner's hawthorn			G3Q	S3	Savanna/Open Woodland; Woodland; Forest
<i>Cuscuta attenuata</i>	marsh-elder dodder			G3	S2	Grassland
<i>Cyperus grayioides</i>	Mohlenbrock's sedge			G3G4	S3S4	Savanna/Open Woodland (sandhills)
<i>Cypripedium kentuckiense</i>	Southern lady's-slipper			G3	S1	Forest (mesic)
<i>Echinacea atrorubens</i>	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland
<i>Eriocaulon koernickianum</i>	small-headed pipewort			G2	S1	Freshwater Wetland (bogs)
<i>Gaillardia aestivalis</i> var. <i>winkleri</i>	white firewheel			G5T2	S2	Savanna/Open Woodland (Longleaf Pine Savanna; Sandhills)
<i>Geocarpon minimum</i>	earth fruit	LT	T	G2	S1	Barren/Sparse Vegetation (slick spots) within Grassland (saline prairie) matrix
<i>Hibiscus dasycalyx</i>	Neches River rose-mallow	C		G1	S1	Riparian (oxbows, swamps)
<i>Lachnocaulon digynum</i>	tiny bog button			G3	S1	Freshwater Wetland (bogs)
<i>Leavenworthia texana</i>	Texas golden gladeceess	C		G1	S1	Savanna/Open Woodland (glades)
<i>Liatis tenuis</i>	slender gay-feather			G3	S3	Savanna/Open Woodland (Longleaf Pine savanna, sandstone barrens)
<i>Paronychia setacea</i>	bristle nailwort			G3	S3	Savanna/Open Woodland
<i>Phlox nivalis</i> subsp. <i>texensis</i>	Texas trailing phlox	LE	E	G4T2	S2	Savanna/Open Woodland (Longleaf Pine savanna, sandhills)
<i>Physaria pallida</i>	white bladderpod	LE	E	G1	S1	Savanna/Open Woodland (glades); Grassland
<i>Physostegia longisepala</i>	long-sepaled false dragon-head			G2G3	S2	Savanna/Open Woodland (Longleaf Pine savanna); Freshwater Wetland
<i>Platanthera chapmanii</i>	Chapman's orchid			G2	S1	Freshwater Wetland; Savanna/Open Woodland (Longleaf Pine savanna)
<i>Platanthera integra</i>	yellow fringeless orchid			G3G4	S1	Freshwater Wetland (bogs); Savanna/Open Woodland (Longleaf Pine Savanna)
<i>Prenanthes barbata</i>	barbed rattlesnake-root			G3	S3	Forest (mesic)
<i>Quercus arkansana</i>	Arkansas oak			G3	S1	Savanna/Open Woodland; Woodland; Forest
<i>Quercus boyntonii</i>	Boynton's oak			G1	SH	Grassland?; Forest (loblolly pine-oak)?
<i>Rhododon ciliatus</i>	Texas sandmint			G3	S3	Savanna/Open Woodland (sandhills)
<i>Rhynchospora macra</i>	large beakrush			G3	S2	Freshwater Wetland (bogs)
<i>Schoenolirion wrightii</i>	Texas sunnybell			G3	S3	Savanna/Open Woodland (sandstone barrens); Forest
<i>Silene subciliata</i>	scarlet catchfly			G3	S3	Savanna/Open Woodland (Longleaf Pine Savanna; Sandhills)
<i>Spiranthes brevilabris</i> var. <i>brevilabris</i>	Texas ladies'-tresses orchid			G1T1	S1	Grassland
<i>Spiranthes longilabris</i>	giant spiral ladies'-tresses			G3	S1	Freshwater Wetland (swamp)
<i>Spiranthes parksii</i>	Navasota ladies'-tresses	LE	E	G3	S3	Savanna/Open Woodland; Woodland
<i>Streptanthus maculatus</i> subsp. <i>maculatus</i>	clasping twistflower			G3T2T3	S2	Savanna/Open Woodland; Forest; Grassland (glades)
<i>Symphyotrichum puniceum</i> var. <i>scabricaule</i>	rough-stem aster			G5T2	S2	Freshwater Wetland (Bogs)
<i>Thalictrum arkansanum</i>	Arkansas meadow-rue			G2Q	S2	Forest; Riparian (bottomland forest)
<i>Trillium texanum</i>	Texas trillium			G2	S2	Forest; Freshwater Wetland (forested seeps and baygalls)
<i>Triphora trianthophora</i> var. <i>texensis</i>	Texas three-birds orchid			G3G4T1Q	S1	Forest (mesic)
<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass			G2	S2	Freshwater Wetland (bogs)
<i>Xyris drummondii</i>	Drummond's yellow-eyed grass			G3	S2	Freshwater Wetland (bogs)
<i>Xyris scabrifolia</i>	roughleaf yellow-eyed grass			G3	S2	Freshwater Wetland (bogs)
<i>Yucca cernua</i>	nodding yucca			G1	S1	Savanna/Open Woodland; Forest (calcareous openings)

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APPENDIX D – INVASIVE SPECIES AT LAKE O THE PINES

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INVASIVE SPECIES AT LAKE O' THE PINES

ANIMALS

BIRDS



Photo by Peter S. Weber

Source: Texasinvasives.org

Eurasian Collared Dove (*Streptopelia decaocto*) – The Eurasian Collared Dove gets its name from the black partial collar on the nape (back) of the neck, which is outlined in white. This dove is a medium to stocky in size, and quite successful in interspecific competition with native doves and other native species. This species, a native of India, Sri Lanka and Myanmar, was introduced to the Bahamas and Lesser Antilles when pet birds inadvertently escaped or were released. Subsequently they dispersed from the Caribbean and colonized southern Florida. They are now known as far west as Oregon. These birds roost communally, often by the hundreds in barns, or in trees in city parks. As successful and aggressive colonizers and breeders, some scientists believe they may be competing with and displacing native dove species, and aggressively competing with a number of other species for food sources. This

species also is known to carry a disease-causing parasite, *Trichomonas gallinae*, which can spread to native doves at feeders and birdbaths, or to the native hawks that feed on them. These birds are frequently seen in the Lake O' the Pines area, but there have been no control efforts necessary, or in place at this time.



Photo: Lee Karney, U. S. Fish and Wildlife Service.
Texasinvasives.org.

European Starling (*Sturnus vulgaris*) – A stocky blackbird with a short tail and long, slender beak. In flight their wings are short and pointed, giving them a star-like appearance (and their name). At a distance they appear black. In summer months they turn iridescent purplish-green with yellow beaks, and in fresh winter plumage they are brown, and covered in brilliant white spots. These birds were introduced to the U. S. in 1890 as part of a plan to introduce to the U. S. all birds mentioned in the works of Shakespeare. They adapt to a wide variety of habitats, and produce two broods per season. This species is a fierce competitor with blue birds, purple martins, woodpeckers and other cavity nesting birds. They often take over the other birds' nests, and expel the occupants. Because of their abundance in a wide variety of

habitats, there is concern about their effect on native bird populations. These birds are abundant, and becoming more so throughout the U. S., and they are quite abundant in East Texas, and at Lake O' the Pines as well. There are no control efforts in place at this time.

FISH



Source: Kentucky Department of Fish and Wildlife Resources

Bighead Asian Carp (*Carpa Cabezona*) – Invasive, large-bodied, fast-growing, highly fecund, voracious feeding fish that are rapidly colonizing North American waterways. They are notorious for their ability to jump out of the water, and are becoming more prevalent along the Mississippi River and its tributaries. These fish are filter feeders and use their specialized gill rakers to feed on zooplankton or phytoplankton. This species was brought to the U. S. in the early 1970's for aquacultural purposes. The species is native to eastern Asia. This species poses a great risk to native ecosystems for three reasons: first, they are aggressive and can out-compete native species for resources; second, they are opportunistic feeders that consume very large quantities of zooplankton and phytoplankton; and third, the species is capable of rapid reproduction, laying thousands of eggs at a time. The species has been documented below the dam at Lake O' the Pines in Big Cypress Bayou. It likely migrated from the Mississippi River at its confluence with the Red River, and then up 12-mile Bayou to Caddo Lake, and then up Big Cypress Bayou. It has not been documented yet in Lake O' the Pines, but the fact that it is below the outlet at Lake O' the Pines gives it a priority for monitoring. Signs were placed in the outlet area in cooperation with Texas Parks and Wildlife Department Inland Fisheries to make visitors aware of the species.

INSECTS



USDA Forest Service, Northeastern Area State and Private Forestry

Emerald Ash Borer (*Agrilus planipennis*)

– The emerald ash borer (EAB) is a destructive non-native wood-boring pest of ash trees (*Fraxinus* spp.). The species is native to Asia, and was discovered in southeast Michigan in 2002. It has occurred in 26 states including Texas where it was detected in Harrison County. It attacks all 16 native ash species in the United States, and has been responsible for killing millions of ash trees across the country. Ash trees with low EAB population densities often have few, or no external signs. EAB infests and carries on its life cycle in the

cambium layer of the tree making many galleries which ultimately cut off the tree's nutrient and moisture supply. Ash trees with significant infestation may have dead branches near the top of the tree, leafy shoots sprouting from the trunk, bark splits exposing larval galleries, extensive woodpecker activity, and D-shaped exit holes. Ultimately, large EAB infestations can result in tree mortality. Harrison County is one of the five counties where Lake O' the Pines (LOTP) occurs. Because of this, EAB infestation(s) needs to be monitored, and education efforts need to occur with visitors. Currently the USDA Forest Service Southern Research Station in Pineville, Louisiana, has EAB trap stations within Corps properties at LOTP.



USDA APHIS PPQ Archive (from texasinvasives.org)

Red Imported Fire Ant (*Solenopsis invicta*)

– The red imported fire ant was introduced around the 1930's and has spread to infest more than 260 million acres of land in 10 southeastern states including; Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Texas. The species is native to Brazil. The species has the potential of spreading west and surviving in southern Arizona and along the Pacific Coast north to Washington, and is currently known to occur in California. Red imported fire ants are prolific breeders and aggressive feeders, and have become very abundant, displacing many native ant species. This species lives in colonies with abundant mounds, and can actually occur

in multiple-queen colonies. Individuals can move freely between mounds, and can occur in hundreds of thousands. Because of this characteristic, they can very quickly invade and take over large areas to the exclusion of other ant species. In addition to the impacts upon native ants, these ants can harm and eat eggs and newly hatched individual ground-nesting bird species like Bobwhite Quail. Other animal species like insects, lizards and small mammals can also be attacked, killed and consumed by red imported fire ants. This species occurs throughout the Lake O' the Pines area. At present, control actions are taken within the developed recreation areas, and control measures are needed annually with supplemental treatments as necessary.

MAMMALS



Photo: Billy Higginbotham. Texas AgriLife Extension Service. Texasinvasives.org

Feral Pig (*Sus scrofa*) – Early Spanish explorers probably were the first to introduce feral pigs into Texas over 300 years ago. In addition early settlers brought domestic swine with them upon settling the area, and many of them escaped captivity. In the 1930's European wild hogs or "Russian boars" were imported into Texas by ranchers and sportsmen for sport hunting. Each of these types of pigs eventually escaped captivity and have contributed to the current feral pig population. While all of these swine interbreed and contribute genetically, the European wild hog traits appear to have become dominant. Overall these pigs are brown to blackish in color, with grizzled guard hairs, a mane of hair running dorsally from the neck to the rump, a strait heavily tufted tail, and ears covered with hair. These animals can breed year-round and are quite prolific. These animals have established sizeable, free-ranging populations across the Pineywoods Region of eastern Texas, and are abundant at Lake O' the Pines. Feral pigs can have detectable influences on wildlife and plant communities as well as on domestic crops and livestock. Extensive disturbance of vegetation and soil occurs as a result of their rooting habits. The disturbed area may cause a shift in plant succession on the immediate site. Feral pigs also compete with several species of wildlife for certain foods, particularly mast (acorns). Sport hunters at Lake O' the Pines are allowed to harvest feral hogs, but that is the only control method in place at present. Damage by feral hogs is abundant at Lake O' the Pines, and impacts need to be monitored to determine if further methods may need to be applied to the management of this species.



Photo: John and Karen Hollingsworth, U. S. Fish and Wildlife Service. Texasinvasives.org

Nutria (*Myocastor coypus*) – The nutria is a large, dark-colored, semiaquatic rodent. They have short legs and a robust, highly arched body that is approximately 24 inches long. Their round tail is 13-16 inches long and like many rodents, scantily haired. Their forepaws have four well developed and clawed toes and one vestigial toe. Four of the five clawed toes on the hind foot are interconnected by webbing, and the fifth, outer toe, is free. The hind legs are larger than the forelegs. Like beavers, nutria have large incisors that are yellow-orange to orange-red on their outer surfaces. Nutria were originally imported into California, Washington, Oregon, Michigan, New Mexico, Louisiana, Ohio, and Utah between 1899 and 1940 by fur ranchers. When these businesses failed, many of the nutria were released into the wild. Federal and State agencies and individuals translocated nutria into Alabama, Arkansas, Georgia, Kentucky, Maryland, Mississippi, Oklahoma, Louisiana and Texas, with the intention to control undesirable vegetation and enhance trapping opportunities. Nutria occupy farm ponds, freshwater impoundments, drainage canals with spoil banks, rivers and bayous, freshwater and brackish marshes, swamps, and combinations of wetland types. Nutria feed on abundant emergent aquatic vegetation, small trees and or shrubs. Freshwater marshes are the preferred habitat. Nutria can have impacts on both native and commercial crops in and near these types of habitats; this includes damages in excess of \$1 million dollars annually to sugarcane and rice crops. Nutria populations are cyclical at Lake O' the Pines, and they likely have some impacts on aquatic vegetation, but that's not been calculated to date.

PLANTS

AQUATIC INVASIVE PLANT SPECIES



Photo: Robert H. Mohlenbrock. USDA SCS. 1991

Alligator Weed (*Alternanthera philoxeroides*) – Floating or rooted semi-terrestrial plant up to 3 ft. long. The plants leaves are opposite, thick and fleshy, and they produce papery, silvery-white flower heads. This plant forms dense colonies, and has done so on the upper end of Lake O' the Pines. This plant has been a problem on the upper end of the lake, and has required treatments with herbicides over the past several years. In addition, alligatorweed flea beetles have been introduced as a biological control for this plant species. Control efforts for this plant involved the Corps, Northeast Texas Municipal Water District and the Texas Parks and Wildlife Department and required significant resources. Each of

these entities provide manpower and resources for monitoring and control of this species, and are currently cooperating in a Nuisance Aquatic Plant Memorandum of Understanding.



Photo: Graves Lovell. Invasives.org

Egeria or Brazilian Waterweed (*Egeria densa*) – Brushy plant floating just below the surface with very dense whorls of 4-6 bright green leaves. Plant produces white flowers, unisexual, extending above the water's surface. This plant forms mats in waterways.



Photo: Alison Fox, University of Florida. Bugwood.org

Eurasian Watermilfoil (*Myriophyllum spicatum*) – Submerged aquatic up to 8 ft. long with whorled, featherlike, finely-dissected leaves on a hollow stem. This plant forms dense mats. While this plant has not occurred in significant mats requiring treatment with herbicides at Lake O' the Pines, it likely does occur on the lake, and it should be included in monitoring efforts.



Photo: Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org

Elephant Ears (*Colocasia esculenta*) – Perennial herb to 1.5m (4ft.) tall, with thick shoots from a large corm; slender stolons also often produced, along with offshoot corms. Leaf blades to 60 cm (24 in.) long and 50 cm (20 in.) wide, arrowhead shaped, with upper surface dark green and velvety. Leaves are shaped in appearance like elephant ears, giving the plant its common name. The plant was introduced to the U. S. in 1910 as a substitute crop for potatoes, and was later cultivated as an ornamental. The plant reproduces primarily vegetatively, via culm fragmentation and budding at the base of the plant. Disturbance greatly encourages spread of the species. The plant invades wetland areas and colonized lake and stream banks, forming dense growth. The plant frequently outcompeted native species, thus altering natural

habitats and ecosystem processes reducing biodiversity. It can form dense stands along lakes and rivers where it completely eliminates native plant species. This plant is known to occur at Lake O' the Pines, but it is not known to be a major problem at this time. Because of this plant's ability to invade and colonize areas, its presence should be monitored.



Photo: Mark A. Garland. USA, FL, Alchua Co.,
Gainesville, Florida Division of Plant Industry

Giant Salvinia (*Salvinia molesta*) –

Free-floating green fern. The plant has paired leaves on a horizontal stem with a third submerged. It is a dissected leaf with an “egg-beater”-like surface with joined hairs (common salvinia has single hairs). Control efforts to prevent this plant at Lake O’ the Pines were successful for a number of years, but the plant has now occupied significant area on the upper end of the lake. Both applications of herbicides and introduction of salvinia weevils for biocontrol have been applied to this plant. Left uncontrolled this plant forms dense mats that can lead to significant degradation of aquatic habitats and the native species of animals and plants that occupy those habitats. Control efforts for this plant involved the Corps,

Northeast Texas Municipal Water District and the Texas Parks and Wildlife Department and required significant resources. Each of these entities provide manpower and resources for monitoring and control of this species, and are currently cooperating in a Nuisance Aquatic Plant Memorandum of Understanding.



Photo: Texasinvasives.org

Hydrilla (*Hydrilla verticillata*) –

Plants submerged and up to 25 ft. long with widely branching stems. Leaves are without stems and in whorls of 4-8 serrated leaves that are rough to touch. Produces small flowers on long stalks. Plants can grow to the surface and form dense mats. This plant has been a problem periodically at Lake O’ the Pines. Control efforts for this plant involved the Corps, Northeast Texas Municipal Water District and the Texas Parks and Wildlife Department and required significant resources. Each of these entities provide manpower and resources for monitoring and control of this species, and are currently cooperating in a Nuisance Aquatic Plant Memorandum of Understanding.



Photo: Minnette Marr. Lady Bird Johnson Wildflower Center

Parrotfeather (*Myriophyllum aquaticum*) – Plant's stem is mostly submerged with 3-5 comb-like, widely separated, whorled leaves. The floating and submerged leaves are similar. While this plant has not occurred in significant mats requiring treatment with herbicides at Lake O' the Pines, it does occur on the lake, and it should be included in monitoring efforts.



Photo: Wendy VanDyk Evans. TexasInvasives.org

Water Hyacinth (*Eichornia crassipes*) – Free-floating with inflated, spongy stalks with glossy leaves. Plants have a single stalk of blue to purple flowers. This plant forms large floating mats, and is an aggressive invader. This plant frequently becomes a problem at Lake O' the Pines, and requires control efforts utilizing herbicides. Control efforts for this plant involved the Corps, Northeast Texas Municipal Water District and the Texas Parks and Wildlife Department and required significant resources. Each of these entities provide manpower and resources for monitoring and control of this species, and are currently cooperating in a Nuisance Aquatic

TERRESTRIAL INVASIVE PLANT SPECIES



Bahiagrass (*Paspalum notatum*) – An exotic invasive grass species that was introduced as a pasture grass because of its production, and its ability to withstand extended periods of drought. This grass was introduced from Mexico, West Indies and South America. Usually rhizomatous or stoloniferous with culms solid. Sheaths are open, slightly compressed; ligule membranous, entire; blades are usually flat, often broad, margins scabrous, and nonauriculate. Inflorescence a panicle of 1 to numerous unilateral spicate or racemose branches; spikelets sessile or short-pedicellate, borne in pairs or singly in 2 rows on 1 side of a flattened, occasionally broadly winged rachis. This species produces many seeds and readily invades and

outcompetes other grasses. It is an ecological threat because it forms dense mats of vegetation, spreading by large coarse stolons. These thick mats replace native bunch grasses and eliminate the spaces utilized by insects and native bird species like bobwhite quail and eastern wild turkey. This species occurs throughout the Lake O' the Pines area. Control efforts have been applied to areas associated with the dam, but results have been sporadic and the species readily invades fairly frequently.



Bermudagrass (*Cynodon dactylon*) - Highly variable sod-forming perennial grass with extensive creeping rhizomes and stolons. Bermudagrass is commonly grown as a durable turf or forage in tropical to warm temperate regions nearly worldwide. It was introduced from Africa. It reproduces vegetatively from creeping rhizomes and stolons and by seed. Because of its biology this species has a “creeping” habit, and readily invades, forming thick mats and outcompeting native grasses. These thick mats replace native bunch grasses and eliminate the spaces utilized by insects and native bird species like bobwhite quail and eastern wild turkey. This species is frequently used as pasture and forage grass in the Lake O' the Pines area and has invaded numerous areas. There are no control efforts in place for this grass at present.



Source: Texasinvasives.org

Chinaberry Tree (*Melia azedarach*)

– Chinaberry is a deciduous tree to 50 feet in height and 2 feet in diameter, much branched with multiple boles, lacy dark-green leaves having a musky odor, and clusters of lavender flower in the spring yielding persistent, poisonous yellow berries. The species was introduced in the mid-1800's from Asia (Himalayas), and has been widely planted as a traditional ornamental around home sites. The species is now common on roadsides, forest margins, and around old home sites, and it is semi-shade tolerant. It has been known to form colonies from root sprouts and/or sprouts from root collars. It also spreads prolifically by bird-dispersed abundant seeds. Ecologically, Chinaberry can outcompete native vegetation due

to its high relative resistance to insects and pathogen. Also, its leaf litter can raise soil pH and alternative plant habitats. Chinaberry is fast growing, and can reach 24 feet in height during its first 4-5 years, and may reach heights of 50-60 feet. There are both individual trees and colonies at Lake O' the Pines, but there are not major widespread impacts requiring treatment from this tree.



Chinese Privet (*Ligustrum sinense*) – Small to medium-sized shrub to 13 ft. with opposite leaves about 2.75 inches in length and 1 inches in width. The plants flowers are white with a sickly sweet smell. The plants fruit is a small black drupe. This plant prefers moist to wet habitats. This species is known to occur in many areas around Lake O' the Pines where it can dominate the understory of forests where it occurs. Some control of this species in the midstory position has been achieved with application of prescribed burning at Lake O' the Pines, but no other control efforts are in place at present.



Photo: James Henson. USDA NRCS National Plant Data Center. U.S., LA, East Baton Rouge Parish, Baton Rouge, Southern University. 2004.

Chinese Tallow (*Triadica sebifera*)

– Moderate-sized tree becoming increasingly common in forested areas and wetlands. The plants leaves are top-shaped (similar in shape to aspen leaves) becoming bright red in color in the fall. The plant produces seeds in mass quantity that have a popcorn-like appearance in shape. This plant is present in mass quantities at Lake O' the Pines and throughout east Texas. It is an invader of open areas and any light gap in wetlands and forested wetlands, and can also invade further upslope as well. There have been significant efforts utilizing herbicides to control this plant species, particularly associated with re-forestation efforts following recent salvage operations resulting from timber mortality as a result of recent long-term flood events. It is likely that control efforts for this species will increase in the future throughout the region.



Photo: Doug Goldman. USDA NRCS National Plants Data Team. U.S., Harris County, Houston, Texas. 2012.

Japanese Climbing Fern (*Lygodium japonicum*)

– Perennial climbing and twining fern with stems up to 90 ft. in length. The plant's leaves are triangular, lacy, and have finely-divided leaflets with green, orange or black vines. While this plant is not known to cover significantly large areas at Lake O' the Pines, it is present and its presence should be monitored. The plant(s) will attach to other plant species and ultimately compete with those plants for space, nutrients, water and sunlight. These plants are quite vigorous and can ultimately outcompete their hosts leading to demise and/or death of the host plants. This plant should continue to be monitored at Lake O' the Pines.



Photo: Robert H. Mohlenbrock. USDA SCS. 1991

Japanese Honeysuckle (*Lonicera japonica*) – Vigorous climbing and trailing semi-evergreen woody vine with white and pink flowers (that fade to yellow). The plants upper leaves are separate. This plant species is an aggressive invader, and it's well distributed at Lake O' the Pines. This plant is not known to have invaded areas at Lake O' the Pines in an excessively detrimental fashion to date, but it should be monitored.



Photo: Nancy Loewenstein.
Auburn University. Bugwood.org.
Invasives.org

Japanese Privet (*Ligustrum japonicum*) - Small to medium-sized shrub to 33 ft. with opposite leaves about 4 inches in length and 2 inches in width. The plants flowers are white with a sickly sweet smell. The plants fruit is a small black drupe. This plant prefers moist to wet habitats. This species is known to occur in many areas around Lake O' the Pines where it can dominate the understory of forests where it occurs. Some control of this species in the midstory position has been achieved with application of prescribed burning at Lake O' the Pines, but no other control efforts are in place at present.

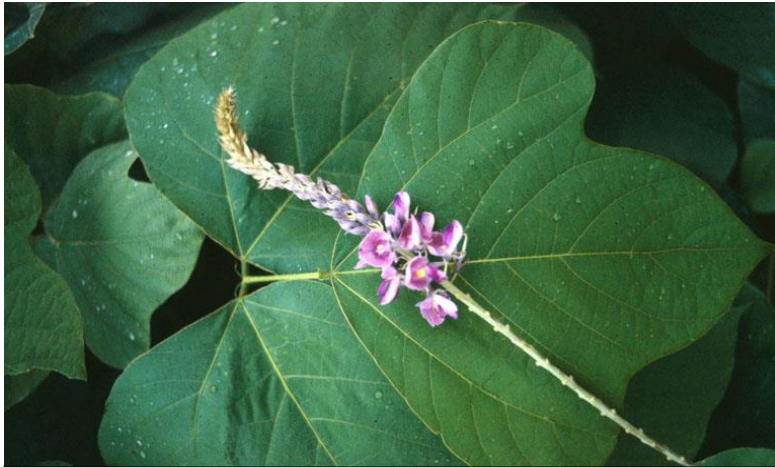


Photo: David J. Moorhead. University of Georgia.
Bugwood.org. Invasives.org

Kudzu (*Pueraria montana*) - A twining and trailing vine about up to about 100ft. in length. Its leaves are alternate with 3 hairy leaflets 3-8 inches in length and 2-8 inches in width. This plant produces pink flowers and hairy beans. This plant is known to overrun trees and other structures and can occur in large stands. While this plant is not known to cover significantly large areas at Lake O' the Pines, it is likely present and its presence should be monitored. A number of established stands are known to occur nearby in Harrison and Titus counties.



Source: J. H. Miller & Ted Bodner
Affiliation: Southern Weed Science
Society Source: Bugwood.org

Johnsongrass (*Sorghum halepense*) – Perennial with vigorous rhizomes. Coarse grass with reddish to purplish-black panicles, to 2m tall. Johnsongrass grows rapidly and is highly competitive and can rapidly produce large colonies. Johnsongrass was introduced from Africa and Asia, and is considered one of the 10 most noxious weed species in the world. Johnsongrass grows rapidly and is highly competitive and displaces native plant communities and agricultural crops. Johnsongrass can be difficult to control. Herbicides are applied annually to infestations of Johnsongrass on the dam at Lake O' the Pines.



Photo: Forest & Kim Starr. USGS. Texasinvasives.org.

Sacred Bamboo or Nandina (*Nandina domestica*) – Small shrub to 8 ft. with alternate compound leaflets and white terminal flowers. The plants fruits are green turning to red, and are favored by birds, promoting its spread. This plant occurs in many locations at Lake O' the Pines. There have been no control efforts to date for this plant, but it should be monitored closely.

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APPENDIX E – WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) REPORT

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APPENDIX E

WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) SUMMARY REPORT

LAKE O' THE PINES MASTER PLAN REVISION

HARRISON, CAMP, MARION, AND UPSHUR COUNTIES, TEXAS



March 2018



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

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Introduction

Habitat assessments were conducted at Lake O' the Pines on July 24-26th, 2017 using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure ([WHAP] TPWD 1995). WHAP survey point locations were haphazardly preselected based on aerial imagery from existing Geographical Information Systems (GIS) data. A total of 80 WHAP points were surveyed, all within U.S. Army Corps of Engineers (USACE) fee boundary (Figures 2A through 2I).

The purpose of this report is to describe wildlife habitat quality within the USACE Lake O' the Pines fee-owned property in Upshur, Harrison, Camp, and Marion Counties, Texas. This report is being prepared by the USACE Regional Planning and Environmental Center to provide habitat quality information and inform land classifications as part of the Lake O' the Pines Master Plan revision process.

Study Area

USACE fee owned property at Lake O' the Pines, approximately 29,417 acres, is located west of Jefferson, Texas in the Pineywoods region of northeast Texas. Among numerous small creeks and tributaries, Big Cypress Creek is the major contributing water body to Lake O' the Pines. Downstream of the Ferrels Bridge Dam, Big Cypress Creek meanders through Big Cypress Bayou into Caddo Lake and eventually into the Red River.

Methodology

A team of biologists, foresters, and USACE rangers conducted the habitat surveys on July 24th-26th, 2017. TPWD's WHAP protocol was used to analyze and describe existing habitats.

The WHAP requires evaluating representative sites of each cover type present within an area of interest. For this project, a search area of 0.1 acre (circle with radius of 37.2 feet) was used at each WHAP site to compile a list of plant species occurring at each site and to complete the Biological Components Field Evaluation Form (https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_w7000_0145.pdf). Field data collected on the form at each WHAP site included the following components:

1. Site Potential
2. Temporal Development of Existing Successional Stage
3. Uniqueness and Relative Abundance
4. Vegetation Species Diversity
5. Vertical Vegetation Stratification
6. Additional Structural Diversity
7. Condition of Existing Vegetation

At each site, a 1/10th acre plot was evaluated and points were assigned to all applicable components based on field conditions. A habitat quality score, where values range from 0.0 (low quality) to 1.0 (high quality), was then calculated for each site by adding together all points and multiplying by 0.01. Habitat quality was then determined for all sites within the same habitat type.

Photographs were taken at each site and are included as Attachment B.

The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for particular tracts of land statewide without imposing significant time requirements in regard to field work and compilation of data (TPWD 1995). The WHAP was not designed to evaluate habitat quality in relation to specific wildlife species.

The WHAP is based on the following assumptions:

1. Vegetation structure including species composition and physiognomy is itself sufficient to define the habitat suitability for wildlife;
2. A positive relationship exists between vegetation diversity and wildlife species diversity;
3. Vegetation composition and primary productivity directly influence population densities of wildlife species.

As designed, the WHAP is intended to be used for the following applications:

1. Evaluating impacts upon wildlife populations from specific development project alternatives.
2. Establishing baseline data prior to anticipated or proposed changes in habitat conditions for specific areas.
3. Comparing tracts of land that are candidates for land acquisition or mitigation.
4. Evaluating general habitat quality and wildlife management potential for tracts of land over large geographical areas, including wildlife planning units.

Habitat

Using TPWD's Texas Ecological Mapping Systems (<https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/>), Lake O' the Pines lies within the West Gulf Coastal Plain Pine-Hardwood Forest region. The most common habitat types include Pine and Mixed Pine Forests. Table 1 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

Table 1. Survey Points per Habitat Type	
Habitat Type	Points Surveyed
Pine Forest	23
Mixed Pine	18
Mixed Forest	6
Deciduous Forest	6
Bottomland Hardwood	5
Riparian Swamp	3
Flatwoods Mixed Forest	3
Riparian CD Forest	3
Floodplain Marsh	3
Grassland-Maintained	2
Mixed Deciduous	2
Mesic Deciduous Forest	2
Grassland-Food Plot	1
Mixed Deciduous Forest	1
Floodplain Forest	1

Figure 1 displays the distribution of habitat types managed by USACE at Lake O' the Pines.

Within the West Gulf Coastal Plain, longleaf pine (*Pinus palustris*) historically dominated. Today the region mostly exhibits stands featuring plantings of *Pinus taeda* (loblolly pine), although *Pinus palustris* (longleaf pine) may also be present in small numbers (Elliot et al 2014). Historically, *Pinus echinata* (shortleaf pine) dominated drier sites. *Pinus taeda* (loblolly pine) was less dominant than in the current landscape, and occupied less dry areas. Typical deciduous hardwoods conspicuous in this system include *Liquidambar styraciflua* (sweetgum), *Carya texana* (black hickory), *Quercus stellata* (post oak), *Quercus falcata* (southern red oak), *Quercus alba* (white oak), *Quercus nigra* (water oak), *Ulmus alata* (winged elm), *Ulmus crassifolia* (cedar elm), and *Nyssa sylvatica* (blackgum). Some sites may be primarily deciduous, with 75% or more of the canopy cover occupied by hardwoods. *Ilex vomitoria* (yaupon), saplings and seedlings of overstory species, *Callicarpa americana* (American beautyberry), *Morella cerifera* (wax-myrtle), *Vaccinium arboreum* (farkleberry), and *Cornus florida* (flowering dogwood) commonly occupy the shrub layer. Woody vines in this system may be conspicuous and often include *Smilax* (greenbrier), *Vitis* spp. (grape, often *Vitis rotundifolia* (muscadine grape), *Parthenocissus quinquefolia* (Virginia creeper), and *Toxicodendron radicans* (poison ivy). The herbaceous layer is generally sparse (often < 20% cover), with *Schizachyrium scoparium* (little bluestem), *Chasmanthium laxum* (slender woodoats), *Chasmanthium sessiliflorum* (narrowleaf woodoats), and *Pteridium aquilinum* (brackenfern) often present to dominant. Forests with dense tree cover (especially evergreen cover), have reduced shrub and herbaceous cover. Herbaceous cover may be additionally limited by dense litter accumulation. Few occurrences of this system can be considered old growth, and much of the system, as it is mapped, constitutes pine plantations or sites recovering from previous logging.

Results

The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. The average, maximum, and minimum total score for each habitat type surveyed is shown in Table 2.

Figures 2A through 2I show the range of total scores for all points surveyed. Overall, Riparian Swamp and Bottomland Hardwood habitats exhibited the highest average total score (82 and 78). These habitats exhibited diverse, older growth forests that are becoming less abundant across the landscape.

Pine and Mixed Pine Forests were the most abundant habitat types surveyed. Pine forest scores ranged from 36 to 81 while Mixed Forest scores fell between 50 and 76. The lower minimum scores, especially for normally drier upland habitats, were partly due to flooding that briefly occurred at Lake O' the Pines in the months leading up to the surveys. Flooding likely impacted herbaceous plant growth, and associated survey metrics, within the inundated areas.

Table 2. Average, Maximum, and Minimum Total Scores per Habitat Type

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Riparian Swamp	82	82	81
Bottomland Hardwood	78	89	71
Mesic Deciduous Forest	71	75	67
Mixed Deciduous	70	71	68
Mixed Deciduous Forest	68	68	68
Floodplain Marsh	68	76	60
Flatwoods Mixed Forest	67	79	54
Mixed Pine	65	78	56
Deciduous Forest	62	76	49
Mixed Forest	59	76	50
Pine Forest	59	81	36
Riparian CD Forest	56	71	41
Floodplain Forest	47	47	47
Grassland-Food Plot	40	40	40
Grassland	39	39	39
Grassland-Maintained	23	30	15

Beyond vegetative diversity, metrics within the WHAP scoring criteria allocate points for site potential, successional stage, and uniqueness and relative abundance. Table 3 shows these metrics' average score per habitat type.

Site potential allocates more points based on soil substrates that can support higher quality, more diverse habitat. This allows areas to score higher even though a recent disturbance, such as fire or flood, may have removed most of the vegetation. Areas scoring high in site potential but low in other metrics can be targeted for management efforts as these areas' vegetation community response should be favorable, thus increasing habitat value.

Successional stage refers to the age of the vegetative community. Older, mature forests score higher than younger pole stands as they provide more diverse forage, cover, and niche habitats.

Uniqueness and Relative Abundance takes into consideration the rarity of a habitat or vegetative community and its abundance in the region. Logging and pine plantations have significantly influenced the region's forest composition. Older stands of pine forests have become less abundant across the region, however several stands persist on USACE property at Lake O' the Pines. To capture this increasingly unique community, a specific scoring criteria was added to the Uniqueness and Relative Abundance component of the WHAP. For Pine Forest stands greater than 25 years old, with less than 80% canopy cover, a score of 12 was given.

Bottomland Hardwood, Riparian Swamp, and Floodplain Marsh are typically found in highly productive soils. Riparian Swamp and Bottomland Hardwood also scored high in terms of Uniqueness and Relative Abundance. Mixed Deciduous Forest scored the highest regarding successional stage.

Table 3. \bar{x} Site Potential, Successional Stage and Uniqueness Scores per Habitat Type

Habitat Type	\bar{x} Site Potential	\bar{x} Successional Stage	\bar{x} Uniqueness and Relative Abundance
Bottomland Hardwood	24	15	16
Flatwoods Mixed Forest	21	12	13
Floodplain Forest	12	6	10
Floodplain Marsh	25	NA	10
Grassland	25	1	5
Grassland-Food Plot	12	5	10
Grassland-Maintained	12	1	0
Mesic Deciduous Forest	12	16	13
Mixed Deciduous	16	16	10
Mixed Forest	10	13	10
Mixed Pine	14	13	11
Pine Forest	13	11	10
Riparian CD Forest	17	7	8
Riparian Swamp	25	12	15
Mixed Deciduous Forest	12	20	10
Deciduous Forest	15	10	11

Fifteen survey points (1, 2, 2A, 12, 22, 35, and 37, 39, 40, 42A, 44B, 44C, 44D, 58, and 59) received the highest site potential score. These sites were located lower in the floodplain with higher hydrologic connectivity supportive of diverse habitat (Figure 3).

Figure 4 shows the points (1, 2A, 2B, 5, 7, 10, 13, 44A, 45, and 53) that received the highest score regarding successional stage.

Only three points (2, 2A, 42A) surveyed received the highest scores for the Uniqueness and Relative Abundance criteria (Figure 5). These areas primarily supported Bottomland Hardwood or Riparian Swamp habitat. Survey points 2 and 2A comprised of Bald Cypress and Overcup Oak stands considered to be highly productive and becoming less abundant in the region.

As previously described, a separate scoring value was added to the Uniqueness and Relative Abundance criteria to acknowledge the rarity of older (>25 years) pine forest with canopy cover less than 80%. Habitats exhibiting these characteristics are believed to be the product of longer stand rotations and prescribed fire management practices. In total, twelve site (0, 2B, 3, 4, 5, 11, 13, 20, 24A, 24B, 25, 26, 27B, 28, 30, 31, 33, and 42) received this score (Figure 6).

Three tree species were identified as indicators of unique habitat at Lake O' the Pines. Sites supporting Overcup Oak (1, 2, 2A, 2B, 40, 42A, 43, 44B, 44C, 44D, 46, and 47), Bald Cypress (1, 2A, 41, 42A, 59, and 61) and/or Cherrybark Oak (23, 27, 27B, 30, 33, 39, and 44D) were noted and are displayed in Figures 7, 8 9.

When assessing all points for the three primary criteria components that yield the majority of the scoring, Site Potential, Successional Stage, and Uniqueness and Relative Abundance, only three points received the maximum scores on two out of three components (1, 2, 42A). In

addition, one point (2A) received maximum scores on all three of the primary criteria components.

In summary, combining the WHAP analytical analysis, spatial distribution of higher scoring points, and presence/absence of the three less abundant tree species, two areas were identified as having higher quality in relation to the remaining lands managed by USACE at Lake O' the Pines. The two areas, below the Ferrell's Bridge Dam and above the Highway 259 Bridge, exhibited high quality tracts of Bottomland Hardwood, Riparian Swamp, and Pine Forests.

Recommendations

Even with planned and unplanned disturbances, there are numerous areas of valuable wildlife habitat remaining on USACE fee property at Lake O' the Pines.

The forest management practices at Lake O the Pines include the salvage of flood-killed and storm-damaged timber, the planting of flood-tolerant trees and shrubs in select areas prone to inundation, and the improvement of upland habitats through selective timber harvests, prescribed fire, and tree plantings, with an overall goal of increasing species diversity and maintaining forest vigor and health. Overall, habitat management has proven effective in maintaining medium- to high-quality wildlife habitat on USACE lands at Lake O' the Pines.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas having the highest scores. The planning team for the Joe Pool Lake Master Plan revision will take into account the WHAP scores when making land classification decisions.

References

Elliott, Lee F., David D. Diamond, C. Diane True, Clayton F. Blodgett, Dyan Pursell, Duane German, and Amie Treuer-Kuehn. 2014. Ecological Mapping Systems of Texas: Summary Report. Texas Parks & Wildlife Department, Austin, Texas.

Texas Parks and Wildlife Department (TPWD). 1995. Wildlife Habitat Appraisal Procedure (WHAP). Last revised January 12, 1995.

Lake O' the Pines WHAP Summary Result Figures

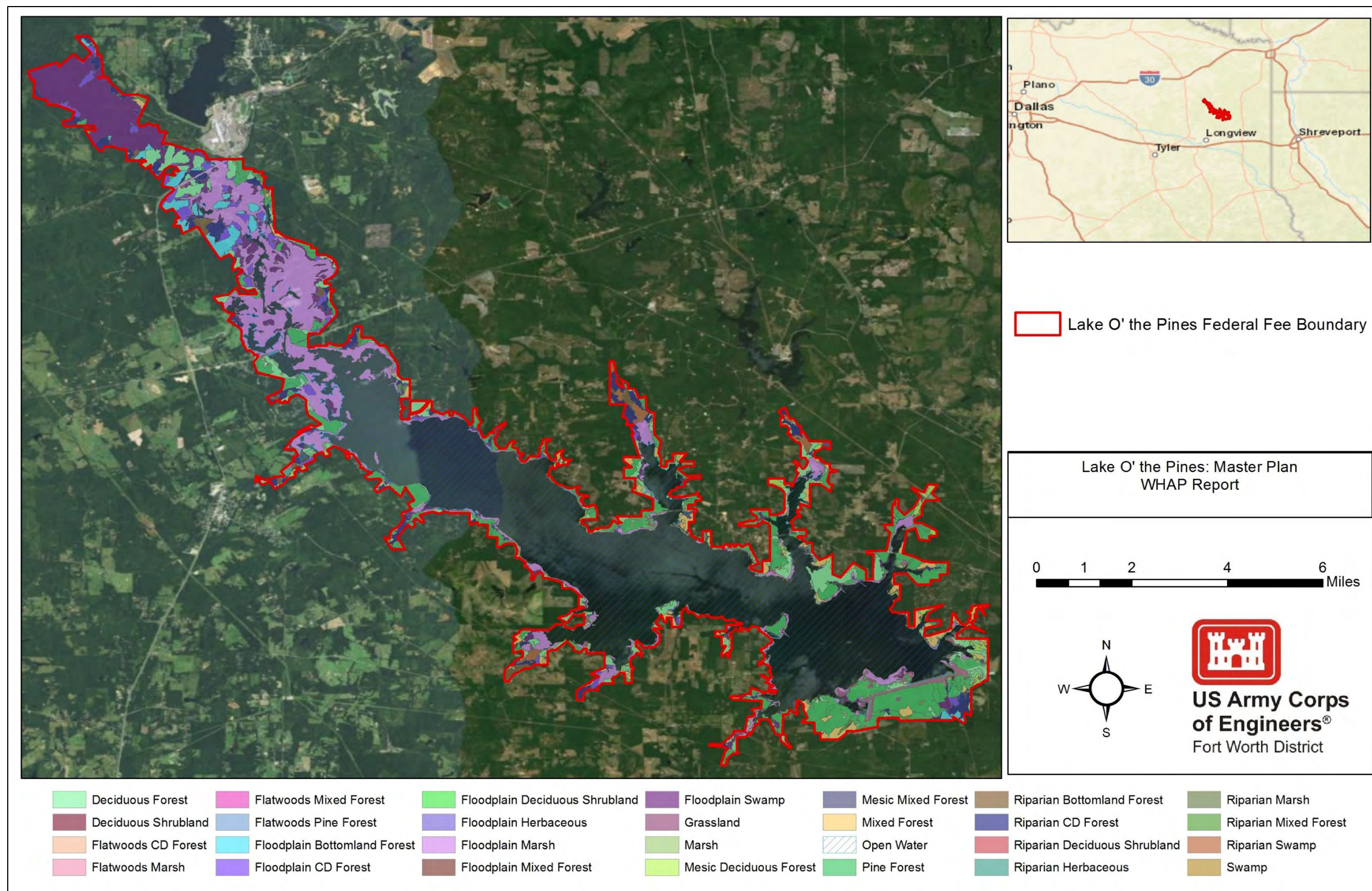


Figure 1. Distribution of Habitat Types within the fee owned boundary at Lake O' the Pines.

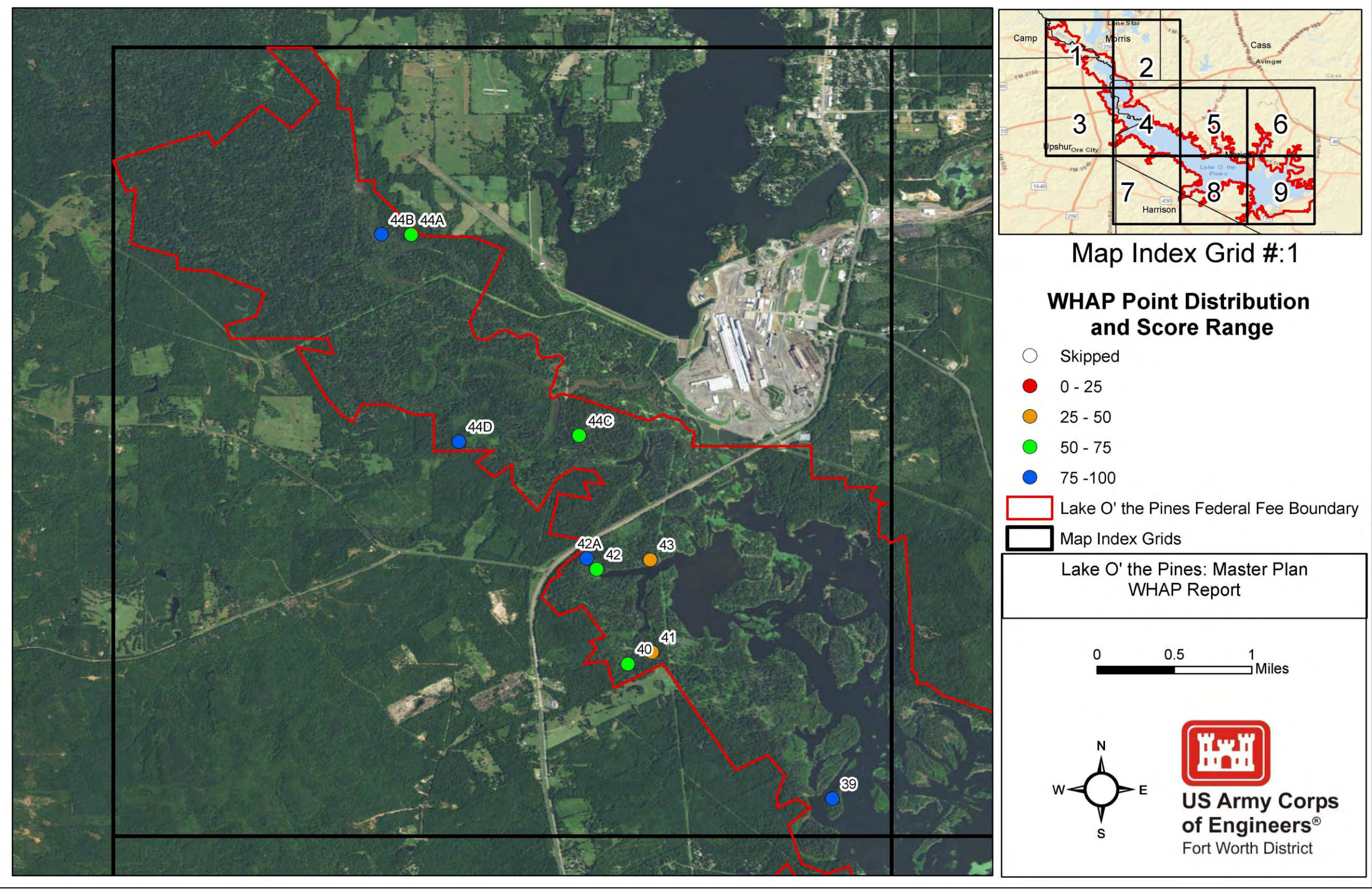


Figure 2A. Total Score Range for All Points Surveyed.

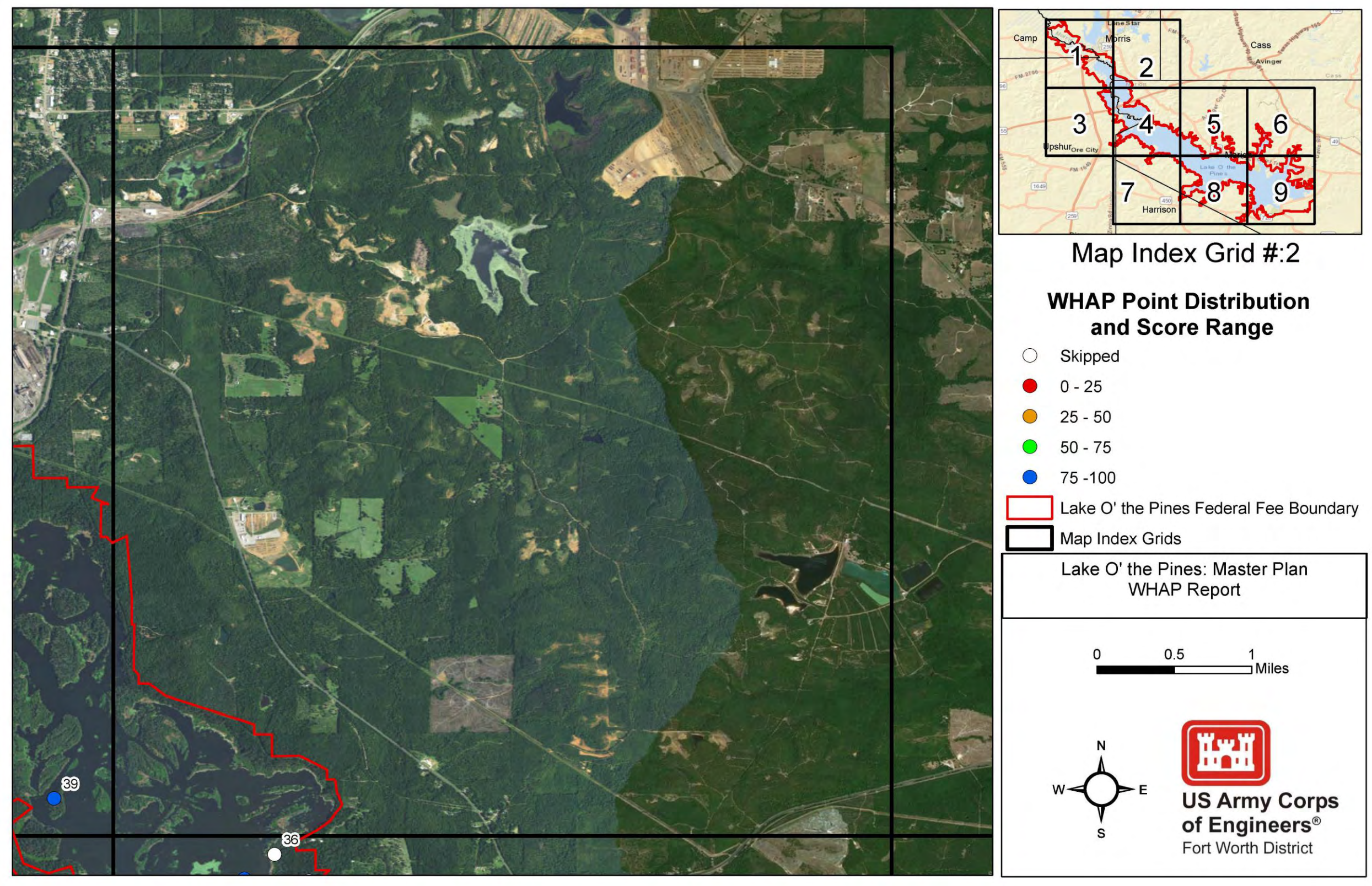


Figure 2B. Total Score Range for All Points Surveyed.

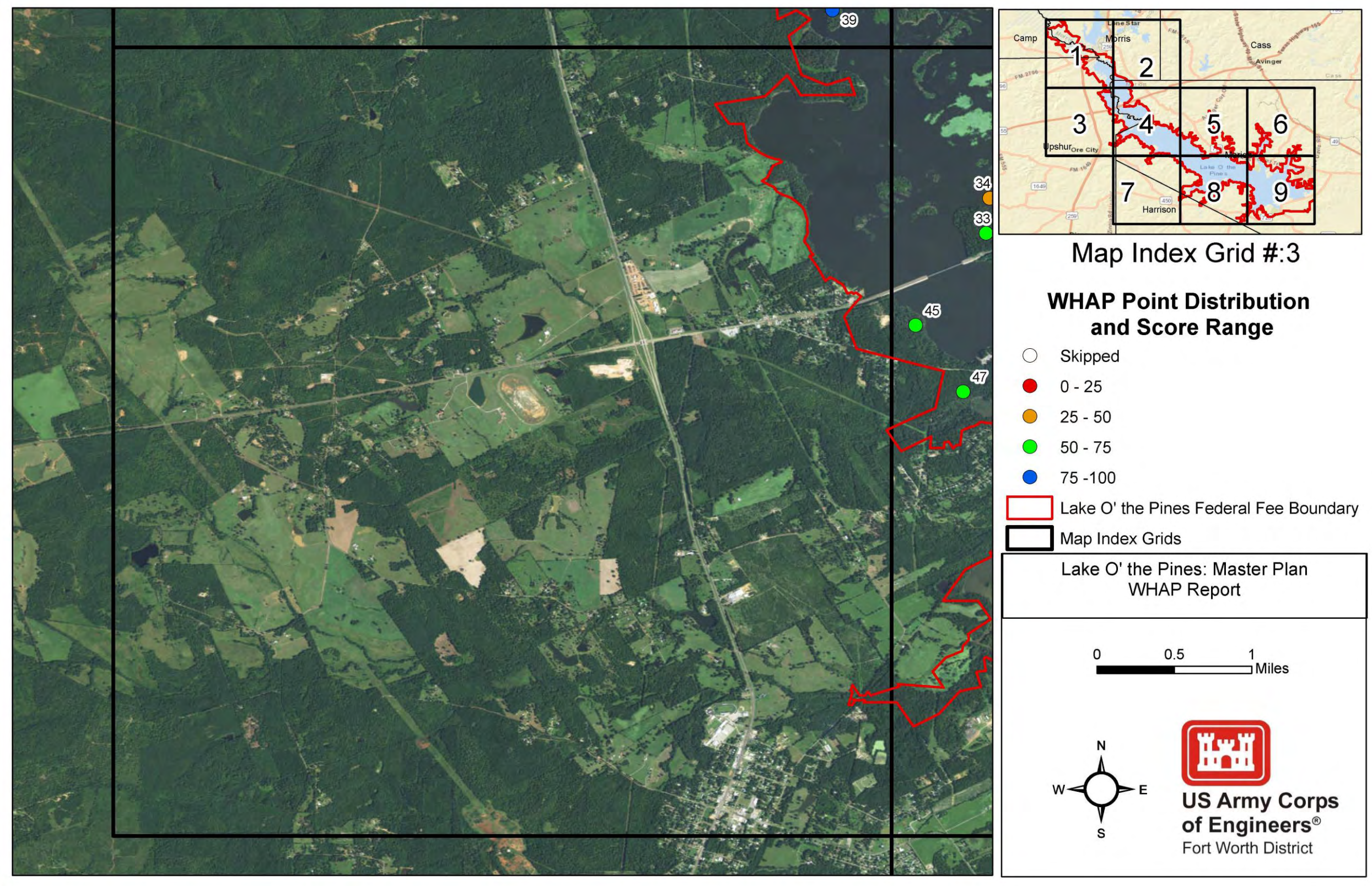


Figure 2C. Total Score Range for All Points Surveyed.

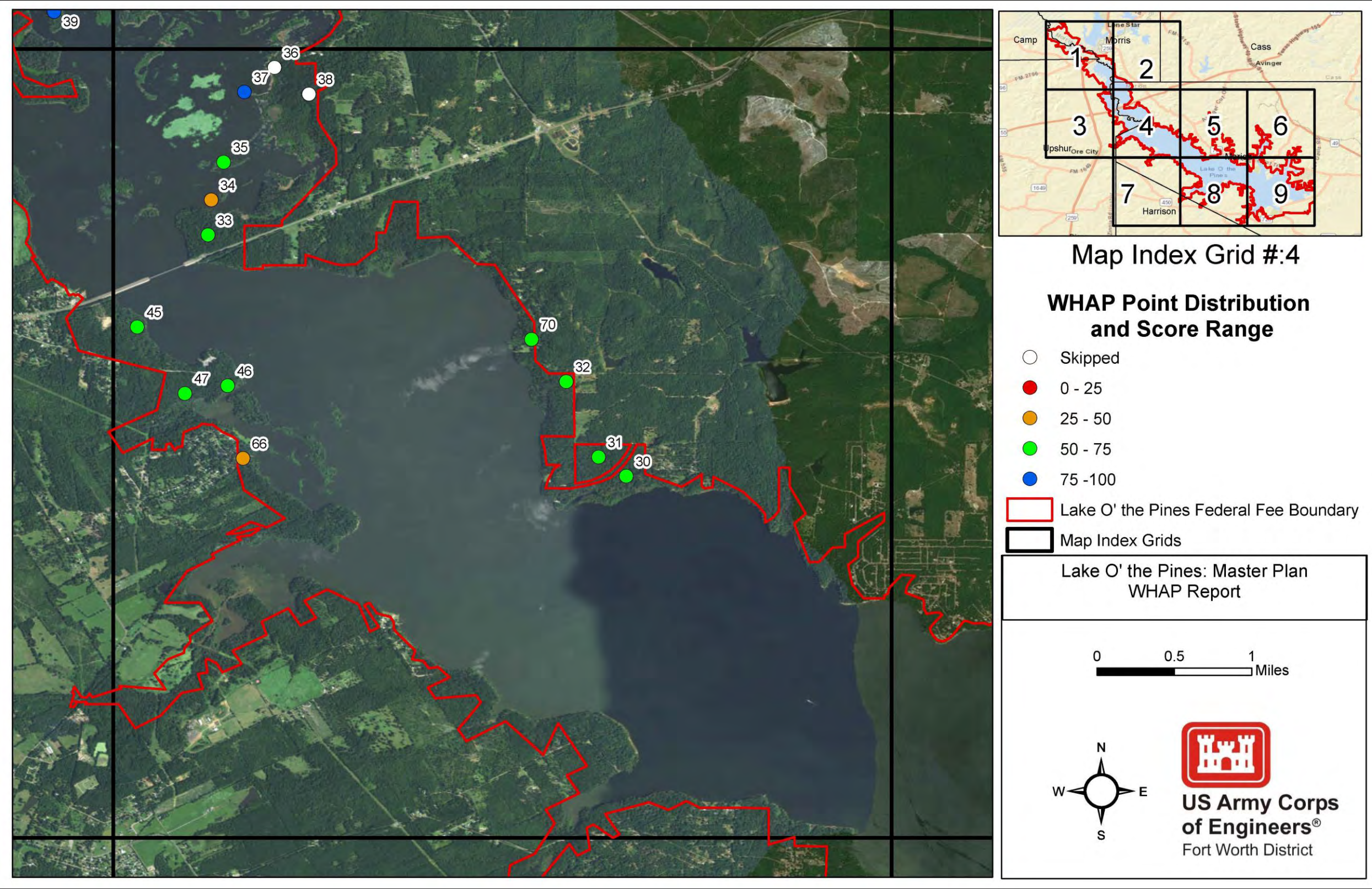


Figure 2D. Total Score Range for All Points Surveyed.

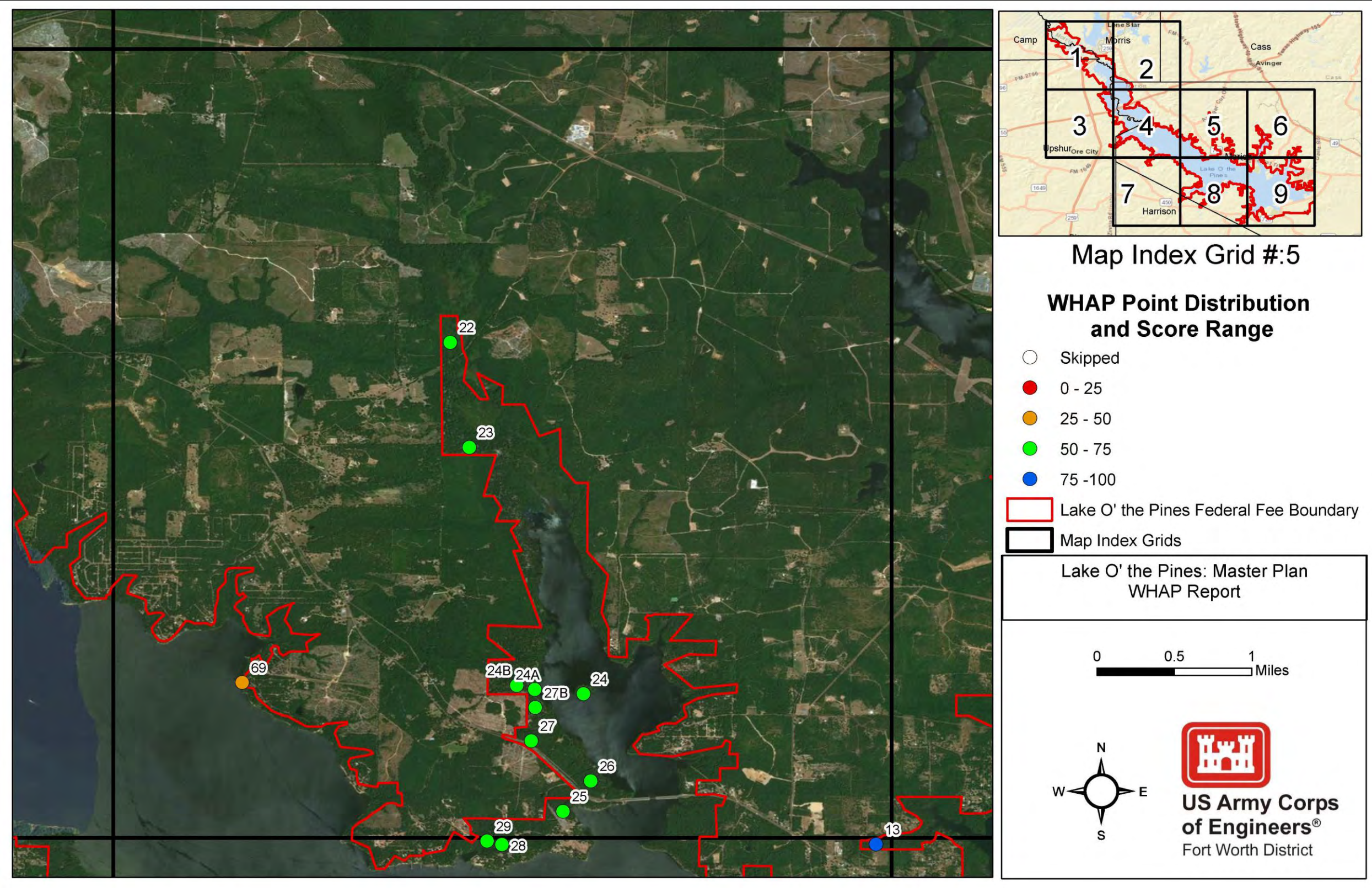
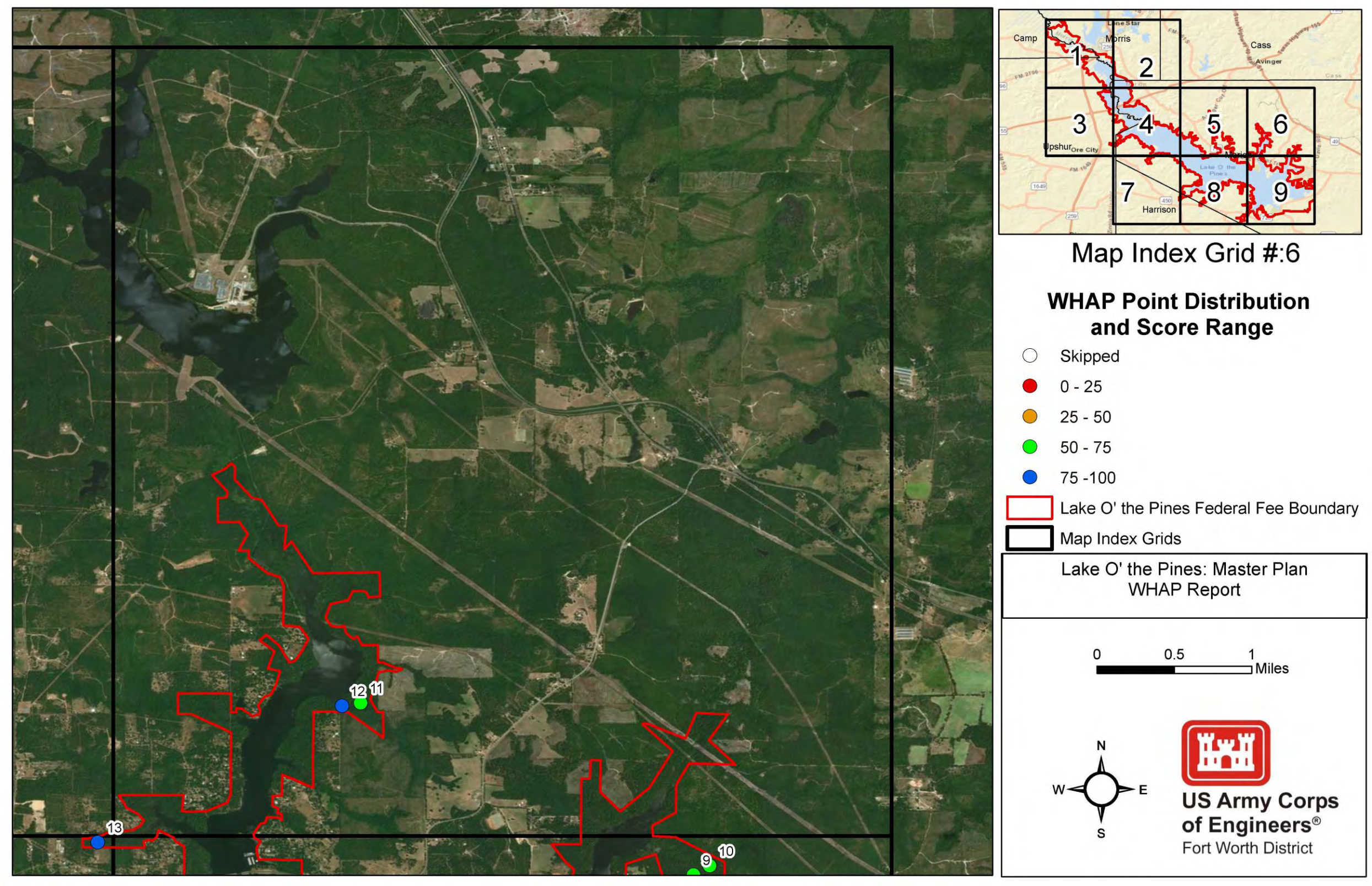


Figure 2E. Total Score Range for All Points Surveyed.



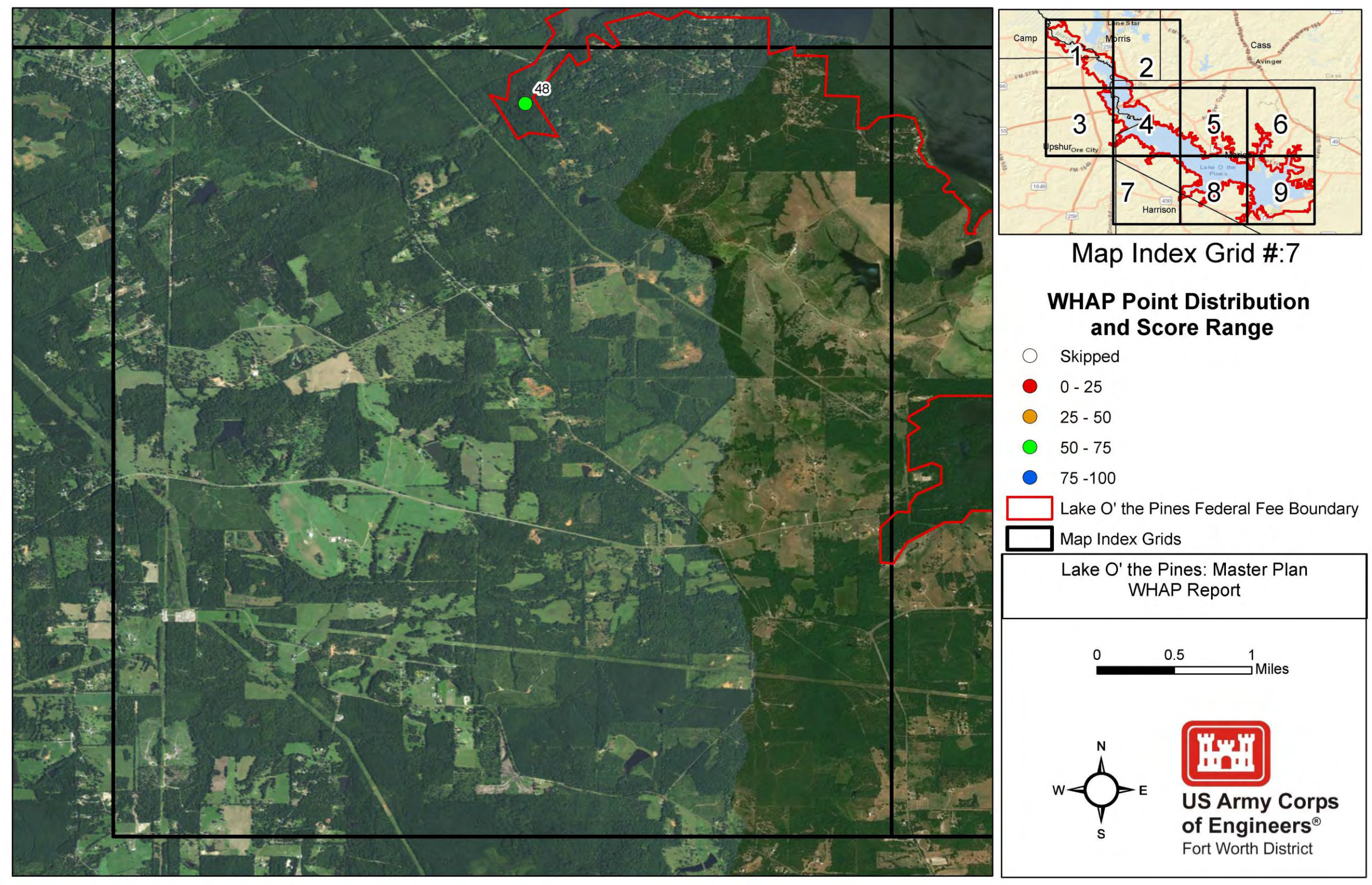


Figure 2G. Total Score Range for All Points Surveyed.

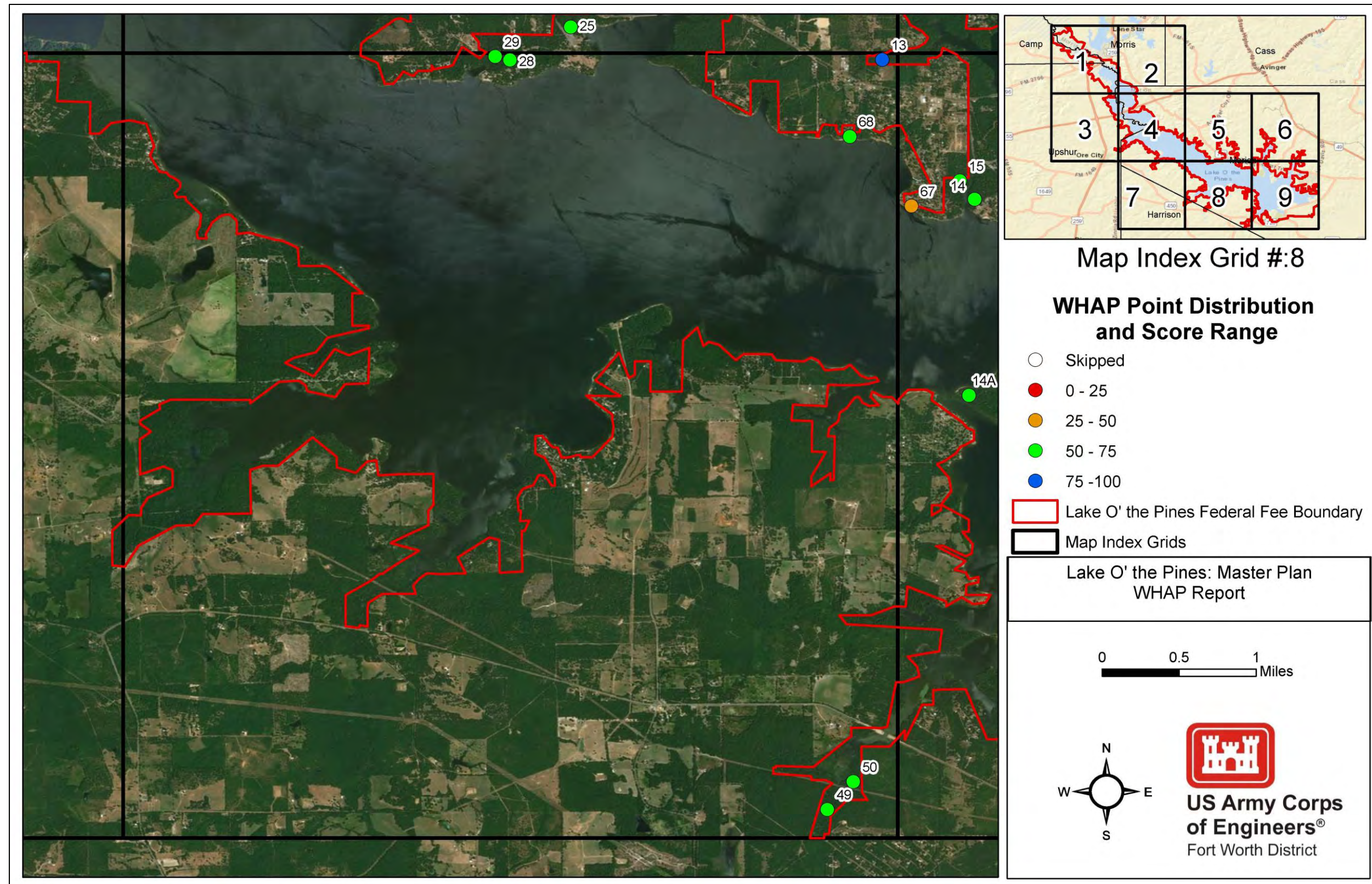


Figure 2H. Total Score Range for All Points Surveyed.

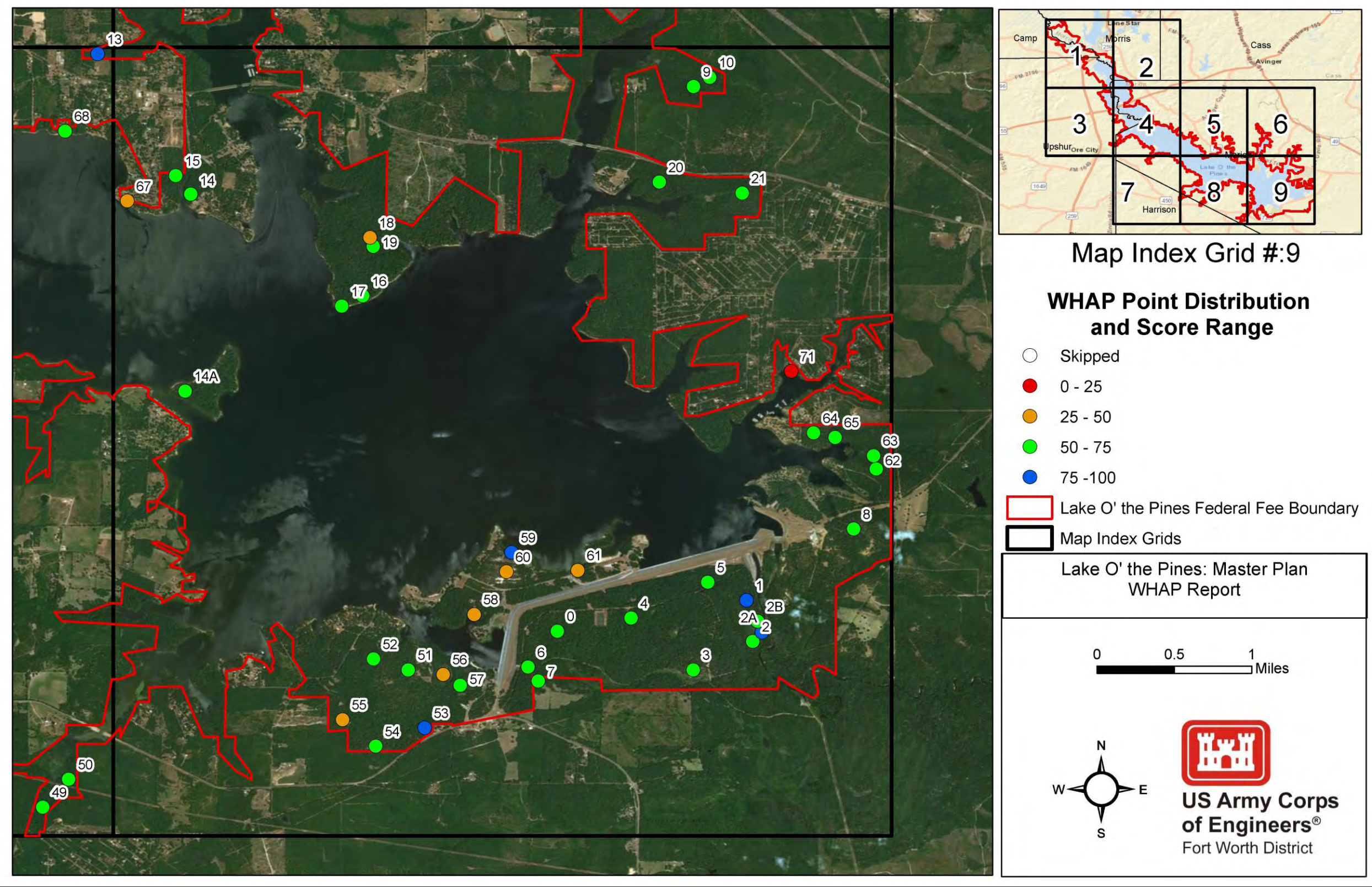


Figure 2I. Total Score Range for All Points Surveyed.

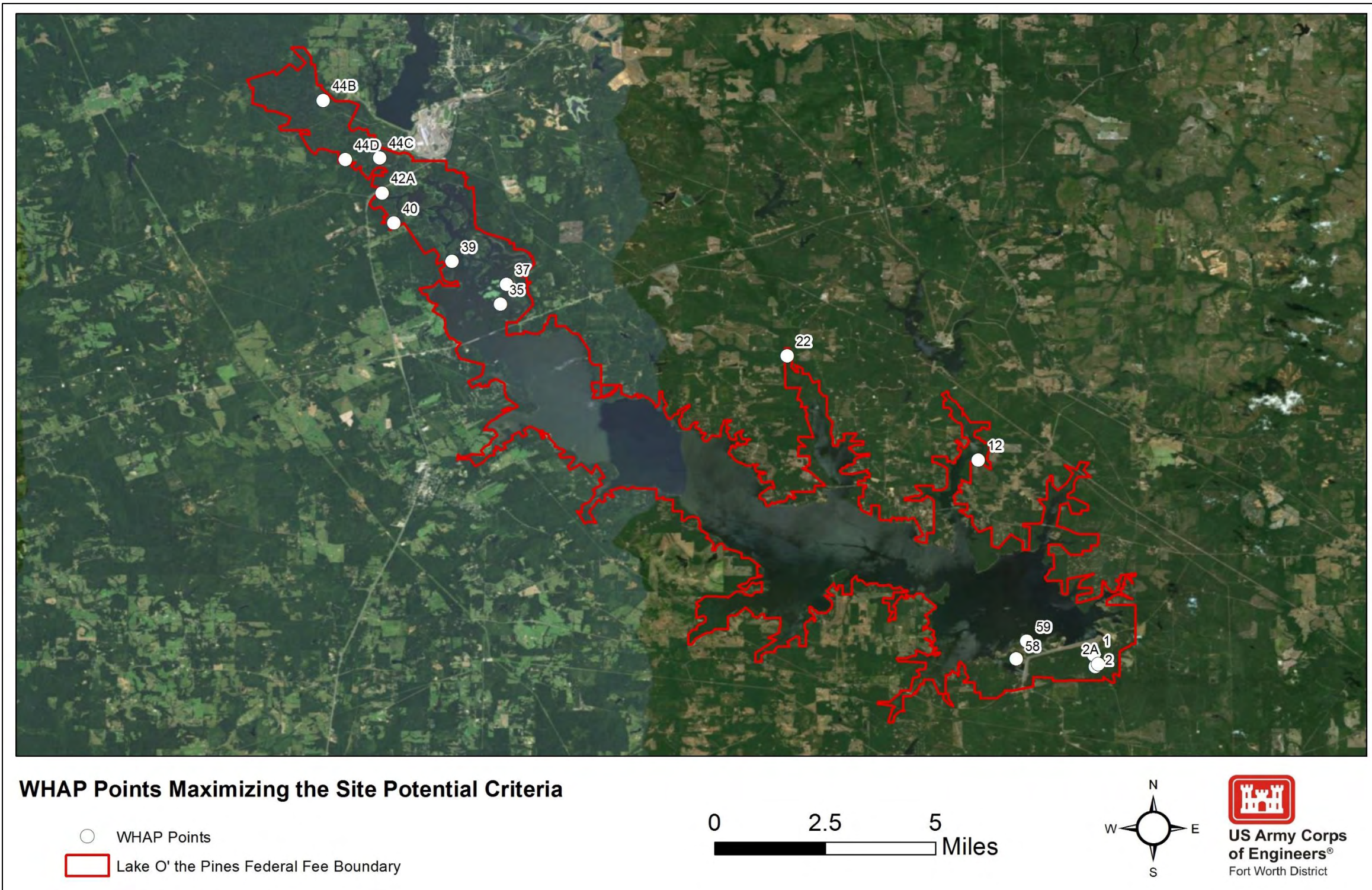


Figure 3. Survey Points Maximizing the Site Potential Criteria.

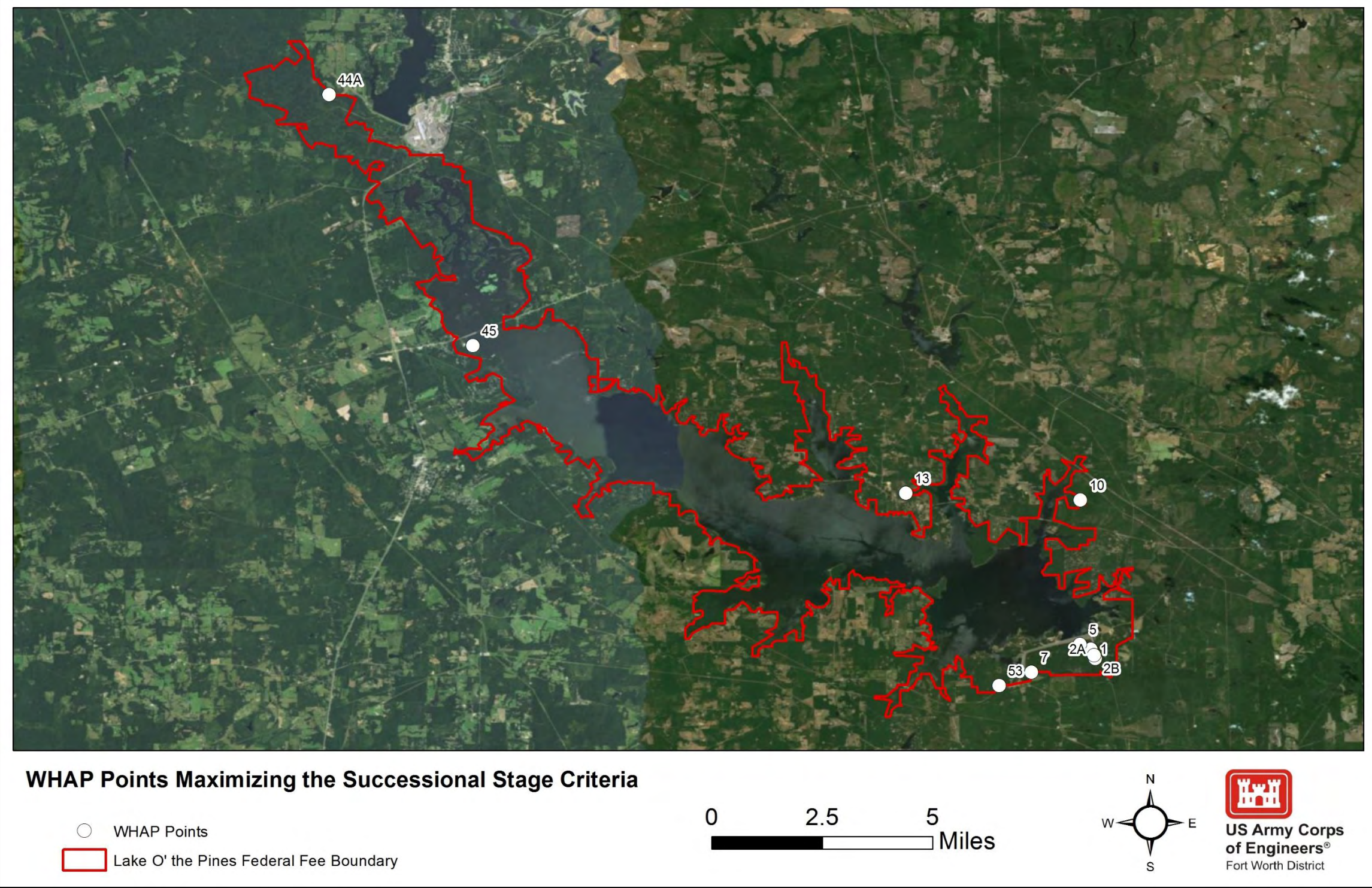


Figure 4. Survey Points Maximizing the Successional Stage Criteria.

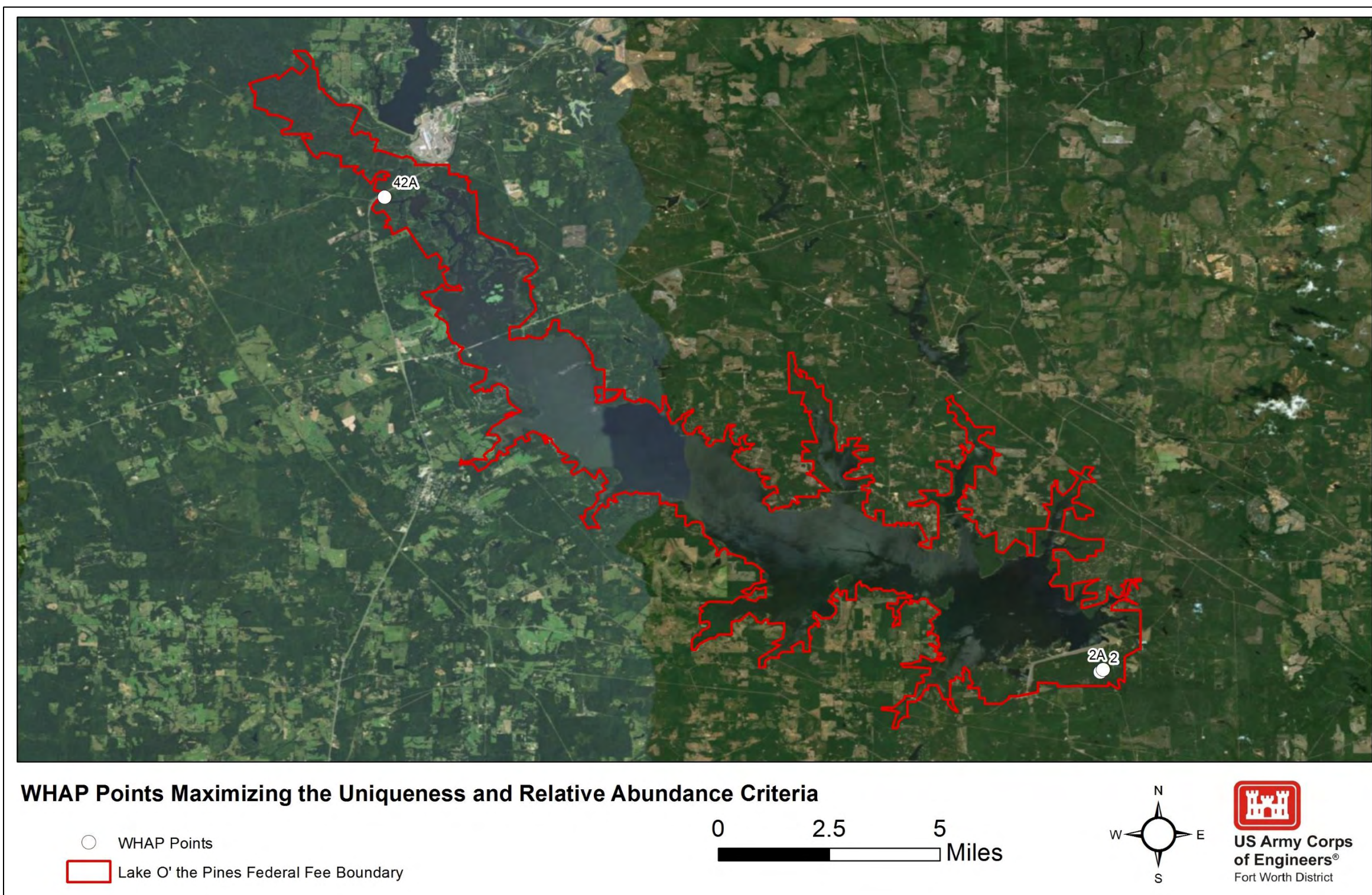


Figure 5. Survey Points Maximizing the Uniqueness and Relative Abundance Criteria.

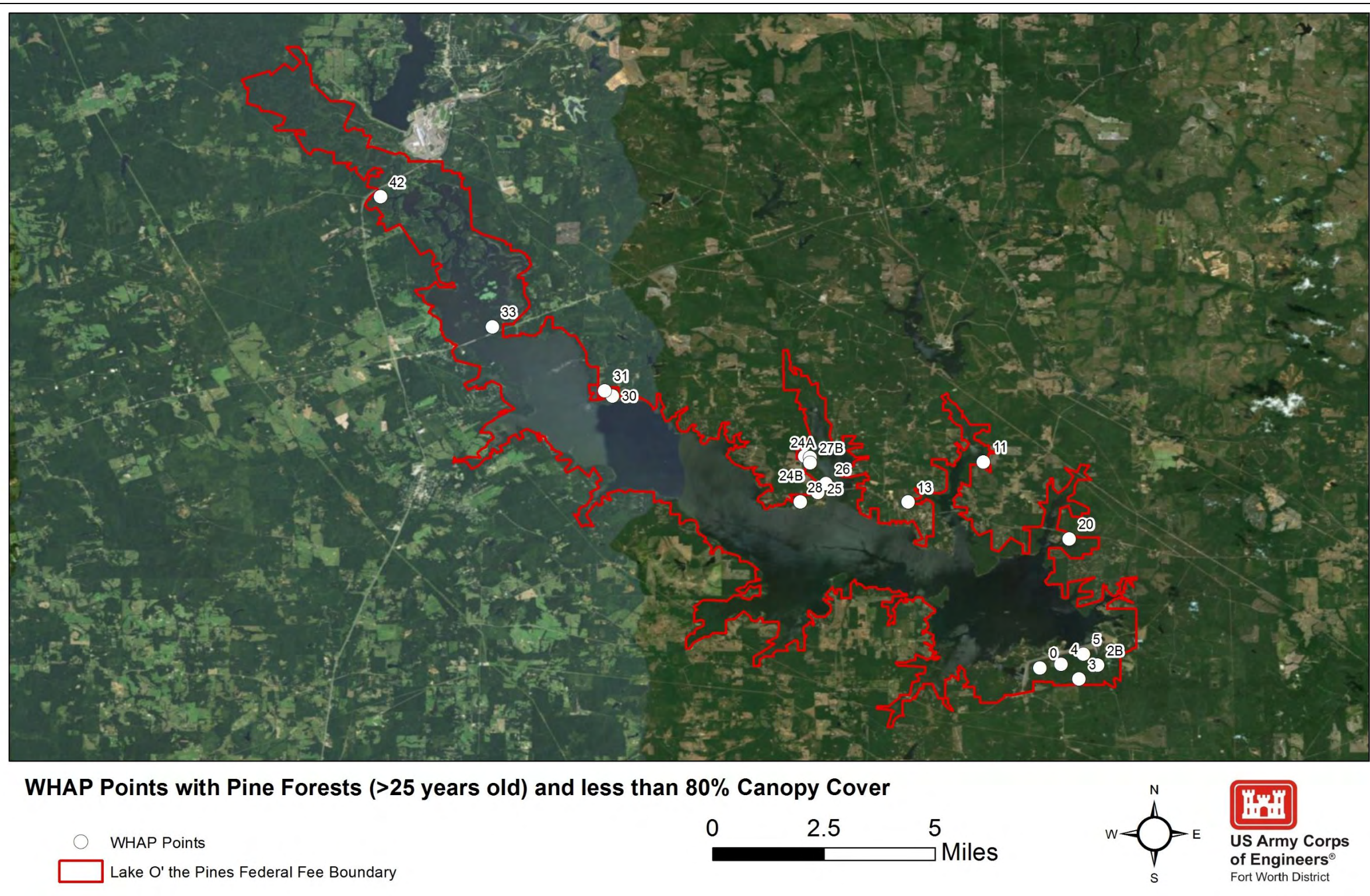


Figure 6. Survey Points with Pine Forests (>25 years old) and <80% Canopy Cover.

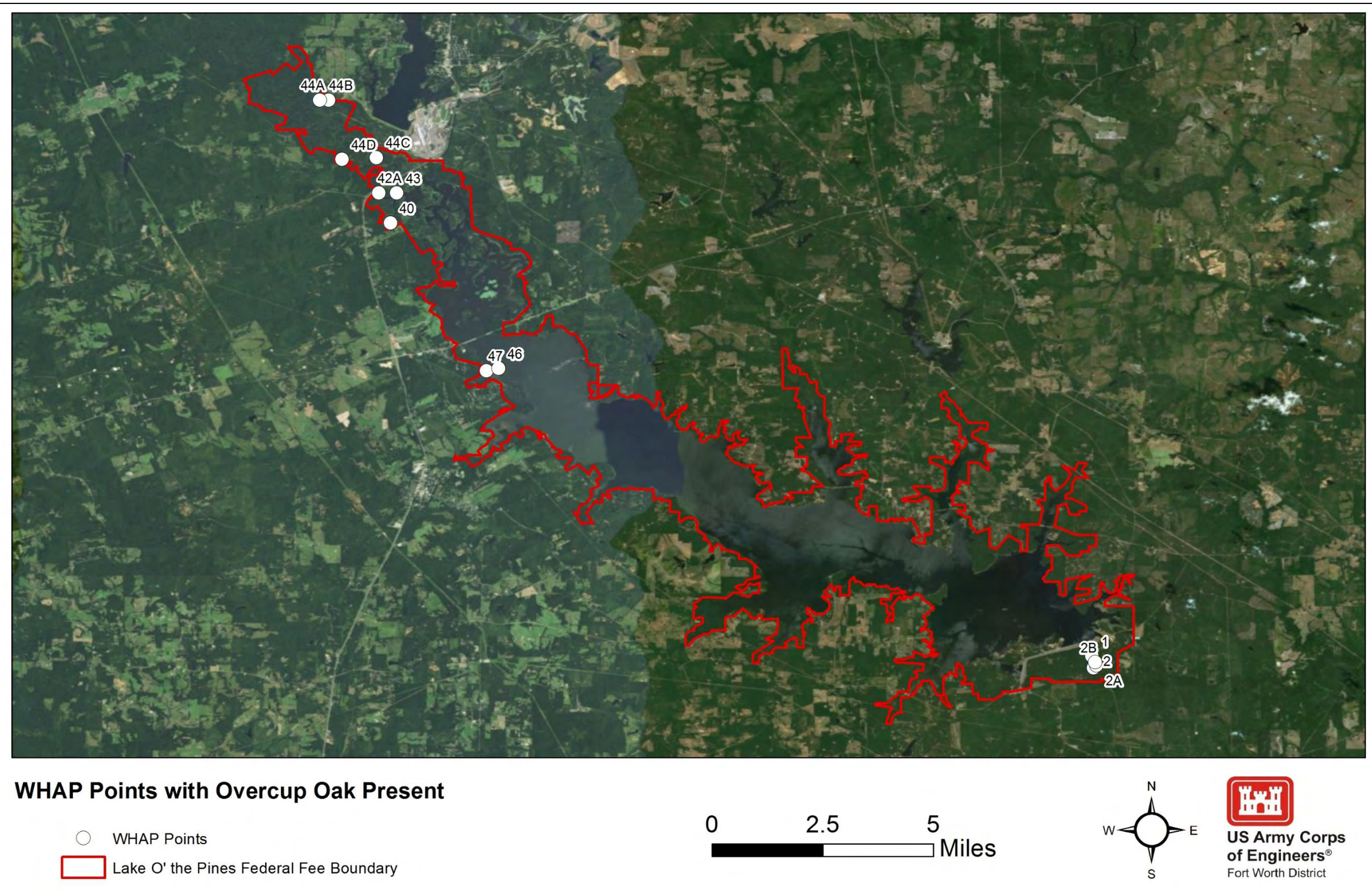


Figure 7. Survey Points with Overcup Oak Present.

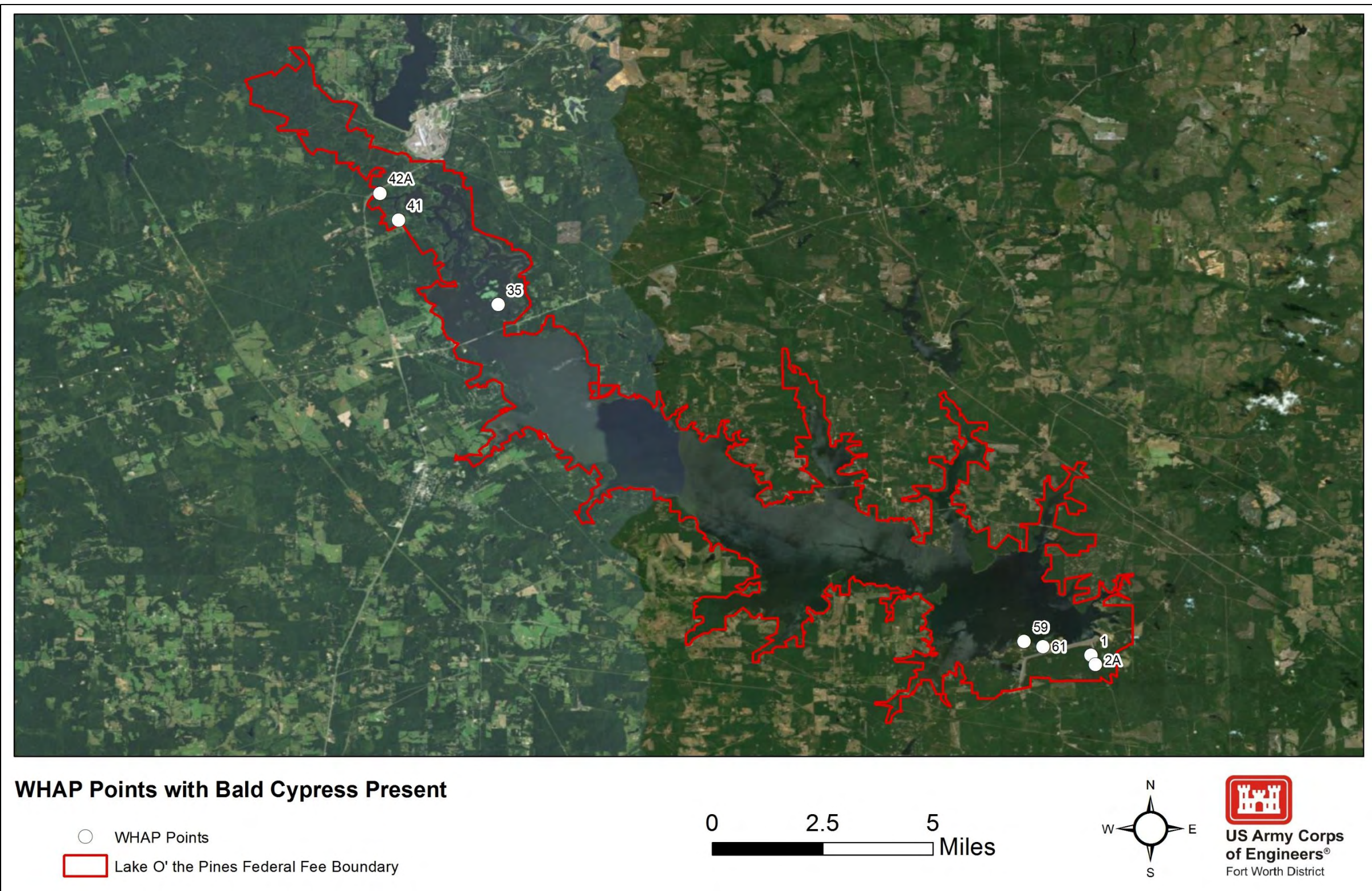


Figure 8. Survey Points with Bald Cypress Present.

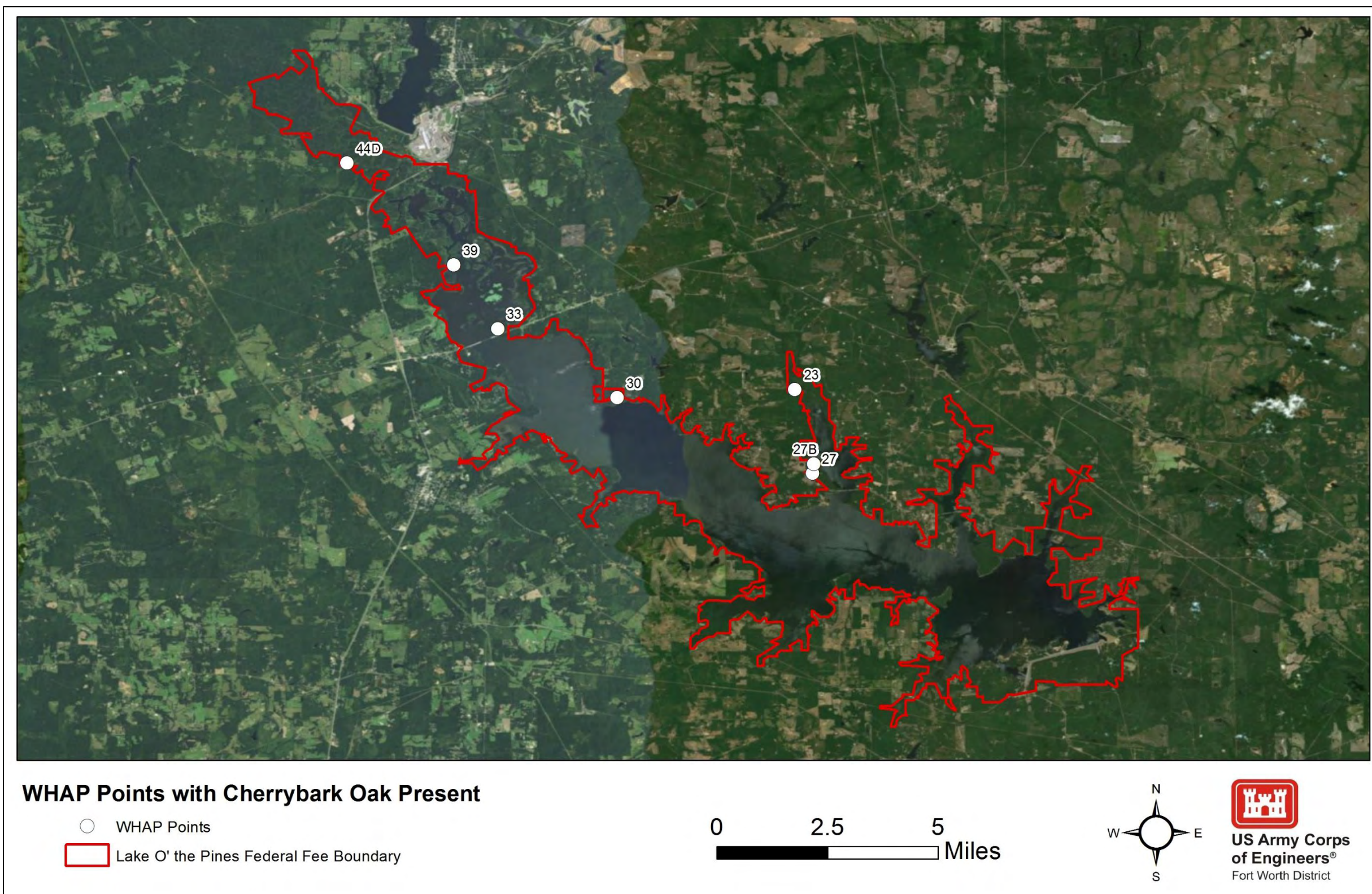


Figure 9. Survey Points with Cherrybark Oak Present.

Attachment A: Lake O' the Pines WHAP Results Summary

<u>Point Number</u>	<u>Habitat Type</u>	<u>Total Score</u>	<u>Berry Drupe</u>	<u>Legume Pod</u>	<u>Acorn</u>	<u>Nut Nutlike</u>	<u>Samara</u>	<u>Cone</u>	<u>Achene</u>	<u>All Others</u>	<u>Herbaceous Species</u>
0	Mixed Pine	64	Blackgum, Summer Grape, Sassafras, American Beautyberry, Poison Ivy, Muscadine, Wild Cherry, Virginia Creeper, Greenbrier, Peppervine, Blueberry, Sumac, American holly	None	White Oak, Red Oak	Wax Myrtle	None	Loblolly Pine	None	Sweetgum	Little Bluestem, Goldenrod, Virginia Wildrye, 3x Panicum spp., Pine Dropseed, Smilax sp.
1	Bottomland Hardwood	89	Blackgum, Sparkleberry, Greenbrier, Blackberry, Peppervine, Muscadine, Yaupon	None	Willow Oak, Overcup Oak, Water Oak	None	Elm, Red Maple	Cypress, Loblolly Pine	None	Sweetgum	Giant Ragweed, Panicum species, Wood Sorrel, Nut Sedge, 4 unknowns, Smartweed
2	Bottomland Hardwood	75	Blackgum	None	Willow Oak, Overcup Oak, Bur Oak	None	None	None	None	Sweetgum	Poison Ivy, 4x Panicum spp., Cherokee Sedge, Fern, Smilax sp., 2x Eleocharis spp
2A	Bottomland Hardwood	84	Blackgum, Peppervine	None	Overcup Oak, Willow Oak	None	elm	Cypress	None	None	Panicum species, Nut Grass, 4 grasses, Smartweed
2B	Pine Forest	75	American Beautyberry, Peppervine, Virginia Creeper, Muscadine, Yaupon, Dewberry, Poison Ivy	None	Willow Oak, Water Oak, Overcup	Black Walnut	Ash, Elm, Maple	Loblolly Pine	None	Sweetgum, Fern	Wood Sorrel, Fern, Goat Weed, Nut Grass, Thistle, Goldenrod, Panicum species
3	Mixed Pine	72	Blackgum, American Beautyberry, Hawthorn, Grapevine, Virginia Creeper, Blackberry, Muscadine, Black Cherry, Persimmon	None	Water Oak, Red Oak, Willow Oak	Hickory	None	Loblolly Pine	None	Sweetgum, Cedar, Moss	Cherokee Sedge, Scribner's Panicum, Gayfeather
4	Pine Forest	66	Persimmon, Peppervine, Summer Grape, Poison Ivy, Mayhaw, American Beautyberry, Muscadine, Sparkle Berry, Wild Grape, Winged Sumac, Decidious Holly, Blackbay Sassafras	Deer Vetch	Willow Oak, Water Oak, White Oak, Red Oak, Water Oak, Red Oak, Blackjack Oak, Post Oak	Wax Myrtle	Winged Elm	Loblolly Pine	None	Sweetgum, Mimosa	Little Bluestem, Cutgrass, Panicum species, Bindweed, Cherokee Sedge
5	Mixed Pine	75	Rattan Vine, Summer Grape, Mulberry, Black Cherry, American Beautyberry, Blackgum, Muscadine, American Holly, Bayberry, Poison Ivy, American Holly, Blackgum, Sassafras, Virginia Creeper, Greenbrier	None	Red Oak, Willow Oak, Buckeye, White Oak, Water Oak	Hickory, Wax Myrtle	Elm, Ash	Loblolly Pine	None	Sweetgum	Devil's Walking Stick, Fern, Thistle, Cutgrass, Panicum, 3 unknowns
6	Mixed Pine	70	Greenbrier, American Beautyberry, Black Cherry, Virginia Creeper, Dewberry, Wildrye, Poison Ivy, Wild Cherry, Blackgum, Rattan Vine	None	Red Oak, Water Oak	Hickory	None	Short Leaf Pine, Loblolly Pine, Elm	None	Sweetgum	Hercules Club, Mint, Cutgrass, Beggars Lice, Ragweed, False Nettle, Panicum, Cherokee Sedge, Bluestem
7	Mixed Deciduous Forest	68	Holly, Blackgum, Muscadine, Greenbrier, American Beautyberry, Hawthorn	None	Red Oak, Willow Oak, unknown Oak	Ironwood	Elm, Maple	Pine	None	Sweetgum, Moss	Palmetto, Scribner Panicum, False Nettle, Carex, Bluestem, Fern
8	Mixed Pine	60	Sparkleberry, Blueberry, American Beautyberry, Blackgum, Persimmon, Muscadine, Yaupon, Virginia Creeper, Greenbrier, Hawthorn	None	Blackjack Oak, Post Oak, Red Oak	Hickory	Winged Elm	Loblolly Pine, Shortleaf Pine	None	Sweetgum, Rusty Blackhaw	Bluestem, Unknown 1, sessile Cutgrass, Spiderwart, Panicum Species, Carex Species
9	Pine Forest	67	Sparkle Berry, Black Gum, Elm, Dogwood, American Holly, Virginia Creeper, Yaupon, Muscadine, American Beautyberry, Greenbrier	None	Post Oak, Water Oak, Red Oak, Willow Oak, Red Oak	Hickory	Elm, Red Maple	Loblolly Pine	None	Sweetgum	Panicum species, Cutgrass
10	Mesic Deciduous Forest	75	American Holly, Blackgum, American Beautyberry, Muscadine	None	White Oak, Water Oak, Willow Oak	Ironwood	Elm	Loblolly Pine	None	Sweetgum	Cutgrass
11	Pine Forest	60	Muscadine Grape, Huckleberry, Sparkleberry, Dogwood, Blackgum, Greenbrier, American Beautyberry, Virginia Creeper, Poison Ivy, Persimmon	None	Water Oak, Willow Oak, Post Oak, Red Oak, Blackjack Oak, Black Oak	Black Hickory, Mockernut Hickory	Red Maple, American Elm, Eastern Hophornbeam,	Shortleaf Pine	None	Cedar, Sweetgum	unknown., Panicum species, Fern species
12	Deciduous Forest	76	Greenbrier, Persimmon, American Beautyberry, Blackgum, Virginia Creeper	Partridge Pea, False Indigo	Water Oak, Willow Oak	None	Red Maple, Winged Elm	None	None	Sweetgum, Buttonbush,	Cherokee Sedge, Scribners Panicum, Common Witchgrass, Giant Ragweed, 2 Panicum species, Dog Fennell, False Nettle, Cut Grass, Wild Rice
13	Pine Forest	81	American Beautyberry, American Holly, Muscadine, Blackgum, Huckleberry, Greenbrier, Poison Ivy, Rusty Blackhaw, Morning Glory, Caroline Buckthorn, Virginia Creeper, Fringe Tree, Persimmon, Black Cherry, Rattan Vine	None	White Oak, Water Oak, Willow Oak	Ironwood	Red Maple, Elm	Loblolly Pine, Shortleaf Pine	None	Button Bush	2 Panicum species, Cutgrass, Blue Stem, Common Switchgrass, 1 unknown, Devil's Walking Steak

<u>Point Number</u>	<u>Habitat Type</u>	<u>Total Score</u>	<u>Berry Drupe</u>	<u>Legume Pod</u>	<u>Acorn</u>	<u>Nut Nutlike</u>	<u>Samara</u>	<u>Cone</u>	<u>Achene</u>	<u>All Others</u>	<u>Herbaceous Species</u>
14	Pine Forest	58	Black Cherry, Rusty Blackhaw, Greenbrier, Blackgum, Huckleberry	None	Red Oak	Mockernut Hickory	Red Maple, Winged Elm	Loblolly Pine	None	Sweetgum	Sessile Cutgrass
14A	Mixed Forest	54	Blackgum, Greenbrier, Black Cherry, Yaupon, American Beautyberry	None	Post Oak, Willow Oak, Red Oak	None	None	Loblolly Pine	None	Sweetgum	Sessile Cutgrass, Nandina
15	Deciduous Forest	58	Black Gum, American Beautyberry, Huckleberry, Muscadine, Yaupon	None	Red Oak, White Oak	None	Winged Elm, Cedar Elm	Loblolly Pine	None	Sweetgum	Sessile Cutgrass
16	Pine Forest	58	Plum, Yaupon, Carolina Buckthorn, Gum Bumelia	None	Willow Oak, Red Oak	None	Green Ash, Eastern Hophornbeam	Loblolly Pine	None	Sweetgum, Chinese Tallow	Cypress Sedge
17	Mixed Forest	59	Plum, American Beautyberry, Greenbrier, Sweetbay, Poison Ivy	Redbud	Red Oak, White Oak	None	Slippery Elm, Winged Elm, Green Ash, Cedar Elm	None	None	Sweetgum	Cypress Sedge, Nandina
18	Pine Forest	43	Greenbrier, Muscadine, Parsley Hawthorn	None	Post Oak, Water Oak, Red Oak	None	Winged Elm	Loblolly Pine	None	Sweetgum	None
19	Mixed Pine	57	Greenbrier, Muscadine	None	Willow Oak, Post Oak, White Oak, Water Oak, Post Oak	None	Green Ash, Winged Elm	Shortleaf Pine, Loblolly Pine	None	Sweetgum, Buttonbush,	Camphorweed
20	Pine Forest	68	Rattan, Virginia Creeper, Yaupon, American Beautyberry, Muscadine, Summer Grape, Carolina Buckthorn, Persimmon, Sugar Berry, Greenbrier, Black Gum, Sumac, Blackberry, Honey Suckle, Sassafras, Peppervine, Mulberry, Black Cherry	None	Red Oak, White Oak, Post Oak, Water Oak, Blackjack Oak	Hickory Spp.	Winged Elm, Elm Spp	Shortleaf Pine, Loblolly Pine	None	Sweetgum	Panicum, Cutgrass, Curex, Dog Fennel, Common Switchgrass, False Nettle, Sessile Cutgrass, Cutleaf, Scribner's Panicum, Bluet, Nandina
21	Bottomland Hardwood	72	American Holly, Blackgum, Muscadine, American Beautyberry, Greenbrier, Yaupon	Partridge Pea	White Oak, Water Oak, Willow Oak	Ironwood	Slippery Elm, Winged Elm	Loblolly Pine	None	Sweetgum	Cutgrass, Panicum, Fern
22	Floodplain Marsh	68	Heartleaf Peppervine	None	None	None	None	None	None	Buttonbush, Witchhazel, Willow, Sweetgum	Smartweed, Dodder
23	Riparian CD Forest	71	American Holly, Huckleberry, Blackgum, Muscadine, Greenbrier, American Beautyberry, Sassafras, Mustang Grape, Poison Ivy	none	Willow Oak, White Oak, Cherrybark Oak, Black Oak	Bitternut Hickory	American Hornbeam	Loblolly Pine	None	Sweetgum	Switchgrass, Panicum species, Cutgrass, Fern
24	Mixed Pine	57	Plum, Vine (unknown), Summer Grape, Rattan Vine, Hackberry	None	Willow Oak, Red Oak	None	Winged Elm, American Elm	Loblolly Pine	None	Sweetgum, Cactus species	St Andrews Cross, Canada Wild Rye
24A	Pine Forest	59	Greenbrier, Muscadine, Yaupon, Rattan Vine, American Beautyberry, Pepper Vine	None	Red Oak, Water Oak	None	Winged Elm, Green Ash, Eastern Hophornbeam	Loblolly Pine	None	Sweetgum	Nandina
24B	Pine Forest	56	Greenbrier, Summer Grape, American Beautyberry	None	Red Oak	None	Green Ash, Loblolly Pine, Eastern Hophornbeam	None	None	Sweetgum	Grass species
25	Pine Forest	64	American Beautyberry, Muscadine, Black Cherry, Black Gum, Greenbrier, Poison Ivy, Rattan Vine, Summer Grape, Huckleberry, Sparkleberry	Black Locust	White Oak, Water Oak, Willow Oak, Red Oak	Black Hickory	Winged Elm	Loblolly Pine, Shortleaf Pine	None	Sweetgum	Cutgrass
26	Pine Forest	65	Muscadine, Greenbrier, American Beautyberry, Blackgum, Summer Grape, Black Cherry, Poison Ivy, Rattan Vine, Crossvine	None	White Oak, Red Oak, Willow Oak, Blackjack Oak, Water Oak	Black Hickory	Winged Elm, Red Maple	Loblolly Pine	None	Sweetgum, Cedar	Dog Fennel, Cutgrass, Panicum species, Switch Grass, Sand Lovegrass, Ipomea sp.
27	Pine Forest	72	Peppervine, Greenbrier, Summer Grape, American Holly, American Beautyberry	Sesbania	Cherrybark, Wateroak, Willowoak	None	American Elm, Winged Elm	None	None	Buttonbush, Sweetgum, Black Willow	Scribner Panicum, Panicum Species, Switchgrass, Smartweed, Cherokee Sedge, Cypress Spp, Panicum Species

<u>Point Number</u>	<u>Habitat Type</u>	<u>Total Score</u>	<u>Berry Drupe</u>	<u>Legume Pod</u>	<u>Acorn</u>	<u>Nut Nutlike</u>	<u>Samara</u>	<u>Cone</u>	<u>Achene</u>	<u>All Others</u>	<u>Herbaceous Species</u>
27B	Mixed Forest	65	American Beautyberry, Yaupon, Virginia Creeper, Poison Ivy, Muscadine, American Holly, Greenbrier, Black Gum, Peppervine, Sparkleberry, Persimmon, Gum Bumelia	Partridge Pea, Deer Pea	Willow Oak, Red Oak, Cherrybark Oak, Water Oak	None	Red Maple, Slippery Elm	Loblolly Pine	None	Sweetgum, Cedar	Cutgrass, Switch Grass, St. Johns Wort
28	Pine Forest	62	Muscadine, Rust Black Haw, Blackgum, American Beautyberry, Greenbrier, Persimmon, Wild Plum, Poison Ivy, Rattan, Cross Vine, Black Gum	None	Red Oak, Willow Oak	Black Hickory	White Ash, American Elm, Winged Elm	Loblolly Pine	None	Sweetgum	Cutgrass
29	Pine Forest	62	American Beautyberry, Blackgum, Muscadine	None	Willow Oak	None	American Elm	Loblolly Pine	None	Sweetgum	Cats Pawvine, Smartweed, Common Switch grass
30	Deciduous Forest	58	Muscadine, Blackgum, Greenbrier, Poison Ivy, Wild Strawberry, Rattan Ivy	Partridge Pea	Cherrybark Oak, Water Oak, Willow, Red Oak	None	Winged Elm, Slippery Elm	Shortleaf Pine, Loblolly Pine	None	Sweetgum, Chinese Tallow	Gramma grass
31	Deciduous Forest	68	American Beautyberry, Poison Ivy, Blackgum, Muscadine, Virginia Creeper, Greenbrier, Rusty Blackhaw, Sparkleberry, Summer Grape	Partridge Pea, Deer Pea	Post Oak, White Oak, Red Oak	Buckeye, Mockernut Hickory	Winged Elm, White Ash, American Elm, Eastern Hophornbeam	Shortleaf Pine	None	Sweetgum, Chinese Tallow	Cutgrass, Giant Ragweed, 5 unknowns, Devil's Walking Stick
32	Mixed Forest	52	Holly, American Beautyberry, Greenbrier, Muscadine	None	Red Oak	None	Green Ash, Red Maple, Eastern Hophornbeam	None	None	Sweetgum	Huckleberry, Cutgrass
33	Pine Forest	63	American Beautyberry, Greenbrier, Sassafras, Carolina Buckthorn, Rattan Vine, Muscadine Grape, Peppervine, Yaupon, Privet	None	Cherrybark Oak	None	Red Maple, Eastern Hophornbeam	Loblolly Pine	None	Sweetgum, Eastern Red Cedar	St Andrews Cross, 2 grasses, Fern, Bull Nettle
34	Floodplain Forest	47	Persimmon, Buttonbush, Yaupon, Greenbrier	None	Willow Oak	None	Green Ash	None	None	Sweetgum, Black Willow, Chinese Tallow	None
35	Floodplain Marsh	60	Buttonbush, Greenbrier	None	None	None	None	Cypress	None	Blackwillow, Chinese Tallow	Fern, Smartweed, Sedge
36	Skipped	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
37	Floodplain Marsh	76	Buttonbush	None	None	None	Water Elm	None	None	None	American Lotus, Coontail, Smartweed, Water Plantain
38	Skipped	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
39	Riparian Swamp	82	Buttonbush	None	Water Oak, Cherrybark Oak, Willow Oak	Water Hickory	River Birch	None	None	Chinese Tallow	None
40	Bottomland Hardwood	71	Greenbrier	None	Overcup Oak, Willow Oak, Water Oak	None	None	None	None	Sweetgum, Black Willow	Cherokee Sedge, Franks Sedge, Unknown Vine, Scribner Panicum, Passion Flower, Zigzag Shrub
41	Riparian CD Forest	41	Blackgum, Muscadine, Greenbrier	None	Water Oak, Red Oak	None	None	Bald Cypress	None	Sweetgum, Chinese Tallow	Poke Weed, St Andrews Cross, Scribners Panicum, Silverleaf Nightshade, Bluet, 2 Leaf Senna, Mint x2, Kroton, Dog Fennel, Sessile Cutgrass
42	Mixed Pine	60	Deciduous Holly, Persimmon, Mustang Grape, Greenbrier, Muscadine, Peppervine	None	Water Oak	None	River Birch	Loblolly Pine	None	Sweetgum, Chinese Tallow	Scribners Panicum, Cherokee Sedge, Verbena, Horehound, Dogfennel, Passion Vine, Pokeweed, 1 unknown, Sand Lovegrass, False Nettle/Partridge
42A	Riparian Swamp	82	Greenbrier	none	Overcup	None	Planar Tree	Bald Cypress	None	Button Bush	Water Hyacinth, Pickeral Weed, Duck Weed
43	Deciduous Forest	49	Mustang Grape, Buttonbush	None	Overcup Oak	None	American Elm, River Birch	Loblolly Pine	None	Sweetgum, Chinese Tallow	Cherokee Sedge, unknown 1, Sessile Cutgrass

<u>Point Number</u>	<u>Habitat Type</u>	<u>Total Score</u>	<u>Berry Drupe</u>	<u>Legume Pod</u>	<u>Acorn</u>	<u>Nut Nutlike</u>	<u>Samara</u>	<u>Cone</u>	<u>Achene</u>	<u>All Others</u>	<u>Herbaceous Species</u>
44B	Mixed Pine	78	American Beautyberry, Blackgum, Peppervine, Muscadine, Trumpet Vine, Rattan, Greenbrier, Poison Ivy, Pea Vine, Cat Briar, Grapevine	Black Locust	Post Oak, Water Oak, Willow Oak, Overcup Oak	Water Hickory	Water Elm, River Birch, Ash	None	None	Sweetgum, Buttonbush, Chinese Tallow	Cherokee Sedge, Cudzo, Scribner Panicum, unknown vine, Snailseed, Arrowhead
44C	Flatwoods Mixed Forest	69	None	None	Overcup Oak	None	Elm, Green Ash, River Birch	None	None	Buttonbush	Cherokee Sedge, unknown x1, Polygom Spp
44D	Flatwoods Mixed Forest	79	Muscadine, Greenbrier, Poison Ivy	None	Water Oak, Willow Oak, Cherrybark Oak, Overcup Oak	Ironwood	River Birch, Red Maple	None	None	Sweetgum, Chinese Tallow, Buttonbush	unknown weed, False Nettle, Mint, Scribner Panicum, Mint, unknown grass, Ragweed, Snail Seed
45	Mixed Deciduous	71	Virgin Creeper, Wild Cherry, Poison Ivy, Greenbrier, Rattan Vine, Blackberry, Blackgum, American Beautyberry, Peppervine, Bayberry	None	Red Oak, White Oak, Water Oak	Hickory	Maple, Elm	Loblolly Pine	None	Sweetgum	Devil's Walking Stick, Cutgrass, Nandina, Fern, 2 species of Panicum, Bench Grass
46	Mixed Deciduous	68	Blackgum, Greenbrier, Muscadine, Peppervine, Rattenvine,	None	Water Oak, Willow Oak, Overcup Oak	Ironwood	Elm, Maple	Loblolly Pine	None	Sweetgum	Ragweed, False Nettle, Smartweed, Nutgrass, Sand Lovegrass
47	Mixed Pine	64	Muscadine, Mulberry, Greenbrier, American Beautyberry, Poison Ivy, Mulberry, Rattan Vine	None	Water Oak, Overcup, Willow Oak	Hickory	Maple, River Birch, Elm	Loblolly Pine	None	Sweetgum, Chinese Tallow	False Nettle, Panicum, 1 unknown vine, Sand Lovegrass
48	Riparian CD Forest	56	Blackgum, Muscadine, Greenbrier, Black Berry	None	Water Oak	None	River Birch, American Elm, Red Maple	None	none	Sweetgum	Panicum, Cherokee Sedge, Ragweed, Unknown #1
49	Mixed Pine	73	American Holly, Muscadine, Greenbrier, Poison Ivy, Persimmon, Peppervine, Black Tupelo	None	Willow Oak	Wax Myrtle, Ironwood	American Elm, Red Maple	Loblolly Pine	None	Sweetgum	Cherokee Sedge, Scribner Panicum, Rice, Cutgrass, False Nettle, Smartweed, Dog Fennel, unknown tiny white flower
50	Deciduous Forest	61	Mustang Grape, Muscodine Grape, Black Tupelo, Peppervine, Greenbrier	None	Water Oak, Willow Oak	None	American Elm, River Birch	None	None	Sweetgum	False Nettle, Dodder, Sessile Cutgrass, Smartweed, Croton
51	Mixed Pine	60	Wild Cherry, Greenbrier, Peppervine	None	Red Oak, Water Oak, Willow Oak,	None	Elm Maple	Loblolly Pine	None	Sweetgum, Eastern Red Cedar	Bluestem, Scribners Panicum, Cutgrass, Beggar's Lice, False Nettle, White Aster, Sedge, Bluestem
52	Mixed Pine	64	American Beautyberry, Blackgum, Decidious Holly, Muscadine, Greenbrier	None	Red Oak, Blackjack Oak, Willow Oak, Buckeye	Hickory	Elm, Maple	Loblolly Pine	None	Eastern Red Cedar, Moss	St Andrew Cross, Panicum, Bluestem, Beggar's Lice
53	Mixed Forest	76	Mulberry, Holly, Rattan Vine, American Beautyberry, Greenbrier, Muscadine, Honey Suckle, Blackberry, Wild Grape	None	Red Oak, Water Oak, Willow Oak, White Oak	Ironwood, Hickory, Wax Myrtle	Maple Elm	Loblolly Pine	None	Sweetgum, Moss	Devil's Walking Stick, Cutgrass, False Nettle, Carex, Bluestem
54	Mixed Pine	63	American Beautyberry, Hawthorn, Blueberry, Yaupon, Greenbrier, Muscadine	None	Water Oak, Willow Oak, Red Oak,	Hickory	Winged Elm, Maple	Loblolly Pine	None	Eastern Red Cedar, Sweetgum, Moss	Bluestem, Scribners Panicum, Cutgrass, Panicum #2, Sedge
55	Grassland-Food Plot	40	American Beautyberry, Dewberry, Sweetgum	None	Red Oak	Hickory	None	None	None	None	Dog Fennel, Beggar's Lice, Panicum, Ragweed, Sunflower, Wood Sorrel, Goatweed, Sunflower, Coreopsis species.
56	Pine Forest	44	Huckleberry, Forkleberry, Black Tupelo	None	Red Oak, Willow Oak	Wax Myrtle	Red Maple	Loblolly Pine, Slash Pine	None	Sweetgum	Little Bluestem, Panicum species, unknown species #1, Scribner's Panicum, Carex species, Elecharis species.
57	Pine Forest	56	Blackgum, Blueberry, Holly, Yaupon, Greenbrier, Unknown Vine	None	Water Oak, Willow Oak, Red Oak, White Oak	Wax Myrtle	Maple	Loblolly Pine	None	Sweetgum, Southern Red Cedar	Bluestem, Elephant Grass
58	Grassland	39	None	None	None	None	None	None	None	Buttonbush	Penny Wort, Arrowhead, Smartweed, Sedge, Carex Frankii, Common Witchgrass, Sand Lovegrass
59	Riparian Swamp	81	Persimmon, Summergrape	None	None	None	American Elm, Eastern Hophornbeam	Cypress	None	Buttonbush, Black-Willow	Snailseed, Pennywort

<u>Point Number</u>	<u>Habitat Type</u>	<u>Total Score</u>	<u>Berry Drupe</u>	<u>Legume Pod</u>	<u>Acorn</u>	<u>Nut Nutlike</u>	<u>Samara</u>	<u>Cone</u>	<u>Achene</u>	<u>All Others</u>	<u>Herbaceous Species</u>
60	Pine Forest	39	Greenbrier, Persimmon	Wild Pea	None	None	None	Loblolly Pine, Shortleaf Pine	None	Sweetgum, Buttonbush,	Dog Fennel, Chenopodium sp, Woolgrass, False Nettle, Scribner's Panicum, Partridge Pea
61	Pine Forest	45	None	Wild pea	None	None	Eastern Hophornbeam	Cypress	none	Sweetgum, Buttonbush,	Arrowhead, Carex Spp
62	Mixed Pine	63	Mustang Grape, American Beautyberry, Yaupon, Greenbrier, Blackgum, Muscadine, Poison Ivy, Winged Sumac, Sparkle Berry, Persimmon	None	Red Oak, White Oak, Post Oak, Water Oak, Blackjack Oak	White Hickory	American Elm	Shortleaf Pine, Loblolly Pine	None	Sweetgum, 2 unknown, Rusty Blackhaw, Eastern Red Cedar	Bull Nettle, False Indigo, Carolina Buckthorn, Panicum spp. x3
63	Mesic Deciduous Forest	67	Muscadine Grape, Poison Ivy, Virginia Creeper, Mustang Grape, Yaupon, American Holly, Blueberry, Sassafras, American Beautyberry, Dogwood	None	Red Oak, White Oak, Post Oak, Water Oak	White Hickory	Winged Elm	Loblolly Pine	None	Rusty Blackhaw, Sweetgum, Unknown #1	Crossvine, Beggers Lice, Caroline Blackthorn, Carex Species, Panicum Spp
64	Mixed Pine	56	Hawthorn, Mustang Grape, Chinese Privet, Yaupon, Blackberry, Greenbrier, Muscadine, Virginia Creeper, Cherry Persimmon, American Beautyberry, Rusty Blackhaw, Winged Sumac	None	White Oak, Water Oak, Red Oak, Post Oak	White Hickory	Winged Elm, Unknown 2, White Ash	Loblolly Pine	None	Eastern Red Cedar	Panicum species, 2 unknowns, Carolina Jessamine, Dogfennel, Bahia Grass, Beggers Tick, Ragweed, Carex, St. Andrew's Cross
65	Mixed Pine	60	Muscadine, Blackgum, American Holly, Greenbrier, Sassafras, Blueberry	None	Red Oak, Post Oak, Water Oak	Ironwood, White Hickory, Wax Myrtle	American Elm	None	None	Sweetgum, Eastern Red Cedar	Braken Fern
66	Grassland-Maintained	30	Blackgum, Greenbrier, Blackberry	None	Water Oak	None	Winged Elm	Short Leaf Pine	None	None	Crabgrass, Nightshade
67	Pine Forest	36	None	None	Post Oak, Red Oak	None	None	None	None	None	St Augustine Grass, Centipede Grass, Bahia Grass, Carex species., Nutsedge, 1 unknown
68	Pine Forest	64	Persimmon, Black Cherry, Muscodine, Greenbrier, Poison Ivy, Yaupon, Black Gum, Deciduous Holly	None	Willow Oak, Blackjack Oak, Red Oak, White Oak, Post Oak	None	Ash, Winged Elm, Eastern Hophornbeam	Shortleaf Pine, Loblolly Pine	Baccharis	Blackwillow, Eastern Cedar, Sweetgum	Witchgrass, Panicum species, Milkweed, +2 others
69	Mixed Forest	50	Persimmon, Deciduous Holly, Sugarberry, Blackgum, Poison Ivy, Greenbrier	Redbud	Water Oak, Red Oak	Black Hickory	American Elm	Loblolly Pine	None	Red Cedar, Sweetgum	Croton, Witchgrass, Flatsedge, Panicum species, Cutgrass
70	Flatwoods Mixed Forest	54	Greenbrier, Muscadine, Japanese Beautyberry, American Beautyberry	None	Water Oak	American Hornbeam	Green Ash, Red Maple	None	None	Sweetgum	Fern, Cutgrass
71	Grassland-Maintained	15	None	None	None	None	None	None	None	None	Bahia Grass, St Augustine Grass, Crabgrass, Sedge, Panicum Species

Attachment B: Lake O' the Pines WHAP Point Photographs

LAKE O' THE PINES WHAP Point #: 0

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 1

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 2

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:2A

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 2B

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 3

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 4

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #5

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:6

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:7

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 14

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 14A

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 15

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 16

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 17

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 18

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 19

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 24

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 28

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 29

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 32

Facing North



Facing East



Facing West



Facing South

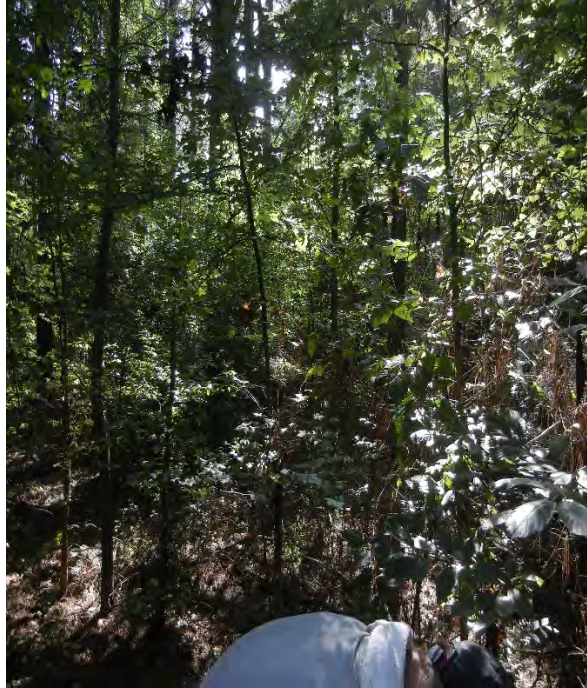


LAKE O' THE PINES WHAP Point #: 33

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 34

Facing North



Facing North-2



LAKE O' THE PINES WHAP Point #: 35

Facing North



Facing East



LAKE O' THE PINES WHAP Point #: 36

Facing North



LAKE O' THE PINES WHAP Point #: 37

Facing 37-1



Facing 37-2



LAKE O' THE PINES WHAP Point #: 39

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:44a

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:44b

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:44c

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 44d

Facing North



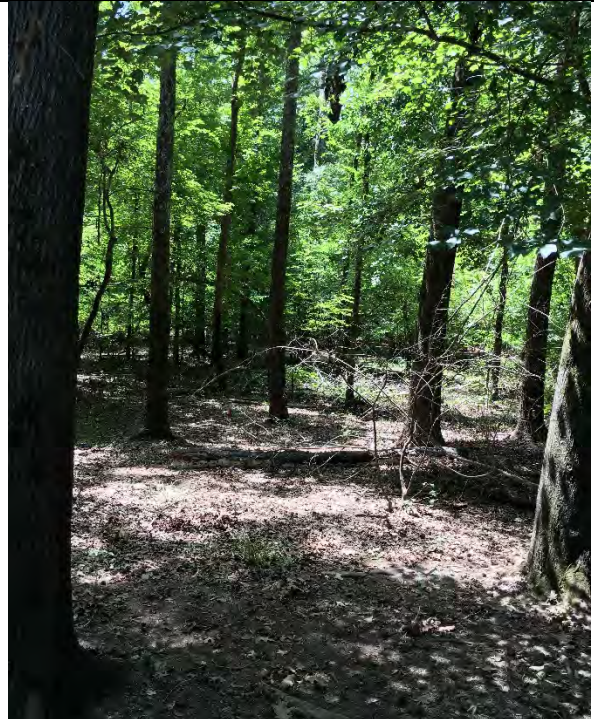
Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 45

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:47

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 51

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:52

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 53

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 54

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 55

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #:57

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 62

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 63

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 64

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 65

Facing North



Facing East



Facing West



Facing South



LAKE O' THE PINES WHAP Point #: 70

Facing North



Facing East



Facing West



Facing South



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APPENDIX F – SEAPLANE POLICY

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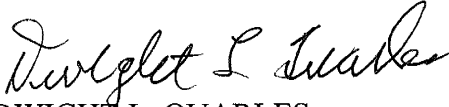
17 Mar 00
Wiese/bw/2707

MEMORANDUM FOR O&M Distribution #2
Number (POL: 00-06)

SUBJECT: Notice to Seaplane Pilots

1. The enclosed Notice to Seaplane Pilots has been updated to correct a few omissions (Waco Lake had been omitted from the last update in Feb 1998) and to include the District's Web Site address.
2. The Notice includes a reference to our Lake Recreation Visitor's Guide pamphlet for additional information. When the Notice is given to a member of the public, the Guide pamphlet should be attached.
3. When printing a copy of the Notice, it should be printed on a Corps of Engineers letterhead.

Encl


DWIGHT L. QUARLES
Chief, Operations Division

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
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>AQUILLA LAKE</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>JIM CHAPMAN LAKE - COOPER DAM</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>BARDWELL LAKE</p> <p>Landings and takeoffs are prohibited north of Highway 34 and in all coves off the main body of the lake.</p>	<p>GRANGER LAKE</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>BELTON LAKE</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>JOE POOL LAKE</p> <p>Landings and takeoffs are prohibited in all lake areas west of the Lakeridge Parkway bridges.</p>
<p>BENBROOK LAKE</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>LAKE O THE PINES</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>CANYON LAKE</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>LAVON LAKE</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>

SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION	
<p>LEWISVILLE LAKE</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>SOMERVILLE LAKE</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>NAVARRO MILLS LAKE</p> <p>Landings and takeoffs are prohibited west of Wolf Creek Park 1.</p>	<p>STILLHOUSE HOLLOW LAKE</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>PROCTOR LAKE</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>WHITNEY LAKE</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>RAY ROBERTS LAKE</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>WRIGHT PATMAN LAKE</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>SAM RAYBURN RESERVOIR</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.

APPENDIX G – PERTINENT PUBLIC LAWS

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- Public Law 59-209, Antiquities Act of 1906. The first Federal law established to protect what are now known as "cultural resources" on public lands. It provides a permit procedure for investigating "antiquities" and consists of two parts: An act for the Preservation of American Antiquities, and Uniform Rules and Regulations.
- Public Law 74-292, Historic Sites Act of 1935. Declares it to be a national policy to preserve for (in contrast to protecting from) the public, historic (including prehistoric) sites, buildings, and objects of national significance. This act provides both authorization and a directive for the Secretary of the Interior, through the National Park Service, to assume a position of national leadership in the area of protecting, recovering, and interpreting national archeological historic resources. It also establishes an "Advisory Board on National Parks; Historic Sites, Buildings, and Monuments, a committee of eleven experts appointed by the Secretary to recommend policies to the Department of the Interior".
- Public Law 75-761, Flood Control Act of 1938. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Title 16 U.S. Code §§ 668-668a-d, 54 Stat. 250, Bald Eagle Protection Act of 1940, as amended. This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The Act defines "take" as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.
- Public Law 78-534, Flood Control Act of 1944. - Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to Federal, State or local governmental agencies.
- 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.
- Public Law 83-780, Flood Control Act of 1954. This act authorizes the construction, maintenance, and operation of public parks and recreational facilities in reservoir areas under the control of the Department of the Army and authorizes the Secretary of the Army to grant leases of lands in reservoir areas deemed to be in the public interest.
- 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 87-874, Rivers and Harbors Act of 1962. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Public Law 88-578, Land and Water Conservation Fund Act of 1965. This act established a fund from which Congress can make –appropriations for outdoor recreation. Section 2(2) makes entrance and user fees at reservoirs possible by deleting the words "without charge" from Section 4 of the 1944 Flood Control Act as amended.
- Public Law 88-29, 28 May 1963, authorized the Secretary of the Interior to inventory and classify outdoor recreation needs and resources and to prepare a comprehensive outdoor recreation plan taking into consideration the plans of the various Federal agencies, State, and other political subdivisions. It also states that the federal agencies undertaking recreational activities shall consult with the Secretary of the Interior concerning these activities and shall carry out such responsibilities in general conformance with the nationwide plan.
- 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 89-90, Water Resources Planning Act (1965). This act established the Water Resources Council and gives it the responsibility to encourage the development, conservation, and use of the Nation's water and related land resources on a coordinated and comprehensive basis.
- Public Law 89-272, Solid Waste Disposal Act, as amended by PL 94-580, dated October 21, 1976. This act authorized a research and development program with respect to solid-waste disposal. It proposes (1) to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of national resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid waste; and (2) to provide technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal programs.

- Public Law 89-665, Historic Preservation Act of 1966. - This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.
- Public Law 90-483, River and Harbor and Flood Control Act of 1968, Mitigation of Shore Damages. Section 210 restricted collection of entrance fee at USACE lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.
- Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). – NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a “continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. 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.

- Public Law 91-611, River and Harbors and Flood Control Act of 1970. – Section 122e Establishes the requirement for evaluating the economic, social, and environmental impacts of projects.
- 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 USACE from collecting entrance fees to projects.
- Public Law 92-500, Federal Water Pollution Control Act Amendments of 1972. The Federal Water Pollution Control Act of 1948 (PL 845, 80th Congress), as amended in 1956, 1961, 1965 and 1970 (PL 91- 224), established the basic tenet of uniform State standards for water quality. Public Law 92-500 strongly affirms the Federal interest in this area. "The objective of this act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters."
- Public Law 92-516, Federal Environmental Pesticide Control Act of 1972. This act completely revises the Federal Insecticide, Fungicide and Rodenticide Act. It provides for complete regulation of pesticides to include regulation, restrictions on use, actions within a single State, and strengthened enforcement.
- Public Law 93-81, Collection of Fees for Use of Certain Outdoor Recreation Facilities. This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended to require each Federal agency to collect special recreation use fees for the use of sites, facilities, equipment, or services furnished at Federal expense.
- Public Law 93-205, Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended. This law repeals the Endangered Species Conservation Act of 1969. It also directs all Federal departments/agencies to carry out programs to conserve endangered and threatened species of fish, wildlife, and plants and to preserve the habitat of these species in consultation with the Secretary of the Interior. This Act establishes a procedure for coordination, assessment, and consultation. This Act was amended by Public Law 96-159.
- Public Law 93-251, Water Resources Development Act of 1974. Section 107 of this law establishes a broad Federal policy which makes it possible to participate with local governmental entities in the costs of sewage treatment plant installations.
- Public Law 93-291, Archeological Conservation Act of 1974. The Secretary of the Interior shall coordinate all Federal survey and recovery activities authorized under this expansion of the 1960 act. The Federal Construction agency may transfer up to one percent of project funds to the Secretary with such transferred funds considered non-reimbursable project costs.
- Public Law 93-303, Recreation Use Fees. This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended, to establish less restricted

criteria under which Federal agencies may charge fees for the use of campgrounds developed and operated at Federal areas under their control.

- Public Law 93-523, Safe Drinking Water Act. The act assures that water supply systems serving the public meet minimum national standards for protection of public health. The act (1) authorizes the Environmental Protection Agency to establish Federal standards for protection from all harmful contaminants, which standards would be applicable to all public water systems, and (2) establishes a joint Federal-State system for assuring compliance with these standards and for protecting underground sources of drinking water.
- Public Law 94-422, Amendment of the Land and Water Conservation Fund Act of 1965. Expands the role of the Advisory Council. Title 2 - Section 102a amends Section 106 of the Historical Preservation Act of 1966 to say that the Council can comment on activities which will have an adverse effect on sites either included in or eligible for inclusion in the National Register of Historic Places.
- Public Law 95-217, Clean Water Act of 1977, as amended. This Act amends the Federal Water Pollution Control Act of 1970 and extends the appropriations authorization. The Clean Water Act is a comprehensive Federal water pollution control program that has as its primary goal the reduction and control of the discharge of pollutants into the nation's navigable waters. The Clean Water Act of 1977 has been amended by the Water Quality Act of 1987, Public Law 100-4.
- Public Law 95-341, American Indian Religious Freedom Act of 1978. The Act protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objections, and the freedom to worship through ceremonials and traditional rites.
- Public Law 95-632, Endangered Species Act Amendments of 1978. This law amends the Endangered Species Act Amendments of 1973. Section 7 directs agencies to conduct a biological assessment to identify threatened or endangered species that may be present in the area of any proposed project. This assessment is conducted as part of a Federal agency's compliance with the requirements of Section 102 of NEPA.
- Public Law 96-95, Archeological Resources Protection Act of 1979. This Act protects archeological resources and sites that are on public and tribal lands, and fosters increased cooperation and exchange of information between governmental authorities, the professional archeological community, and private individuals. It also establishes requirements for issuance of permits by the Federal land managers to excavate or remove any archeological resource located on public or Indian lands.
- Public Law 98-63, Supplemental Appropriations Act of 1983. This Act authorized the USACE Volunteer Program. The United States Army Chief of Engineers may accept the services of volunteers and provide for their incidental expenses to carry out any activity of the USACE, except policymaking or law or regulatory enforcement.

- 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.
- Public Law 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.

APPENDIX H – ACRONYMS

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AC-FT	Acre Feet
CO	Carbon Monoxide
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DC	District Commander
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
DM	Design Memorandum
DoD	Department of Defense
DQC	District Quality Control
EA	Environmental Assessment
EC	Engineer Circular
EM	Engineering Manual
EOP	Environmental Operating Principles
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Areas
F	Fahrenheit
FEMS	Facilities and Equipment Maintenance System
FM	Farm to Market Road
FONSI	Finding of No Significant Impact

GIS	Geographical Information Systems
HDR	High Density Recreation
HQ	USACE Headquarters
I	Interstate
ICRMP	Integrated Cultural Resource Management Plan
IPaC	USFWS Information for Planning and Conservation
JCF	Japanese Climbing Fern
LDR	Low Density Recreation
LEED	Leadership in Energy and Environmental Design
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
MSL	Mean Sea level
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act, 1970
NETMWD	North Texas Municipal Water District
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NO	Nitrogen Dioxide
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRRS	National Recreation Reservation System

NSRE	National Survey on Recreation and the Environment
NWI	National Wetland Inventory
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OMBIL	Operations and Maintenance Business Information Link
OMP	Operations Management Plan for a specific lake Project
OPM	Operations Project Manager
PDT	Project Development Team
PM	Project Management or Project Manager
PMBP	Project Management Business Processes
PMP	Project Management Plan
PL	Public Law
REAS	Recreation Economic Assessment System
RIIS	Recreational Infrastructure Investment Strategy
RPEC	Regional Planning and Environmental Center
RRC	Texas Railroad Commission
SGCN	Species of Greatest Conservation Concern
SH	State Highway
SHPO	State Historical Preservation Office
SO2	Sulfur Dioxide
SWEPCO	Southwestern Electric Power Company
SWF	U. S. Army Corps of Engineer's Fort Worth District Office

SWF-OD	Operations Division, U. S. Army Corps of Engineers, Fort Worth
TCAP	Texas Conservation Action Plan
TCEQ	Texas Council on Environmental Quality
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
TSWQS	Texas Surface Water Quality Standards
TX	Texas
TXDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
TWDB	Texas Water Development Board
VM	Vegetative Management
US	United States Route
USACE	United States Army Corps of Engineers
USACE-SWF	U. S. Army Corps of Engineer's Fort Worth District Office
USFWS	U. S. Fish and Wildlife Service
USGS	United States Geological Survey
WDA	Workforce Development Area
WHAP	Wildlife Habitat Appraisal Procedure
WM	Wildlife Management