STILLHOUSE HOLLOW LAKE MASTER PLAN

Lampasas River
Brazos River Basin

Bell County, Texas

May 2021

STILLHOUSE HOLLOW LAKE VISION

"The land, water, and recreational resources at Stillhouse Hollow Lake are 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."

US Army Corps of Engineers

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

CESWF-PEM

27 May 2021

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

SUBJECT: Stillhouse Hollow Lake, Texas Master Plan Revision (May 2021)

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 Stillhouse Hollow Lake Master Plan is intended to bring the master plan up to date to reflect ecological, socio-demographic, and outdoor recreation trends that are currently affecting the lake, as well as those anticipated to occur within the planning period of 2020 to 2045, 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 (1975) Land Classifications	Acres	2021 Land Classifications	Acres
Project Operations[1]	627	Project Operations (PO)	500
Recreation Intensive Use (Includes 236 acres Allocated as Separable Recreation Lands)	1,934	High Density Recreation (HDR)[2]	982
Natural Areas	230	Environmentally Sensitive Areas (ESA)[2]	625
Recreation Low Density	2,416	Multiple Resource Management – Low Density Recreation (MRML-LDR)	55
Wildlife Areas	3,726	Multiple Resource Management – Wildlife Management (MRML-WM)[2]	6,178
	0	Future/Inactive Recreation[2]	414
Total Fee Land 1975	**8,933**	**Total Fee Land 2021**	**8,754**
Prior (1975) Water Surface Classifications	**Acres**	**2021 Water Surface Classifications**	**Acres**
Water Surface*	6,430	Open Recreation	6,375
		Designated No-wake	75
		Restricted	23
Total Water Surface 1975	**6,430**		**6,473**
1975 Flowage Easement	**882**	**2021 Flowage Easement**	**914**
1975 Shoreline Miles	**58**	**2021 Shoreline Miles[3]**	**71.8**

Conservation Pool 622.0 NGVD29
*Acreage differences from the 1975 total to the 2021 totals are due to improvements in measurement technology, siltation and erosion.
[1] Includes 26 acres of Project Operations by Others (Water intakes managed by Brazos River Authority and others)
[2] These classifications include a portion of the Separable Recreation Lands as follows: HDR, 65 acres; WMA, 13 acres; ESA, 93 acres; and Future Recreation, 65 acres.
[3] 1975 Master Plan did not include a good portion of the Lampasas River on USACE lands.

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 2021 Stillhouse Hollow Lake Master Plan (2021 Master Plan) would have on the natural, cultural, and human environments. The EA evaluated and analyzed two alternatives: No Action Alternative (continued use of the 1975 Master Plan) and the implementation of the 2021 Master Plan. Based on the findings of the EA, the implementation of the 2021 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.

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

Approve ✓
Disapprove
Date

NEWMAN.ARNOLD.R.1231040958 Digitally signed by NEWMAN.ARNOLD.R.1231040958 Date: 2021.05.27 14:25:24 -05'00'

ARNOLD R. NEWMAN
Director, Regional Planning & Environmental Center

Approve
Disapprove
Date

LEE.ROCKY.DUANE.1127701942 Digitally signed by LEE.ROCKY.DUANE.1127701942 Date: 2021.05.28 13:20:11 -05'00'

ROCKY D. LEE
Chief, Real Estate Division

Approve ✓
Disapprove
Date

PHELPS.BRIAN.G.1231017573 Digitally signed by PHELPS.BRIAN.G.1231017573 Date: 2021.05.28 10:25:41 -05'00'

BRIAN G. PHELPS
Assistant Chief, Operations Division

Approve ✓
Disapprove
Date 03 JUN 2021

KENNETH N. REED, PMP
Colonel, EN
Commanding

EXECUTIVE SUMMARY

PURPOSE

The revision of the *Stillhouse Hollow Lake 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 Stillhouse Hollow Lake over the next 25 years. The 1975 Stillhouse Hollow Lake Master Plan Revision (Design Memorandum [DM] 11c) is a revision to the January 1965 Plan (DM 11b, supplemented in February 1966 and October 1970) and has served well past its intended 25-year planning horizon. The Master Plan is primarily a land use and outdoor recreation strategic plan. The lake and dam's primary purposes are flood risk management, water supply, recreation, and fish and wildlife enhancement.

The 1975 Master Plan classifies a total of 15,363 acres of USACE land, which includes 6,430 acres of surface water at conservation pool (622.0 feet National Geodetic Vertical Datum [NGVD]) within the fee boundary. Due to land changes from erosion and sedimentation, as well as more advanced measurement technology, these numbers have changed[1]. Currently, Stillhouse Hollow Lake encompasses 8,757 acres of land and 6,430 acres of surface water for total fee lands of 15,230 acres, protecting the areas below the dam, including the city of Belton, TX. This Plan and supporting documentation provide an inventory, analysis, goals, objectives, and recommendations for USACE lands and waters surface at Stillhouse Hollow Lake, Texas.

PUBLIC INPUT

Stillhouse Hollow Lake is a federally owned and managed public property, and it is USACE's goal to be a good neighbor, as well as steward for public interest as it concerns Stillhouse Hollow Lake. As such, USACE is bound to the equal enforcement of policies and fees for this publicly held national asset and must balance the needs of the recreating public with the needs associated with the flood control and water supply aspects of Stillhouse Hollow Lake and stewardship of natural resources on Federal lands.

Public and agency input toward the Master Plan was obtained to ensure a balance between operational, environmental, and recreational outcomes. 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.

USACE hosted a public meeting held March 12, 2020 at the Harris Community Center in Belton, Texas in which 20 members of the public attended. USACE received 21 comments from eight members of the public in the 30-day public comment period. Issues

[1] These figures are for planning purposes only and differ from the official real estate records.

that were addressed in the comments included environmental stewardship and preservation; hunting; facilities conditions; access for fishing and boating; and hike and bike trails. Table 7.1 in Section 7 provides a summary list of the comments received during the initial scoping comment period for the Master Plan, followed by the USACE response.

Due to COVID-19, the presentation and public and agencies input was held virtually, in which comments were accepted February 24 through March 26, 2021. The presentation received 87 views, and two agencies sent comments: the EPA and Texas Parks and Wildlife.

RECOMMENDATIONS

The following land classifications changes (detailed in Chapter 8, Table 8.2) resulted from the inventory, analysis, and synthesis of data, documents, and public and agency input. In general, 3,473 total acres were updated to the new classification nomenclature or were reclassified, with fee and conservation pool acreage changes due in part to siltation and improvements in measurement technology using Geographical Information System (GIS) technology. This software allows for more finely tuned measurements and thus acreages may vary slightly from official land acquisition records.

Table ES.1 Land Use Acreage Changes

Prior (1975) Land Classifications	Acres	2021 Land Classifications	Acres
Project Operations[1]	627	Project Operations (PO)	500
Recreation Intensive Use (Includes 236 acres Allocated as Separable Recreation Lands)	1,934	High Density Recreation (HDR)[2]	982
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[3] 1975 Master Plan did not include a good portion of the Lampasas River on USACE lands.

PLAN ORGANIZATION

Chapter 1 of the Master Plan presents an overall introduction of Stillhouse Hollow Lake. Chapter 2 consists of an inventory and analysis of project resources. Chapters 3 and 4 lay out management goals, resource objectives, and land allocation and classification. Chapter 5 is the resource plan that identifies how project lands will be managed through a resource use plan for each land use classification. This includes

current and projected park facility needs, an analysis of existing and anticipated resource use, and anticipated influences on overall project operation and management. Chapter 6 details topics that are unique to Stillhouse Hollow Lake. Chapter 7 identifies the coordination efforts and stakeholder input gathered for the development of the Master Plan, and Chapter 8 gives a summary of the changes in land classification from the previous Master Plan to the present one. Finally, the appendices include information and supporting documents for this Master Plan revision, including Land Classification and Park Plate Maps (Appendix A).

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

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

1

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOS

CHAPTER 1: INTRODUCTION

1.1 OVERVIEW

Stillhouse Hollow Lake (formally Lampasas Lake) 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 Bell County, Texas (TX). Stillhouse Hollow Lake is situated on the Lampasas River in the Brazos River Basin located two miles south of U.S. 190 on Farm to Market (FM) 1670 in Belton, TX. The dam and associated infrastructure as well as all lands acquired for the Stillhouse Hollow Lake project are federally owned and administered by the USACE.

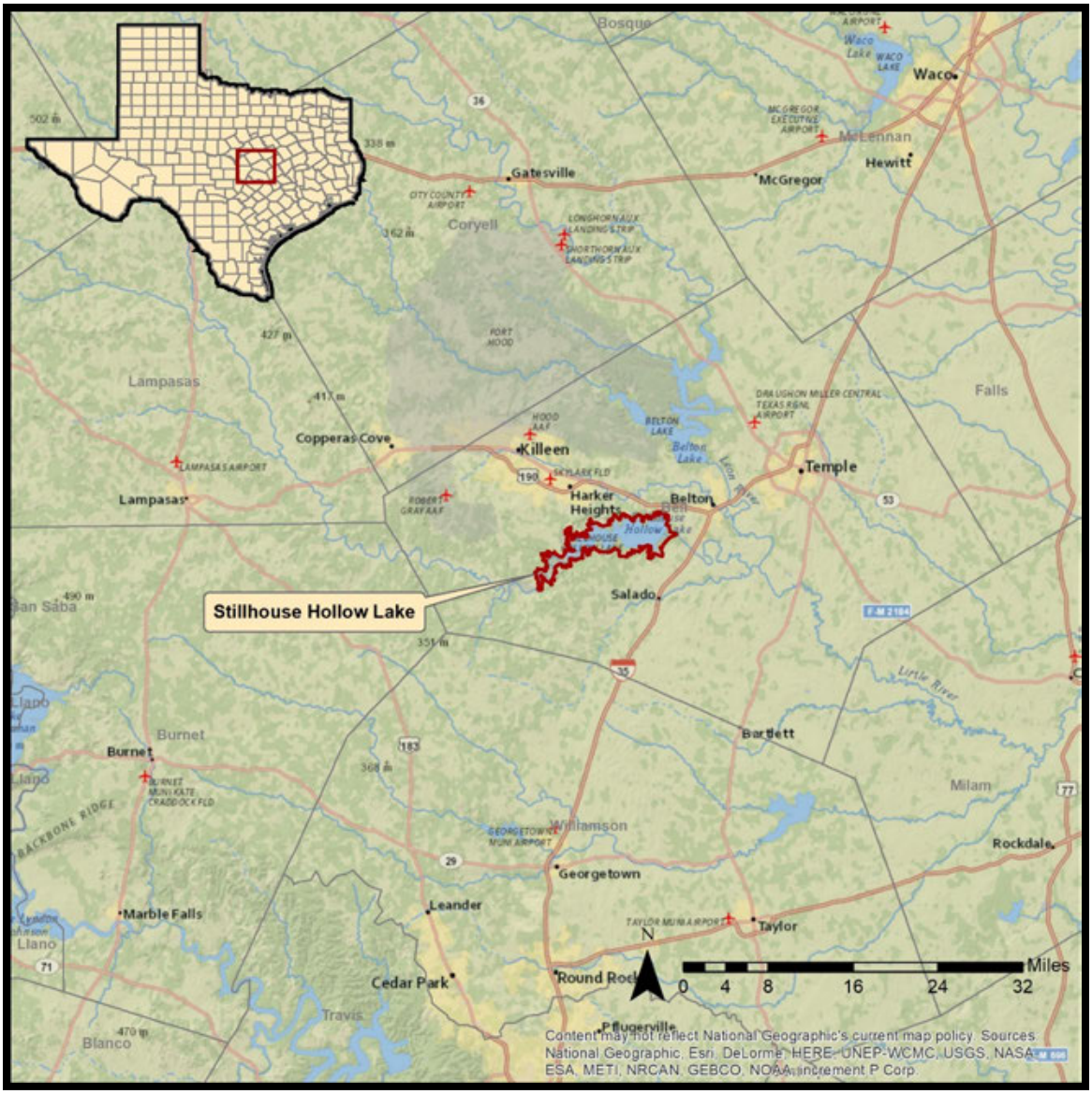


Figure 1.1 Stillhouse Hollow Lake Vicinity Map

The Stillhouse Hollow Lake Master Plan (hereafter Plan or Master Plan) is a revision of the 1975 Master Plan, Design Memorandum (DM) 11c, revised from the 1965 DM 11b, 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 guide the stewardship of natural and cultural resources and make provision for outdoor recreation facilities and opportunities on federal land associated with Stillhouse Hollow Lake. The Plan does not address the flood risk management or water supply purposes of Stillhouse Hollow Lake (the Water Control Manual [WCM] for Stillhouse Hollow Lake describes these purposes. Some information from the WCM could be made available upon written request through the Freedom of Information Act).

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, 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 temperature. To this end, USACE has developed the following statements.

The USACE Sustainability Policy and Strategic Plan states:

> *"The U.S. Army Corps of Engineers strives to protect, sustain, and improve the natural and man-made environment of our Nation, and is committed to compliance with applicable environmental and energy statutes, regulations, and Executive Orders. Sustainability is not only a natural part of the Corps' decision processes, it is part of the culture.*
>
> *Sustainability is an umbrella concept that encompasses energy, climate change and the environment to ensure today's actions do not negatively impact tomorrow. The Corps of Engineers is a steward for some of the Nation's most valuable natural resources and must ensure customers receive products and services that provide sustainable solutions that address short and long-term environmental, social, and economic considerations."*

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

> *"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

Stillhouse Hollow Lake is a multipurpose water resource project constructed and operated by USACE for the purpose of flood risk management, water supply, recreation and fish and wildlife. Environmental stewardship, though not listed as a primary project purpose, is a major responsibility and inherent mission in the administration of federally owned lands.

Congressional authority for the construction of the Lampasas Lake, now Stillhouse Hollow Lake, is contained in The Flood Control Act September 03, 1954 (Public Law 83-780). The name was changed by Public Law 86-307, approved September 21, 1959.

Congressional authority for the recreational program at Stillhouse Hollow Lake is contained in the December 1944 Flood Control Act Section 4 (Public Law 534, 78th Congress, 2nd Session) as amended, and the May 1963 Outdoor Recreation Act (Public Law 88-29) which designates recreation as an authorized project purpose. Congressional authority for the fish and wildlife program at reservoir projects under the control of the Department of the Army is contained in Fish and Wildlife Coordination Act of 1958, as amended, Public Law 85-624 (72 Stat 563), approved August 12, 1958, and Public Law 89-669 (80 Stat 926), approved October 15, 1966.

Land acquisition for Stillhouse Hollow Lake was authorized under the Rivers & Harbor Act of March 1945 (Public Law 14; 79th Congress, 1st Session); Engineer Regulation 405-1-1, Planning and Project Authorization of October 1952; and Engineer Regulation 405-1-620, Acquisition by Purchase, Donation and Transfer, February 1974.

Several 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.

1.3 MASTER PLAN PURPOSE AND SCOPE

In accordance with Engineering Regulation (ER) 1130-2-550 Change 07, dated January 2013 and Engineering Pamphlet (EP) 1130-2-550 Change 05, dated 30 January 2013, Master Plans are required for most USACE water resources development projects having a federally owned land base. The Master Plan revision is intended to bring the MP up to date to reflect current ecological, socio-demographic, and outdoor recreation trends affecting the lake, as well as those anticipated to occur within the planning period of 2021 to 2046 (i.e., 25 years).

The Stillhouse Hollow Lake Master Plan is the strategic land use management document that guides the efficient, cost-effective, comprehensive management, development, and use of recreation, natural resources, and cultural resources throughout

the life of the Stillhouse Hollow Lake 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 Stillhouse Hollow Lake 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 Stillhouse Hollow Lake resources and facilities, and that goals and objectives are accomplished at an appropriate scale and rate.

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 socio-economic 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 Stillhouse Hollow Lake 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 Stillhouse Hollow Lake. The Plan also does not address details of design, management, administration, or implementation of the project, as these are addressed in the Stillhouse Hollow Lake Operational Management Plan (OMP). In addition, the Master Plan does not address the specifics of regional water quality or shoreline management with respect to private actions conducted by adjoining landowners such as vegetation modification. 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 1975 Master Plan 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 Stillhouse Hollow Lake and the region in general. In response to these continually evolving trends, USACE has determined that a full revision of the 1975 Plan is required as set forth in this Plan.

1.4 BRIEF PROJECT AND WATERSHED DESCRIPTION

Stillhouse Hollow Lake (formerly Lampasas Lake) was initiated in the summer of 1962 with the deliberate impoundment of water beginning February 19, 1968. The Stillhouse Hollow Dam site is located on the Lampasas River 16.0 river miles upstream

from the confluence of the Lampasas and Leon Rivers, and is in the central part of Bell County about five miles southwest of Belton, Texas (Figure 1.1). The reservoir area lies entirely within Bell County.

The Lampasas River is in segment 1217 of the 45,000 square mile Brazos River Basin, which is the second largest river basin by area within Texas. The Lampasas River rises in western Hamilton County 160 miles west of Hamilton and flows southeast for 75 miles, passing through Lampasas, Burnet, and Bell Counties. In Bell County the river turns northeast and is dammed five miles southwest of Belton to form Stillhouse Hollow Lake (segment 1216). Below Stillhouse Hollow Lake, the Lampasas River flows to its confluence with Salado Creek and the Leon River to form the Little River.

Stillhouse Hollow Lake has a drainage area of 1,318 square miles. The dam is rolled earth filled, approximately 15,624 feet in length including the spillway and dike, is 200 feet high and has a top width of 42 feet, with the dike at 10 feet. The spillway is a broad-crested weir at elevation 1,650 feet NGVD. The outlet works consist of one gate-controlled conduit with two hydraulically operated slide gates and invert elevation of 515.0 feet NGVD[2].

1.5 PROJECT ACCESS

State Highway Farm to Market 1670 crosses the main embankment. This highway intersects U.S. Highway 190 approximately three miles southwest of Belton, TX, and leads to Interstate 35 approximately three miles southeast of the main embankment. Access to government property and public use areas is also available over existing improved and unimproved county roads (Figure 1.2).

[2] TWDB 2015 Volumetric and Sedimentation Survey

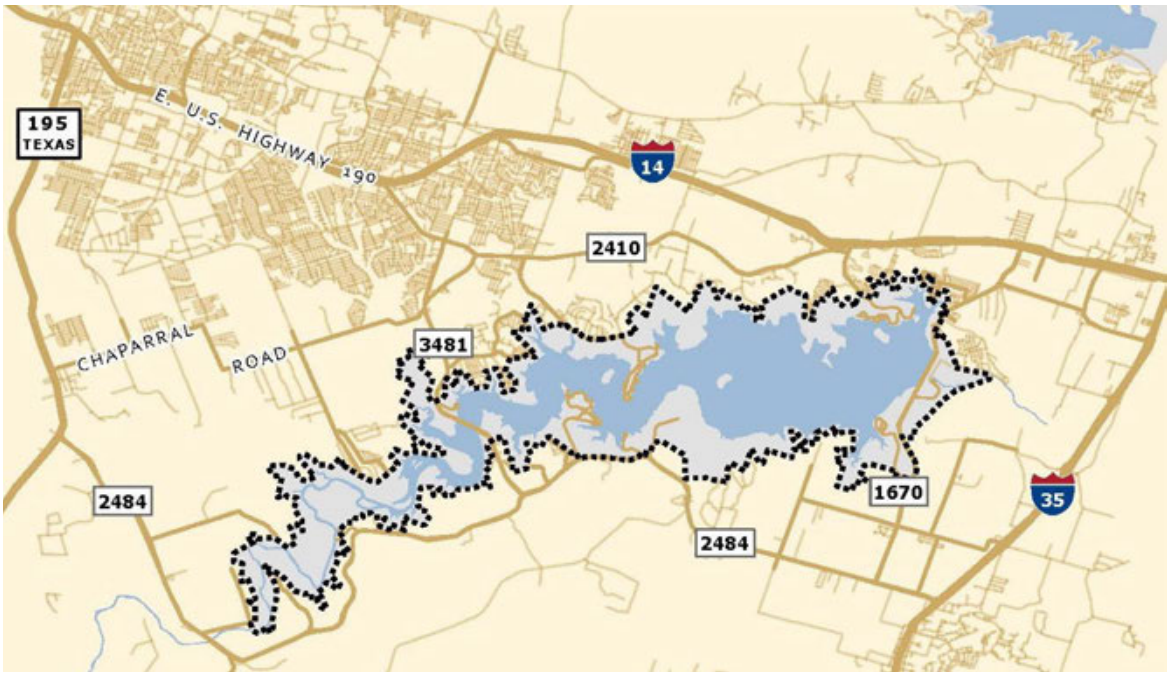


Figure 1.2 Road Network at Stillhouse Hollow Lake 2020

1.6 PRIOR DESIGN MEMORANDUMS

Design Memorandums were prepared from 1956 through 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. Table 1.1 list of the Design Memoranda for Stillhouse Hollow Lake.

Table 1.1 Design Memorandums

DM #	Title	Date
	Interim Report on Brazos River	Dec 1945
	Report on Survey of Brazos River and Tributaries, Texas - Oyster Creek, Texas, and Jones Creek, Texas	Aug 1947
	Horizontal and Vertical Control for Dam Site Work Areas and Reservoir Area, Lampasas Reservoir, Belton, Texas	Jun 1959
1	Stillhouse Hollow Reservoir - Hydrology, Supplement No. 1	Jul 1959 Rev. Jan 1960
1	Stillhouse Hollow Reservoir - Hydrology, Supplement No. 1	Rev. Jul 1963
2	Stillhouse Hollow Reservoir - Site Selection (Geology Only)	Dec 1958
4	Stillhouse Hollow Reservoir - Relocations, Part II – F.M. Road 1670, Vol. 10-3	Jul 1962
4	Stillhouse Hollow Reservoir - Relocations, Part I - Bell County Roads	May 1963
5	Stillhouse Hollow Reservoir - General	Mar 1960
6	Stillhouse Hollow Reservoir - Availability of Materials	Dec 1960
7	Stillhouse Hollow Reservoir - Clearing	Mar 1963

DM #	Title	Date
8	Stillhouse Hollow Reservoir - Part I - Dike	Jun 1960
8	Stillhouse Hollow Reservoir - Part II - Earth Dam and Spillway	Jul 1962
9	Stillhouse Hollow Reservoir - Maintenance Facilities, Access Road and Visitors' Overlook	Apr 1962
10	Stillhouse Hollow Reservoir - Outlet Works Vol. 10 - 12	Aug 1962
11A	Stillhouse Hollow Reservoir - Preliminary Master Plan Part of the Master Plan For Stillhouse Hollow Reservoir Lampasas River, Texas	Apr 1961
11B	Stillhouse Hollow Reservoir - Master Plan Revision and supplement	Feb 1965, 1966 and Oct 1970
11C	Stillhouse Hollow Reservoir - Master Plan Revision	Jan 1975
12	Stillhouse Hollow Reservoir - Channel Improvement Vol. 10-14	Apr 1962

1.7 PERTINENT LAWS

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

- Public Law 78-534, Flood Control Act of 1944. - Section 4 of the Act, as last amended in 1962 by Section 207 of Public Law 87-874, authorizes USACE to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to federal, state, or local governmental agencies.

- Public Law 85-624, Fish and Wildlife Coordination Act 1958. - This Act, as amended in 1965, establishes 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 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; (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 that requires the President’s Advisory Council on Historic Preservation to 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 86-717, Forest Conservation. - This act provides for the protection of forest and other vegetative cover for reservoir areas under the jurisdiction of the Secretary of the Army and the Chief of Engineers.

- Public Law 89-72, Federal Water Project Recreation Act of 1965. - This act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at federal reservoir projects shall be borne by a non-federal public body. A HQUSACE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.

- Public Law 91-190, National Environmental Policy Act of 1969 (NEPA). - NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a *"continuing policy of the Federal Government... to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."* Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations, and public law of the United States shall be interpreted and administered in accordance with the policies of the Act. It is Section 102 that requires consideration of environmental impacts associated with federal actions. Section 101 of NEPA requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony.

  Specifically, Section 101 of the National Environmental Policy Act declares:
  - o Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
  - o Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
  - o Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
  - o 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;
  - o Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
  - o Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

- 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

The Flood Control Act September 03, 1954 (Public Law 83-780) authorized acquisition of land at Stillhouse Hollow Lake. Initially, 15,404 acres of fee simple land and 915 acres of easement were acquired. Since that time, 123 acres of fee and 1 acre of easement have been disposed, leaving a current total of 15,281.50 acres of fee and 913.57 acres of flowage easement. These are official acres and are slightly different than the planning acres derived using GIS computations. Additionally, the fee simple and easement acreage identified in this master plan was obtained from the Real Estate Management Information System (REMIS) and is subject to change as the acquisition documents are audited.

1.8.2 Outgrants

Real Estate outgrants at Stillhouse Hollow Lake include easements, licenses, leases, and other formal real estate documents. A summary of outgrants at Stillhouse Hollow Lake is as follows:

- Total Easements: 17
- Total Leases: 3 (2 Recreation, 1 Water Supply)
- Licenses: 0
- Consents/Other: 2

The Fort Worth District Real Estate Division and Operations Division, in coordination with Operations Division staff at Stillhouse Hollow Lake, conduct annual compliance inspections of all major outgrants. Inspections of leased areas are conducted annually, while park and recreation leases issued to the state are conducted no more than once every three years. All easement inspections are conducted on a five-year rotating schedule.

Individuals and entities 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 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 relies on the project's natural resources, supports water-based activities, and would be beneficial to users at Stillhouse Hollow Lake. Further, recreational leases are typically only allowed on High Density Recreation Lands (see Appendix A for maps). Questions regarding this topic can be directed to the lake office.

1.8.3 Trespass and Encroachment

Government property is monitored by Stillhouse Hollow Lake 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 Regulations (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 USACE 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.

Additional rules exist for flowage easement lands. While not owned by the Federal Government, these lands have special rules for activities on these lands. See Section 4.3 of this Master Plan for more details on flowage easement lands.

1.9 PERTINENT PROJECT INFORMATION

Table 1.2 outlines pertinent project information such as key elevations, water storage, and spillway flow capacity at Stillhouse Hollow Lake. A contract with the Brazos River Authority (BRA) was approved on Apr 13, 1962 for 13 percent (26,740 acre-feet [ac-ft]) as future supply of the conservation storage below elevation 622.0 feet NGVD29.

Table 1.2 Pertinent Data

Feature	Elev Feet* (NGVD29)	Reservoir Area (acres)	Reservoir Capacity		Total Spillway Capacity (cfs)	Outlet Works Capacity (3 Gates)
			Accumulative (ac-ft)	Runoff (inches)		
Top of Dam	698.0	16,800	1,053,800	14.98		
Max. Design Water Surface (1963 Study)	693.2	16,310	1,800,700	14.33	673,500	6,500
Top of Flood Control pool & Spillway Crest (1983 Study)	666.0	11,830	630,400	8.96		7,400
Top of Conservation Pool	622.0	6,484	227,825	3.35		6,200
Shoreline at Designed Conservation Pool – approximately 58 miles (1975 Plan and Pertinent Data Table) * The elevation listed on the pertinent data sheet is based on the datum of NGVD29. The datum conversion from NGVD29 to NAVD88 is NGVD29+.0.2 feet = NAVD88						

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. Stillhouse Hollow Lake is in the Edwards Plateau section of the Great Plains province of the Interior Plains division. The Interior Plains cover a vast area of central North America, extending from the Gulf Coast to the Arctic Ocean along the east flank of the Rocky Mountains. The Great Plains is the broad expanse of flat land, much of it covered in prairie, steppe, and grassland. The Edwards Plateau is a region of west-central Texas, which is bounded by the Balcones Fault to the south and east, the Llano Uplift and the Llano Estacado to the north, and the Pecos River and Chihuahua Desert to the west.

2.1.1 Ecoregion Setting

Ecoregions are major ecosystems within physiographic regions defined by geographically distinct plant and animal species, natural communities, and environmental conditions. There are 12 different Level III and 56 Level IV ecoregions in Texas. Stillhouse Hollow Lake, like Belton Lake, is within the far southern end of the Level Ill Ecoregion know as Cross Timbers and the Level IV region known as Limestone Cut Plain. Early settlers coined the name Cross Timbers due to their repeated crossing of the timbered areas that impeded their prairie crossing. The Cross Timbers region extends from central Texas to southern Kansas; however, its vegetation has undergone significant changes over the past 150 years, and only small pockets of the ancient Cross Timbers remain intact.

The Limestone Cut Plain is a broader, southern extension of the Grand Prairie, found only in Texas. Geologically, it is underlain by limestone rather than sandstone, and serves as a physiological and vegetation transition to the Edwards Plateau, which lies on the southern edge of the region. The region encompasses all of Hamilton and Coryell counties, large parts of Bell, Lampasas, Mills, Erath, and Bosque counties, and smaller parts of Williamson, Burnet, Brown, Comanche, Hood, Somervell, and McClennan counties, and includes Fort Hood Army Base.

To help understand the region and guide future management of the USACE lands at Stillhouse Hollow Lake, the following sections reflect conditions that are both typical of the Cross Timbers region and unique to Bell County and Stillhouse Hollow Lake. While Section 2.1 covers the specifics of the region, Section 2.2 covers the natural resources specific to the region, its watershed, and the lake.

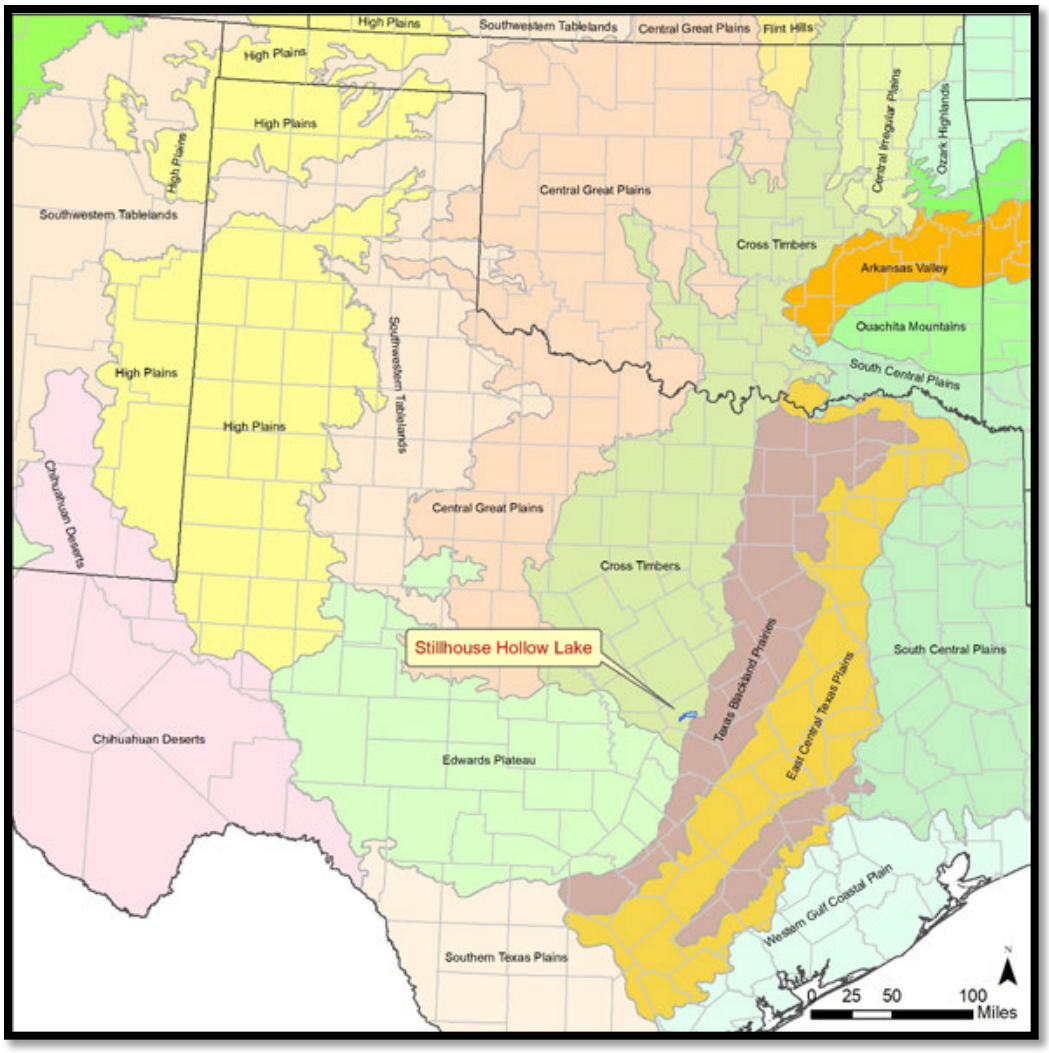


Figure 2.1 Stillhouse Hollow Lake Ecoregion

2.1.2 Climate

Stillhouse Hollow Lake lies in a moderately humid region of the southwest United States where the temperature is generally mild. Summer temperatures are generally hot during the day and warm at night, while winter temperatures are generally mild, with occasional cold periods, including some freezing temperatures of short duration. Sub-zero temperatures are very rare. While the mean annual temperature is about 67 degrees Fahrenheit (°F), the maximum recorded temperature was 112°F in August 2011, and the minimum recorded temperature was -2°F in January 1949. The growing season between killing frosts is normally from mid-March to late-November.

The average annual precipitation over the watershed above the dam since 1963 is about 35.88 inches. Table 2.1 below shows the highest precipitation by month and annual accumulation of precipitation recorded at Stillhouse Hollow Lake from 1963 - 2016. This table shows the record daily precipitation was 14.57 inches in October 2015, and the minimum daily precipitation of 0.0 in both July and August 1993. The record maximum and minimum annual precipitation were 56.77 in 2007 and 20.47 in 1988, respectively. Areas highlighted in orange

represent the month's record lowest precipitation, and the areas highlighted in blue are the highest precipitation recorded for the month from 1963 to 2016. As can be seen, there have been more months of exceptionally high and low rainfall from 1996-2016 than in 1963-1995, which is likely due, in part, to the negative effects of climate change.

Table 2.1 Stillhouse Hollow Lake Area 1963-2016 Monthly Record and Annual Accumulated Precipitation in Inches

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
1963							0.37	0.72	1.11	0.47	2.97	1.73	
1964	3.45	2.29	3.38	2.57	1.68	11.01	T	3.62	6.18	1.50	3.45	1.24	40.37
1965	4.49	3.84	1.30	1.38	12.63	2.65	0.33	0.47	4.42	1.74	3.50	3.94	40.69
1966	1.98	4.04	0.80	5.88	2.18	1.55	0.85	2.48	4.56	0.29	0.11	0.86	25.58
1967	0.45	0.54	0.95	1.66	5.69	0.14	0.18	1.16	3.18	4.86	3.16	3.02	24.99
1968	9.46	2.31	2.70	2.84	7.26	3.46	3.55	0.82	3.27	0.52	3.29	2.20	41.68
1969	0.61	3.00	3.78	4.04	2.38	0.74	0.55	3.30	1.70	3.86	2.06	2.66	28.68
1970	1.44	3.92	4.10	1.82	4.74	0.81	0.64	1.28	7.45	3.38	0.04	0.44	30.06
1971	T	1.75	0.17	2.14	4.58	1.21	5.21	2.67	1.76	6.78	2.96	3.91	33.14
1972	1.27	0.39	0.53	1.88	4.72	2.98	2.41	4.04	3.46	5.55	3.68	1.32	32.23
1973	4.57	2.36	2.86	2.83	2.23	3.52	4.93	0.94	6.84	7.29	1.13	0.44	39.94
1974	1.71	0.56	0.93	1.22	4.00	0.60	2.17	10.15	5.48	8.57	3.21	2.29	40.89
1975	1.33	3.48	1.77	1.39	9.97	5.50	1.09	3.93	2.55	2.59	0.88	1.58	36.06
1976	0.08	1.13	3.99	9.80	3.98	4.38	4.99	2.09	7.55	4.86	1.54	2.64	47.03
1977	1.96	4.15	2.43	7.01	2.36	2.87	0.11	0.56	0.52	1.89	1.44	0.33	25.63
1978	1.51	3.69	2.17	1.33	2.03	1.84	0.98	0.34	2.45	1.23	5.64	2.31	25.52
1979	2.57	3.19	5.64	5.47	8.65	5.06	5.33	3.37	2.75	1.38	0.64	2.99	47.04
1980	1.01	1.96	2.13	2.75	8.32	1.67	0.00	0.52	4.24	0.63	3.49	1.49	28.21
1981	1.00	3.30	3.40	2.95	3.79	13.91	0.60	1.55	2.79	7.95	1.29	0.56	43.09
1982	1.34	1.52	1.88	3.97	5.08	3.62	0.42	2.55	0.25	2.26	5.19	1.91	29.99
1983	1.62	3.10	4.18	0.14	7.66	1.17	1.61	4.14	4.06	1.34	2.03	0.61	31.66
1984	1.69	0.20	3.11	0.55	1.54	7.01	1.86	2.61	1.55	6.54	2.68	2.90	32.24
1985	1.55	3.77	3.62	3.53	3.94	3.12	0.43	1.62	4.94	5.45	5.66	2.48	40.11
1986	0.33	6.15	0.47	1.61	5.69	6.05	0.09	2.21	7.39	6.32	2.96	5.63	44.90
1987	1.00	3.33	1.33	1.20	3.66	6.85	1.60	0.63	2.62	0.35	4.77	3.47	30.81
1988	0.41	1.17	2.46	1.41	1.07	3.36	4.15	0.61	1.04	1.53	1.21	2.05	20.47
1989	4.71	4.33	3.12	0.59	5.46	4.68	0.92	3.03	0.27	1.94	0.71	0.40	30.16
1990	1.21	2.51	4.24	3.69	4.18	0.47	4.20	0.45	7.11	5.12	3.47	1.47	38.12
1991	4.99	1.56	1.21	1.92	11.65	5.83	1.15	1.38	5.60	5.19	1.68	9.78	51.94
1992	4.49	7.39	3.09	1.65	8.00	2.66	2.38	2.83	1.42	0.25	5.01	3.29	42.46
1993	3.60	2.74	5.27	4.64	4.86	3.29	0.00	0.00	4.57	3.50	1.46	2.08	36.01
1994	1.49	2.39	1.68	2.51	7.36	3.46	0.65	1.80	0.34	4.73	2.51	5.55	34.47
1995	0.74	1.44	3.02	4.21	4.29	5.80	1.77	2.30	3.50	0.96	1.74	1.13	30.90
1996	0.24	0.15	1.41	1.59	3.58	2.91	1.52	6.87	7.38	1.62	5.11	2.79	35.17
1997	2.43	5.67	3.55	7.37	4.78	5.72	1.67	0.53	3.15	3.58	4.94	7.37	50.76

1998	4.28	4.22	2.61	2.11	1.31	0.76	1.20	2.09	5.14	10.26	3.02	2.22	39.22
1999	0.96	0.22	2.84	2.06	4.58	2.36	3.01	0.13	4.81	1.84	0.20	2.18	25.19
2000	2.10	2.23	3.35	4.53	4.80	3.56	0.06	0.14	5.42	4.12	8.32	3.21	41.84
2001	6.61	1.61	4.56	1.85	7.11	2.62	1.37	14.5	2.18	2.54	5.92	3.39	54.20
2002	0.88	1.48	1.52	1.90	2.43	3.68	4.86	0.43	1.46	8.14	1.87	5.10	33.75
2003	1.07	5.27	1.88	0.57	1.26	4.81	0.80	1.79	3.10	4.28	1.33	0.72	26.88
2004	3.01	4.26	1.89	5.37	1.55	11.83	0.34	2.30	0.86	4.95	8.66	1.14	46.16
2005	2.97	2.93	2.23	0.88	3.71	2.91	4.93	5.43	1.07	1.42	1.31	0.22	30.01
2006	1.66	0.93	3.46	5.20	4.27	3.05	1.74	0.21	2.75	5.01	0.20	2.86	31.34
2007	7.15	0.20	8.71	1.64	11.34	10.99	7.44	0.53	4.54	0.71	1.66	1.86	56.77
2008	0.91	0.59	5.47	3.06	6.51	0.49	1.79	4.57	0.38	1.05	0.77	0.24	25.83
2009	1.04	0.92	4.03	5.12	2.65	0.02	1.14	0.38	10.75	12.22	1.70	1.84	41.81
2010	3.84	3.11	4.33	2.56	0.05	2.24	4.11	0.02	11.90	0.53	1.46	1.08	35.23
2011	3.47	1.09	0.21	0.32	4.13	0.74	0.15	0.00	0.36	2.87	1.13	6.01	20.48
2012	2.93	4.10	7.35	0.15	3.07	1.85	3.61	2.04	4.72	0.30	0.15	0.41	30.68
2013	4.95	1.43	1.42	1.36	6.73	1.06	2.42	1.91	2.98	7.14	2.72	1.18	35.30
2014	0.44	0.46	1.99	1.10	7.59	2.49	2.95	0.29	4.00	3.65	3.60	0.61	29.17
2015	3.91	1.26	2.74	2.69	9.14	5.87	0.33	1.45	0.99	14.6	7.23	2.12	52.30
2016	0.45	2.12	5.23	6.48	5.98	2.03	0.91	10.46	0.93	0.44	2.78	1.80	39.61
Average (in)	2.37	2.49	2.88	2.80	4.95	3.65	1.92	2.34	3.63	3.74	2.77	2.35	35.88

Source: NOAA Climatological Annual Summary – Note: "T" = "Trace"

The U.S. Global Change Research Program (USGCRP) looks at potential impacts of climate change globally, nationally, regionally, and by resource (e.g., water resources, ecosystems, human health). Stillhouse Lake lies within the Great Plains region of analysis. The Great Plains region has already seen evidence of climate change in the form of rising temperatures and population growth leading to increased demand for water and energy as well as having a negative impact on agricultural practices. Over the last few decades, the Great Plains region has experienced more frequent climate extremes of heat, drought, and precipitation, with a decrease in the number of cold days, which results in an overall lengthening of the frost-free season by one to two weeks.

Within this region there has been a 1.5 °F increase in average temperatures from a 1960 baseline to the year 2000 (USGCRP, 2014). In addition to more extreme rain events, the region is experiencing more frequent extreme heat events. The increased severity and frequency of climate events has been connected to human activity, specifically the increase in greenhouse gas (GHG) due to human use of fossil fuels (USGCRP, 2014). Since 2000, the longest duration of drought in Texas lasted 271 weeks beginning on May 4, 2010 and ending on July 7, 2015. The most intense period of drought occurred the week of October 4, 2011 where it affected 87.99 percent of Texas land (National Integrated Drought Information System, 2020). This was followed by massive flooding and major storm events across the state of Texas beginning May 22, 2015.

This trend of rising temperatures and more frequent extreme climate events such as heat waves, drought, and heavy rainfall is predicted to continue (USGCRP 2014). The USGCRP looks at two potential future conditions as part of its predictive modeling process; lowering GHG

emissions and continued current high GHG emissions. Under conditions of lower GHG emissions, the average temperature in the Great Plains region may increase as much as 4°F by 2020, 6°F by 2050, and 8°F by 2090 from averages observed in 2000. Under conditions of higher continuous GHG emissions, potential increase is greater in the long-term, and may be as much as 13.5°F by 2090. This will dramatically affect water and land usage throughout the region including Stillhouse Hollow Lake. Thus, maintaining a healthy natural environment is paramount to future sustainability and resilience in operations and recreation.

2.1.3 Geology and Topography

The Limestone Cut Plain of the Cross Timbers Ecoregion is underlain by Lower Cretaceous limestone, including the Glen Rose Formation and Walnut Clay, which are older than the limestone of the neighboring Edwards Plateau. The Glen Rose Formation has alternating layers of limestone, chert, and marl that erode differentially and generally more easily than the Edwards Limestone. The effects of increased precipitation and runoff are also apparent in the increased erosion and dissolution of the limestone layer.

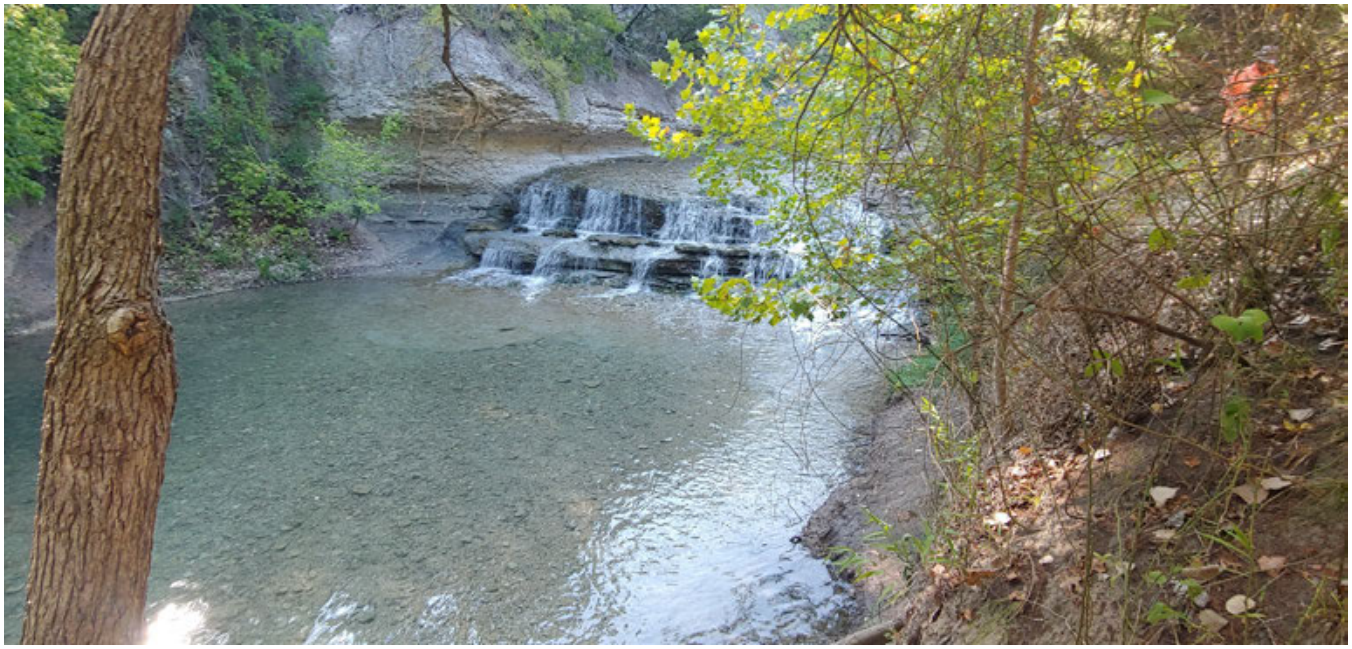


Photo 2.1 Typical Geology and Topography at Stillhouse Hollow Lake (USACE Photo)

The Limestone Cut Plain has flatter topography, lower drainage density, and a more open woodland character than does the Balcones Canyonlands, which lies further to the south of the Lake. The Stillhouse Hollow Lake topography is characterized by buttes, mesas, and divides.

2.1.4 Hydrology and Groundwater

The 45,573 square mile Brazos Basin, which feeds Stillhouse Hollow Lake, is the second largest river basin by area within Texas. The total basin is 840 miles long with an annual flow of 6,074,000 ac-ft per year, most of which is in Texas. The basin's namesake river was coined Los Brazos de Dios, "the arms of God," by early Spanish explorers. The Brazos River flows from the confluence of its Salt and Double Mountain forks in Stonewall County, Texas to the Gulf of Mexico. It is the state's third longest river and has the largest average annual flow volume of any river in the state. Other streams in the basin include the Salt, Double Mountain, and Clear forks

of the Brazos River; Gabriel, Lampasas, Little, Leon, Navasota, Nolan, Paluxy, Sabana, and White rivers; and many creeks such as Big Sandy, Cedar, Millers, Salt, Sweetwater, and Yegua creeks. One of the issues in this basin is the increasing demand on surface water resources in the upper basin as groundwater supplies decline, particularly in the Ogallala Aquifer, which has historically supplied most of the water in the upper basin.

The two primary sources of groundwater in the Stillhouse Hollow Lake area are the Edwards Balcones Fault Zone (BFZ) Aquifer and the Trinity Aquifer (TWDB, 2015). The Edwards BZF forms a narrow belt extending through most of the southwestern part of the state of Texas, through thirteen counties from a groundwater divide in Kinney County, Texas through the San Antonio area, northwestward to the Leon River in Bell County. Water in the aquifer occurs in fractures, honeycomb zones, and solution channels in the Edwards and associated limestone formations of Cretaceous age. Water quality for the Edwards (BFZ) ranges from fresh to slightly saline as it approaches the west side of the Trinity Group, with total mineral dissolve ranging from 100 to 3,000 milligram per liter. Water from the Edwards (BFZ) is primarily used for municipal, irrigation, and recreational purposes.

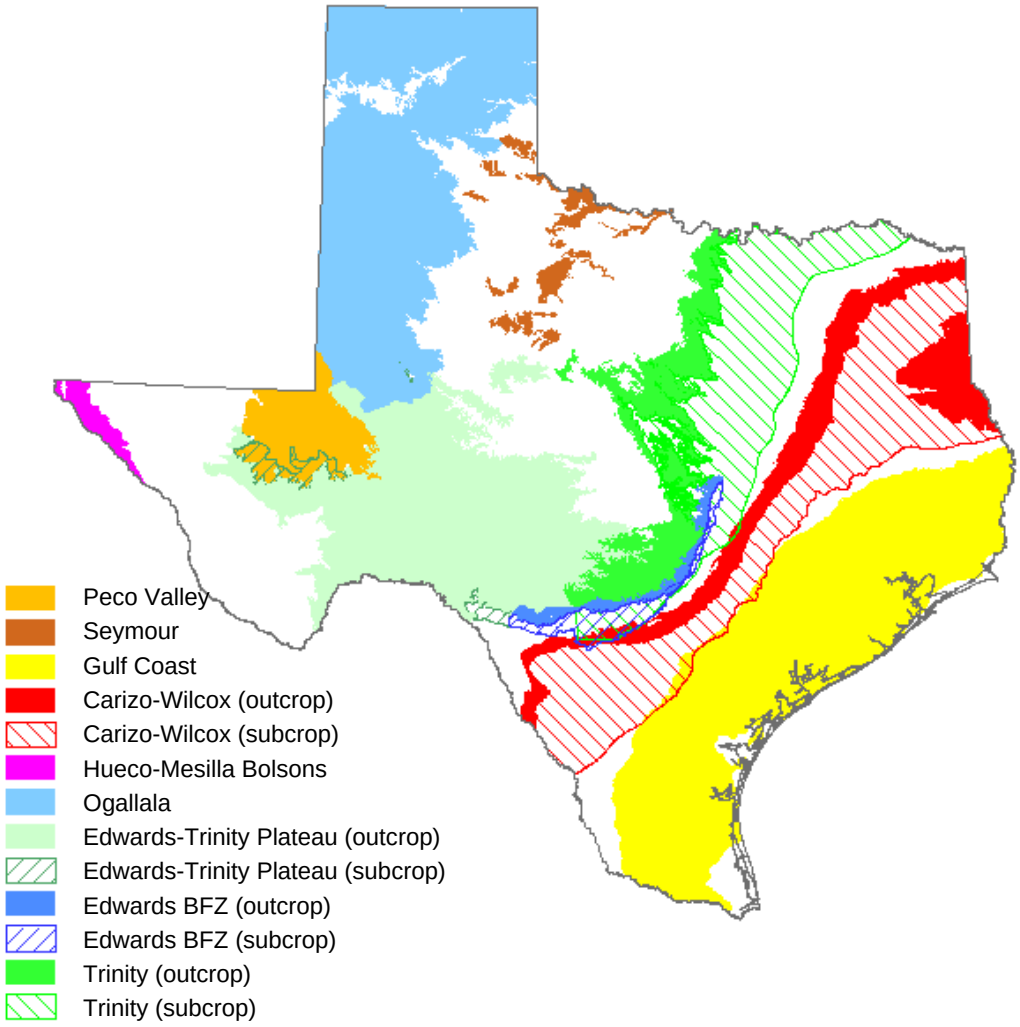


Figure 2.2 Groundwater Map of Texas (Courtesy TWDB)

The Trinity Aquifer consists of basal Cretaceous-age Trinity Group formations extending across much of the central and northwest parts of the state of Texas, through 61 counties. From the Red River in North Texas to the Hill Country of Central Texas, the aquifer is comprised of the Antlers, Twin Mountains, Glen Rose, Paluxy, Hosston, Travis Peak, and Hensell formations. In general, groundwater in the Trinity Aquifer is fresh but very hard in the outcrop. The dissolved solids increase from 1,000 - 5,000 milligram per liter, and slightly to moderately saline as the depth of the aquifer increases. Sulfate and chloride concentrations increase in the aquifer as depth increases. The Trinity Aquifer is mostly used for municipalities, irrigation, and livestock and is one of the most used groundwater resources in the state of Texas.

The Stillhouse Hollow Lake area is administratively under the Groundwater Management Area (GMA) 8 as designated by Texas Water Development Board (TWDB). In 1993, the Edwards Aquifer Authority (EAA) was created by the legislature to regulate aquifer pumpage to benefit all users. Texas Water Code (TWC) Section 36.0015 states that groundwater conservation districts (GCDs) are the state's preferred method of groundwater management and establishes that GCDs will manage groundwater resources through rules developed and implemented in accordance with TWC Chapter 36. Chapter 36 gives directives to GCDs and the statutory authority to carry out such directives, so that GCDs are provided the proper tools to protect and manage the groundwater resources within their boundaries. The ground water in and around Stillhouse Hollow Lake is primarily managed by the Clearwater Underground Water Conservation District.

The estimates of the annual amount of recharge to the groundwater resources that are recognized as Major Aquifers by TWDB are based on the Groundwater Availability Models (GAM) simulations provided by TWDB are:

1. Edwards BFZ Aquifer Recharge - 27,565 ac-ft per year
2. Trinity Aquifer Recharge - 2,816 ac-ft per year

The estimates of the annual amount of water discharged to surface water systems by the groundwater recognized as Major Aquifers by TWDB are based the GAM simulations provided by TWDB are:

1. Edwards BFZ Aquifer - 27,556 ac-ft per year
2. Trinity Aquifer - 11,131 ac-ft per year

2.1.5 Soils

Soil type and condition are an important component affecting the lake mission in terms of erosion and sedimentation, recreation options, and environmental stewardship. The Stillhouse Hollow Lake area has thin limestone soils in the hilly portion, which are timbered with oak, elm, mesquite, juniper, and ash. Alluvial soils along the streams support pecan, willow, and hackberry trees.

Soils in the Stillhouse Hollow Lake area are naturally susceptible to soil erosion. The major soil series found in the area are Topsey Clay Loam, Doss-real Complex, Eckrant-Rock Outcrop Complex, Real-Rock Outcrop Complex, and Sony Silty Clay Loam. The soils in general are well drained and moderately permeable, but can vary in depth, parent material, and slope.

Hydrologically, these soil groups generally have moderate water infiltration rates, however in the areas where soils tend to be of clay formation, a very slow infiltration rate (high runoff potential) is recorded which gives the soil a shrink-swell potential. Figure 2.3 illustrates the distribution of soil associations within Bell County.

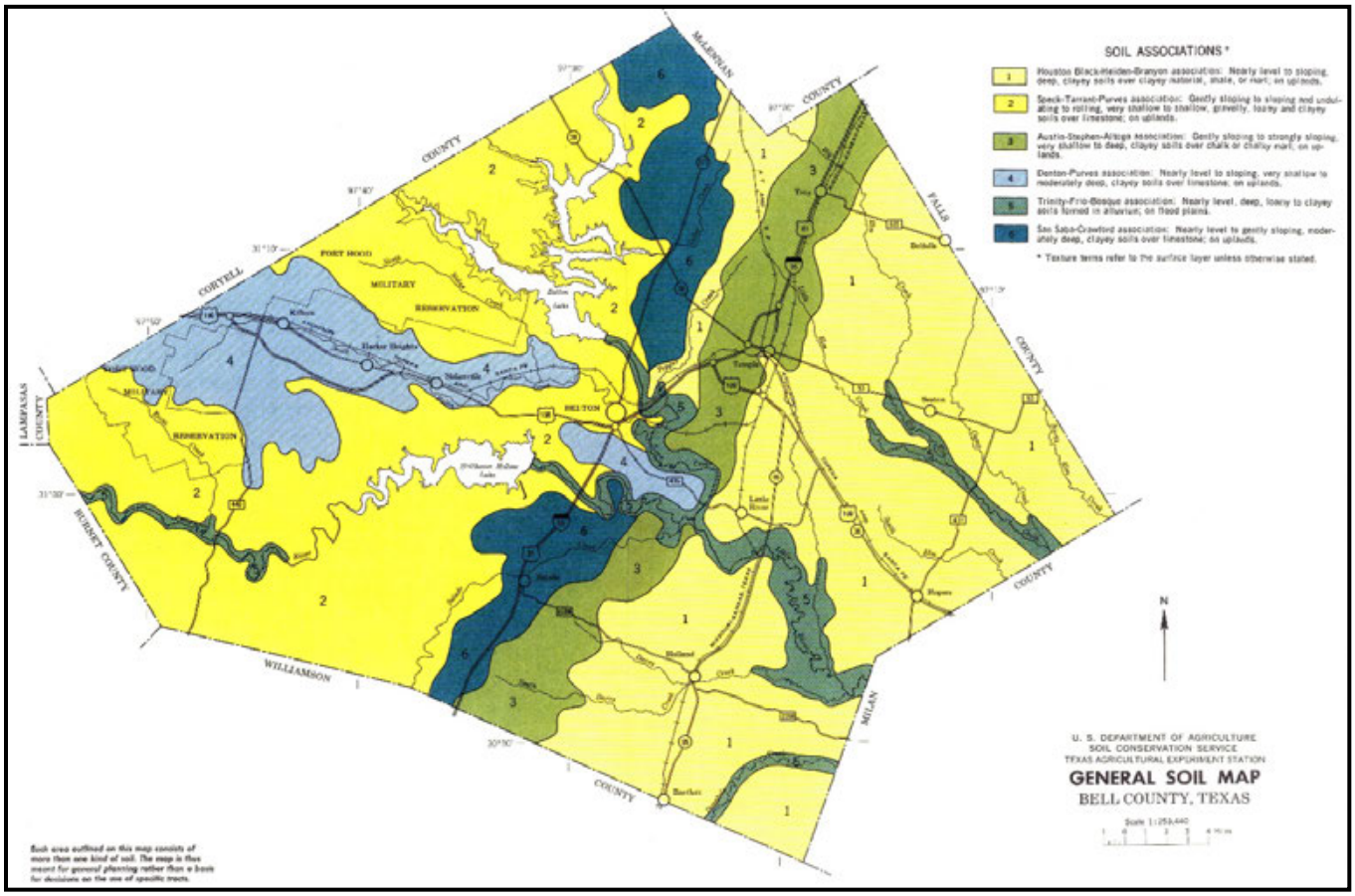


Figure 2.3 General Soil Map for Bell County Source: US Department of Agriculture

A soil survey by the Natural Resource Conservation Service (NRCS) shows there are eight possible general classifications (Classes I through Class VIII) occurring in the reservoir area. The erosion hazards and limitations for use increase as the class number increases. Class I has few limitations, whereas Class VIII has many. The soil class data for project lands is provided in Table 2.2 This data is compiled by the NRCS and is a standard component of natural resources inventories on USACE lands. This, and other inventory data, is recorded in the USACE Natural Resource Management Assessment Tool (NRM).

Table 2.2 Soil Classes

Soil Class	Acreages
Class I	0
Class II	328
Class III	935
Class IV	476
Class V	153
Class VI	024
Class VII	806
Class VIII	119

Source: 2019 NRM website

A general description of the soils and the land capability classes are described below.

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

Detailed information on all soil types surrounding Stillhouse Hollow Lake is available on websites maintained by the NRCS, U.S. Department of Agriculture.

2.2 ECOREGION AND NATURAL RESOURCE ANALYSIS

2.2.1 Vegetative Resources

USACE regulations and policy require a basic inventory of the vegetation at all operational projects. This inventory, referred to in EP 1130-2-540 as a Level 1 inventory, classifies the vegetation in accordance with the National Vegetation Classification System (NVCS) down to the Sub-Class level which is a very broad classification level. The inventory data, presented in Table 2.3, is recorded in the USACE national database referred to as the NRM Assessment Tool and is useful in providing a general characterization of the vegetation on all operational projects. Daily management of USACE lands requires more detailed knowledge of the vegetation down to the Association level within the NVCS, and for most management prescriptions, down to the individual species level of dominant vegetation.

Table 2.3 Vegetation Classification and Condition

Division	Order	Class	Sub-Class	Total Sub-Class Acres	Sustainable Areas	Transitioning Acres	Degraded Acres
Non-Vegetated	Non-Vegetated	Non-Vegetated	Non-Vegetated	6,947	6,947	0	0
Vegetated	Herb Dominated	Herbaceous Vegetation	Perennial gramimoid vegetation	2,650	265	530	1,855
Vegetated	Scrub Dominated	Shrubland (Scrub)	Mixed evergreen deciduous shrubland (scrub)	1,459	145	876	438
Vegetated	Tree Dominated	Closed Tree Canopy	Mixed evergreen-deciduous closed tree canopy	1,442	70	219	1,153
Vegetated	Tree Dominated	Open Tree Canopy	Mixed evergreen-deciduous open tree canopy	2,329	460	1,390	479
Vegetated	Vegetation Not Dominant	Sparse Vegetation	Bolder gravel cobble or talus sparse vegetation	444	30	294	120
Stillhouse Hollow Lake Totals				**15,271**	**7,917**	**3,309**	**4,045**

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

The vegetation of the Cross Timbers section of the Limestone Cut Plain is composed numerous tree species including those listed in Table 2.4. A denser woody understory forms in the absence of fire.

Table 2.4 Cross Timbers Common Tree Species

Tree Species	
Common Name	**Scientific Name**
Post oak*	*Quercus stellata*
White shin oak	*Quercus sinuata var. breviloba*
Cedar elm	*Ulmus crassifolia*
Texas ash	*Fraxinus albicans*
Plateau live oak	*Quercus fusiformis*
Bur oak	*Quercus macrocarpa*
Blackjack oak*	*Quercus marilandica*
Hickories*	*Carya spp*

*Primary species of the Cross Timbers wooded areas

Although the grasslands of the Limestone Cut Plain are a mix of tall, mid, and short grasses, some consider it a westernmost extension of the tallgrass prairie, which distinguishes this ecoregion from the Edwards Plateau Woodland. Grasses includes those listed in Table 2.5.

Table 2.5 Cross Timbers Common Grass Species

Common Name	Scientific Name
Big bluestem	*Andropogon gerardi*
Little bluestem	*Schizachyrium scoparium*
Yellow Indiangrass	*Sorghastrum nutans*
Silver bluestem	*Bothriochloa saccharoides*
Texas wintergrass	*Nassella leucotricha*
Tall dropseed	*Sporobolus compositus*
Sideoats grama	*Bouteloua curtipendula*
Common Curly mesquite	*Hilaria belangeri*

A Wildlife Habitat Appraisal Procedure (WHAP) was completed in conjunction with the Stillhouse Hollow Lake Master Plan and associated EA (see Appendix E for a detailed description). USACE looked at major habitat types throughout USACE lands at Stillhouse Hollow Lake, as shown in Figure 2.4, and scored them based on their value for terrestrial wildlife habitat.

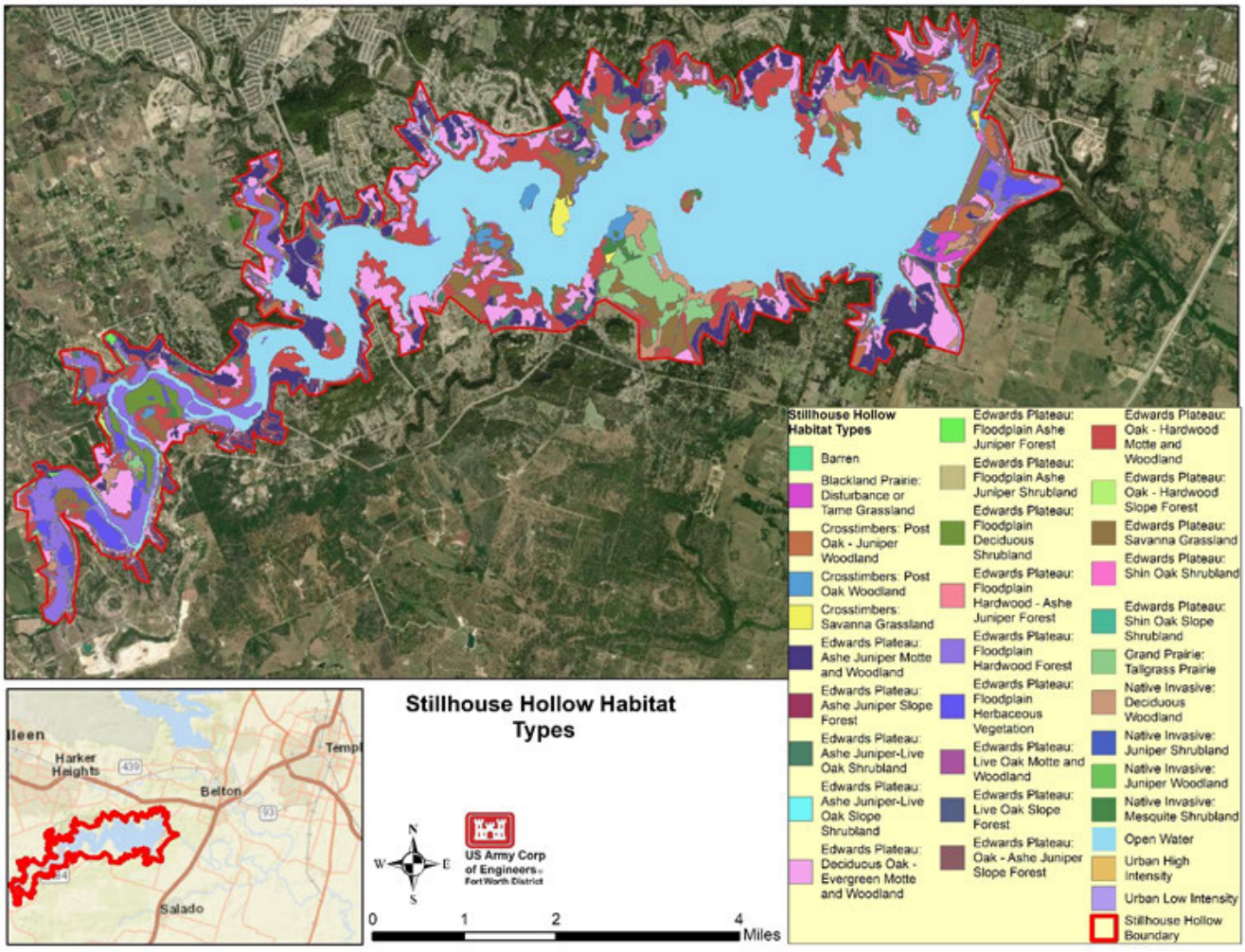


Figure 2.4 Habitat Types at Stillhouse Hollow Lake

A total of 81 WHAP points around the lake were selected, all within USACE fee property. The major habitat types selected and assessed were Grasslands, Upland Forest, and Riparian Forest. The following is a summation of the findings derived from the WHAP. The WHAP report and results can be found in Appendix E of this Plan.

Grassland: There were 20 Grassland sites assessed. WHAP scores for these areas ranged from a low of .47 to a high of .88. The average score for this habitat type was .67. Table 2.6 list the major species observed in these areas.

Table 2.6 Grassland Species at Stillhouse Hollow Lake

Common Name	Scientific Name
Prairie verbena	*Glandularia bipinnatifida*
Hedge parsley	*Torilis arvensis*
Johnson grass	*Sorghum halepense*
Hairy vetch	*Vicia villosa*
Texas thistle	*Cirsium texanum*
Yellow wood sorrel	*Oxalis stricta*
Ragweed	*Ambrosia spp*

Some of the woody species observed during the WHAP are listed in Table 2.7.

Table 2.7 Woody Species at Stillhouse Hollow Lake

Common Name	Scientific Name
Ashe juniper	*Juniperus ashei*
Prickly pear	*Opuntia macrorhiza*
Cedar elm	*Ulmus crassifolia*
Texas persimmon	*Diospyros texana*
Pecan	*Carya illinoinensis*

Photo 2.2 Site 9, Grasslands

Upland Forest: There were 47 Upland Forest sites assessed that had WHAP scores ranging from a low of .34 to a high of .72. The average score for this habitat type was .54. Generally, the Upland Forest sites observed around Stillhouse Hollow Lake are in good condition. The major vegetation species observed are listed in Table 2.8.

Table 2.8 Upland Forest Species at Stillhouse Hollow Lake

Common Name	Scientific Name
Yellow wood sorrel	*Oxalis stricta*
Hairy vetch	*Vicia villosa*
Hedge parsley	*Torilis arvensis*
Rosette grass	*Dichanthelium acuminatum*
Dewberry	*Rubus trivialis*
Ashe juniper	*Juniperus ashei*
Live oak	*Quercus fusiformis*
Hackberry	*Celtis occidentalis*
Greenbrier	*Smilax rotundifolia*
Texas persimmon	*Diospyros texana*
Cedar elm	*Ulmus crassifolia*
Shumard oak	*Quercus shumardii*
Red oak	*Quercus buckleyi*

Photo 2.3 Site 2, Upland Forest

Riparian Forest: There were 14 Riparian Forest sites assessed that had a WHAP score ranging from a low of .43 to a high of .78. The average score for this habitat type was .59. Generally, the Riparian Forests observed around Stillhouse Hollow Lake were in good condition. The dominant vegetation species observed are listed in Table 2.9.

Table 2.9 Riparian Forest Species at Stillhouse Hollow Lake

Common Name	Scientific Name
Woodland lettuce	*Lactuca floridana*
Johnson grass	*Sorghum halepense*
Yellow wood sorrel	*Oxalis stricta*
Hairy vetch	*Vicia villosa*
Hedge parsley	*Torilis arvensis*
Catchweed bedstraw	*Galium aparine*

The dominant woody species in the Riparian Forest observed are listed in Table 2.10.

Table 2.10 Riparian Woody Species at Stillhouse Hollow Lake

Common Name	Scientific Name
Greenbrier	*Smilax rotundifolia*
Dewberry	*Rubus trivialis*
Ashe juniper	*Juniperus ashei*
Cedar elm	*Ulmus crassifolia*
Live oak	*Quercus fusiformis*
Poison ivy	*Toxicodendron radicans*
Box elder	*Acer negundo*
Button bush	*Cephalanthus occidentalis*
Mustang grape	*Vitis mustangensis*

Photo 2.4 Site 5, Riparian Forest

2.2.2 Wetland Resources

Waters of the United States are defined within the Clean Water Act (CWA), and jurisdiction is addressed by USACE and the United States Environmental Protection Agency (EPA). Wetlands are a subset of the waters of the United States that may be subject to regulation under Section 404 of the Clean Water Act (CWA) (40 CFR 230.3). The Section 404 definition of wetlands states that wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. In addition to the wetland definition specified under Section 404 of the CWA, the USFWS has prepared a National Wetlands Inventory using what is referred to as the Cowardin system of wetland classification. For the purpose of inventorying wetlands that occur on USACE-administered Federal lands, the USFWS system is used. Figure 2.5 illustrates the different wetland types and locations around Stillhouse Hollow Lake.

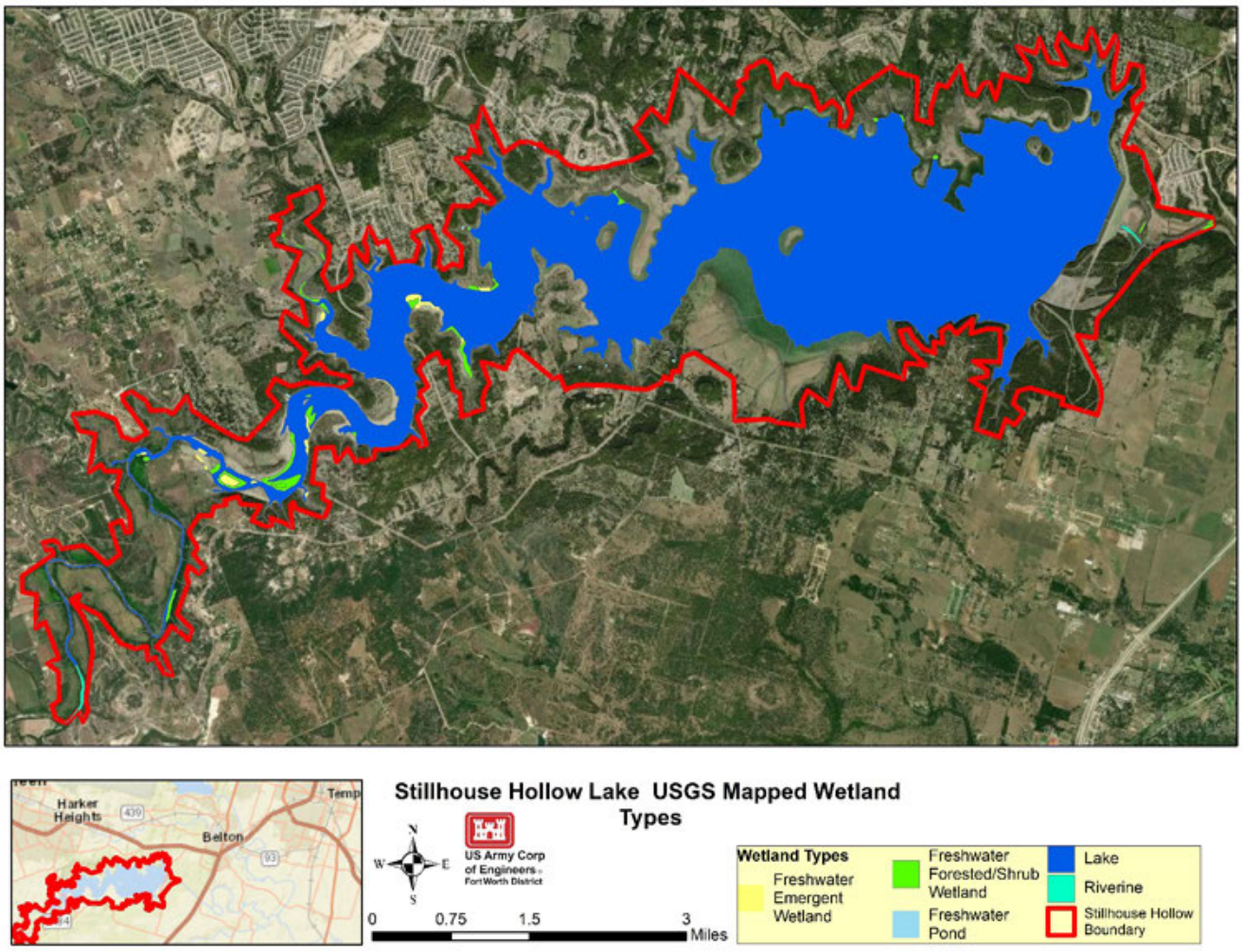


Figure 2.5 Stillhouse Hollow Wetland Resources

Table 2.11 lists the acreages of various types of wetlands present at Stillhouse Hollow Lake. Wetland classifications presented are derived from the U.S. Fish & Wildlife Service's (USFWS) Trust Resource List generated using the Information, Planning, and Conservation (IPAC) System decision support system.

Table 2.11 Wetland Resources

Wetland Inventory Complete	System	SubSystem	Class	Class Acres
No	Palustrine	NO SUB-SYSTEM	Unconsolidated Shore	1
No	Riverine	Lower Perennial	Unconsolidated Bottom	12
No	Lacustrine	Littoral	Emergent Wetland	25
No	Palustrine	NO SUB-SYSTEM	Scrub-Shrub Wetland	44
No	Lacustrine	Limnetic	Unconsolidated Bottom	6,277
No	Palustrine	NO SUB-SYSTEM	Forested Wetland	71

Note: These acres are from NRM and vary from USFWS acres.

2.2.3 Fish and Wildlife Resources

Stillhouse Hollow Lake provides habitat for an abundance of fish and wildlife species. The lake provides a quality fishery, as well as quality wildlife habitat on public land associated with the project. The resources are further described in the following sections.

2.2.3.1 Fish Resources

Stillhouse Hollow Lake provides fishing opportunities for both boater and bank angler. Table 2.12 lists the fish species found at Stillhouse Hollow Lake.

Table 2.12 Fish Resources at Stillhouse Hollow Lake

Sport Fish Species	
Striped bass	*Morone saxatilis*
White bass	*Morone chrysops*
Largemouth bass	*Micropterus salmoides*
Smallmouth bass	*Micropterus dolomieu*
Spotted bass	*Micropterus* punctulatus
White crappie	*Pomoxis annularis*
Channel catfish	*Ictalurus punctatus*
Blue catfish	*Ictalurus furcatus*.
Flathead catfish	*Pylodictus olivaris*
Other Species	
Sunfish	*Lepomis spp*.
Bluegill	*Lepomis macrochirus*
Redear	*Lepomis microlophus*
Warmouth	*Lepomis gulosus*
Carp	*Cyprinus carpio*
Drum	*Aplodinotus grunniens*
Gizzard shad	*Dorosoma cepedianum*

USACE is committed to continued cooperation with Texas Parks and Wildlife Department (TPWD) in developing fish resources, whose management strategies include:

- Manage sport fishes at Stillhouse Hollow Lake with statewide regulations.
- Stock smallmouth bass to supplement low natural reproduction.
- Stock Florida largemouth bass.
- Install artificial reefs in upper half of the lake.
- Maintain invasive species signage at boat ramps and inform the public about the negative impacts of aquatic invasive species when meeting with Stillhouse Hollow Lake user groups.
- Continue educating marina owners about zebra mussels and other invasive species, and provide them with posters, literature, etc. so that they can in turn educate their customers.
- Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.
- Conduct access and vegetation surveys.
- Conduct surveys with trap nets, gill nets, and electrofishing.

2.2.3.2 Wildlife Resources

Stillhouse Hollow Lake provides habitat for an abundance of wildlife species, including game and non-game species, migratory waterfowl, resident and migratory songbirds, wading birds, reptiles, amphibians, and insects. The area offers a mixture of geologic features, riparian forest, grasslands, springs, and river habitats. Table 2.13 lists some of the species supported at Stillhouse Hollow Lake.

Table 2.13 Wildlife Resources at Stillhouse Hollow Lake

Common Name	Scientific Name		Common Name	Scientific Name
Virginia opossum	*Didelphis virginiana*		White-tailed deer	*Odocoileus virginianus*
Nine-banded armadillo	*Dasypus novemcinctus*		Eastern gray squirrel	*Sciurus carolinensis*
Eastern cottontail rabbit	*Sylvilagus floridanus*		Fox squirrel	*Sciurus niger*
Swamp rabbit	*Sylvilagus aquaticus*		Southern flying squirrel	*Glaucomys volans*
Gray fox	*Urocyon cinereoargenteus*		North American river otter	*Lontra canadensis*
Red fox	*Vulpes vulpes*		Eastern wild turkey	*Meleagris gallopavo*
Coyote	*Canis latrans*		Several species of bat	Order Chrioptera
Striped skunk	*Mephitis mephitis*		Owl	Order *Strigiformes*
Bobcat	*Lynx rufus*		Over a hundred other species of bird	Class *Aves*
Bald eagle	*Haliaeetus leucocephalus*		Osprey	*Pandion haliaetus*

Waterfowl, wading birds, bald eagles and ospreys can be viewed from several vantage points around the lake. These birds are most likely seen during winter as well as during the fall and spring migrations.

USACE currently allows hunting at Stillhouse Hollow Lake in specified areas and in accordance with specific restrictions on allowable game species and means and methods of hunting. Hunting at Stillhouse Hollow Lake is subject to the rules and regulation promulgated by the Texas Parks and Wildlife Department (see Section 6.2 for more information). USACE Fort Worth District publishes a Public Hunting Guide listing each USACE lake in the Fort Worth District. The guide is updated each year to address any changes in State wildlife/hunting rules that may affect hunting at USACE lakes, as well as any changes in the management of USACE land at each lake. Hunters are advised to obtain a copy of the guide and to visit with USACE lake staff when planning to hunt.

2.2.4 Threatened and Endangered Species

The federal government and state agencies both list threatened and endangered species. Threatened species are those that are likely to become endangered within the foreseeable future, while endangered species are in danger of extinction throughout all or a significant portion of their range. Additionally, USFWS identifies species that are candidates for listing as a result of identified threats to their continued existence. The Candidate designation includes those species for which USFWS has sufficient information to support proposals to list as endangered or threatened under the Endangered Species Act; however, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. The USFWS Information for Planning and Conservation (IPaC) identified several species of birds, flowering plants, insects, and reptiles listed by the USFWS as Threatened, Endangered, or Candidate species that could potentially be found at Stillhouse Hollow Lake listed in Table 2.14 (See Appendix C for the IPAC report for Stillhouse Hollow Lake). Further information on specific species of concern can be found in Section 6 of this plan.

Table 2.14 Federal and State-Listed Threatened and Endangered Species with Potential to Occur at Stillhouse Hollow Lake

Common Name	Scientific Name	State Status	Federal Status
Amphibians			
Salado salamander	*Eurycea chisholmensis*	Threatened	Threatened
Birds			
Black rail	*Laterallus jamaicensis*	Threatened	Not Listed
Golden-cheeked warbler	*Setophaga chrysoparia*	Endangered	Endangered
Interior least tern	*Sternula antillarum athalassos*	Endangered	Delisted
Piping plover	*Charadrius melodus*	Threatened	Threatened
Red knot	*Calidris canutus rufa*	Threatened	Threatened
White-faced ibis	*Plegadis chihi*	Threatened	Not listed
Whooping crane	*Grus americana*	Endangered	Endangered
Wood stork	*Mycteria americana*	Threatened	Not listed
Zone-tailed hawk	*Buteo albonotatus*	Threatened	Not listed

Fish			
Smalleye shiner	*Notropis buccula*	Endangered	Endangered
Insects			
Kretschmarr cave mold beetle	*Texamaurops reddelli*	Not listed	Endangered
Reptiles			
Texas horned lizard	*Phrynosoma cornutum*	Threatened	Not listed
Mollusks			
Texas fawnsfoot	*Truncilla macrodon*	Threatened	Candidate

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 2.15 lists the primary invasive and exotic species that occur at Stillhouse Hollow Lake identified by TPWD and USACE. Further information on specific species of concern can be found in Section 6 of this plan.

Table 2.15 Invasive Species Found at Stillhouse Hollow Lake

Common Name	Scientific Name	Prevalence
Argentine ant	*Linepithema humile*	Minor/Moderate
Armored catfish	*Hypotomus plecostomus*	Moderate
Castor beans	*Ricinus communis*	Slight
Chinaberry	*Melia azedarach*	Major
Chinese tallow tree	*Triadica sebifera*	Moderate
Feral hog	*Sus scrofa*	Moderate
Giant reed	*Arundo donax*	Slight
Hydrilla	*Hydrilla verticillata*	Moderate
King ranch bluestem	*Bothriochloa ischaemum*	Slight
Nutria	*Myocastor coypus*	Slight
Red imported fire ant	*Solenopsis invicta*	Slight
Tree-of-heaven	*Ailanthus altissima*	Slight
Willow baccharis	*Baccharis salicina*	Major
Zebra mussel	*Dreissena polymorpha*	Significant/Major

Source: TPWD 2018 and NRM USACE 2020

2.2.6 Visual and Scenic Resources and Interpretation

Stillhouse Hollow Lake includes many acres of scenic shorelines, lake views, and wildlife viewing areas providing high visual and scenic qualities. Some areas are admired for their scenic attractiveness (intrinsic scenic beauty that evokes a positive response), scenic integrity

(wholeness of landscape character), and landscape visibility (how many people are able to view the landscape, for what reasons, and for how long). Some areas have been designated as Wildlife Management or Environmentally Sensitive Areas to preserve specific animal, plant, or environmental features that also add to the scenic qualities at the lake. Parks have been designed on USACE lands to provide public access to the lake, allow access to hiking trails, and take advantage of scenic qualities at the lake and surrounding areas.

Interpretive programming is a systematic approach to providing information and education services to Stillhouse Hollow Lake visitors. The primary objective is to tell the USACE story, inform visitors of the park rules, and provide educational opportunities for visitors to develop intellectual and emotional connections to the resources found at Stillhouse Hollow Lake. A variety of interpretive techniques are used including personal visitor contacts, public speaking engagements, and hosting grade school students through college groups. In addition, the staff uses print, video, and various forms of social media to keep the visiting public informed.

Interpretive programming also includes the management of public affairs, community relations, marketing, publications, special events, and cooperation with civic groups and resources partners. A variety of physical components such as signs and posters are used to enhance the interpretive programming effectiveness.

To protect the inherent beauty of Stillhouse Hollow Lake, 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. Vegetative management, mowing permits, debris removal, and other shoreline issues are addressed through the Stillhouse Hollow Lake Shoreline Management Policy. The Shoreline Management Policy has details concerning permits for vegetation manipulation. Adjacent landowners are advised to contact USACE lake staff prior to conducting any vegetation manipulation on USACE land.

2.2.7 Sedimentation and Shoreline Erosion

Based on two methods for estimating sedimentation rates, the 2005 TWDB sedimentation survey estimates Stillhouse Hollow Lake has 1.3 percent more capacity than the 1995 revised survey would indicate. Comparison of the TWDB 2005 Survey to the USACE original design capacity of 235,700 acre-feet and a surface area of 6,430 acres, results in a 3.3 percent loss in volume, and an 0.8 percent increase in surface area in 2005. Figure 2.6 illustrates the depths at Stillhouse Hollow Lake.

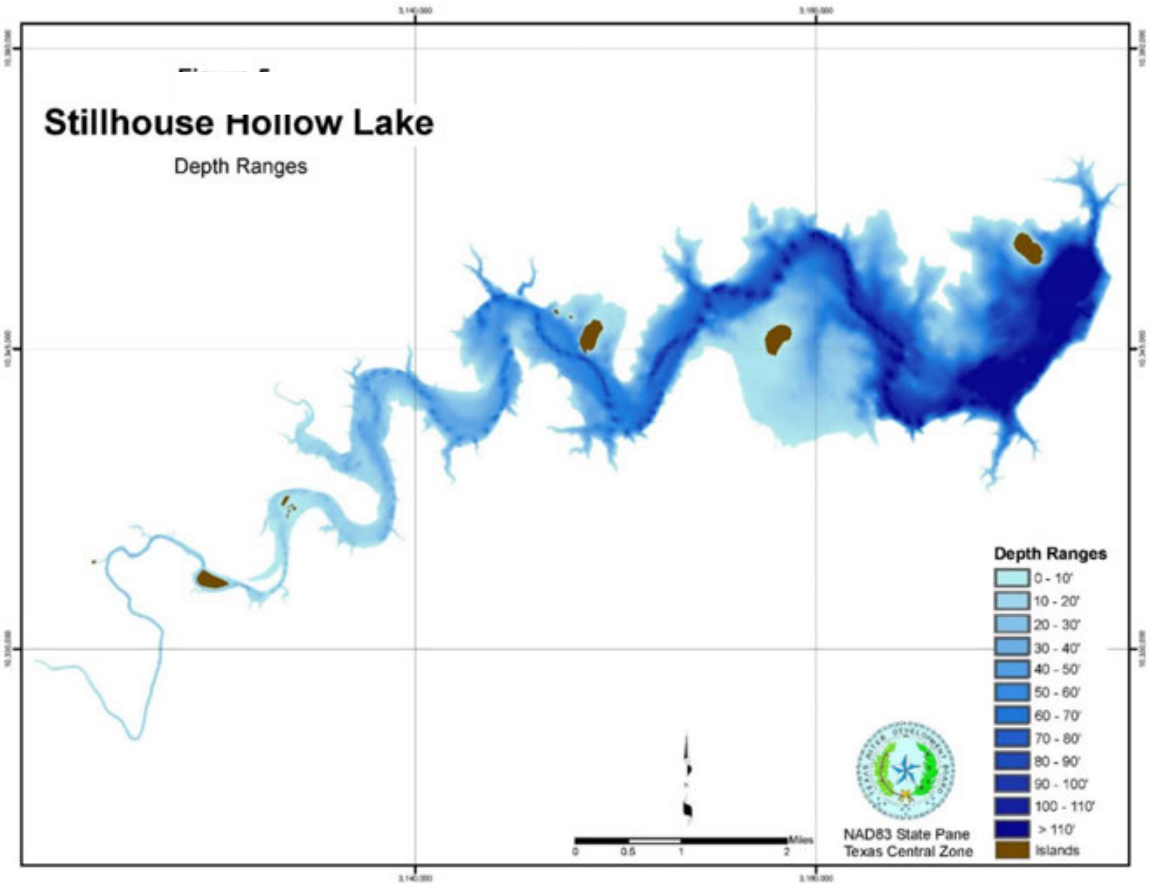


Figure 2.6 Stillhouse Hollow Lake Depth Ranges Source: 2005 TWDB Volumetric Survey

2.2.8 Water Quality

The Lampasas River above Stillhouse Hollow Lake is listed as impaired on the Texas Water Quality Inventory and 303(d) list due to elevated bacteria levels. Surface water quality monitoring also indicates a dissolved oxygen concern on North Fork Rocky Creek. In addition, population growth and rapid urbanization is occurring in the lower portion of the watershed, further stressing the need to protect the chemical, physical, and biological integrity of the river.

2.2.9 Air Quality

The Clean Air Act, last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for pollutants considered harmful to public health and the environment. NAAQS standards specify maximum permissible short- and long-term concentrations of various air contaminants including primary and secondary standards for six criteria pollutants: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NO), particulate matter (PM10 and PM2.5), and Lead (Pb).

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. If the concentrations of one or more criteria pollutants in a geographic area is found to exceed the regulated "threshold" level for one or more

of the NAAQS, the area may be classified as a non-attainment area. Areas with concentrations that are below the established NAAQS levels are considered either attainment or unclassifiable areas. Based on monitoring data, the EPA has determined that the Stillhouse Hollow Lake area is currently in attainment, meaning that it meets standards.

2.2.10 Health and Safety

The USACE, with some assistance from the TPWD and USFWS, has established public outreach programs to educate the public on water safety and conservation of natural resources. In addition to the water safety outreach programs, the USACE staff at Stillhouse Hollow Lake has established recreation management practices to protect the public. These include safe boating and swimming regulations, and speed limit and pedestrian signs for park roads. Stillhouse Hollow Lake also has solid waste management plans in place for camping and day use areas. Any leaseholder operating on USACE land at Stillhouse Hollow Lake is responsible for implementing basic health and safety practices within their respective leasehold area.

2.3 CULTURAL RESOURCE AND ANALYSIS

2.3.1 Prehistoric

The earliest well-documented evidence of human occupation in the Stillhouse Hollow Lake area is the Clovis culture, which dates to about 13,000 years before present (B.P.). Recent claims of an earlier pre-Clovis occupation (ca. 16,000 B.P.) have been made for the Gault Site in far southern Bell County. Prehistory is divided generally into three broad time periods: Paleo-Indian (13,000-8,500 B.P.), Archaic (8,500-1.250 B.P.), and Late Prehistoric (1,250-300 B.P.).

Evidence for Paleo-Indian period occupation is relatively rare in the Stillhouse Hollow Lake area and is known primarily from distinctive projectile point styles dating to this time period found in surface collections or in mixed multi-component sites. It is likely that intact Paleo-Indian camp sites may be buried deeply beneath Holocene floodplain alluvium. South of Stillhouse Hollow Lake in Bell County, where a Clovis period occupation is well-represented by a major component at the Gault Site. Evidence suggests that the region was occupied by small groups of highly mobile hunter-gatherers that traveled over very large territories. Traditionally thought of as mammoth and bison hunters, more recent evidence indicates Paleo-Indians exploited a much broader range of animal and plant resources.

The Archaic period is divided into Early (8,500-6,000 B.P.), Middle (6,000-3,500 B.P.), and Late (3,500-1,250 B.P.) sub periods. During this long time period, a generalized hunting and gathering subsistence strategy is indicated. Trends through time suggest increasing population density and decreasing group mobility within smaller territories. Sites with Late Archaic components are well represented in the Stillhouse Hollow Lake area and in Central Texas generally. Archaic period sites at Stillhouse Hollow Lake include open campsites and burned rock midden features.

The Late Prehistoric Period (1,250-300 B.P.) is marked by the presence of the bow and arrow and pottery. During the early portion of this time span, subsistence strategies remained similar to those of the preceding Late Archaic. The Late Prehistoric period is divided into early Austin phase (1,250-650 B.P.) and late Toyah phase (650-300 B.P.) sub periods, both of which

have been documented at Stillhouse Hollow Lake archeological sites. The Toyah phase differs from the preceding Austin phase in terms of technology and subsistence strategies. Bison became an important economic resource. Evidence of horticulture also appears but was of only minor importance to overall Toyah phase subsistence.

2.3.2 Historic

When Anglo settlers were beginning to occupy what is now Bell County in the 1830s, Native American tribes reported in the area included the Tonkawa, Lipan Apache, Waco, Kiowa, and Comanche. The present area of Bell County was included in Robertson's Colony, and Anglo-American colonists began settling there in the 1830s. Following the annexation of Texas by the United States in 1845, Bell County was formed in 1850 with a population of 660. The economy was dominated by farming and cattle ranching.

Population growth in the area accelerated following the arrival of the railroads in 1881. This improved access to major markets and led to a dramatic increase in the numbers of local farms and ranches. Most of the historic period resources at Stillhouse Hollow Lake are expected to be the archeological remains of house sites and outbuildings associated with farms and ranches dating from the late 19th century through the mid-20th century.

2.3.3 Previous Investigations at Stillhouse Hollow Lake

Studies related to the construction of Stillhouse Hollow Lake began with a preliminary survey in 1960 and 1961 by the Texas Archeological Salvage Project (TASP) that recorded 11 archeological sites. TASP recorded 27 additional sites in 1964, and excavations were conducted at two sites in 1964 and 1966. These were the Landslide Site (41BL85) and the Evoe Terrace Site (41BL104). The results of these excavations were used to define a detailed temporal sequence of projectile point types for Central Texas.

In 1994, the Texas Archeological Research Laboratory relocated and evaluated 28 previously recorded sites, and six new sites were recorded. Most recently, in 2009-2010, 2,570 acres of fee property managed by USACE was surveyed for cultural resources. This resulted in the recording of 38 new sites and 21 previously known sites.

2.3.4 Recorded Cultural Resources

Currently, 86 archeological sites have been recorded at Stillhouse Hollow Lake. Three of these sites have been determined to be eligible for the National Register of Historic Places (NRHP) and 16 have been determined to be ineligible. The remaining 67 archeological sites have not yet been formally evaluated for NRHP eligibility. At this time, 2,570 acres of Stillhouse Hollow Lake fee property located above the Conservation Pool elevation now have been inventoried to current archeological survey standards.

2.3.5 Long-term Cultural Resources Objectives

As funding allows, a Cultural Resources Management Plan (CRMP) shall be developed and incorporated into the Operational Management Plan (OMP) in accordance with EP 1130-2-540. The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Stillhouse Hollow Lake. A full inventory of cultural

resources at Stillhouse Hollow Lake needs to be completed in compliance with Section 110 of the National Historic Preservation Act (NHPA). In consultation with the Texas State Historic Preservation Officer (SHPO), all currently known sites must be evaluated to determine their eligibility for the NRHP. In accordance with Section 106 of the NHPA, any proposed ground-disturbing activities or projects, such as those described in this master plan or as may be proposed in the future by others for right-of-way easements, will require coordination with the SHPO to locate and evaluate potential impacts to historic and prehistoric resources. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated. All future cultural resource investigations at Stillhouse Hollow Lake must be coordinated with the SHPO and federally-recognized Tribes to insure compliance with the NHPA, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.

2.4 DEMOGRAPHIC AND ECONOMIC ANALYSIS

The following information covers the current demographic and economic data for communities near Stillhouse Hollow Lake (Zone of Interest). This basic information gives a snapshot of the current population and looks at growth trends for the area.

2.4.1 Zone of Interest

Stillhouse Hollow Lake lies completely within Bell County in Central Texas. The zone of interest for the socio-economic analysis of Stillhouse Hollow Lake is defined as the county in which the lake lies, Bell County, as well as the seven additional surrounding counties, which are Burnet, Coryell, Falls, Lampasas, McLennan, Milam, and Williamson counties as illustrated in Figure 2.7.

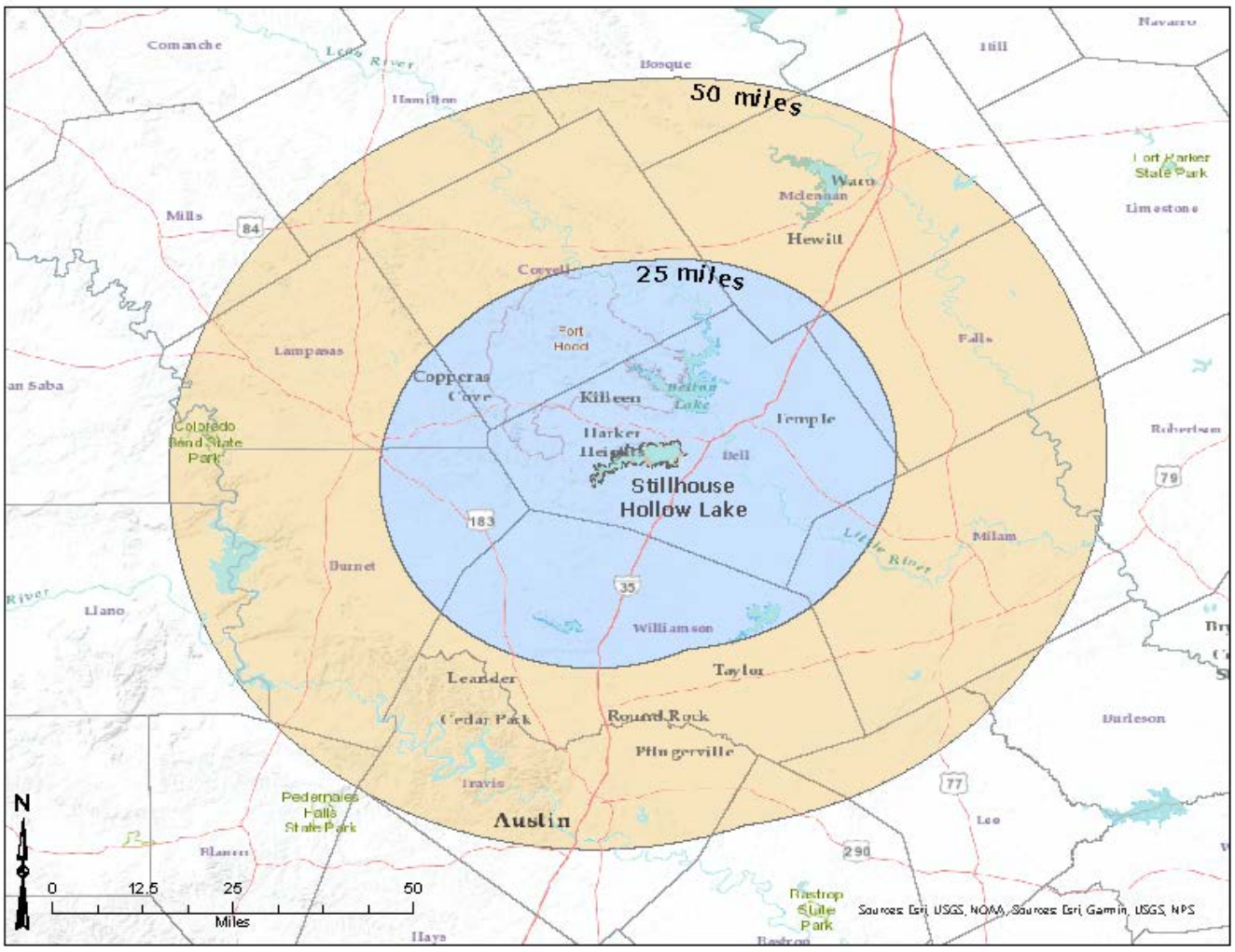


Figure 2.7 Zone of Interest for Stillhouse Hollow Lake

2.4.2 Population

The total population for the zone of interest in 2018 was 1,301,464, as shown in Table 2.16. Most of the zone of interest's population (approximately 41 percent) resides in Williamson County, 26 percent in Bell County, 19 percent in McLennan County, six percent in Coryell County, and four percent in Burnet County. The remaining counties in the zone of interest each account for two percent or less of the zone of interest's population.

The zone of interest's population makes up approximately five percent of the total population of Texas. From 2018 to 2045, the population in the zone of interest is expected to increase to just under two million from 1.3 million, an annual growth rate of 1.6 percent. By comparison, the population of Texas is projected to increase at a rate of 1.2 percent per year, and the national growth rate is expected to be 0.6 percent per year between 2018 and 2045. During this timeframe, all counties within the zone of interest are projected to have growth, with Bell County and Williamson County growing the most at 1.7 percent and 2.1 percent, respectively.

The distribution of the population among gender, as shown in Table 2.16, is approximately 49 percent male and 51 percent female in the zone of interest, similar to the overall gender distribution in Texas.

Table 2.16 Population Estimates 2000, 2018 and 2045 Projections

Geographical Area	2000 Population Estimate	2018 Population Estimate	2045 Population Projection
Texas	20,851,820	27,885,195	38,499,538
Bell County	237,974	342,236	524,806
Burnet County	34,147	45,750	58,349
Coryell County	74,978	75,389	107,138
Falls County	18,576	17,299	18,823
Lampasas County	17,762	20,640	27,062
McLennan County	213,517	248,429	298,063
Milam County	24,238	24,664	29,535
Williamson County	249,967	527,057	908,070
Zone of Interest Total	**871,159**	**1,301,464**	**1,971,846**

Source: U.S. Census Bureau, Population Division (2000 Estimate); U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates (2017 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 Projections)

The distribution of the population among gender, as shown in Table 2-17, is split evenly in the zone of interest, which is similar to the overall gender distribution in Texas.

Table 2.17 Percent of Population Estimate by Gender 2018

Geographical Area	Male	Female
Texas	13,849,775	14,035,420
Bell County	170,918	171,318
Burnet County	22,642	23,108
Coryell County	37,630	37,759
Falls County	8,189	9,110
Lampasas County	10,187	10,453
McLennan County	121,359	127,070
Milam County	12,343	12,321
Williamson County	259,443	267,614
Zone of Interest Total	**642,711**	**658,753**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

Figure 2.8 displays the population by age group. The distribution of age groups between the zone of interest and the state of Texas is similar, with the largest deviation being in the 25 to 34 and the 45 to 54-year-old age groups. The zone of interest has 3.2 percent more people in the 25 to 34 age group and 2 percent less in the 45 to 54 group when compared to Bell County. Figure 2.8 shows the zone of interest's population by age group in 2017 compared to the

population projections by age group for 2045. The forecast shows that the population ages 0 to 54 will decrease while ages 55 and over will increase between 2017 and 2045.

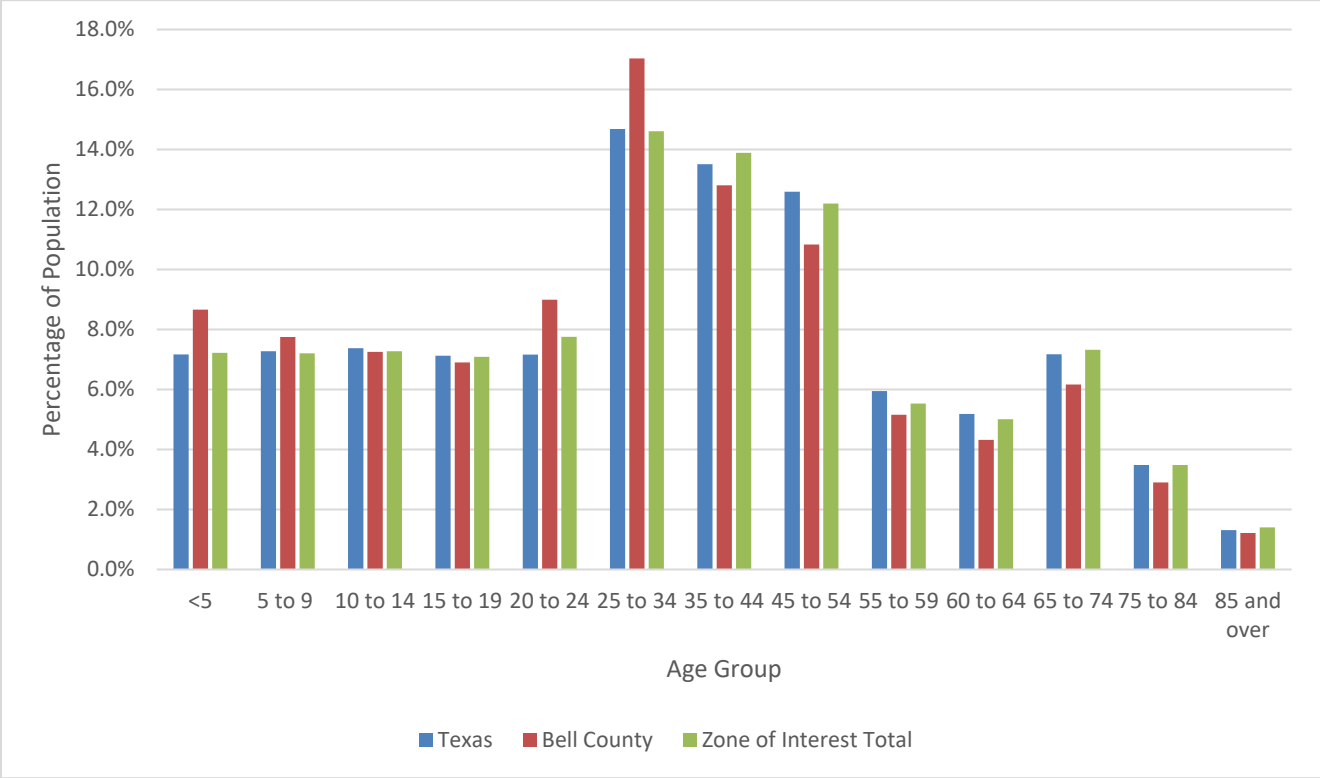


Figure 2.8 2018 Percent of Population by Age Group
Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

Population by race and Hispanic Origin is displayed in Table 2.18. The zone of interest is approximately 56 percent White, 12 percent Black, and 24 percent Hispanic or Latino. The other race categories account for less than four percent each of the population. By comparison, the state's population is approximately 42 percent White, 12 percent Black, and 39 percent Hispanic or Latino. Figure 2.9 shows the 2018 estimate and 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 13 percent and three percent respectively, while the White category decreases by 14 percent and the Black category decreases by one percent.

Table 2.18 2018 Population Estimate by Race/Hispanic Origin

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
Texas	11,807,263	3,269,253	68,452	1,292,813	20,381	42,354	463,123	10,921,556
Bell County	158,804	72,677	1,066	9,767	2,156	286	13,850	83,630
Burnet County	33,745	831	292	383	0	0	379	10,120
Coryell County	44,478	9,991	472	1,476	569	0	4,772	13,631
Falls County	8,878	4,153	57	73	7	0	144	3,987
Lampasas County	14,980	903	25	208	63	78	358	4,025
McLennan County	139,766	35,575	418	3,957	30	304	3,646	64,733
Milam County	15,426	2,093	28	121	0	12	525	6,459
Williamson County	316,640	31,855	866	33,636	366	1198	14,363	128,133
Zone of Interest Total	**732,717**	**158,078**	**3,224**	**49,621**	**3,191**	**1,878**	**38,037**	**314,718**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

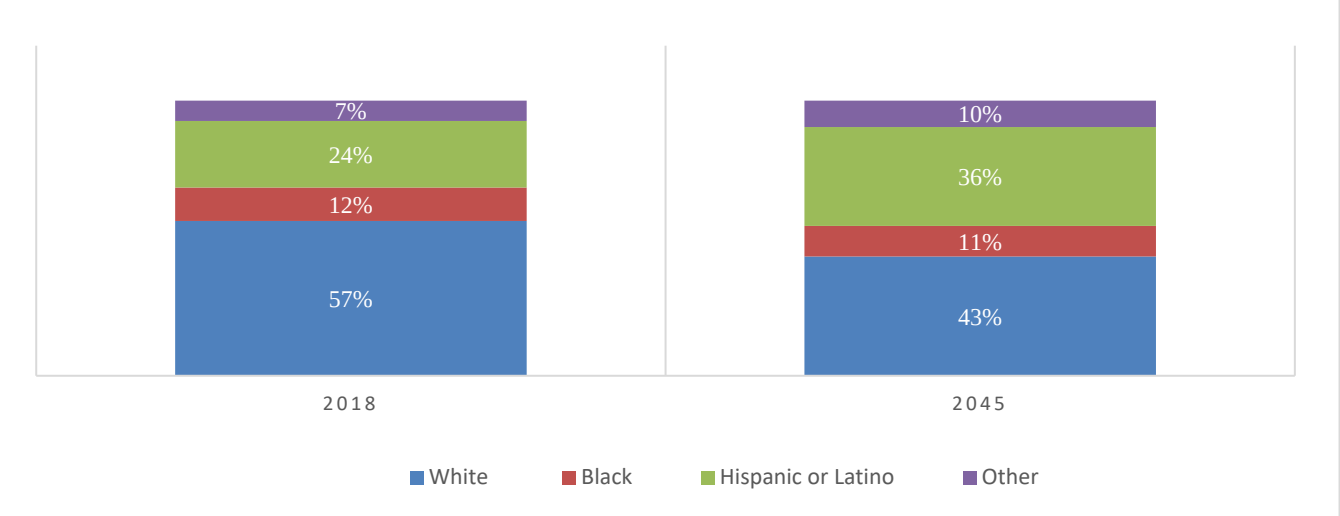


Figure 2.9 Zone of Interest Population Estimate and Projection by Race/Ethnicity
Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate); Texas State Data Center, The University of Texas at San Antonio (2045 Projections)

2.4.3 Education and Employment

Table 2.19 displays the highest level of education attained by the population ages 25 and over. In the zone of interest, four percent of the population has less than a 9th grade education, and another six percent has between a 9th and 12th grade education; 25 percent has a high school diploma or equivalent, and another 25 percent has some college and no degree; 10% has an Associate's degree; 20 percent has a Bachelor's degree; and 10 percent has a graduate or professional degree. In Texas, eight percent of the population has less than a 9th grade education; another eight percent has between a 9th and 12th grade education; 25 percent has at

least a high school diploma or equivalent; 22 percent has some college; seven percent has an Associate's degree; 19 percent has a Bachelor's degree; and 10 percent has a graduate or professional degree. Thus, the education level in the zone of interest is slightly higher than that of the state of Texas.

Table 2.19 2018 Population Estimate by Highest Level of Educational Attainment, Population 25 Years of Age and Older

Area	Highest Level of Educational Attainment							
	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree
Texas	17,815,359	1,506,111	1,487,321	4,448,881	3,892,527	1,261,050	3,409,836	1,809,633
Bell County	206,845	8,130	11,374	53,563	60,328	22,680	33,194	17,576
Burnet County	32,115	1,550	2,263	9,992	7,764	2,474	5,482	2,590
Coryell County	47,257	2,266	3,343	13,217	15,831	5,198	5,339	2,063
Falls County	12,035	1,124	1,639	4,562	2,343	814	1,252	301
Lampasas County	14,416	532	830	4,052	4,043	2,078	1,933	948
McLennan County	150,034	9,370	14,205	41,380	34,621	14,966	22,940	12,552
Milam County	16,546	1,118	1,824	6,320	3,565	1,434	1,695	590
Williamson County	346,522	10,851	12,584	70,838	79,994	29,687	94,573	47,995
Zone of Interest Total	**825,770**	**34,941**	**48,062**	**203,924**	**208,489**	**79,331**	**166,408**	**84,615**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

Employment by sector is presented in Figure 2.10 and Table 2.20. Figure 2.10 shows that the largest percentage of the zone of interest is employed in the *educational services, and health care and social assistance* sector at 23 percent, followed by 12 percent in *retail trade*, 11 percent in the *professional, scientific, and management, and administrative and waste management* services. The remainder of the employment sectors each comprise nine percent or less of the zone of interest's labor force.

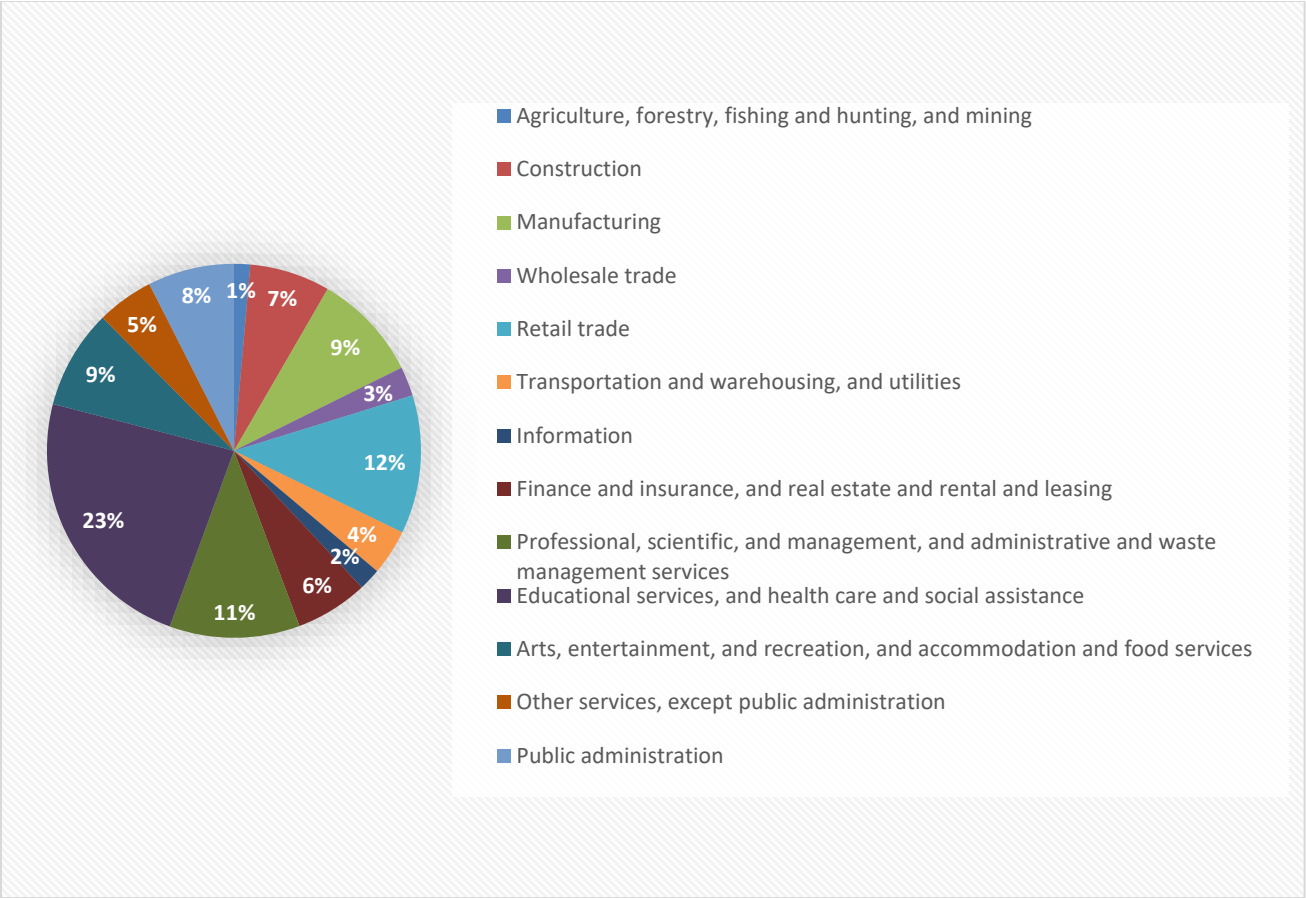


Figure 2.10 Zone of Interest Employment by Sector
Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

Table 2.20 Annual Average Employment by Sector by County

Employment Sector	Geographic Area							
	Bell County	Burnet County	Coryell County	Falls County	Lampasas County	McLennan County	Milam County	Williamson County
Civilian employed population 16 years and over	139,158	20,303	23,340	5,809	8,776	113,281	9,931	266,094
Agriculture, forestry, fishing and hunting, and mining	1,215	778	247	471	312	1,467	1137	2,387
Construction	9,843	2,787	1,701	319	970	8,631	708	18,324
Manufacturing	7,792	1,364	1,143	1054	569	13,130	930	27,240
Wholesale trade	3,021	495	470	172	117	2,821	146	6,525
Retail trade	16,687	2,789	2,782	661	1,143	14,192	1142	30,132
Transportation and warehousing, and utilities	6,497	800	1,071	345	321	5,226	820	8,656
Information	2,020	372	379	41	76	1,464	152	6,979
Finance and insurance, and real estate and rental and leasing	6,817	1,151	1,078	265	395	6,791	453	20,259
Professional, scientific, and management, and administrative and waste management services	13,185	1,809	2,299	222	721	9,074	446	40,428
Educational services, and health care and social assistance	37,101	3,711	5,576	1,286	2,043	28,944	2,194	57,015
Arts, entertainment, and recreation, and accommodation and food services	13,392	2,366	1,971	374	695	10,495	700	21,629
Other services, except public administration	6,741	944	1,028	293	644	6,011	544	12,226
Public administration	14,847	937	3,595	306	770	5,035	559	14,294

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

The civilian labor force in the zone of interest accounts for less than five percent of the civilian labor force of the state of Texas. As shown in Table 2.21, the zone of interest had an unemployment rate of 3.5 percent in 2018, slightly lower than that of the state of Texas, which had an unemployment rate of 3.8 percent that same year. Within the zone of interest, Bell, Coryell, Falls, and Milam counties all had higher or slightly higher unemployment rates than the state of Texas.

Table 2.21 Labor Force, Employment and Unemployment Rates, 2018 Annual Averages

Geographic Area	Civilian Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Texas	13,816,690	13,285,118	531,572	3.8%
Bell County	142,598	136,734	5,864	4.1%
Burnet County	22,921	22,264	657	2.9%
Coryell County	23,895	22,900	995	4.2%
Falls County	6,513	6,261	252	3.9%
Lampasas County	9,150	8,810	340	3.7%
McLennan County	118,211	114,001	4,210	3.6%
Milam County	9,887	9,347	540	5.5%
Williamson County	304,215	294,970	9,245	3.0%
Zone of Interest Total	**637,390**	**615,287**	**22,103**	**3.5%**

Source: Bureau of Labor Statistics, 2018 Annual Averages

2.4.4 Households, Income and Poverty

Table 2.22 displays the number of households and average household sizes in the state and zone of interest. There were approximately 9.5 million households in the state of Texas with an average household size of 2.86 in 2018. The zone of interest contained approximately 445,50048 of those homes with an average household size of 2.92.

Table 2.22 2018 Households and Household Size

Area	Total Households	Average Household Size
Texas	9,553,046	2.86
Bell County	120,241	2.76
Burnet County	16,849	2.68
Coryell County	22,314	2.72
Falls County	5,237	2.96
Lampasas County	7,738	2.63
McLennan County	89,034	2.69
Milam County	9,381	2.58
Williamson County	174,754	2.99
Zone of Interest Total	**445,548**	**2.92**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

The median household income in the zone of interest ranged from $38,032 in Falls County to $83,679 in Williamson County in 2018, as displayed in Table 2.23. Per capita income in the zone of interest was $29,518 in 2018, comparable to the state of Texas, which had a per capita income of $30,143.

Table 2.23 2016 Median and Per Capita Income

Geographic Area	Median Household Income	Per Capita Income
Texas	$59,570	$30,143
Bell County	$54,184	$25,911
Burnet County	$59,238	$30,507
Coryell County	$51,440	$21,507
Falls County	$38,032	$17,830
Lampasas County	$58,194	$28,158
McLennan County	$48,199	$24,826
Milam County	$47,081	$24,015
Williamson County	$83,679	$35,825
Zone of Interest Total	**N/A**	**$29,518**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

Table 2.24 displays the percentage of persons and families whose incomes fell below the poverty level in the past twelve months as of 2018. There were less persons in the zone of interest with incomes below the poverty level in 2018 (12 percent) as compared to the state of Texas (15.5 percent). Falls County had the most persons with incomes below the poverty level at 25.5 percent, followed by McLennan County at 19.3 percent. Bell, Burnet, Coryell, Lampasas, and Milam counties each had between 11 and 15 percent of individuals below the poverty level. Williamson had the least poverty, with 6.7 percent of the population below the poverty level. The only counties with a greater percentage of families below the poverty level than that of the state of Texas were Falls County at 21.8 percent and McLennan County at 13 percent. The remainder of the counties in the zone of interest had between 4.5 percent and 11.8 percent of families below the poverty level in 2018.

Table 2.24 Percent of Families and People Whose Income in the Past 12 Months is Below the Poverty Level (2018)

Geographic Area	All Persons	All Families
Texas	15.5%	11.9%
Bell County	13.9%	11.1%
Burnet County	11.0%	7.8%
Coryell County	13.5%	10.9%
Falls County	25.5%	21.8%
Lampasas County	11.3%	7.3%
McLennan County	19.3%	13.0%
Milam County	14.6%	11.8%
Williamson County	6.7%	4.5%
Zone of Interest Total	**12.0%**	**N/A**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates (2018 Estimate)

2.4.5 Social, Environmental and Environmental Benefits

Though not a mission of Stillhouse Hollow Lake, USACE recognizes the importance of Stillhouse Hollow Lake 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 25-27 describes some of the extended social, environmental, and economic benefits of Stillhouse Hollow Lake for the surrounding communities for 2019.

Table 2.25 Stillhouse Hollow Lake Social Benefits 2019

Facilities in FY 2019
9 recreation areas • 83 picnic sites • 73 camping sites • 2 playgrounds • 3 swimming areas • 10 trails • 27 trail miles • 3 fishing docks and piers • 5 boat ramps • 148 marina slips
Visits (person-trips) in FY 2019
486,475 in total • 91,744 picnickers • 15,601 campers/overnight visitors • 151,029 swimmers • 98,454 walkers/hikers/joggers • 88,979 boaters • 156,312 sightseers • 47,699 anglers • 15,399 special event attendees • 22,188 others
Public Outreach in FY 2019
1,470 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 2.26 Stillhouse Hollow Lake Economic Benefit 2019

Economic Data in FY 2016
Visitation per year resulted in: • $19,486,584 in visitor spending within 30 miles of the USACE lake • $10,186,260 in sales within 30 miles of the USACE lake • 137 jobs within 30 miles of the USACE lake • $4,317,355 in labor income within 30 miles of the USACE lake • $6,339,795 in value added within 30 miles of the USACE lake • $4,365,409 in National Economic Development Benefits • With multiplier effects, visitor trip spending resulted in: • $15,289,653 in total sales • 174 jobs • $5,908,287 in labor income • $9,151,685 in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes)
Benefits in Perspective
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.

Table 2.27 Stillhouse Hollow Lake Environmental Benefit 2016

Resources Data in FY 2016
8,841 land acres 6,430 water acres 58 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.

Source: https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll2/id/6227

2.5 RECREATION FACILITIES, ACTIVITIES, AND NEEDS

2.5.1 Zone of Influence and Visitation Statistics

The primary Zone of influence for Stillhouse Hollow Lake encompasses Burnet, Coryell, Falls, Lampasas, McLennan, Milam, and Williamson counties. These are the primary areas from which visitors to Stillhouse Hollow Lake originate, thus have the most impact and are impacted the most from activities at the lake.

2.5.2 Visitation Profile

The majority of visitors to Stillhouse Hollow Lake come from a 100-mile radius of the reservoir, with a greater concentration of visitors from a 50-mile radius. These visitors are a diverse group of people with a wide variety of interests. Examples of visitors include campers who utilize the campgrounds around the reservoir and in the county and federally operated parks; adjacent residents; hunters and anglers who utilize hunting grounds and participate in fishing tournaments; and day users who picnic, hike, bird watch, bicycle, and ride horses. Stillhouse Hollow Lake is a significant resource for water-related recreation in the region, providing the public with a location for boating, sailing, canoeing/kayaking, paddle boarding, and swimming in the area.

In 2016, Stillhouse Hollow Lake entertained almost 400,000 visitors, with the peak visitation months running from March through September. Figure 2.11 depicts a 2016 comparison in visitation between USACE lakes in the Fort Worth District region.

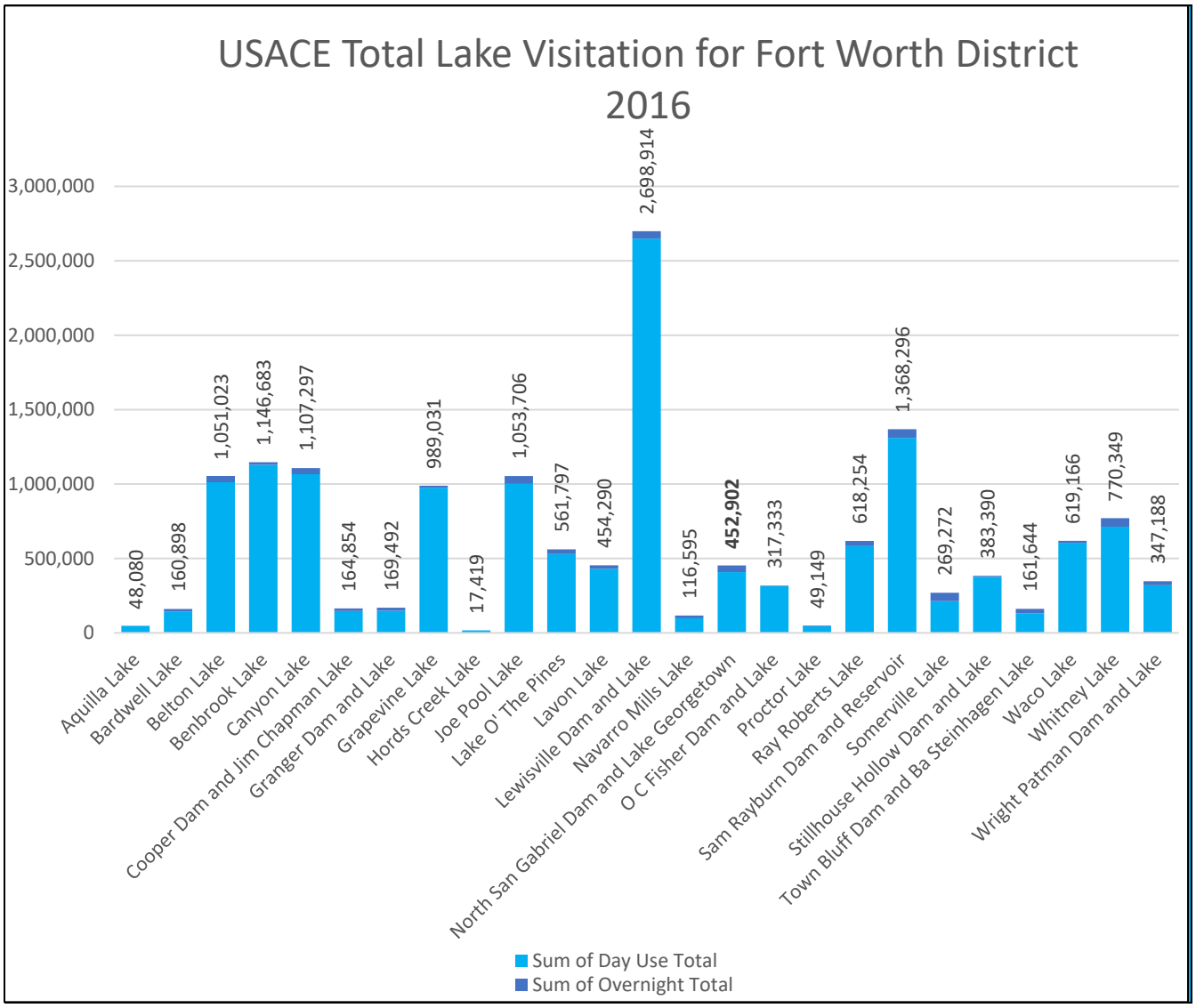


Figure 2.11 USACE Lake Visitation Map for Fort Worth District, 2016

2.5.3 Recreation Areas and Facilities

The existing recreational opportunities and future potential of Stillhouse Hollow Lake is 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 cycling trails. Table 2.28 lists the various recreational facilities collectively provided by USACE at Stillhouse Hollow Lake.

Table 2.28 Stillhouse Hollow Lake USACE Parks and Facilities

Park Name/Facilities Provided	Restrooms	Parking	Courtesy Docks	Picnic Areas	Camping	Boat Ramps
Cedar Gap Park	*	*	*			*
Chalk Ridge Falls Nature Area	*	*				
Dana Peak Park	*	*	*	*	*	*
Overlook Park	*	*		*		
Rivers Bend Park	*	*	*	*		
Stillhouse Park	*	*	*	*		*
Union Grove Park	*	*	*	*	*	*

2.5.4 Recreational Analysis - Trends

Recreational use at Stillhouse Hollow Lake continues to evolve. While visitation in USACE managed recreational areas remains strong, there is demand for recreational opportunities not offered in these parks. To identify potential needs and opportunities at Stillhouse Hollow Lake, the 2018 Texas Outdoor Recreation Plan (TORP) was used. The TORP is a comprehensive recreational demand study completed and published by TPWD. Presented in Figure 2.12 is the top ten recreational activities by participation rate that resulted from the survey. Survey results presented in the TORP indicated that walking for pleasure had the largest participation, with about 55 percent of the respondents indicating they participated in this activity. This was followed closely with a participation rate of about 51 percent for picnicking/cookouts/other gatherings. Activities with the third and fourth highest participation rates are swimming in a swimming pool and sightseeing with 43 percent and 42 percent respectively. Stillhouse Hollow Lake offers hiking trails and picnic areas for the public to enjoy.

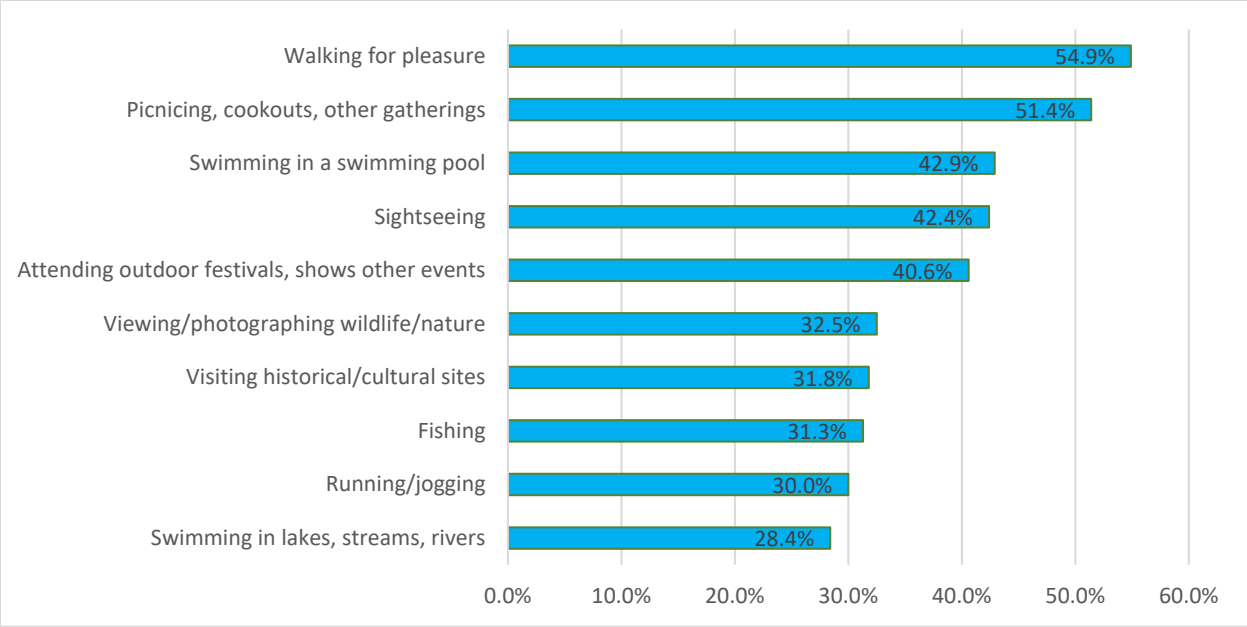


Figure 2.12 Top Ten Participation Rates of Texas Residents for Outdoor Recreation Activities (2018 TORP)

The outdoor recreation survey also asked adult respondents what activities they participated in during childhood that lead to spending time outdoors. The top six activities identified were fishing (27%), swimming (21%), camping (17%), bicycling (15%), hunting (13%), hiking (12%), and outdoor children's games (11%). A breakdown of activities adults enjoyed during childhood by race and ethnic groups is shown in Table 2:29, which shows there are some differences among activities for each group. For African American/Black respondents, the top three activities were bicycling, children's outdoor games, and swimming. For Hispanics/Latino respondents, the top three were fishing, swimming and camping/campfires. The top three activities reported by Asian adults were hiking, swimming, and a tie between fishing and bicycling. White/Caucasian respondents gave their top three as fishing, hunting, and swimming. As can be seen, swimming was the one common activity among the top three for each group. Stillhouse Hollow Lake offers opportunities for each of these activities, thus supporting a rich outdoor recreation element that adds to increase in quality of life for visitors.

Table 2.29 Outdoor Activities Enjoyed by Adults as Children

Activity	Black/African American	Hispanics/ Latino	Asian	White/ Caucasian
Fishing	12.4%	24.0%	17.0%	37.0%
Swimming	13.8%	23.1%	18.9%	21.9%
Camping/campfires	7.3%	19.5%	16.1%	16.6%
Bicycling	20.3%	16.1%	17.0%	11.7%
Hunting	5.1%	9.3%	2.2%	22.0%
Children's games/play	15.6%	13.1%	7.8%	9.6%
Hiking (including backpacking)	5.5%	14.1%	20.0%	10.1%
Park visit/playground	9.8%	13.3%	7.6%	4.2%
Jogging/running	8.3%	11.0%	14.0%	1.4%
Walking	5.6%	10.0%	8.0%	3.0%

2018 TORP

Adults respondents with children in their homes were asked what activities they enjoy particiapting in outdoors. A comparison of adult and youth's responses is shown in Figure 2.13. For both groups, the highest participation rate is fishing, followed by swimming in pools, and the rates are similar between what adults enjoyed as children and current youths enjoy. Today's youths appear to enjoy running/walking, visiting/playing in parks, soccer, and basketball more than the adults did as children. Stillhouse Hollow Lake offers ample opportunities for fishing, running, walking, biking, camping, and hiking.

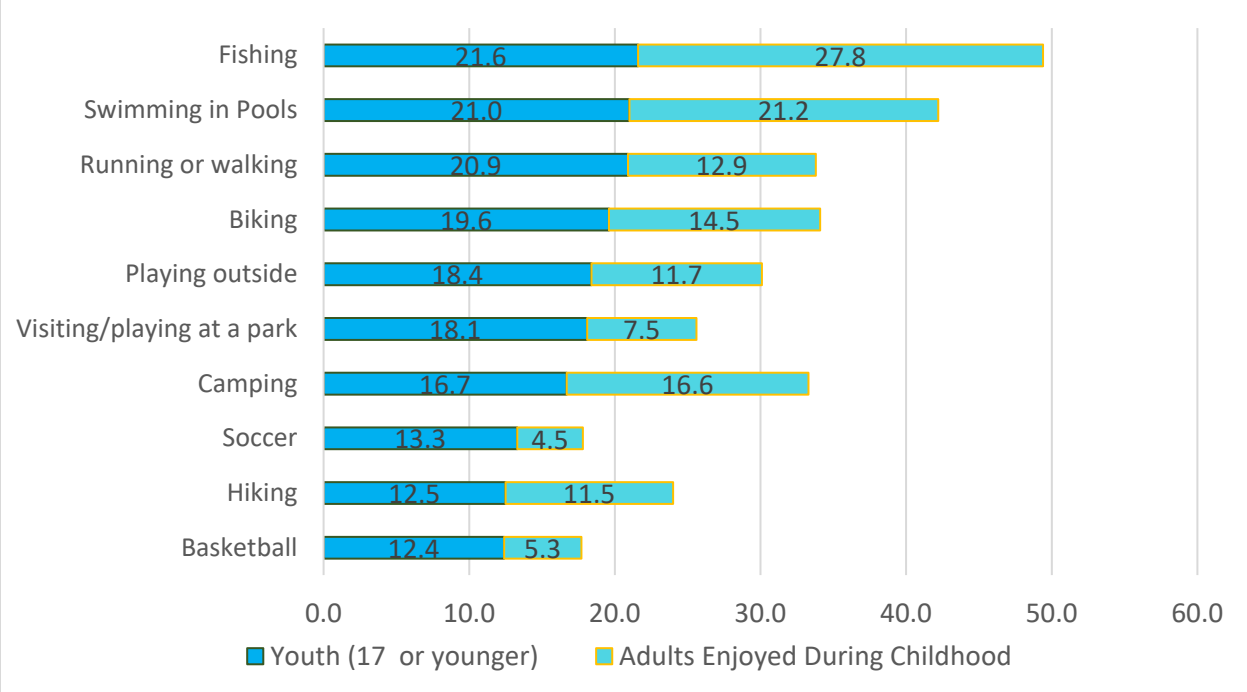


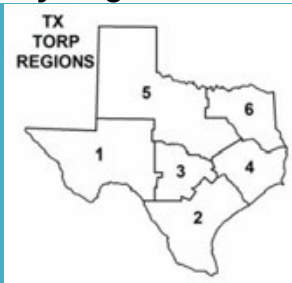
Figure 2.13 Comparison of Outdoor Recreation Activities between Current Youth Activities vs. Activities Adults Enjoyed During Childhood (2018 TORP)

Respondents who did not visit local or state parks in Texas for the preceding 12 months were asked why they had not visited. The common responses were lack of time, age/health issues, and lack of interest. Less frequent responses were no parks close to home, the weather, and not knowing where to go. However, approximately 28 percent of the non-visiting respondents indicated they could be encouraged to visit local parks if they had more time, had people to go with, and had more information about park activities. About 33 percent of the respondents indicated they could be encouraged to visit state parks if they had more time, activities/events/amusements at the parks, and had parks closer to home.

Approximately 28 percent of the respondents identified a lack of outdoor recreational opportunities as being an issue. A list of the top two needs, by region, is shown in Table 2.30. The most common shortfall across the state was trails, with number of parks and park capacity seen and the largest need in Region 1. There was more diversity in the second most common response among the regions. For region 3 and 4, number of parks and park capacity was identified. For region 1, children's activities were cited; campgrounds in region 2; fishing in region 5; and swimming pools in region 6.

Table 2.30 Two Responses to Lacking Outdoor Activities by Region

Region	Most Common Response	Second Most Common Response
Region 1	Parks/Park Capacity	Children's Activities
Region 2	Trails	Campgrounds
Region 3	Trails	Parks/Park Capacity
Region 4	Trails	Parks/Park Capacity
Region 5	Trails	Fishing
Region 6	Trails	Swimming Pools



Source: 2018 TORP

Stillhouse Hollow Lake 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 Stillhouse Hollow Lake falls within two broad categories: land-based and 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 water-based recreation.

The reservoir provides recreational opportunity for swimming, boating, fishing, and other water sports. The area around the reservoir provides picnicking and camping for casual, overnight, or vacationing visitors. Additionally, horseback riding is permitted in designated areas, and 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 -2018 via the USACE- administered Comment Card program. The most recent customer satisfaction comment card summary for Stillhouse Hollow Lake is provided in Table 2.31. The summary from the Stillhouse Hollow Lake visitor comment cards shows that visitors are very satisfied with the current facilities.

Table 2.31 Stillhouse Hollow Lake Comment Cards, 2019

Customer Satisfaction Item	No. of Visitor Responses	Response Distribution (Percent)						Mean Response
		Very Good (5)	Good (4)	Neither Good nor Poor (3)	Poor (2)	Very Poor (1)	Total	(1-5 Scale)
Facilities:								
Suitability of park facilities for my recreational equipment and activities	49	80	20	0	0	0	100	4.8
Restroom cleanliness and availability of conveniences	47	81	19	0	0	0	100	4.8
Appearance of park grounds	49	80	20	0	0	0	100	4.8
Adequacy of signs providing directions and information	49	86	12	2	0	0	100	4.8
Parking space availability during my visit	49	78	20	6	0	0	100	4.8
Condition of roads and parking areas in the park	49	67	27	2	0	0	100	4.6

Employees:								
Availability of park rangers and staff	49	78	20	2	0	0	100	4.8
Helpfulness of park rangers and staff	49	82	16	2	0	0	100	4.8
Environmental Setting:								
Attractiveness of surrounding scenery and landscape	49	71	27	2	0	0	100	4.7
Quality of land and water resources for my activities	49	63	33	4	0	0	100	4.6
Overall:								
Waiting times needed to access park facilities and services	49	84	14	2	0	0	100	4.8
Feeling of safety and security in the park	49	86	14	0	0	0	100	4.9
Value received for any visitor fees paid	49	84	16	0	0	0	100	4.8
Overall satisfaction with my visit to this area	49	84	16	0	0	0	100	4.8

2.5.5 Recreation Analysis – Needs

Stillhouse Hollow Lake offers an array of recreational opportunities. Public comments received during the master planning process indicate there is a desire to have more recreational facilities to enhance the already outstanding outdoor recreation experience, such as cycling trails and increases in amenities to facilitate fishing and boating, while preserving the natural environment. The TORP supports the expressed need for hiking, biking, and in general more non-motorized outdoor activities. USACE relies on partnerships for recreational amenities, and as time, partnerships, and budget

allows, will integrate more facilities to accommodate the public. These activities are balanced with the primary missions of the Lake, namely flood risk management, water supply, and the inherent mission of 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. At Stillhouse Hollow Lake, carrying capacity has become a normal occurrence during the peak recreational season. Parks such as Dana Peak and Stillhouse Hollow are being managed with a carrying capacity. This allows maximum visitation without minimal impact to the parks, infrastructure, or the natural resources. Generally, once all parking lots are full, USACE will not allow additional entry for approximately two hours. After the two-hour period, the park may be reopened if numerous parking spots are available. This carrying capacity not only protects facilities and resources, but it improves safety for the public by assuring the road systems are open for emergency responders if needed.

Given the number of boat ramp parking spaces and number of wet slips that currently exist at Stillhouse Hollow Lake, USACE believes that the level of boating during peak use days may exceed the Fort Worth District target usage level of 22 acres per boat. Proposals to expand parking capacity at boat ramps or expand the number of wet slips would require a comprehensive boating capacity study before a decision could be reached to allow or prohibit future expansion.

USACE strives to have facilities that cater to a variety of tastes and different user groups to 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 and regulating or modifying visitor behavior.

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 Stillhouse Hollow Lake. 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 Stillhouse Hollow Lake Master Plan:

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

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

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

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

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

In addition to the above goals, USACE management activities are guided by USACE-wide Environmental Operating Principles (EOPs) 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; actively listen to them and learn from their perspective in search of 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, Stillhouse Hollow Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, USACE Environmental Operating Principles (EOPs), and applicable national performance measures. 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. The regional and state planning documents including TPWD's Texas Conservation Action Plan (TCAP) and TORP were also reviewed and used in the development of recreational resources.

The objectives in this Master Plan provide project benefits, meet public needs, and foster environmental sustainability for Stillhouse Hollow Lake to the greatest extent possible. They include recreational objectives; natural resource management objectives; visitor information; education and outreach objectives; general management objectives; and cultural resource management objectives. Tables 3.1 through 3.5 list the objectives along with the associated goal(s) addressed.

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 (RV) pads, tent pads, restrooms, trails, pavilions, and improved park entrances.	*		*	*	
Monitor public use levels (including boating areas) 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 EOPs associated with recreational use of waterways for all water-based management activities and plans.		*	*		*
Increase universally accessible facilities on Stillhouse Hollow Lake lands.	*		*		*
Evaluate established permits/outgrants to determine impacts on public lands and waters. Sustain the Shoreline Management Policy 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 fluctuations 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.					*
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 Stillhouse Hollow Lake.	*	*	*	*	*

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

Table 3.2 Natural Resource Management Objectives

Natural Resource Management Objectives	Goals				
	A	B	C	D	E
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, especially habitat for the golden-cheeked warbler and other federally listed species, and 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.		*			*
Minimize activities that disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	
Continually evaluate erosion control and sedimentation issues at Stillhouse Hollow Lake 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 non-native invasive species, and aggressively spreading native species, taking action to prevent and/or reduce the spread of these species. Implement recommended management practices to control the spread of noxious plants. Control of invasive species will promote the vigor of native prairie grasses and forbs.	*	*		*	*
Protect and/or restore important native habitats such as Texas Cross Timbers, riparian zones, grasslands, blackland prairies, 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 Concern. Some of these habitats may be designated as Environmentally Sensitive Areas.	*	*	*	*	*
Continue to manage the public hunting program to ensure public safety and sustainability of game species and wildlife habitat.	*	*	*		*

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

Table 3.3 Visitor Information, Education, and Outreach Objectives

Visitor Information, Education and Outreach Objectives	Goals				
	A	B	C	D	E
Provide more opportunities for communication with agencies, special interest groups, and the general public (i.e. comment cards, updates to City Managers, web page).	*	*		*	*
Implement more educational, interpretive, and outreach programs at the lake office and around the lake. Topics to include history, lake operations (flood risk management and water supply), water safety, recreation, nature, cultural resources, ecology, and USACE missions.	*	*	*	*	*
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 Statement of Policy 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	Goals				
	A	B	C	D	E
Resurvey and maintain the public lands boundary line to ensure it is clearly marked and recognizable in all areas to reduce habitat degradation and encroachment actions.	*	*		*	
Secure sustainable funding for the shoreline management program.	*	*	*	*	*
Ensure consistency with USACE Campaign Plan (national level), IPlan (regional level), OPlan (District level).					*
Ensure green design, construction, procurement, 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 (EO).					*
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 “meet such statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment”, as set forth in EO 13834 and related USACE policy.					*

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

Table 3.5 Cultural Resources Management Objectives

Cultural Resources Management Objectives	Goals				
	A	B	C	D	E
Monitor and coordinate lake development and the protection of cultural resources with appropriate entities.	*	*		*	*
Complete and maintain an inventory of cultural resources.	*	*		*	*
Increase public awareness and education of regional history.		*		*	*
Ensure any current or future historical preservation is fully integrated into the Stillhouse Hollow Lake Master Plan and planning decision-making process (Section 106 and 110 of the NHPA; 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 Stillhouse Hollow Lake.		*	*	*	*
Stop unauthorized use of public lands as it pertains to the illegal excavation and removal of cultural resources.		*		*	*

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: Operations, Recreation, Fish and Wildlife, and Mitigation. At Stillhouse Hollow Lake the only land allocation categories that apply are Operations and Recreation. Operations is defined as those lands that are required to operate the project for the primary authorized purposes of flood risk management, and water conservation. Recreation is defined as those lands acquired specifically for the congressionally authorized purpose of recreation, which are referred to as separable recreation lands and must be used for the purpose of recreation. The remaining allocations of Fish and Wildlife and Mitigation would apply only if lands had been acquired specifically for these purposes. The entire fee simple federal estate at Stillhouse Hollow Lake as calculated for this Master Plan is 8,754 acres of land at conservation pool, of which 8,521 acres are allocated to Operations and 236 acres are allocated to Recreation (see SH20MP-0C-00 in Appendix A). These separable recreation lands are included in the following land classifications acres:

- High Density Recreation (HDR) – 65 acres
- Wildlife Management Areas (WMA) – 13 acres
- Environmentally Sensitive Areas (ESA) – 93 acres
- Future Recreation – 65 acres

4.2 LAND CLASSIFICATION

Previous versions of the Stillhouse Hollow Lake Master Plan included land classification criteria that were similar to the current criteria. These prior land classifications were based on projected need rather 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 prior to current land classification changes.

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 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 Stillhouse Hollow Lake were established after considering public comments and input from key stakeholders including elected officials, city and county governments, and lessees operating on USACE land. Additionally, wildlife habitat values and the trends analysis provided in TPWD's TORP and TCAP were used in decision making, as well as input from experts in planning, recreation, environmental, wildlife, and cultural resources. Maps showing the various land classifications can be found in Appendix A. The land classifications, acreage, and description of allowable uses is described in the following paragraphs.

4.2.2 Project Operations (PO)

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, incidental recreational use may be allowed for activities such as public access to the fishing piers. Regardless of any limited recreation use allowed on these lands, the primary classification of PO will take precedent over other uses. There are 500 acres of PO land specifically managed for this purpose, which includes 26 acres of PO by Others. PO by Others includes water intake and other operations that are not directly related to USACE operations but require a higher level of protection for public safety.

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 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 HDR 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 Stillhouse Hollow Lake, prior land classifications included several areas under the HDR classification. Several of these areas were never developed and/or were determined to be unsuitable for development resulting in a change to another, more suitable land classification. At Stillhouse Hollow Lake there are 982 acres classified as HDR land. Each of the HDR areas is described briefly in Chapter 5 of this Plan.

4.2.4 Mitigation

This classification is used only for lands set aside for mitigation for the purpose of offsetting losses associated with the development of the project. This is not the same as *allocated* lands, which are purchased for the purpose of mitigation. There are no lands at Stillhouse Hollow Lake with this classification.

4.2.5 Environmentally Sensitive Areas (ESA)

These are areas where scientific, ecological, cultural, and aesthetic features have been identified. At Stillhouse Hollow Lake several distinct areas have been classified as ESA, primarily for the protection of sensitive habitats, unique aesthetics features, or cultural resources. These areas are further discussed in Chapter 5 and shown on the maps in Appendix A of this Plan. There are 625 acres classified as ESA at Stillhouse Hollow Lake.

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 one or more of these sub-classifications, but the primary sub-classification should reflect the dominant use of the land. Typically, Multiple Resource Management Lands support only passive, non-intrusive uses with very limited facilities or infrastructure. Where needed, some areas may require basic facilities that include but are not limited to minimal parking spaces, a small boat ramp, and/or primitive sanitary facilities. There are 6,647 acres of land under this

classification at Stillhouse Hollow Lake. 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 LDR, but during the study process to develop this Plan, these larger tracts were reclassified under the sub-classification of Wildlife Management. LDR 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 HDR, Vegetation Management or Wildlife Management. There are 55 acres under this land classification at Stillhouse Hollow Lake.

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. Passive recreation uses such as natural surface trails, fishing, hunting, and wildlife observation are compatible with this classification unless restrictions are necessary to protect sensitive species or to promote public safety. There are 6,178 acres of land included in this classification at Stillhouse Hollow Lake.

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 no acres of land included in this classification at Stillhouse Hollow Lake.

4.2.6.4 Future or Inactive Recreation

These are lands with site characteristics compatible with High Density Recreation development where HDR development was anticipated in prior land classifications, but the development either never took place or was minimal. These areas are typically closed to vehicular traffic and will be managed as multiple resource management lands until development takes place. There are 414 acres of land included in this classification at Stillhouse Hollow Lake.

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 Stillhouse Hollow Lake Dam. There are 23 acres of restricted water surface at Stillhouse Hollow Lake.

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 three boat ramps at Stillhouse Hollow Lake where no-wake restrictions are in place for reasons of public safety and protection of property. There are 75 acres of designated no-wake water surface at Stillhouse Hollow Lake.

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. Stillhouse Hollow Lake 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 most 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 6,375 acres of open recreation water surface at Stillhouse Hollow Lake.

4.2.8 Recreational Seaplane Operations

Seaplane restrictions are part of Title 36 Code of Federal Regulations. At Stillhouse Hollow Lake 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 Stillhouse Hollow Lake 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 classified as water vessels and fall under guidelines for watercraft.

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

Table 4.1 Proposed Land Classification Acres at Stillhouse Hollow Lake

Classification	Acres
Project Operations[1]	500
High Density Recreation[2]	982
Environmental Sensitive Areas[2]	625
Multiple Resource Managed Lands - Low Density Recreation	55
Multiple Resource Managed Lands - Wildlife Management[2]	6,178
Multiple Resource Managed Lands - Vegetative Management	0
Multiple Resource Managed Lands - Future/Inactive Recreation Areas[2]	414
Water Surface: Restricted	23
Water Surface: Designated No-Wake	75
Water Surface: Fish and Wildlife Sanctuary	0
Water Surface: Open Recreation	6,375

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: 1,287 acres - Miles of Shoreline at conservation pool: approximately 25 miles
Includes 26 acres of Project Operations by Other
*These classifications include portions of the lands allocated as separable recreation lands. These include HDR-65 acres; WMA-13 acres; ESA-93 acres; and Future Recreation - 65 acres.

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. Flowage easement lands are the only easements that exist at Stillhouse Hollow Lake. 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 913.57 acres of Flowage Easement lands at Stillhouse Hollow Lake.

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 Stillhouse Hollow Lake are Project Operations, High Density Recreation, Environmentally Sensitive Areas, and Multiple Resource Management Lands, which consist of Low Density Recreation and Wildlife Management. The Water Surface is divided into Restricted, No-Wake, and Open Recreation sub-classifications. 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 Stillhouse Hollow Lake 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 500 acres of lands under this classification, of which 474 acres are managed by the USACE and 26 acres are managed by other agencies. 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.

Recommended future actions for these areas include facility upgrades to meet USACE sustainability objectives as funding and personnel allow. Opportunities to incorporate environmental stewardship objectives for land management such as invasive species control and wildlife management through use of food or pollinator plots will be implemented as appropriate.

5.3 HIGH DENSITY RECREATION

Stillhouse Hollow Lake has 982 acres classified as HDR. These lands are developed for intensive recreational activities for the visiting public including day use and campgrounds. 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. 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 parks 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.

5.3.1 USACE Class A Parks

In accordance with historical visitation rates and recent outdoor recreation trends documented in the 2018 TORP, trails, picnicking, fishing, swimming, and wildlife viewing and photography are in high demand. Camping as well remains a popular activity at USACE lakes. Visitation rates for some of the Class A parks at Stillhouse Hollow Lake are growing. Facilities provided are sufficient in some parks, while at others demand exceeds available resources during summer use. 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.

Popular activities at Stillhouse Hollow Lake include boating, fishing, and hunting in and on the clear waters and lands of the lake. Fishing is excellent in the area, and the lake contains black bass, white bass, hybrid stripers, white crappie, channel catfish and flathead catfish, but it's most known for its abundance of smallmouth bass. Hunting is subject to rules and regulations promulgated by TPWD (see Section 6 for more details) and available for migratory birds and feral hogs.

Dana Peak Park – Dana Peak Park has a total of 454 acres with 140 acres developed. The park is located on a peninsula on the north shoreline of Stillhouse Hollow Lake adjacent to the City of Harker Heights in Central Texas. The park includes the following:

- 22 single sites and three (3) double sites with water and electric hookups, parking pad, covered picnic table, fire ring, and grill
- Eight (8) primitive campsites
- Restroom with hot showers and flush toilet
- Fishing pier
- Four lane concrete Boat ramp
- Courtesy dock
- Swim beach
- Group shelter
- Hike/bike/equestrian trailhead and trails
- Playground
- Dump station
- Picnic areas
- Launch, camp sight, and pavilion fees required
- March 01 – September 30, 6 am - 9 pm

Photo 5.1 Cycling at Dana Peak Park

Union Grove Park – Union Grove Park has a total of 286 acres, with 59 acres developed. The park located on the south side of the lake across from Dana Peak Park. The park includes the following amenities:

- 35 single and 2 double campsites with water and electric hookups, parking pad, covered picnic table, fire ring, and grill
- Three (3) screened shelters with water and electrical hook-ups
- Four-lane concrete ramp and fishing dock
- Courtesy dock
- Fishing pier
- Dump station
- Restroom with hot showers and flush toilet
- Lease for a model airplane field
- Launch, camp sight, and pavilion fees required
- Whole park open March 01 – September 30, 6 am - 9 pm, boat ramp only October 01-March 01

5.3.2 USACE Day Use (Class C) Parks

Visitation rates for most of the Day Use parks at Stillhouse Lake are increasing rapidly along with the residential development in the area. Facilities provided are aging and deficient to meet the summer use demands. The management plan for all of the day use parks listed below is to continue to operate them as day use areas 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, maintaining roads, parking areas, and site amenities such as tables fire rings, lantern posts and cookers. Trails within parks will be considered in cooperation with other agency partners for development and operation.

Overlook Park – Overlook Park has a total of 34 acres of land with 27 acres developed. The main use of this park is a scenic viewing area of the lake. The park has five picnic sites, restroom facilities, and parking. A walking/exercise trail is also located here.

Stillhouse Park – Stillhouse Park has a total of 249 acres with 62 acres developed. There are 38 picnic sites, a marina, a four-lane boat ramp, a courtesy dock, two pavilions, a beach area, and restrooms.

Cedar Gap Park – Cedar Gap Park has a total of 143 acres with 7 acres developed. Cedar Knob Road divides the Park in half with the eastern half having the only recreational development. It has a one-lane boat ramp, a courtesy dock, restrooms and two parking lots.

River's Bend Park – River's Bend Park has a total of 72 acres with 16 acres developed. The park is a day-use only area, with a gate entrance that is closed at night. There are 16 recreational sites at this park along with a four-lane boat ramp and restrooms.

Bluff Park (closed) – Bluff Park has 268 acres of land with most of the area designated as ESA. Only 58 areas may be available for development. This park has been closed to public access since 1981 and the recreational facilities have been re-located to other park areas. The circulation roads and a chain link fence around the perimeter of the bluff remain, which overlooks the lake. The Brazos River Authority has a water intake structure located on the south east bluff line of this area. They are under agreement to maintain the road, which they use to access their structure.

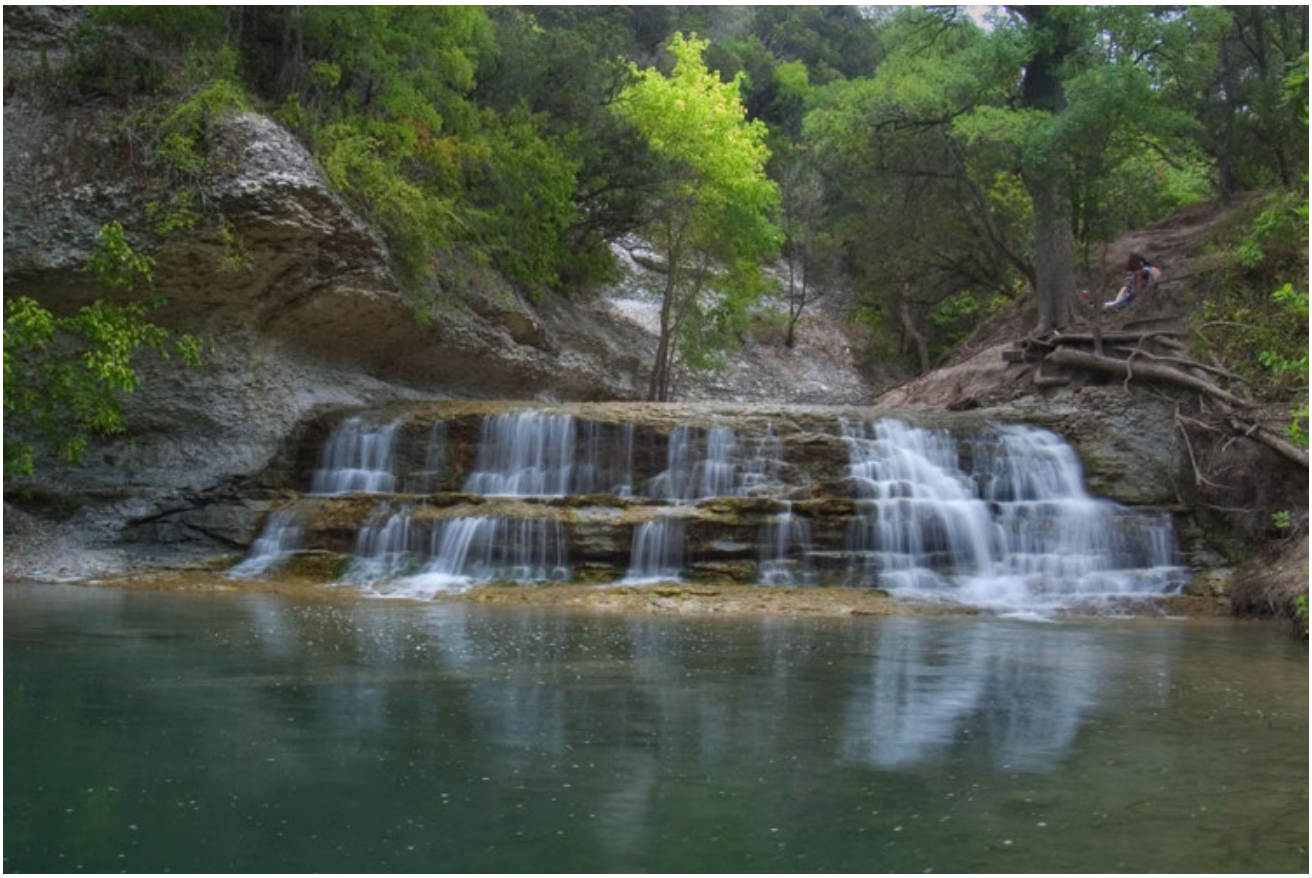


Photo 5.2 Chalk Ridge Falls Located withing Chalk Ridge Falls Environmental Learning Center

5.3.3 USACE Access Points

USACE has three designated access points on Stillhouse. The management plan for these areas is to continue to maintain the roads and parking lots, providing access for bank fishermen, kayakers to launch, and hikers.

Chalk Ridge Falls Environmental Learning Center – Located off FM 1670 at the toe of Stillhouse Hollow Dam paralleling the Lampasas River downstream of the Dam, Chalk Ridge Falls has a total of 155 acres of land with 10 acres developed. Facilities include restrooms, a parking area, hiking trail and a pavilion. Most of this area is classified as an Environmentally Sensitive Area.

Long Bridge Access Area – Located at the west end of the lake across from Cedar Gap Park on FM 3481, this park is approximately four acres in size and is used heavily by bank fishermen. A gravel access road and parking lot are the extent of development and are in very poor repair due to erosion, potholes, and use.

Gravel Crossing Access Area – Located approximately four miles west of the Cedar Knob Road intersection with FM 2484, this area is primarily an unimproved river access area

on the Lampasas River. A gravel road and parking lot are the only USACE maintained facilities.

5.3.4 USACE Boat Ramps

Stillhouse Hollow – This four-lane concrete boat ramp is located within the Stillhouse Hollow Park gatehouse and is open from 6:00 AM - 10:00 PM daily.

Cedar Gap – This one-lane concrete boat ramp currently provides 24-hour access and is available at no cost.

Rivers Bend – This four-lane concrete boat ramp is located within a gate that is open from 6:00 AM - 10:00 PM daily.

Union Grove – This four-lane concrete boat ramp is located within the Union Grove gatehouse and is open from 6:00 AM - 10:00 PM daily.

Dana Peak – This four-lane concrete boat ramp is located within the Dana Peak gatehouse and is open from 6:00 AM - 10:00 PM daily.

5.3.5 Leased Park Areas

USACE has three outgrants issued in the form of permits or leases to recreational partners, referred to as grantees. Each grantee 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.

Commercial Marina

Stillhouse Marina – Located in Stillhouse Park, this lease is issued for approximately 19.37 acres of land and water areas. The Marina provides boat storage, boat rental, sale of gasoline and oil and food supplies.

Model Airport

Hall Field – Located in Union Grove Park area, this lease is issued to operate and maintain a model airplane field on 1.38 acres of land.

Water Intake Structure Lease

Texas Water Supply Corporation – Located off Lakecliff Drive, this lease is issued for approximately 6.34 acres of land for a water supply plant and related facilities.

5.3.6 Trails

As stated in the TORP, the demand for trails and outdoor fitness areas of all kinds is growing exponentially. As Texas has seen the largest growth in the nation for the past six years, and with the Central Texas area being conveniently located on the I35 corridor with Fort Hood providing economic consistency, this area has experienced major growth in development the past 15 years. With the population explosion, more people than ever before are craving trails. Because of this, the developed parks require more visitor assistance and repair/maintenance. USACE has focused all efforts on maintaining areas, and thus many areas do not have new amenities nor are they designed to meet the volume of today's customers. Continued and expanded partnerships are needed and welcomed to provide these much-demanded amenities on USACE lands.

Dana Peak Park Trail – This area was initially developed by Texas Equestrian Trail Riders Association (TETRA) as a partnership with USACE. Over the years TETRA interest declined but the City of Harker Heights has taken interest. The City of Harker Heights has signed a Memorandum of Understanding (MOU) with USACE under which all trail maintenance/repair and improvements are performed with an interest in providing more biking amenities. With the expressed interest to provide biking opportunities, this trail has been completed converted from equestrian use to biking use. This six-mile trail system begins outside the gated entrance of Dana Peak Park and travels along USACE property to Stillhouse Hollow Park. This area has numerous trails including some of which are highly challenging. The trails have bike repair stations, kiosks, benches, and directional signs. More trail markers, definable trails, benches, restrooms, and an improved entrance parking area are a few of the needed items.

Chalk Ridge Falls Environmental Center – This area was designed for group environmental experiences with an emphasis on younger school-aged children. The area provides parking for multiple buses and limited parking for smaller vehicles. Over the years, and especially when flood events caused closure of other USACE parks, visitation to the Chalk Ridge Falls Environmental Center has steadily increased. Because of the increased visitation, USACE efforts have been focused on maintenance and repairs. This area has numerous trails, kiosks, vault restroom, cable-bridge, two streams (one that flows all year with a waterfall), and 200-foot wooden bridge over a gorge.

Photo 5.3 Bridge Over Gorge at Chalk Ridge Falls Environmental Center

The gorge has excellent geological features that was created when 20,000 cubic feet per second of water flow through the uncontrolled spillway. This trail system is parallel to the Lampasas River and traverses a wetlands area located within the old abandoned riverbed. Because of these unique features, this popular area needs a careful redesign to accommodate more users including a critical need for more parking.

5.4 MITIGATION

This 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 Stillhouse Hollow Lake under this classification.

5.5 ENVIRONMENTALLY SENSITIVE AREAS

Environmentally Sensitive Areas 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 statues. These areas must be managed to ensure they are not adversely impacted, so typically, limited or no development of public use is allowed. 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 distinct parcels separate from other, and perhaps larger, land classification areas.

The results of the WHAP conducted in September 2020 were used, in part, to assist in determining which areas should be classified as ESA. Other factors, including

the presence of visual aesthetics, cultural resources, and species of conservation concern were also included in the selection of ESA areas. At Stillhouse Hollow Lake there are 625 acres 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, point numbers, WHAP scores, acreage, and habitat type. More information on the WHAP can be found in Appendix E of this Plan.

Table 5.1 ESA Areas at Stillhouse Hollow Lake

ESA Area Number	WHAP Scores Per Sample Point Number and Associated Habitat Type				
	Point No.	Score	Habitat Type	Approx. Acres	Determining Factor
ESA 1	16 18 19	.61 .44 .59	Upland Forest	179	Known golden-cheeked warbler habitat
ESA 2	6 7 8	.66 .64 .81	Riparian/ Bottomland Hardwood Forest	51	Unique green tree wetland habitat along old riverbed
ESA 3	9	.73	Grassland	10	High species diverse grassland prairie
ESA 4	1 2 3	.60 .55 .44	Upland Forest	127	Known golden-cheeked warbler habitat
ESA 5	81 82 83	.72 .34 .51	Upland Forest	384	Known and Critical golden-cheeked warbler habitat
ESA 6	N/A	N/A	N/A	7	Aesthetic and other value
ESA 7	N/A	N/A	N/A	42	Aesthetic and other value
ESA 8	N/A	N/A	N/A	86	Aesthetic and other value

Future management of ESA areas will be designed to protect and improve the resources that qualify these areas for ESA classification. 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. Specific management measures may include but are not limited to the following:

- 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.

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 management strategies, acreages, and description of use.

5.6.1 Low Density Recreation

These lands are generally 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 controlled hunts in designated hunting areas. Future uses may include additional designated natural surface hike/bike/equestrian trails. There are 55 acres classified as Low Density Recreation.

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 6,178 acres of land under this classification at Stillhouse Hollow Lake, however, areas of low density recreation, ESA's and vegetative management all support wildlife. Management efforts focus on producing native wildlife food and habitat.

The broad objective of fish and wildlife management is to conserve, maintain and improve the fish and wildlife habitat to produce the greatest dividend for the benefit of the general public. Implementation of a fish and wildlife management plan is the first step toward achieving the goals of the Fish and Wildlife Coordination Act (Public Law 85-624). The TPWD and the USFWS share responsibility with USACE for managing fish and wildlife, primarily through enforcement of laws and regulations and establishing seasons and bag limits for game species.

Best Management Practices such as prescription burning, native grass and forbs species planting, fencing, construction of water features, native tree plantings, species inventories, nesting structures, and invoking certain requirements on public hunting will be utilized. Other non-game programs, such as songbird nest box construction and

installation of bat boxes, are performed on an intermittent basis. USACE intends to continue these initiatives in order to provide some form of management for non-game species. Future management plans for Wildlife Management areas include continued cooperation with partners and managing/improving areas under this land classification. A holistic management approach is taken in conserving these areas with some emphasis on white-tailed deer, golden-cheeked warbler, and pollinator habitat management.

5.6.3 Vegetative Management.

These are lands that have vegetative types considered to be sensitive and needing special classification to ensure success. A good example of these types of vegetation would be forested wetlands and Cross Timbers forests. However, no acres are currently identified at Stillhouse Hollow Lake for the primary purpose of vegetative management.

5.6.4 Future/Inactive Recreation Areas.

These are areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources. There are 414 acres classified under this sub-classification at Stillhouse Hollow Lake.

5.7 WATER SURFACE

At conservation pool 622.0 feet NGVD29 there are 15,230 acres of surface water. Buoys are managed by USACE and help mark hazards, swim beaches, no-wake, and other restricted boat access areas. 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.

5.7.1 Restricted

Restricted areas are around swim beaches, the dam, and intake structures for project operations, safety, and security purposes. Water surface zoned as restricted total approximately 23 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. Currently, approximately 75 total acres at Stillhouse Hollow Lake 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 Stillhouse Hollow Lake.

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 6,375 total acres of Stillhouse Hollow Lake is zoned for open recreation.

5.8 SUSTAINABILITY

Sustainability is a multi-pronged aspect of responsible stewardship of USACE lands. The goal of sustainability initiatives is to have an adaptable program to address fiscal challenges, safeguard 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 country, USACE is committed to implementing initiatives that link people to public lands and 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 Stillhouse Hollow Lake resources and management. The USACE 2011 Recreational Strategic Plan identifies several goals and objectives designed to build a more robust environmental and recreational program on USACE managed lands. Many of the goals focus specifically on promoting environmental sustainability in all aspects of recreation resources management. This includes integrating environmental operating principles and other environmental regulations 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 rapport 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 LAKE-TO-LAKE ROAD PROJECT

The Lake-to-Lake Road project is a long-term project by the City of Belton to connect Belton Lake to Stillhouse Hollow Lake with a new road. The City of Belton has been in different planning stages of this project since 2000, with USACE involvement since 2013. In coordination with the Texas Department of Transportation, it was determined that federal guidelines must be followed, and the City of Belton will need to request a Feasibility Study with an expanded scope. An Environmental Assessment (EA) will likely be needed (a draft EA was initiated but not finalized in 2007) as well as a Belton Lake Master Plan supplement. The city has received the rights-of-way on all portions of this road except via USACE property, so finalizing this last section has been critical for the City of Belton.

6.2 MANAGEMENT OF PUBLIC HUNTING

State Hunting (Goodnight) Law at Stillhouse: Local hunters have voiced opinions to have Stillhouse Hollow Lake wildlife lands open for a full range of pubic hunting to include deer hunting. As stated in TPWD's Outdoor , which lists of all rules governing hunting in the state of Texas : " It is unlawful to hunt on water of Stillhouse Hollow reservoir or land adjacent to the reservoir owned by the federal government in Bell County, except for game birds hunted with a shotgun. A hunter must be 600 feet from the nearest private property line."

6.3 WATER SUPPLY CONCERNS

While not a component of the master plan, the public is concerned about water supply issues involving Stillhouse Hollow Lake. Texas, as the fastest growing state in the nation, has an increased demand for municipal water. The Brazos River Authority (BRA) is authorized by the State of Texas to directly manage the water supply component of Stillhouse Hollow Lake, or contract water to the local or downstream municipalities. To meet future needs, the BRA has developed several systems to move the water to the customers, some of which have raised a few concerns with the public at large. The following are some of the projects.

1) Belhouse Project: The BRA is in the planning phases of creating a new pipeline that will transfer water from Belton Lake to Stillhouse Hollow Lake for water right holders in Williamson County. The pipeline intake will be located at the existing Bell County Water Control Improvement District (WCID) #1 facility. Expected completion date is 2040.

2) BRA Intake: The BRA has an intake structure south of the uncontrolled spillway. This intake connects a 54" raw waterline from Stillhouse Hollow Lake to Georgetown Lake that is capable of providing 43 million gallons/day (49K Acre Feet/Year).

3) Kempner Water Supply Corporation (KWSC) Intake: The KWSC owns and operates an intake just south of Union Grove Park. KWSC primary supplies the City of Kempner and rural customers located in Burnet, Bell and Coryell Counties.

4) Killeen Intake: The BRA has authorized a new water intake that is currently being installed on Stillhouse Hollow Lake to provide water to the growing Killeen, Copperas Cove, Harker Heights and Nolanville area. It will be managed by Bell County Water Improvement District #1 and parallels the Killeen intake. Expected completion date is 2021.

5) Central Texas Water Supply Corporation (CTWSC): The CTWSC owns and operates a floating intake just north of the Cedar Gap Park boat ramp. The CTWSC supplies wholesale water to the cities of Salado, Rosebud, Lott, Belton, Rogers, Lampasas, Holland, Buckholts, and the following water supply corporations, Salem-Elm Ridge, Westphalia, Dog Ridge, Little Elm, Mooreville, Bell-Milam-Falls, Bell County WCID#5, East Bell, and Armstrong.

6.4 FORT HOOD IMPACT ON LAKE RESOURCES

Minutes from Stillhouse Hollow Lake, Fort Hood is the largest active duty armed post in the world. Fort Hood is a sprawling 340 square (214,968 acres) miles and has capability of stationing and training two armored divisions. It houses nearly 50,000 soldiers and 9,000 civilian employees who could all potentially utilize the lake.

USACE offers free entry to all day use areas for active duty soldiers, where at Belton Lake Outdoor Recreation Facility (BLORA) an Army MWR (Morale, Welfare and Recreation) facility near Fort Hood, TX charges fees to all soldiers.

Because of the close proximity of young adult soldiers and their families, Stillhouse Hollow Lake visitation is approximately 70-80 percent soldiers, with the heaviest concentrations in the day use parks.

6.5 GOLDEN-CHEEKED WARBLER

USACE is responsible for participating in the recovery actions for federally endangered and threatened species occurring on USACE-managed lands. Golden-cheeked warblers (GCWA) (*Setophaga chrysoparia*) are federally endangered migratory songbirds that breed exclusively in the juniper-oak (*Juniperus ashei-Quercus spp*.) woodlands of central Texas. Campbell (2003) described vegetation associations where GCWA are expected to occur as woodlands with mature Ashe juniper in a natural mix with oaks (*Quercus spp*.), elms (*Ulmus spp*.), and other hardwoods, in relatively moist areas such as steep canyons, slopes, and adjacent uplands.

Some of the properties managed by the USACE around Stillhouse Hollow Lake fit Campbell's description. Multiple USACE areas have been determined to contain golden-

cheeked warblers. The main areas include Chalk Ridge Falls Environmental Learning Center, Bluff Park, and Stillhouse Hollow Park.

Photo 6.1 Golden-cheeked Warbler. (Courtesy, USFWS)

A golden-cheeked warbler survey was conducted in selected areas during the 2013 breeding season and a minimum of five males were spotted in the Chalk Ridge Falls recreational area. This area is located on FM 1670 just below Stillhouse Hollow Lake Dam and contains approximately 60 hectares (ha) of warbler habitat. At Bluff Park recreational area only one male was observed. This area is located 1.5 miles south of Chalk Ridge Falls Park on FM 1670 and contains approximately 80 ha of warbler habitat. At the Stillhouse Park recreational area, a minimum of five males were spotted. This area is located two miles south of U.S. 190 (I14) on Simmonds Road and contains approximately 80 ha of warbler habitat.

6.6 INVASIVE SPECIES

The extent of invasive species currently documented as present at Stillhouse Hollow Lake lands and waters is presented in Table 2.15. While efforts are made to prevent and eradicate invasive species from the lands and waters at Stillhouse Hollow Lake, special attention is given to particularly destructive species, including the zebra mussel (*Dreissena polymorpha),* which were positively identified at the lake on July 25, 2016. Population levels of zebra mussels at several Texas lakes have quickly risen and

are impacting raw water intakes for water supply and associated pipelines. At present these impacts are mainly in the form of increased maintenance costs due to mussel removal. The zebra mussel is roughly the size of a fingernail but can reach up to 2 inches long and is characterized by an alternating light and dark stripped pattern resembling zebra stripes on two connected hard shells. Precautions are being taken as educational and warning signs are posted at the lake and affiliated websites. Currently, USACE is working with TPWD to help educate the lake users about the species at Stillhouse Hollow Lake, including creating a series of informational YouTube videos for boaters, hunters, and anglers. Management plans are being formulated to address zebra mussels at Stillhouse Hollow Lake.

Photo 6.2 Concrete Drinking Fountain Inundated for 45 days. (USACE Photo)

Feral hogs are a destructive hazard on both USACE managed public lands and lands adjacent to the project. The public has voiced concerns about major damage to their properties and the inability to hunt on USACE lands to help control the growing population of hogs. There has not been major damage to USACE lands at this time. USACE and TPWD have discussed control measures for those populations by use of special hunts and cooperative control efforts and will continue to cooperate with agencies to devise means for controlling the feral hog presence at Stillhouse Hollow Lake.

Terrestrial invasive plant species with major prevalence at Stillhouse Hollow Lake include the Chinese tallow tree (*Triadica sebifera*), Chinaberry tree (*Melia azedarach*), and willow baccharis (*Baccharis salicina*).

The Chinese tallow tree is a deciduous species with a 12 to 18-inch crooked trunk and a height of 50 feet at maturity. The USDA first introduced it to the Gulf coast in the 1900's to develop a soap-making industry from the seeds. Eradication of the tree is difficult due to its fast growth and ability to adapt to all soils. The species causes large-scale ecosystem modification by replacing native vegetation thereby reducing native species diversity that, in turn, has a negative effect on wildlife. Additionally, the plant is toxic to humans and cattle and can cause dermatitis on contact.

The Chinaberry tree is a very drought tolerant tree native to Asia that grows extremely fast (5-10 feet each year) and has very few diseases allowing it to out-compete native species. While it has brilliant yellow fall foliage and lavender spring flowers, the berries, bark, leaves and flowers produced by the tree are all toxic to livestock, humans and pets. The plant was originally introduced for its ability to thrive in poor conditions, and its berries were used to make soap, and extracts from the tree have been used as natural pesticides. Seeds are spread by birds, and the plant spreads by root sprouts, thus forming a dense thicket.

Willow baccharis is a weedy, noxious, perennial shrub that grows between three to nine feet. The plant prefers wet sites along rivers, streams and lakes but has begun spreading into the upland sites, tolerating saline soils. Originally used to control erosion, it is a prolific seed producer, reproducing by seed and rhizomes, rapidly spreading and invading mesic sites. While native, it is toxic and aggressively invades in disturbed areas. It can be controlled with some herbicides.

6.7 RECREATIONAL BOATING STUDY

In 2002, the Fort Worth District adopted a policy governing water-related recreation development that has the potential to affect the degree of boating traffic on the water surface of all Fort Worth District lakes. In brief terms, the policy established a target capacity of 22 surface acres of boatable water surface for each vessel on the water during peak use periods. Using the number of boat ramp parking spaces, wet storage slips and dry stacked storage slips as a basis for calculating potential boating activity, USACE can determine whether any proposed additions of parking spaces or storage slips has the potential to exceed the target capacity. USACE has determined that the number of existing parking spaces and slips at Stillhouse Hollow Lake as of the date of this Plan has the potential to exceed the target capacity and may have already done so. In view of this potential, USACE would require a comprehensive water-related recreation use study prior to deciding to approve or deny a proposal for additional slips or boat ramp parking spaces at Stillhouse Hollow Lake. The policy allows limited flexibility in decision-making. Adequate funding to conduct a Recreational Boating Study at the same time as the Master Plan revision was not available.

6.8 DANA PEAK PARK RECREATIONAL LEASE

The City of Harker Heights in considering leasing Dana Peak Park on Stillhouse Hollow Lake. USACE is working with the city to facilitate this action and requested a long-term recreational lease.

6.9 SHORELINE MANAGEMENT STATEMENT OF POLICY

On December 13, 1974 the USACE published regulation ER 1130-2-406 in the Federal Register entitled "Civil Works Projects: Lakeshore Management." This regulation was published as Part 327.30 of Chapter III, Title 36 of the Code of Federal Regulations. A subsequent change to the regulation was published in the Federal Register on October 31, 1990, incorporating the results of recent legislation and changing the name to "Shoreline Management at Civil Works Projects." The focus of this regulation is to establish national policy, guidelines, and administrative procedures for management of certain private uses of federal lands administered by USACE. A key requirement in the regulation is that private shoreline uses, as defined in the regulation, are not allowed at lakes where no such private uses existed as of December 13, 1974. At Stillhouse Hollow Lake, no such private uses existed as of that date and therefore private shoreline uses are not allowed.

The private uses described in the regulation primarily include privately-owned floating facilities such as floating boat docks, fixed or movable piers, and vegetation modification activities such as plantings, mowing, and selective removal of shrubs and trees to the extent that exclusive benefits accrue to an individual or group and the general public is denied use of public lands or waters. Not included in the above definition are certain limited private activities that do not provide exclusive benefits to an individual or group, nor preclude general public use. These limited private activities may be allowed by written shoreline use permit for reasons of public safety, erosion control, benefits to wildlife, or to provide reasonable pedestrian access to the shoreline. A key requirement of the regulation is stated as follows: "Except to honor written commitments made prior to publication of this regulation, private shoreline uses are not allowed on water resources projects where construction was initiated after December 13, 1974, or on water resources projects where no private shoreline uses existed as of that date." The regulation requires USACE to prepare a Shoreline Management Plan for those projects where private uses existed as of December 13, 1974, and a Shoreline Management Policy Statement (SMPS) for all other projects. In response to this requirement a SMPS was prepared for Stillhouse Hollow Lake.

In FY 2012, an administrative update to the Stillhouse Hollow Lake Shoreline Management Statement of Policy was prepared to incorporate current terminology and to ensure compliance and compatibility with the most current versions of ER 1130-2-406 and ER 1130-2-540, as well as Fort Worth District policy decisions related to shoreline management. One of the primary reasons for the administrative update was to incorporate language that supports the USACE natural resources mission statement to "manage and conserve natural resources consistent with ecosystem management principles" as set forth in ER 1130-2-540.

The purpose of the SMPS is to set forth the policy and procedures by which USACE manages certain private uses of public lands at Stillhouse Hollow Lake. Private uses that accrue exclusive benefits to an individual are not allowed at Stillhouse Hollow Lake. The non-exclusive private uses that may be authorized by written permit from USACE include mowing and removal of underbrush to the extent needed for protection from wildfire and limited clearing to provide a pedestrian access path from private property to the shoreline. These non-exclusive uses may not be authorized in all areas and are subject to restrictions set forth in the SMPS. To further inquire about the SMPS at Stillhouse Hollow Lake, please contact the lake office.

6.10 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 utility corridors would be designated at Stillhouse Hollow Lake. USACE policy EP 1130-2-550, Chapter 17 states that project lands will generally be available only for roads that are considered regional arteries or freeways. Changes to existing roadways, such as those described in regional and county mobility plans that call for widening of some existing roadways across USACE lands, will be addressed on a case-by-case basis.

The following two utility corridors have been designated across USACE land at Stillhouse Hollow Lake with each corridor incorporating and/or running parallel to an existing easement. These corridors are shown on the maps provided in Appendix A. Future use of these corridors, where the corridor is limited to an existing easement, would in most cases require prior approval of those entities that have legal rights to the easement. Some existing easements at Stillhouse Hollow Lake are designated as *restricted* and may be used for placement of additional utilities by the grantee holding the easement, but only for purposes which directly serve the grantee or are of direct benefit to the Government. Expansion or widening of these restricted existing corridor easements will generally not be permitted.

- Corridor 1 (FM 3481 Bridge). This corridor includes the existing Bell County easement right-of-way for FM 3481 as it crosses the main body of Stillhouse Hollow Lake and travels approximately 6,100 feet through government property. The corridor crosses USACE Tracts 312-2, 314, 403 and 404.

- Corridor 2 - LIMITED (Gravel Crossing area): This corridor is available for future use but must be under special considerations, because a portion of this area has been deemed as an Environmental Sensitive Area (ESA). This designation may not prohibit future use, but it will have additional requirements (e.g. limits, boring to bed rock, mitigation, surveys or other criteria) depending on the proposed purpose. All future considerations will be evaluated on a case-by-case basis.

  Multiple utility lines are in existence in this general corridor area. The Kempner Water Supply Corporation's raw water line begins near Gravel Crossing at

USACE monument (5-20) in USACE Tract 502 and crosses the Lampasas River at a 90-degree intersection and continues across USACE property approximately 4,100 feet in a western straight direction through USACE Tract 504. The Bell County WCID #1 raw water line for the City of Killeen begins at the Gravel Crossing area near USACE monument (5-20) in USACE Tract 502 and travels approximately 2,100 feet paralleling Kemper's line until it crosses the Brazos Electric easement (above ground electric transmission). At this point, the WCID water line turns approximately 90 degrees then runs north under the Brazos Electric corridor for approximately 3,900 feet until it exits near USACE monument (5-89) in Tract 504.

In summary, the following best management practices shall be applied in the future use of the corridors.

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

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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 Stillhouse Hollow Lake. An integral part of this effort is gathering public comment and engaging stakeholders in the process of planning. USACE policy guidance in ER and EP 1130-2-550 requires thorough public involvement and agency coordination throughout the Master Plan revision process including any associated NEPA process. Public involvement is especially important at Stillhouse Hollow Lake to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs in a region that is experiencing rapid population growth. The following milestones provide a brief look at the overall process of revising the Stillhouse Hollow Lake Master Plan.

USACE began planning to revise the Stillhouse Hollow Lake Master Plan in September 2019. The objectives for the Master Plan revision were to (1) update land classifications to reflect changes in USACE land management policies since 1975 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

The first action was a scheduled public scoping meeting providing an avenue for public and agency stakeholders to ask questions and provide comments. The public scoping meeting was held on 12 March 2020 at the Harris Community Center, 401 N. Alexander Street, Belton, Texas 76513. The Fort Worth District placed advertisements on the USACE webpage, social media and print publications two weeks prior to the public scoping meeting.

USACE employees hosted the workshop, which was conducted in an open format. Twenty members of the public attended the public meeting. Through initial media contact, the public and agencies were directed to access the information on the Fort Worth District webpage. A slideshow containing the public involvement process, project overview, overview of the NEPA process, master plan and current land classifications, and instructions for submitting comments was made available. Person's interested in submitting comments had the opportunity to comment about the master plan using a variety of methods, including the following:

- Filling out a comment form and returning it within the 30-day comment period
- Submitting a comment using electronic mail
- Submitting a comment and mailing it in on letterhead or choice of paper

USACE received 21 comments from eight (8) members of the public in the 30-day public comment period. Issues that were addressed in the comments included environmental stewardship and preservation, hunting, facilities conditions, access for fishing and boating, and hike and bike trails. Stillhouse Hollow Lake is a federally owned and managed public property, and it is USACEs goal to be a good neighbor, as well as steward for public interest as it concerns Stillhouse Hollow Lake. As such, USACE is bound to the equal enforcement of policies and fees for this publicly held national asset. Table 7.1 provides a summary list of the comments received during the initial scoping comment period for the Master Plan, followed by the USACE response.

Table 7.1 Public Comments from 12 March 2020 Public Scoping Meeting

Count	Comment Description	USACE Response
3	Would like Bluff Park put in a classification that will allow hike and bike trails due to the population growth and to relieve congestion at Dana Peak Park	Concur: USACE supports improvements and additions to recreation at Stillhouse Hollow Lake. Bluff Park and much of the area is classified in this Master Plan as an Environmentally Sensitive Area and thus protected. The area includes an easement to the Brazos River Authority for a water intake and pipeline, and there are nearby trails available. Care will be taken in any development as this area has been surveyed and has potential to serve as habitat for the federally listed endangered golden cheeked warbler. USACE must have partners/organizations to develop and maintain trails or other recreational improvements, including parking to support visitors.
5	Maintain existing facilities and make them safer and more universally accessible. Boat docks and boat ramps at Cedar Gap, Union Grove, and River's Bend parks need maintained or replaced	While this is an operational issue and not a master planning issue, USACE is committed to maintaining all recreational facilities as well as providing facilities that are universally accessible. Repairs from flood damage to facilities has proven to be expensive and time consuming. USACE is continuing to evaluate the facilities to best balance and support project operations and recreational needs within budget and personnel limitations.

Count	Comment Description	USACE Response
3	Gravel Crossing needs improvement, better parking, and better access for watercraft	While this is an operational issue and not a master planning issue, USACE recognizes the concerns surrounding this area. The gravel access point has major erosion problems. USACE has partnered with Bell County to fix the road and install pipe railing. Other recognized issues are illegal dumping and other unauthorized activities, an unauthorized boat ramp, and silting. This area is not a designated recreation area, but the launching of small boats is currently allowed. USACE will need a partner to make improvements, and in the meantime will continue to maintain this primitive access point as a natural area.
4	Allow hunting of deer and feral hogs to reduce damage to natural habitat and protect endangered species. Union Grove, Cedar Gap, and Dana Peak parks be set aside for white-tailed deer management to protect the threatened and endangered species that inhabit this area.	The topic of public hunting is not addressed in the master plan except to describe the status quo. USACE reviews the status of public hunting annually at each operational lake and makes changes dictated by changes in residential development, state law, and habitat quality or wildlife populations. Hunting on federal land at Stillhouse Hollow Lake is managed in accordance with state law, which currently limits hunting at the project to game fowl only, shotgun only, and feral hog hunting. State hunting law prohibits hunting on any USACE land that is within 600 feet from the boundary. USACE is willing to work with the state and other agencies/organizations to examine state law and make reasonable changes to allow expanded hunting at Stillhouse Hollow Lake.
2	Create signage for rules at boat ramps and enforce the rules	While this in an operational issue and not a master planning issue, USACE strives to continually improve and replace damaged and missing signage and enforce rules at the project as personnel and funding permit.
1	Create habitat to improve fishing	While this is an operational issue and not a master planning issue, USACE relies on partnerships with TPWD and other organizations to maintain and improve fish habitat such as spawning beds and artificial structures. USACE generally does not participate in fish stocking, which is a specific mission of TPWD.

Count	Comment Description	USACE Response
1	Extend hours for ramps to 24 hours or at least open before 0500	While this in an operational issue and not a master planning issue, USACE and its partners are committed to creating high quality recreational opportunities while balancing the needs of other missions, such as environmental stewardship. Note that some boat ramps at Stillhouse Hollow Lake are open 24 hours and 7 days a week.
1	Expand parking at marina	This is not an element of the master plan. The single marina at Stillhouse Hollow Lake operates under a lease agreement from USACE. The lessee is responsible for parking, maintenance, and enhancements of the area.
1	Missing Appendix D Wildlife Management Plan, in current MP	Appendix D, Wildlife Management was once part of the 1975 Master Plan for Stillhouse Hollow Lake but is now addressed in the Operational Management Plan. Wildlife management is conceptually addressed in the Master Plan in Chapter 5 where potential management techniques are described for the Multiple Resource Management Lands - Wildlife Management (MRML-WM).

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

Due to COVID-19 restrictions, the draft release of the Stillhouse Hollow Master Plan, Environmental Assessment, and FOSI was accomplished virtually. Public announcements were sent to local news agencies, social media venues were updated with draft availability and comment instructions, and stakeholders were contacted via e-mail. A presentation on the Master Plan contents and instructions and links for commenting were posted at https://www.swf.usace.army.mil/About/Lakes-and-Recreation-Information/Master-Plan-Updates/Stillhouse-Hollow-Lake/. The comment period was open from February 24 through March 26, 2021, during which time the presentation was viewed 87 times and USACE received two comments: one from the Environmental Protection Agency (EPA) and another from TPWD. The comments and responses can be found in Table 7.2.

Table 7.2 Public Comments from February 24 through March 26, 2021

Agency	Comment Description	USACE Response
EPA	**Public Participation**: Page ES-1 stated that "Due to the COVID 19 pandemic outbreak, no members of the public attended the public meeting held March 12, 2020 at the Harris Community Center in Belton, Texas. Speaking about the same meeting, Section 7.2 states that "USACE employees hosted the workshop, which was conducted in an open format. Twenty members of the public attended the public meeting." EPA recommends USACE determine if the meeting on March 12 had public attendees and update the Final EA with the correct information.	Noted and Corrected.
EPA	**Environmental Justice**: The draft Stillhouse Lake Master Plan and Environmental Assessment did not discuss cumulative impacts, reasonably foreseeable future impacts, and their resulting effects on environmental justice populations. EPA recommends the USACE include a discussion of the proposed action's potential indirect and direct adverse impact to minority and low-income populations in the surrounding area as a result of the Bellhouse Project, City of Killeen Project, and the multiple Texas Department of Transportation (TXDOT) projects identified in the Draft EA and Lake Master Plan.	Section 2.4 of the draft Stillhouse Lake Master Plan discusses the Demographic and Economic Analysis in the region surrounding Stillhouse Hollow Lake. This analysis includes statistics on minority and low-income populations, but not effects on those resources – that is the purpose of the Environmental Assessment. Section 3.11.2 was added to the EA to specifically mention address Environmental Justice. Section 3.11.3 and 3.11.4 of the Environmental Assessment do address the proposed actions' direct and indirect effects on low-income and minority populations (environmental justice populations). The term Environmental Justice was added to the effects determination to eliminate any confusion.

Agency	Comment Description	USACE Response
		Sections 3.11.3 and 3.11.4 address potential impacts of the proposed action, including those to Environmental Justice Populations. Since there are no impacts anticipated to those populations, they were not included in the Cumulative Effects discussion. A proposed action would not contribute to a cumulative impact if it would not have a direct or indirect effect on the resource. Since there are direct or indirect impacts from the proposed action, discussion of impacts to minority and low-income populations in the surrounding area as a result of the Bellhouse Project, City of Killeen Project, and the multiple Texas Department of Transportation (TXDOT) projects is beyond the scope of the Stillhouse Hollow Master Plan EA. Those impacts should be addressed in the supporting NEPA documents for those projects.
EPA	**Air Quality**: EPA recommends that all Non-Road Engines be certified as in compliance with the EPA Tier 4 regulations found at 40 CFR Parts 89 and 1039, which includes new and in-use nonroad compression-ignition engines. Also, we ask that any land-clearing activities using open burning for woody debris disposal be coordinated with the Texas Commission on Environmental Quality (TCEQ) to determine air quality conditions such as atmospheric inversions, and air quality/visibility impacts to Class I Federal Areas identified in 40 CFR Part 81, Subpart D.	Noted: though not a part of the Master Plan revision, this will be communicated to the appropriate parties within the USACE.

Agency	Comment Description	USACE Response
TPWD	The state listing status of several species in Table 2.14 in section 2.2.4 of the draft Stillhouse Hollow Lake Master Plan are incorrect. Houston toad is not a state-listed species for Bell County. Salado Springs Salamander is state-listed threatened. Bald eagle is not a state-listed threatened species. Black-capped vireo is not a state-listed species. Rufa Red Knot is state-listed threatened. Smooth pimpleback is not a state-listed species. Please review the TPWD Annotated County List of Rare Species in Appendix C of the Environmental Assessment and the most current county list for Bell County found at: https://tpwd.texas.gov/gis/rtest/	Revised as requested.

CHAPTER 8: SUMMARY OF RECOMMENDATIONS

8.1 SUMMARY OVERVIEW

The preparation of the Stillhouse Hollow Lake Master Plan followed the 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 guidance include (1) preparation of contemporary Resource Objectives, (2) Classification of project lands using the newly approved classification standards, and (3) 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 public recreational opportunities, improve environmental quality, and foster a management philosophy conducive to existing and projected staff levels at Stillhouse Hollow Lake. Factors considered in the Plan were identified through public involvement and review of statewide planning documents including TPWD's 2018 TORP (synonymous with SCORP) and the TCAP – Cross Timbers ecoregion. This Master Plan will ensure the long-term sustainability of the USACE managed recreation program and natural resources associated with Stillhouse Hollow Lake.

8.2 LAND CLASSIFICATION PROPOSALS

A key component in preparing this Master Plan was examining prior land classifications and addressing the needed transition to the 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 and outcome.

Of the 21 public comments received as a result of the initial public scoping meeting, most concerned an interest in maintaining the existing facilities, hunting, Gravel Crossing improvements, and Bluff Park to be under a land classification that will allow for hike and bike trails. While these issues are not a component the master plan, consideration was given to include land classifications that would support these activities. The land classifications presented in the Plan were formulated based on these comments, first-hand experience, professional training of USACE Stillhouse Hollow Lake project staff, Operations Division staff and Regional Planning and Environmental Center (RPEC) staff assigned to the Master Plan Project Development Team (PDT), as well as proven best management practices. There were 3,473 acres reclassified or updated to the new land classification name. 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 (1975) Land Classifications	Acres	2021 Land Classifications	Acres
Project Operations[1]	627	Project Operations (PO)	500
Recreation Intensive Use (Includes 236 acres Allocated as Separable Recreation Lands)	1,934	High Density Recreation (HDR)[2]	982
Natural Areas	230	Environmentally Sensitive Areas (ESA)[2]	625
Recreation Low Density	2,416	Multiple Resource Management – Low Density Recreation (MRML-LDR)	55
Wildlife Areas	3,726	Multiple Resource Management – Wildlife Management (MRML-WM)[2]	6,178
	0	Future/Inactive Recreation[2]	414
Total Fee Land 1975	**8,933**	**Total Fee Land 2021**	**8,754**
Prior (1975) Water Surface Classifications	**Acres**	**2021 Water Surface Classifications**	**Acres**
Water Surface*	6,430	Open Recreation	6,375
		Designated No-wake	75
		Restricted	23
Total Water Surface 1975	**6,430**		**6,473**
1975 Flowage Easement	882	2021 Flowage Easement	914
1975 Shoreline Miles	58	2021 Shoreline Miles[3]	71.8

Conservation Pool 622.0 NGVD29

*Acreage differences from the 1975 total to the 2021 totals are due to improvements in measurement technology, siltation and erosion.

[1] Includes 26 acres of Project Operations by Other

[2] These classifications include a portion of the Separable Recreation Lands as follows: HDR, 65 acres; WMA, 13 acres; ESA, 93 acres; and Future Recreation, 65 acres.

[3] 1975 Master Plan did not include a good portion of the Lampasas River on USACE lands.

Table 8.2 Reclassification Proposals

Proposal	Description	Justification
Project Operations (PO)	Lands classified as PO were reduced from 623 acres to 500 acres as a result of the following reclassifications: • ESA: -189 acres • HDR: +31 acres • LDR: +50 acres • Disposed: -15 acres	The Project Operations land classification was expanded to take in the spillway, staging area, and operations by other entities associated with the water supply mission. The conversion of these lands will have no effect on current or projected public use.
High Density Recreation (HDR)	Lands classified as HDR were reduced from 1,934 acres to 982 acres as a result of the following reclassifications: • PO: -31 aces • ESA: -252 acres • LDR: -29 acres • WM: -237 acres • F/I: -398 acres • Disposed: -1 acres • GIS Correction: -4 acres	Decreases in prior Recreation Intensive Use lands were the result of evaluating historic land uses in these areas and reclassifying acres to more appropriately reflect current needs and uses, especially ESA's to protect golden cheeked warbler habitat. The conversion of these lands will have no effect on current or projected public use.
Environmentally Sensitive Areas (ESA)	The classification of 625 acres as ESA resulted from reclassifying acres in the prior classifications of Operations: • PO: +189 acres • HRD: +252 acres • LDR: +49 acres • WM: +135 acres	These classification changes were necessary to recognize those areas at Stillhouse Hollow Lake having the highest ecological value, including areas of high value for protection of important habitat for the endangered GCWA as designated by the USFWS, and to protect unique views and cultural and archeological sites. The conversion of lands will have little to no effect on current or projected public use. Lands classified as ESA are given the highest order of protection among possible land classifications.

MRML – Low Density Recreation (LDR)	Lands classified as LDR were reduced from 2,416 acres to 55 acres as a result of the following reclassifications: • PO: -50 acres • ESA: -49 acres • WM: -2,015 acres • FIR: -16 acres • Disposed: -80 acres • HDR: +29 • GIS Change: -180	The land in the former classification of Operations: Recreation Low Density were converted to other land uses due to the areas having historic land use patterns supporting the change. The conversion of these lands will have no effect on current or projected public use.
MRML – Wildlife Management (WM)	Lands classified as WM were increased from 3,726 acres to 6,178 acres as a result of the following reclassifications: • PO: +237 acres • ESA: -135 acres • LDR: +2,015 acres • Formally Natural Areas: +230 acres • Property not calculated in the 1975 plan: +30 acres • GIS Change: +75	Lands were converted from previous land classifications of Project Operations, Operation: Low Density Recreation, and Natural Areas to Wildlife Management to more appropriately align with historic and current land use patterns. Additionally, some lands were converted to ESA to protect important cultural and habitat areas. The conversion of these lands will have no effect on current or projected public use.
MRML – Future or Inactive Recreation (FIR)	The classification of 414 acres as FIR resulted from reclassifying acres in the prior classifications of Operations: • HDR: 398 acres • LDR: 16 acres	These classification changes were necessary to recognize areas at Stillhouse Hollow Lake having potential for future recreation.
Water Surface	The classification of 6,473 acres of water surface of the lake at the conservation pool elevation is as follows: • 23 acres of Restricted water surface include the water surface in front of Stillhouse Hollow Dam, water intakes,	The previous Master Plan for Stillhouse Hollow Lake did not specify different classifications on the water surface, though these classifications were recognized in practice. This Master Plan revision recognizes and specifies

	and designated swimming areas in the parks around Stillhouse Hollow Lake. Buoys mark the line in front of the dam. Keep-out buoys and floating barrier pipes mark the designated swimming areas in each park. • 75 acres of Designated No-Wake areas are in place near the boat ramps at Stillhouse Hollow Lake. • There are 6,375 acres of Open Recreation water surface at Stillhouse Hollow Lake.	these uses. The classification of water surfaces will have no effect on current or projected public use

Note: The land classification changes described in this table are the result of changes to parcels of land ranging from a few acres to over 100 hundred acres. Acreages were measured using GIS technology. The acreage numbers provided are approximate.

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

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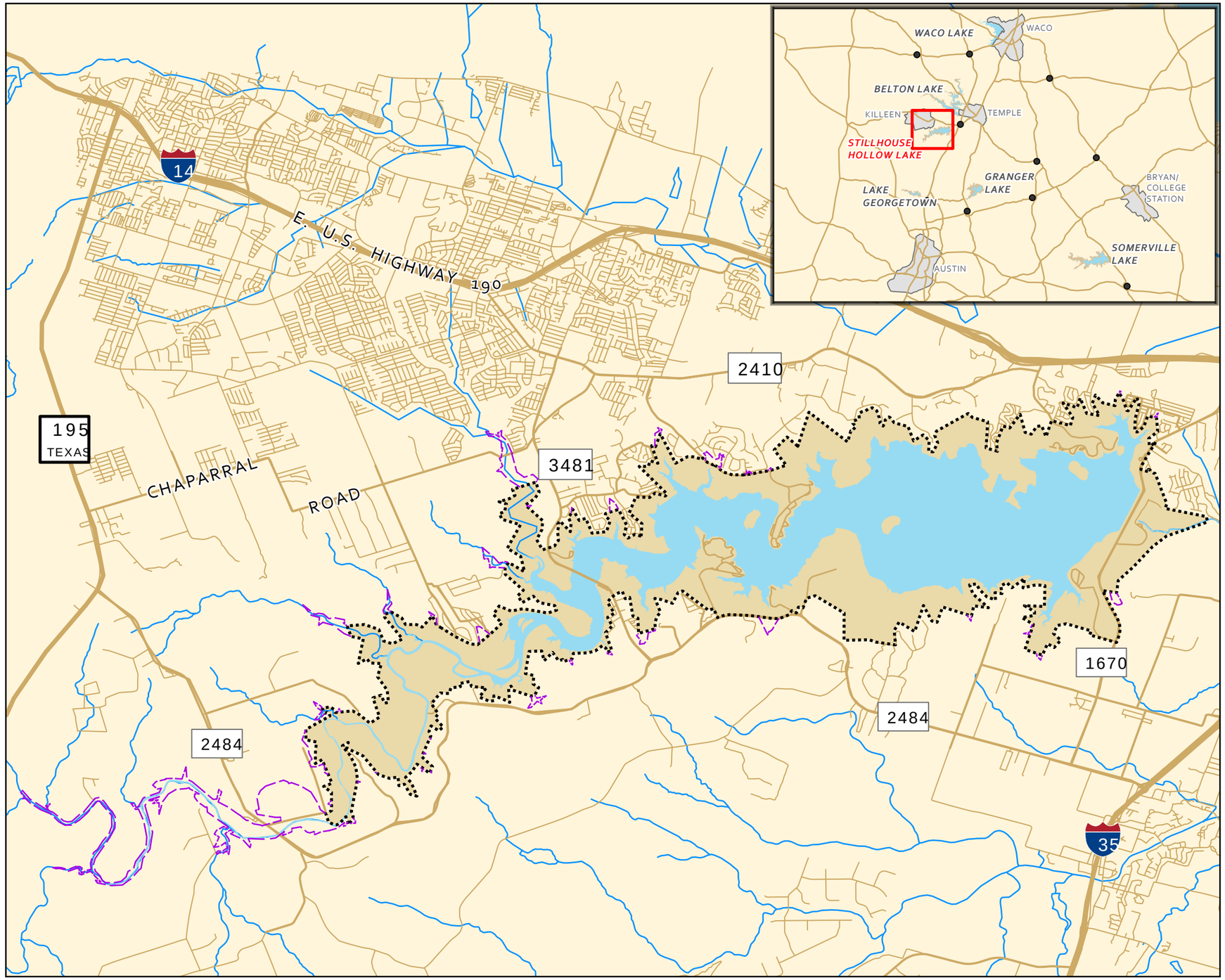

INDEX TO MASTER PLAN MAPS

GENERAL

MAP NO.	TITLE
SH20MP-01-00	PROJECT LOCATION & INDEX
SH20MP-01-01	AGENCY LAND MANAGEMENT
SH20MP-01-02	UTILITY CORRIDOR

LAND CLASSIFICATION

MAP NO.	TITLE
SH20MP-0C-00	LAND AND WATER CLASSIFICATION (INDEX)
SH20MP-0C-01	LAND AND WATER CLASSIFICATION (SHEET 1)
SH20MP-0C-02	LAND AND WATER CLASSIFICATION (SHEET 2)
SH20MP-0C-03	LAND AND WATER CLASSIFICATION (SHEET 3)
SH20MP-0C-04	LAND AND WATER CLASSIFICATION (SHEET 4)
SH20MP-0C-05	LAND AND WATER CLASSIFICATION (SHEET 5)
SH20MP-0C-06	LAND AND WATER CLASSIFICATION (SHEET 6)
SH20MP-0C-07	LAND AND WATER CLASSIFICATION (SHEET 7)
SH20MP-0C-08	LAND AND WATER CLASSIFICATION (SHEET 8)

RECREATIONAL AREAS

MAP NO.	TITLE
SH20MP-0R-0A	RECREATIONAL DEVELOPMENT MAP
SH20MP-0R-0B	TRAILS MAP
SH20MP-0R-01	STILLHOUSE PARK PLATE
SH20MP-0R-02	UNION GROVE PARK PLATE
SH20MP-0R-03	RIVERSBEND PARK PLATE
SH20MP-0R-04	CEDAR GAP PARK PLATE
SH20MP-0R-05	DANA PEAK PARK PLATE

LEGEND

- FEE PROPERTY
- FLOWAGE EASEMENT
- FEE PROPERTY AREA
- WATER SURFACE AREA
- TRIBUTARIES

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US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

PROJECT LOCATION AND INDEX

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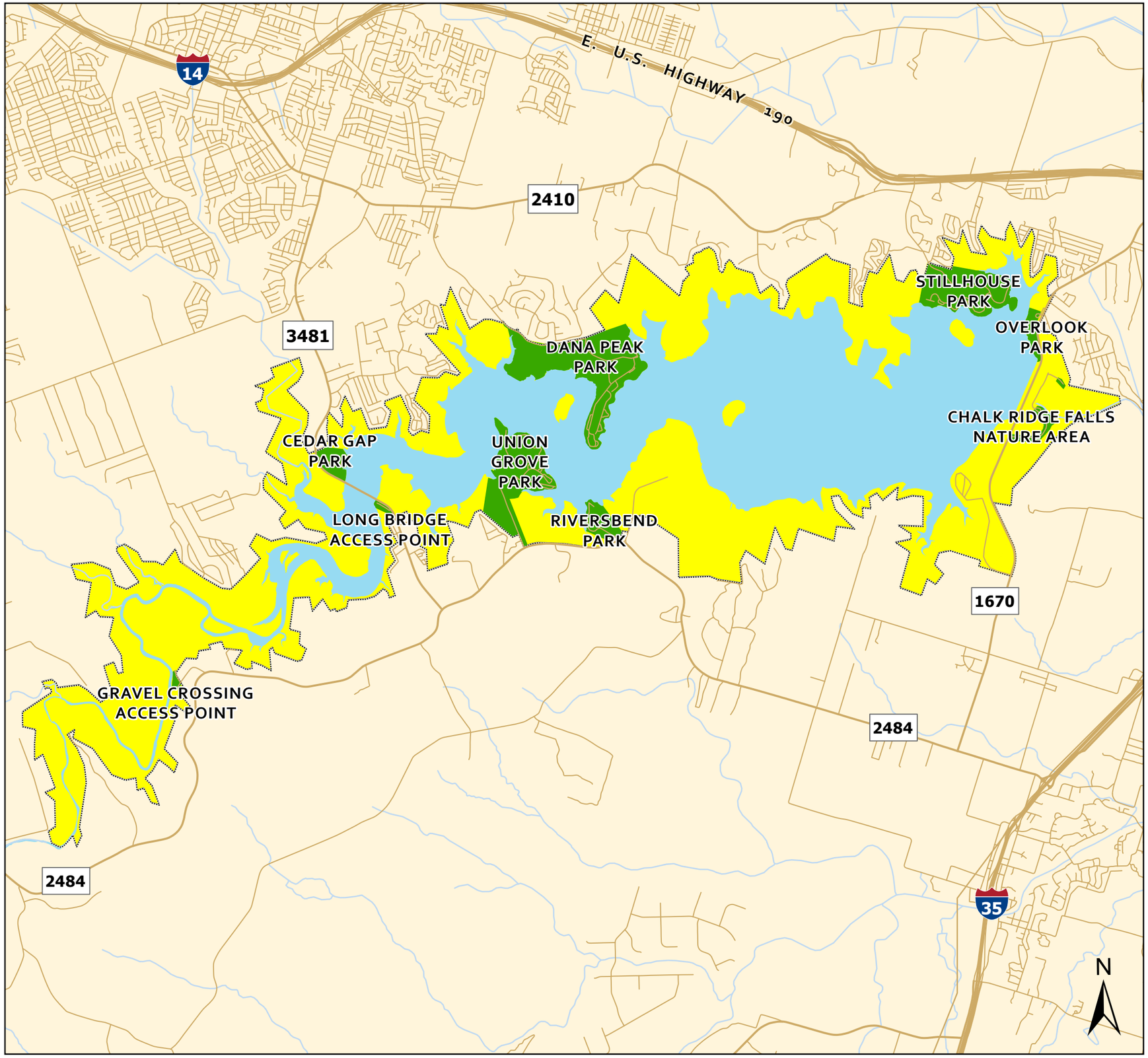

FEE PROPERTY

WATER SURFACE AREA

TRIBUTARIES

USACE RECREATIONAL AREAS

MANAGING AGENCY

U.S. ARMY CORPS OF ENGINEERS

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

AGENCY LAND MANAGEMENT MAP

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DATE:	MAP NO
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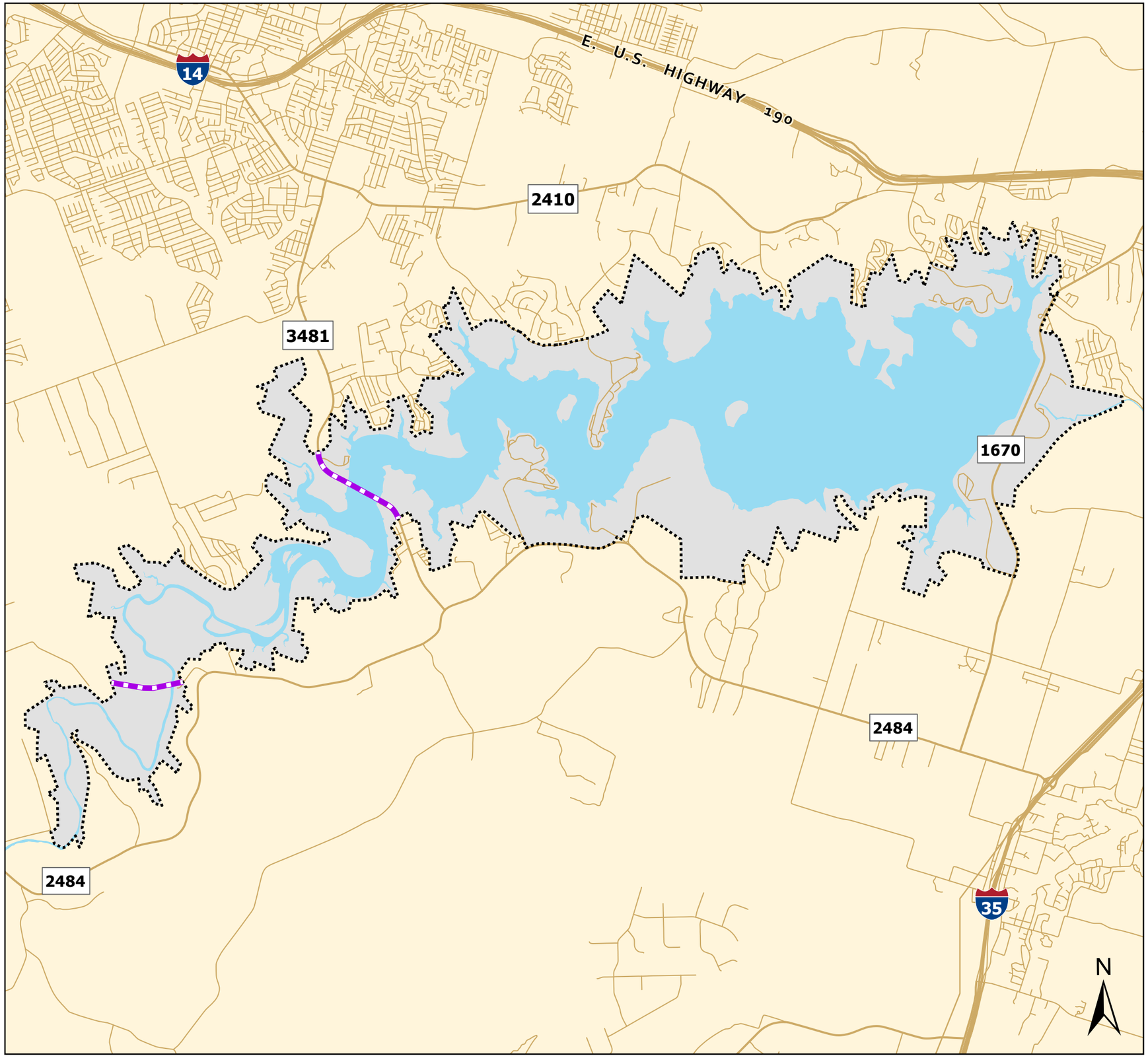
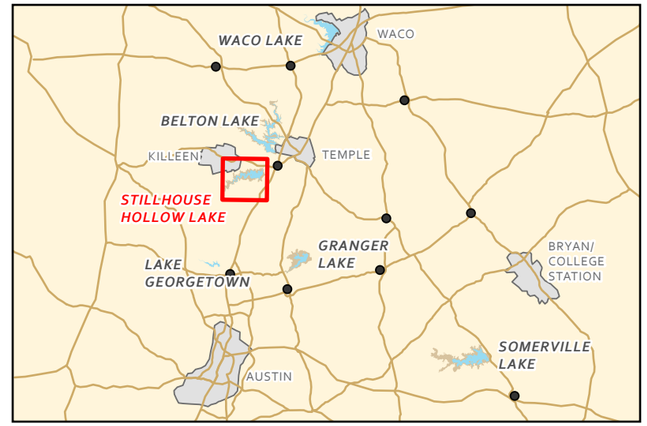




LEGEND

- UTILITY CORRIDOR
- ROADWAY
- FEE PROPERTY
- FEE PROPERTY AREA
- WATER SURFACE AREA

US Army Corps
of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

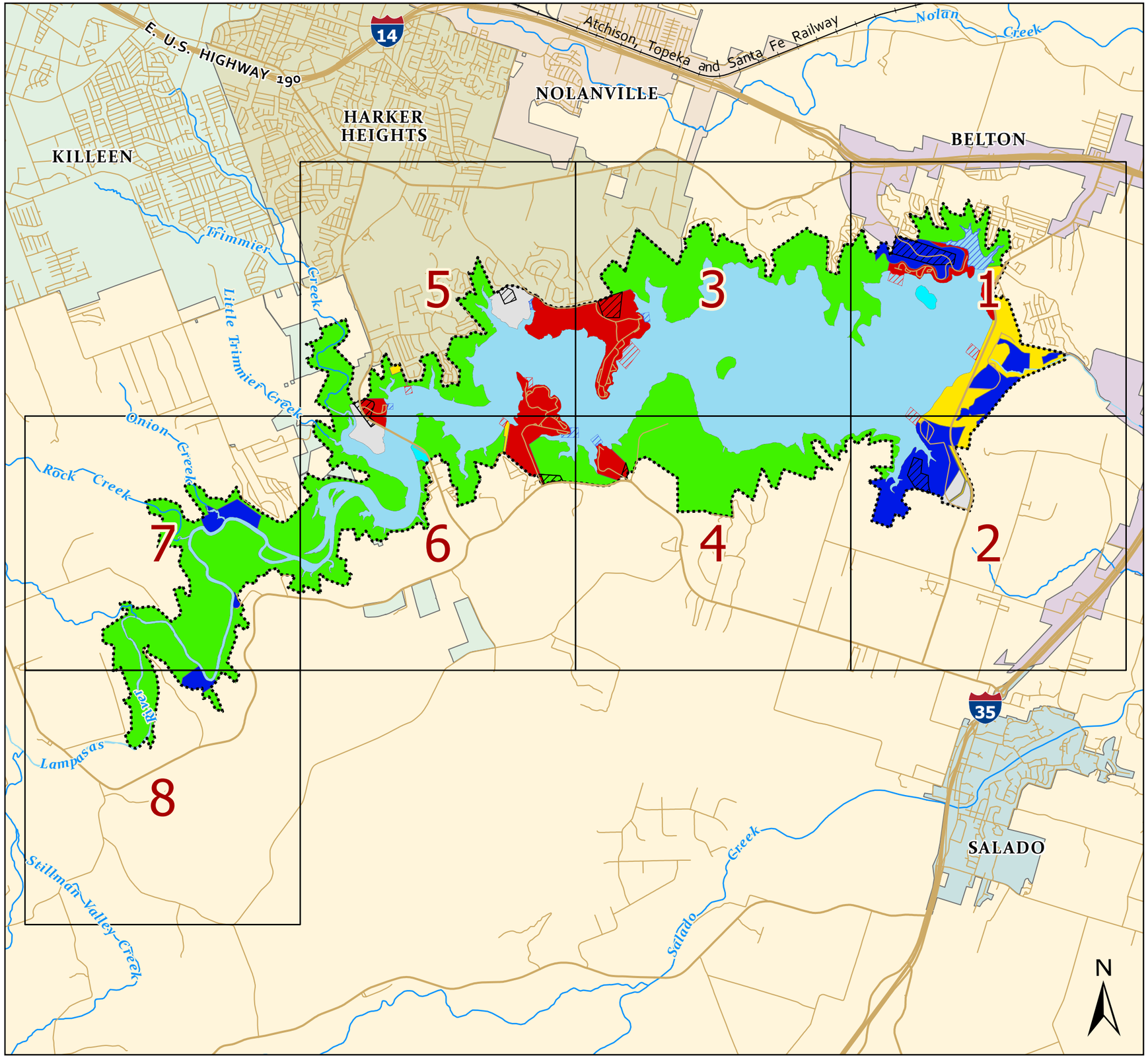
STILLHOUSE HOLLOW LAKE MASTER PLAN

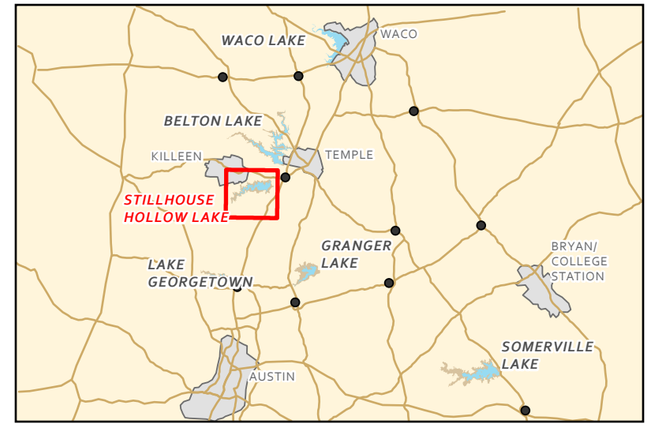
UTILITY CORRIDOR MAP

1 0 1 2

Miles

DATE:	MAP NO.
May 2021	SH20MP-01-02





FEE PROPERTY

WATER CLASSIFICATION

- RESTRICTED
- DESIGNATED NO-WAKE
- OPEN RECREATION

LAND ALLOCATION

- SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

- PROJECT OPERATIONS
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- FUTURE RECREATION AREA
- WILDLIFE MANAGEMENT AREA
- ENVIRONMENTALLY SENSITIVE AREA

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

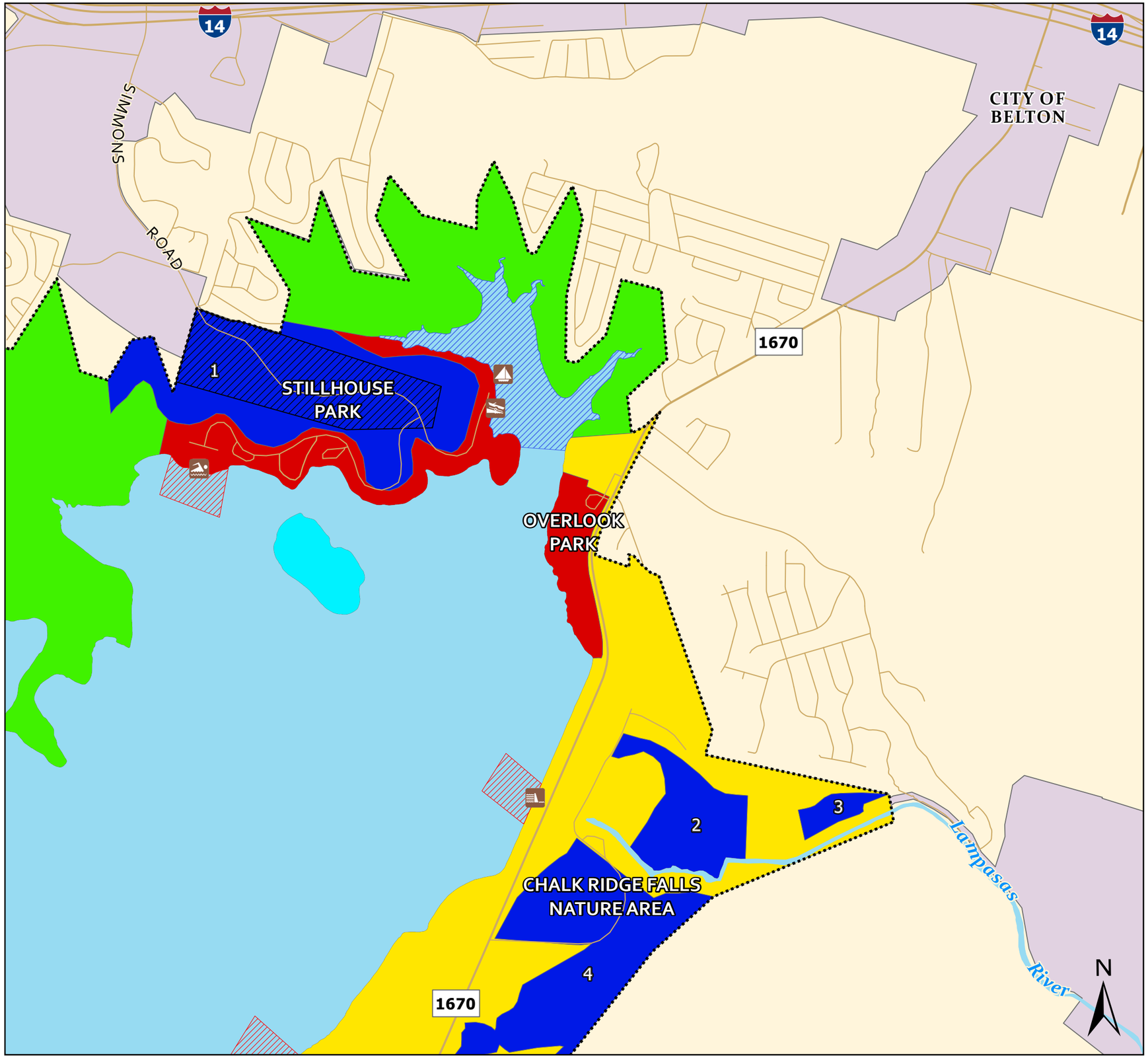
STILLHOUSE HOLLOW LAKE MASTER PLAN

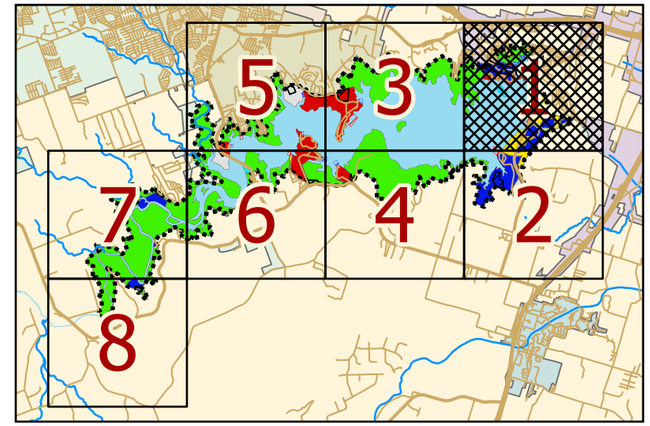
LAND CLASSIFICATION INDEX

1 0 1 2

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-00





FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 1)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
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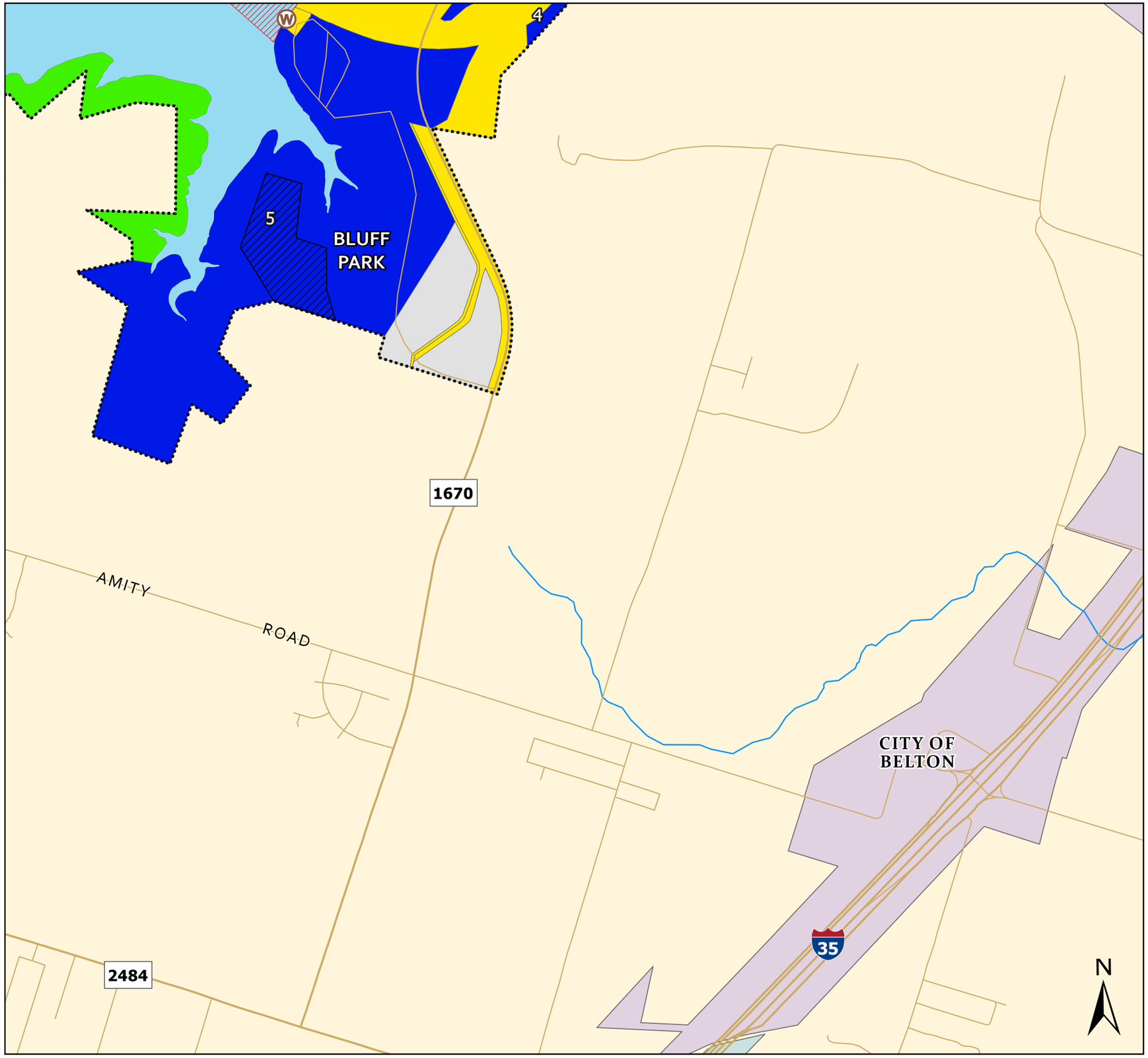
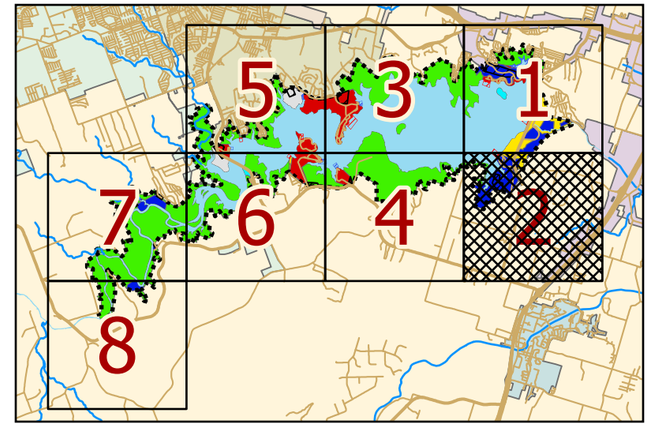




FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 2)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-02

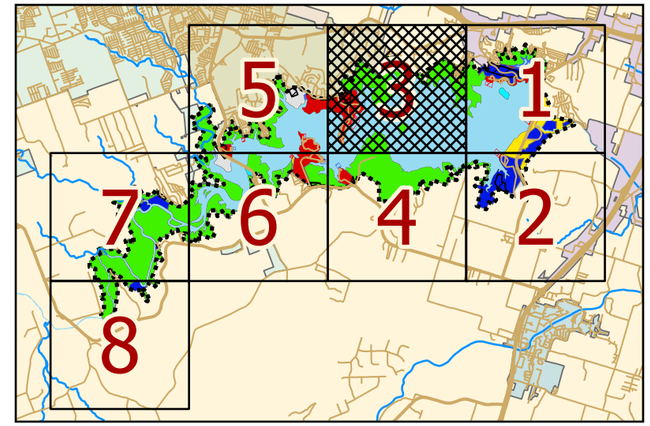
CITY OF HARKER HEIGHTS

CITY OF BELTON

2410

DANA PEAK PARK

N



FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

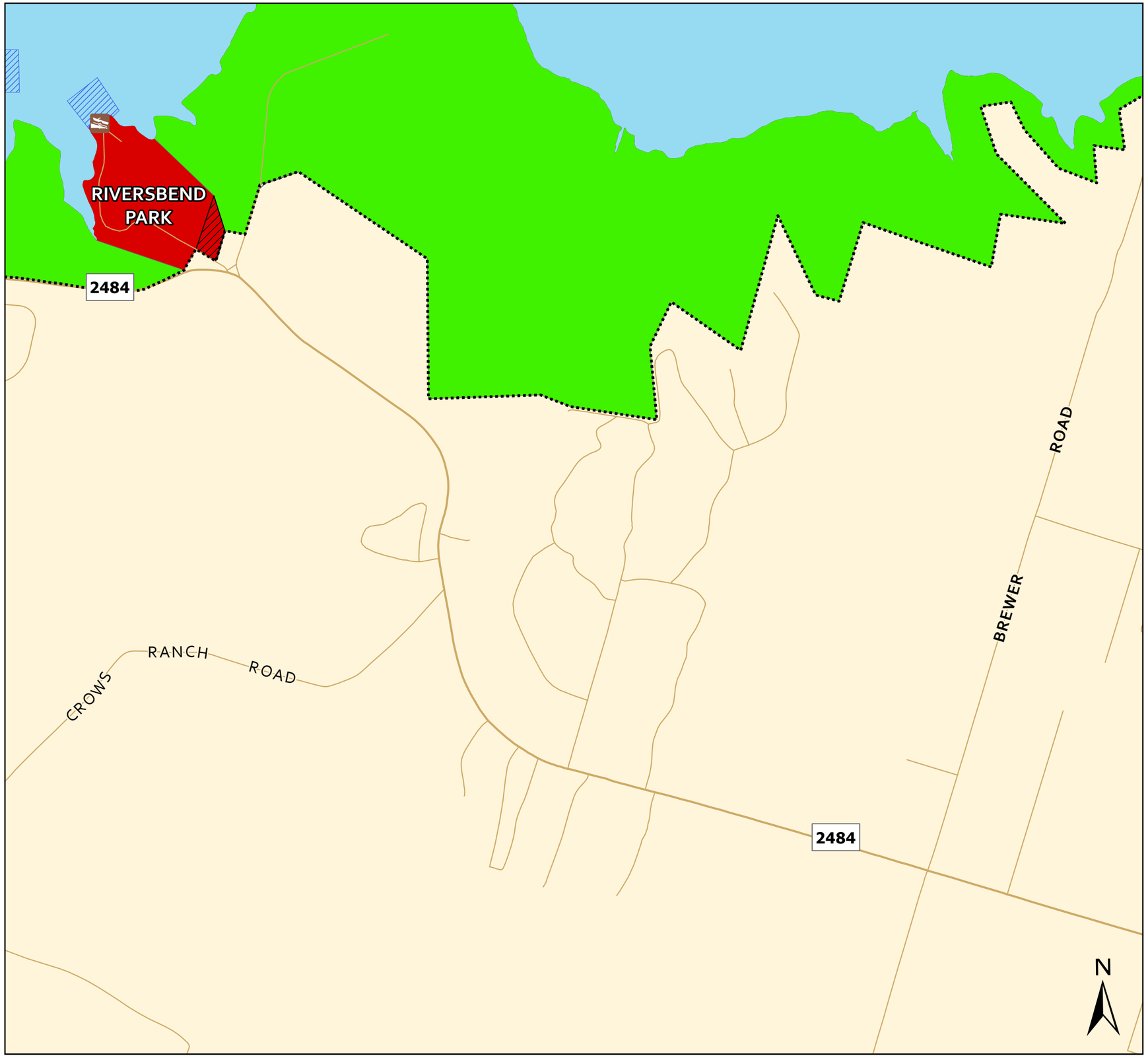
STILLHOUSE HOLLOW LAKE MASTER PLAN

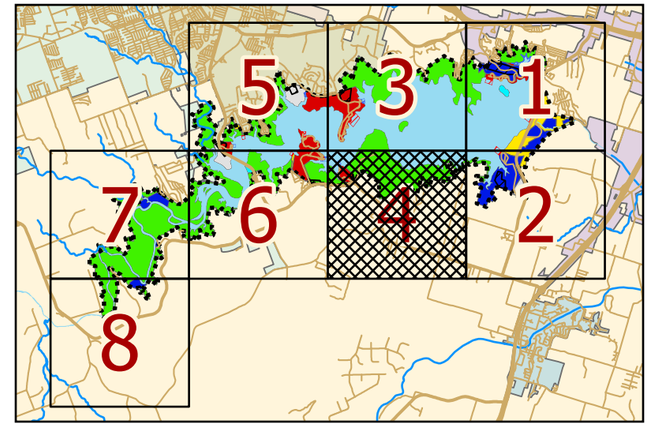
LAND CLASSIFICATION (SHEET 3)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-03





FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

LAND CLASSIFICATION (SHEET 4)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
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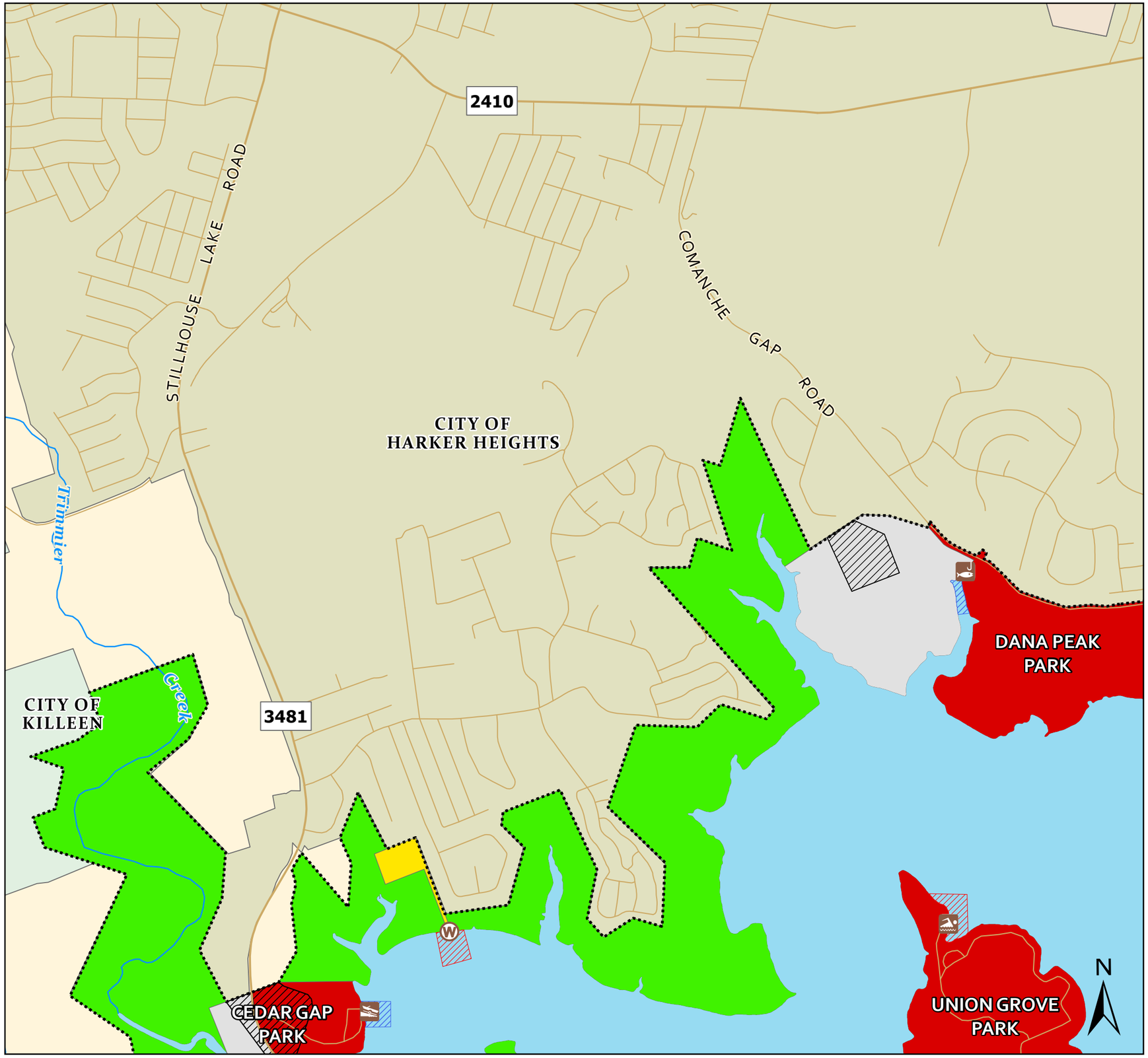
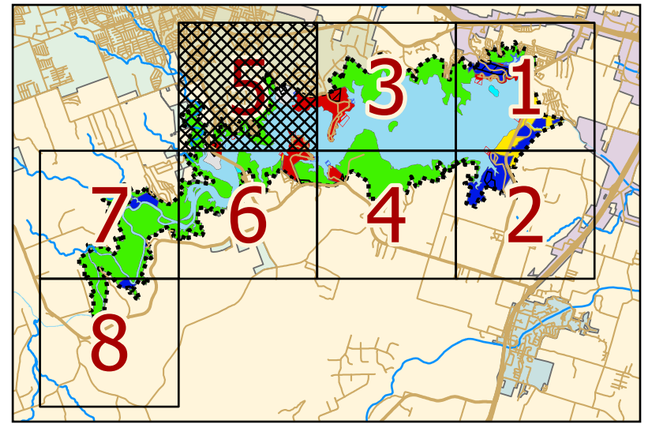




FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

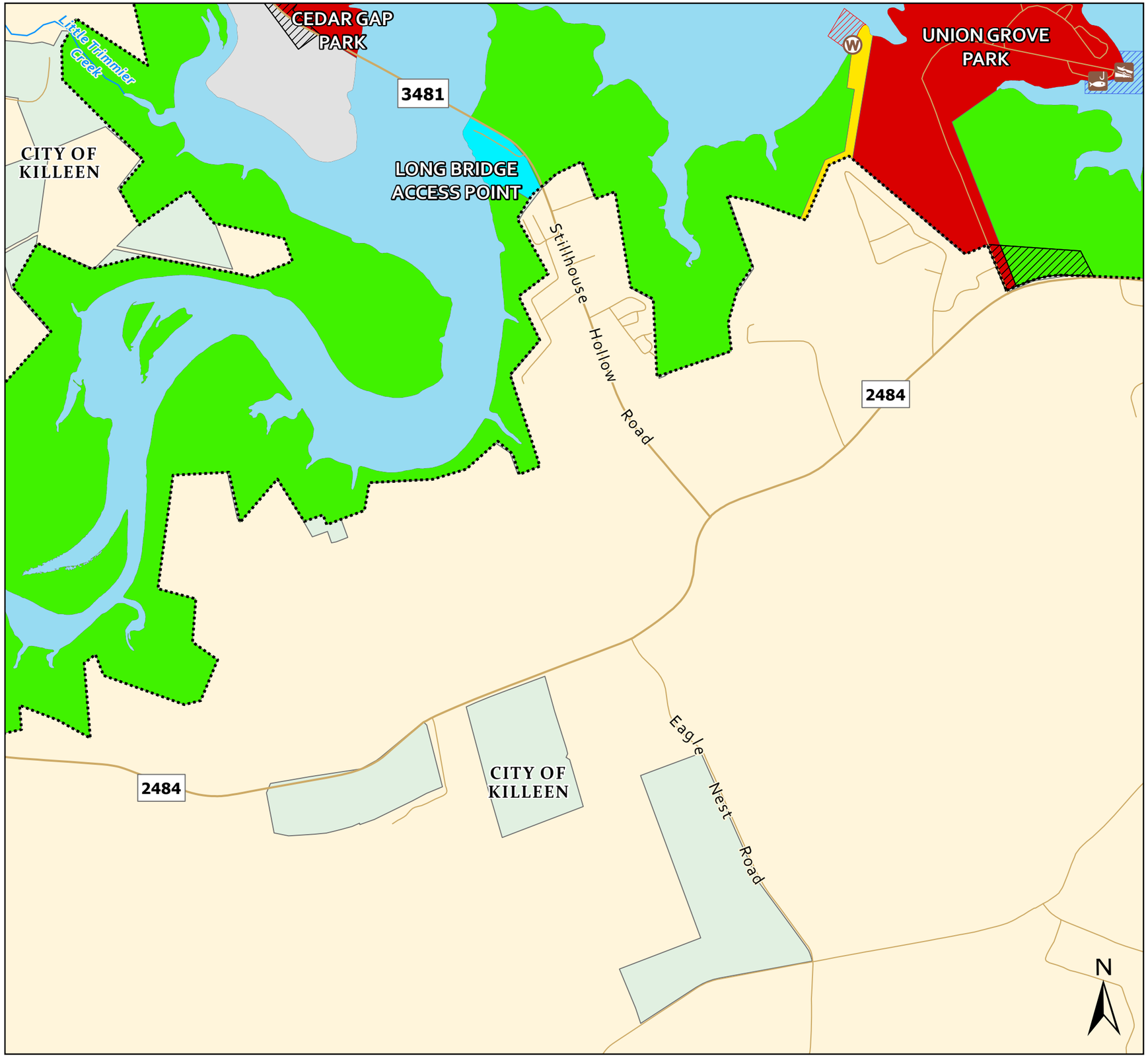
STILLHOUSE HOLLOW LAKE MASTER PLAN

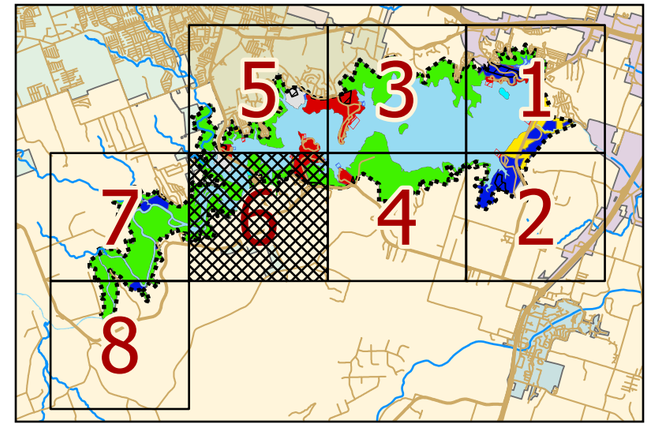
LAND CLASSIFICATION (SHEET 5)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-05





FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

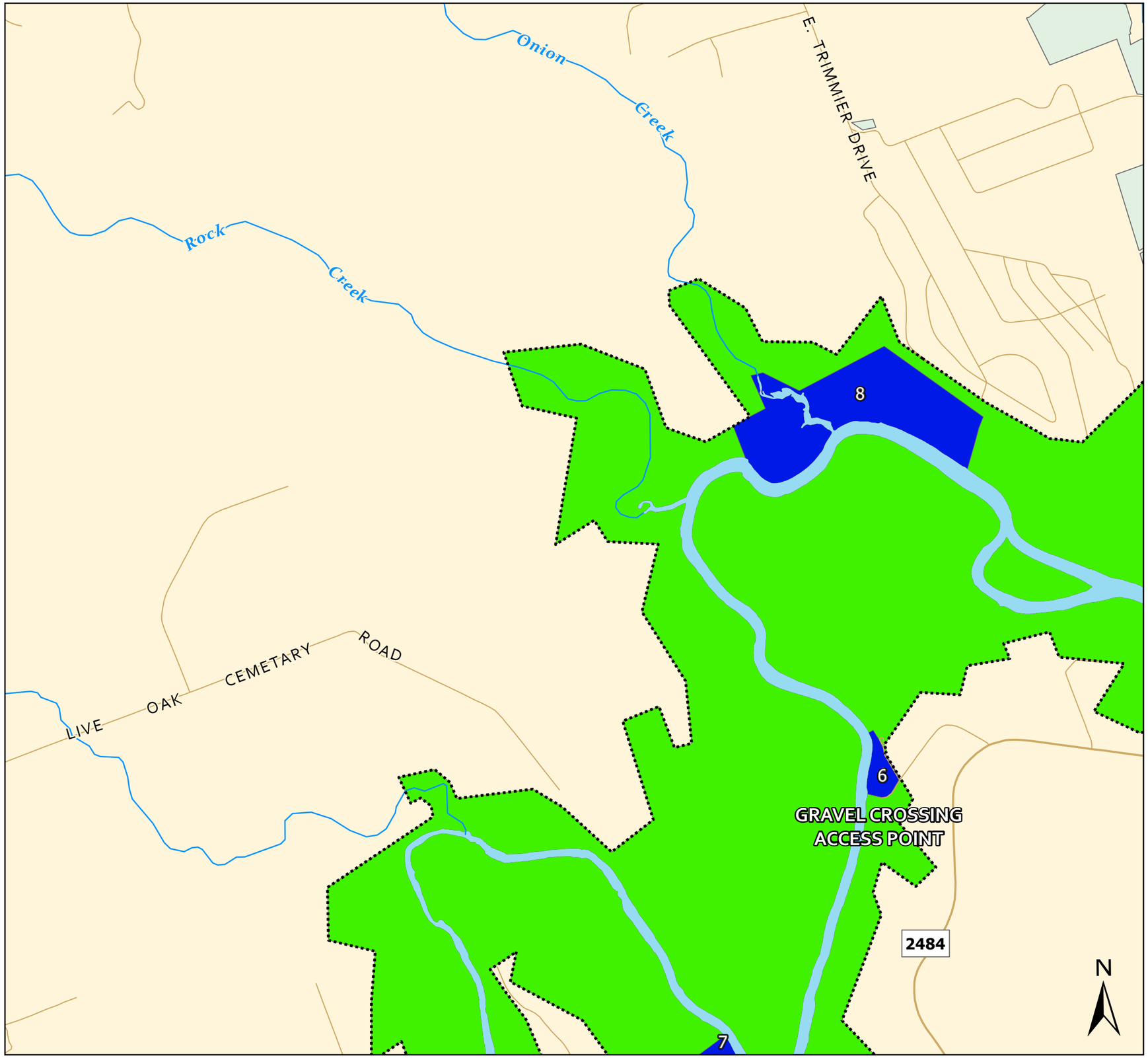
STILLHOUSE HOLLOW LAKE MASTER PLAN

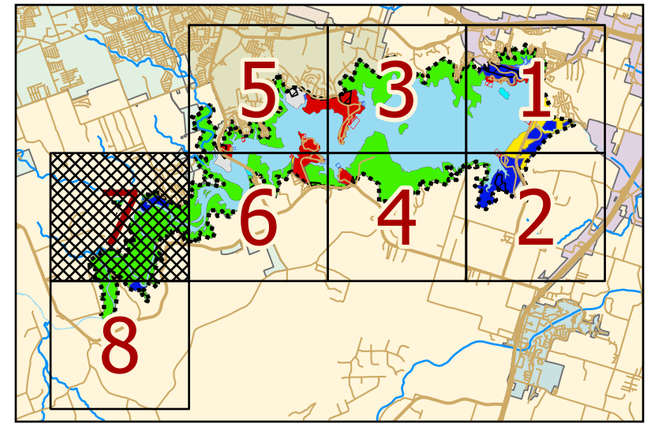
LAND CLASSIFICATION (SHEET 6)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-06





FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

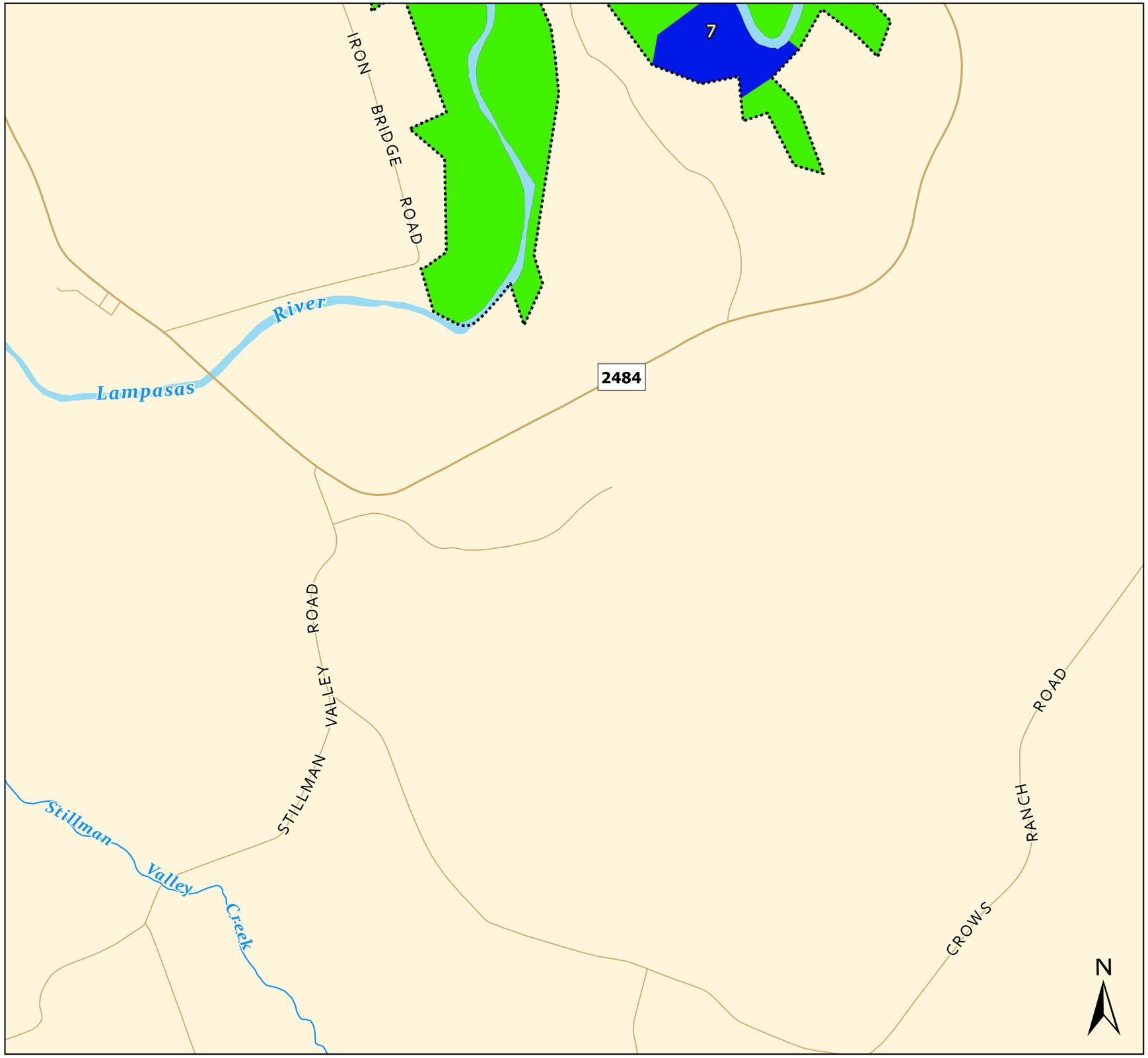
STILLHOUSE HOLLOW LAKE MASTER PLAN

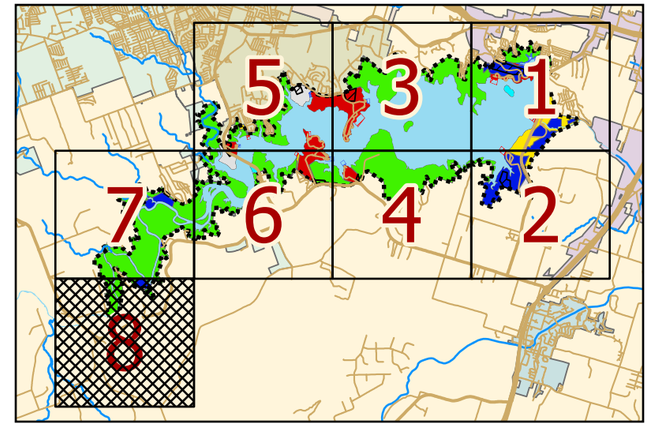
LAND CLASSIFICATION (SHEET 7)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-07





FEE PROPERTY

BOAT RAMP

SWIMBEACH

FISHING POINT

MARINA

FLOOD CONTROL STRUCTURE

WATER INTAKE

LAND ALLOCATION

SEPERABLE RECREATION LANDS

LAND CLASSIFICATION

PROJECT OPERATIONS

HIGH DENSITY RECREATION

LOW DENSITY RECREATION

FUTURE RECREATION AREA

WILDLIFE MANAGEMENT AREA

ENVIRONMENTALLY SENSITIVE AREA

WATER CLASSIFICATION

RESTRICTED

DESIGNATED NO-WAKE

OPEN RECREATION

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

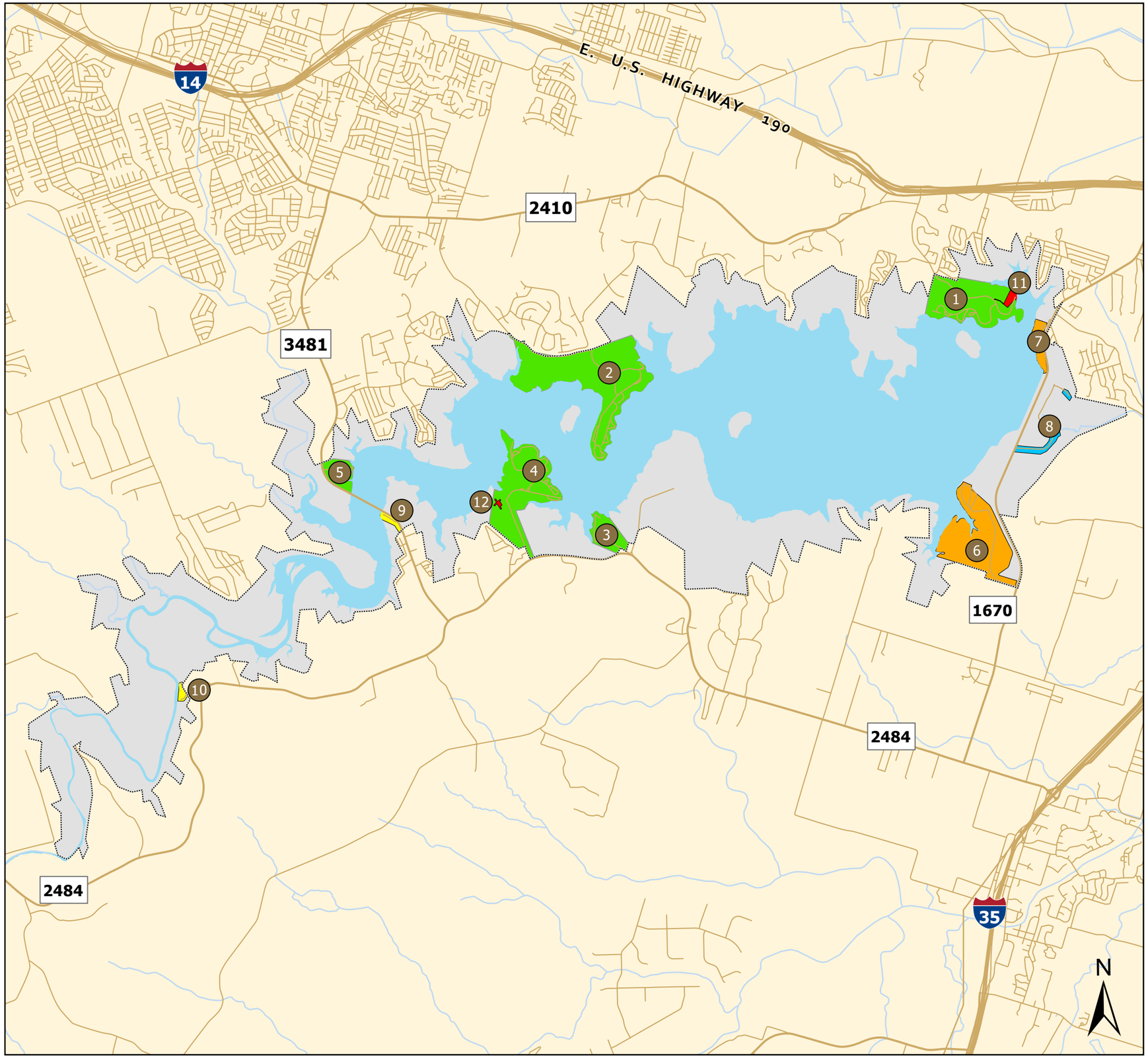
STILLHOUSE HOLLOW LAKE MASTER PLAN

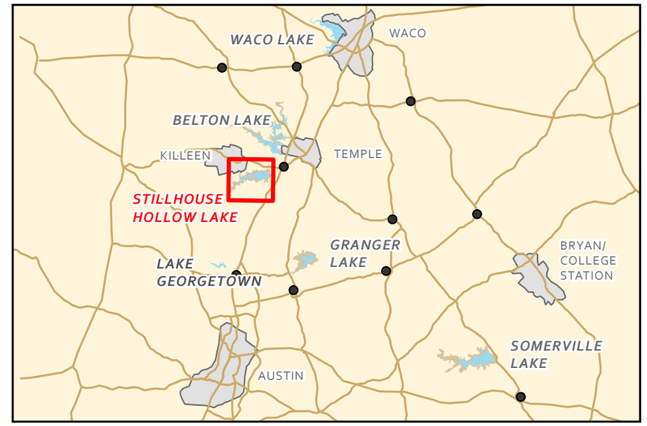
LAND CLASSIFICATION (SHEET 8)

0.25 0 0.25 0.5

Miles

DATE:	MAP NO.
May 2021	SH20MP-0C-08





FEE PROPERTY

WATER SURFACE AREA

RECREATIONAL AREAS

- DEVELOPED
- UNDEVELOPED
- NATURE AREA
- ACCESS POINT
- LEASED AREA

1. STILLHOUSE PARK
2. DANA PEAK PARK
3. RIVERSBEND PARK
4. UNION GROVE PARK
5. CEDAR GAP PARK
6. BLUFF PARK
7. OVERLOOK PARK
8. CHALK RIDGE FALLS NATURE AREA
9. LONG BRIDGE ACCESS POINT
10. GRAVEL CROSSING ACCESS POINT
11. STILLHOUSE MARINA LEASE AREA
12. CEN-TEX MODELERS AIRFIELD LEASE AREA

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

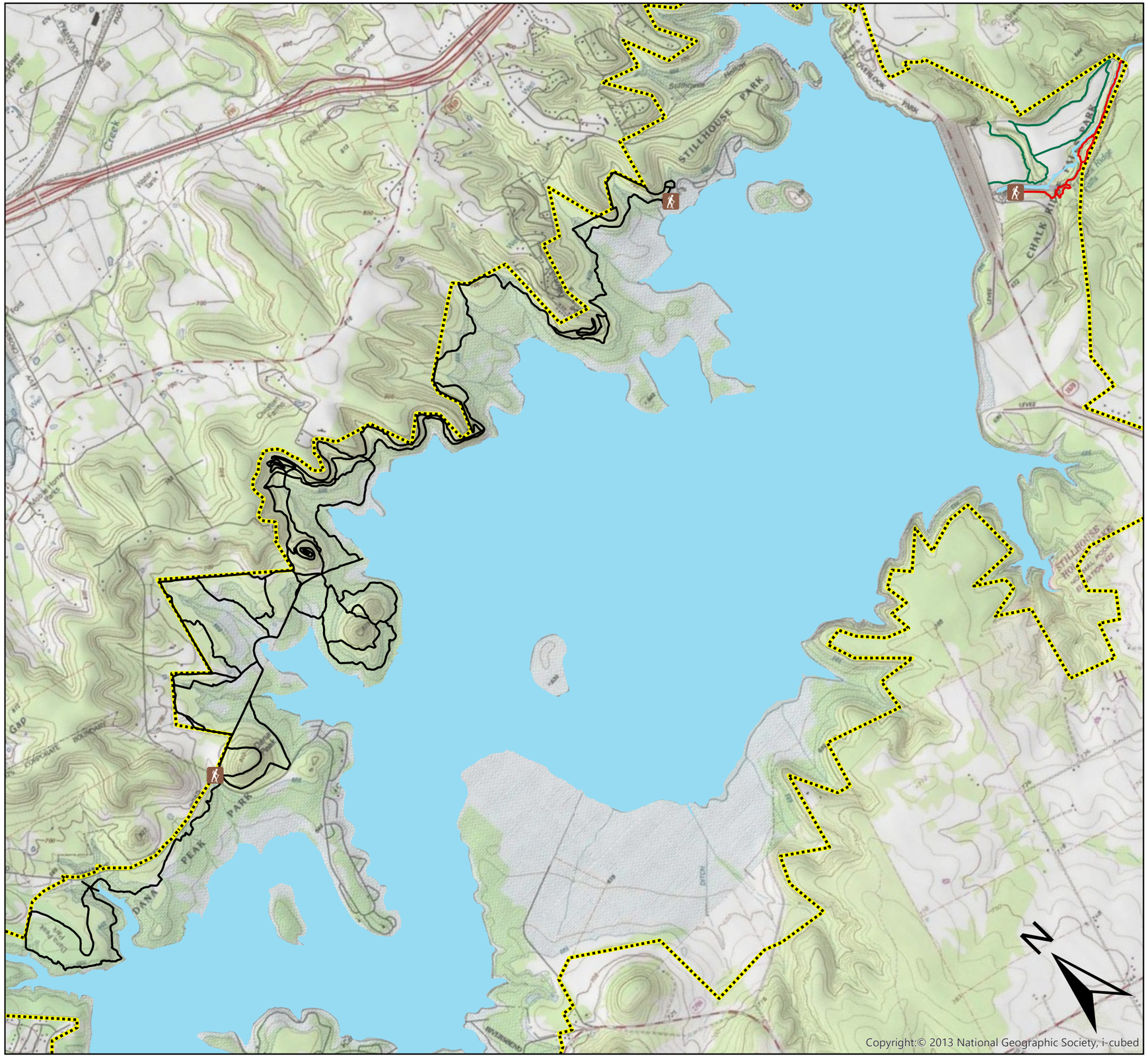
STILLHOUSE HOLLOW LAKE MASTER PLAN

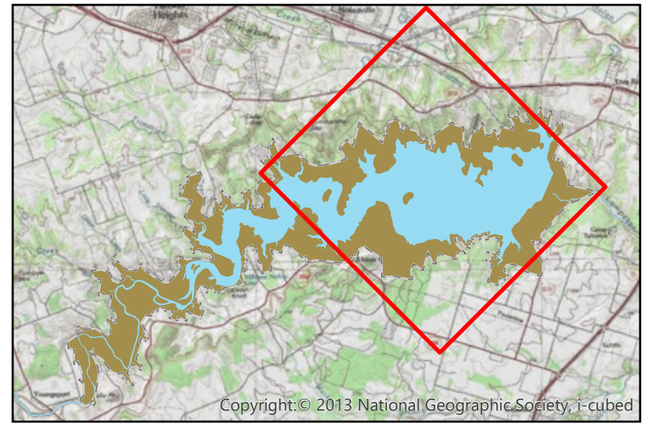
RECREATIONAL DEVELOPMENT MAP

1 0 1 2

Miles

DATE:	MAP NO.
May 2021	SH20MP-0R-0A





TRAILHEAD
DANA PEAK TRAIL SYSTEM
CHALK RIDGE FALLS TRAIL
GREEN TREE TRAIL
FEE PROPERTY
WATER SURFACE AREA

US Army Corps of Engineers
Fort Worth District

STILLHOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

TRAILS MAP

0.5 0 0.5 1
Miles

DATE:	MAP NO.
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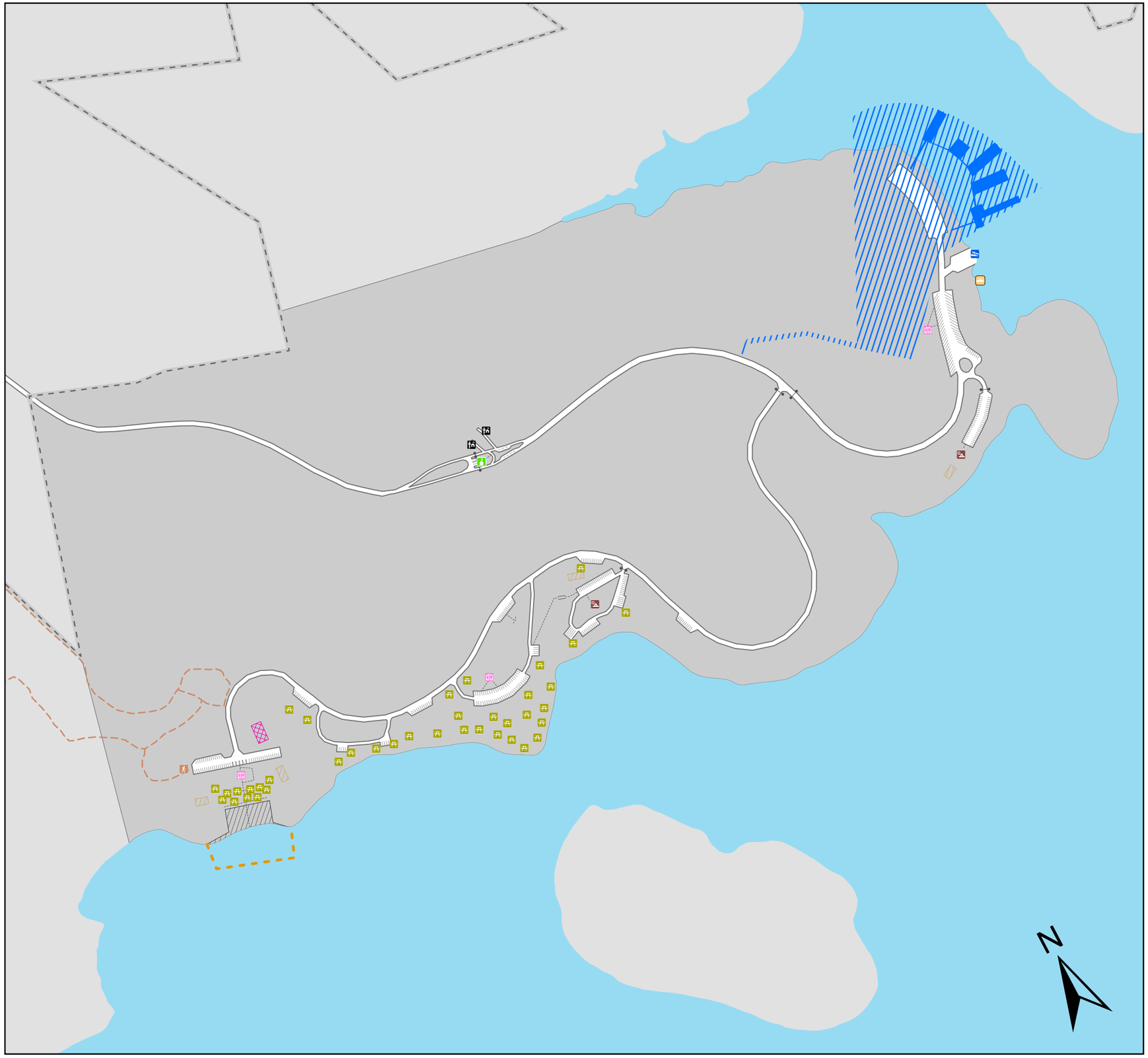
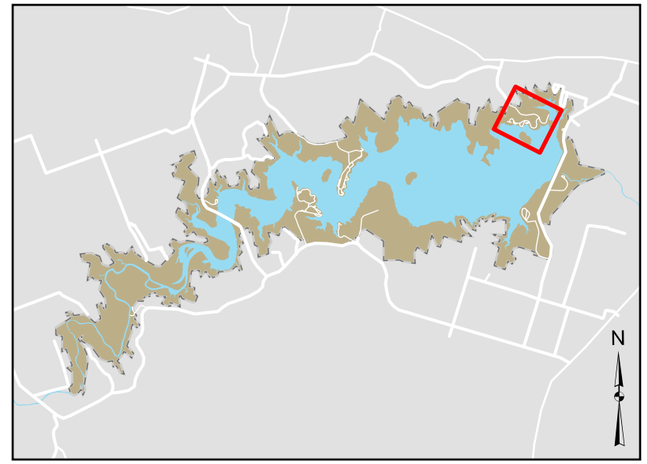




- FEE PROPERTY
- WATER SURFACE AREA
- PAVED ROAD
- SIDEWALK
- FOOT BRIDGE
- PICNIC SITE
- GROUP SITE
- HOST SITE
- BOATRAMP
- COURTESY DOCK
- RESTROOM
- GATEHOUSE
- SWIMBEACH
- BEACH LINE
- VOLLEYBALL COURT
- SPORTS COURT
- TRAIL
- TRAILHEAD
- GATE
- MARINA LEASE AREA
- MARINA

US Army Corps
of Engineers
Fort Worth District

STILL HOUSE HOLLOW LAKE — BELTON, TEXAS

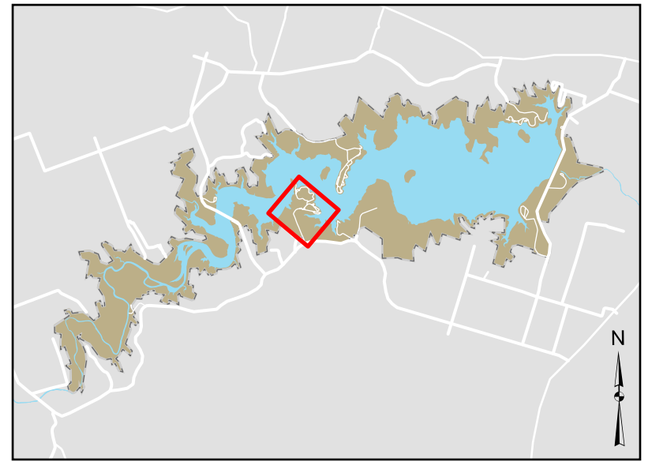
STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

STILLHOUSE PARK PLATE

Feet
250 0 250 500

DATE:	MAP NO.
May 2021	SH20MP-0R-01



- FEE PROPERTY
- WATER SURFACE AREA
- PAVED ROAD
- UNPAVED ROAD
- SIDEWALK
- CAMPSITE
- SCREENED SHELTER
- TENT ONLY SITE
- HOST SITE
- BOATRAMP
- COURTESY DOCK
- FISHING DOCK
- RESTROOM
- DUMPSTATION
- GATEHOUSE
- SWIMBEACH
- BEACH LINE
- GATE
- AUTOMATIC GATE
- MODEL AIRFIELD LEASE AREA

US Army Corps of Engineers
Fort Worth District

STILL HOUSE HOLLOW LAKE — BELTON, TEXAS

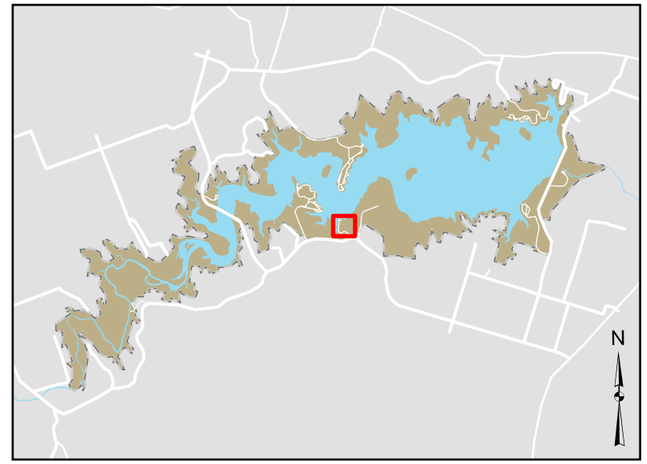
STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

UNION GROVE PARK PLATE

Feet
250 0 250 500

DATE:	MAP NO
May 2021	SH20MP-0R-02



FEE PROPERTY
WATER SURFACE AREA
PAVED ROAD
UNPAVED ROAD
SIDEWALK
PICNIC SITE
BOATRAMP
COURTESY DOCK
RESTROOM
GATE

US Army Corps
of Engineers
Fort Worth District

STILL HOUSE HOLLOW LAKE — BELTON, TEXAS

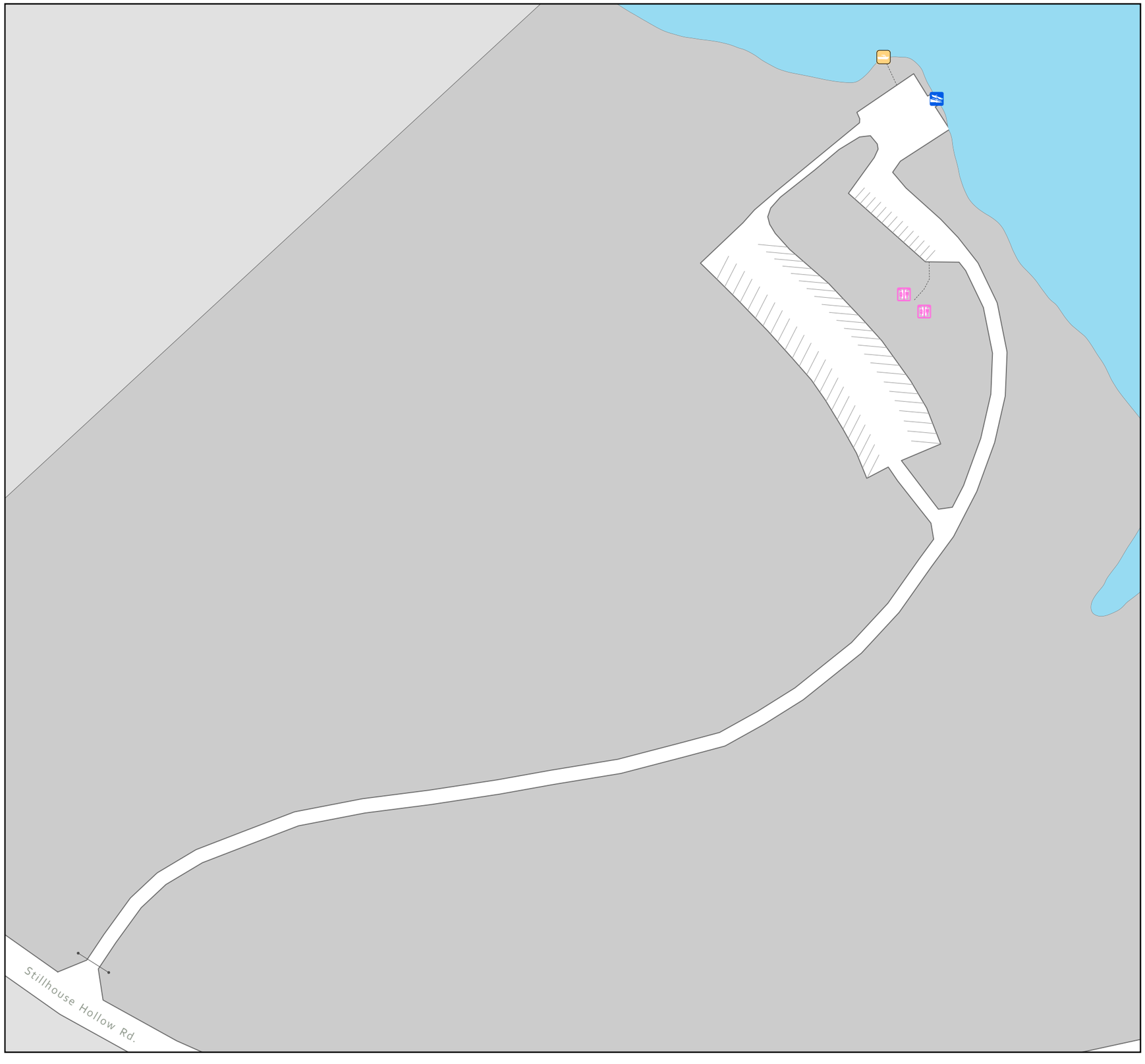
STILLHOUSE HOLLOW LAKE

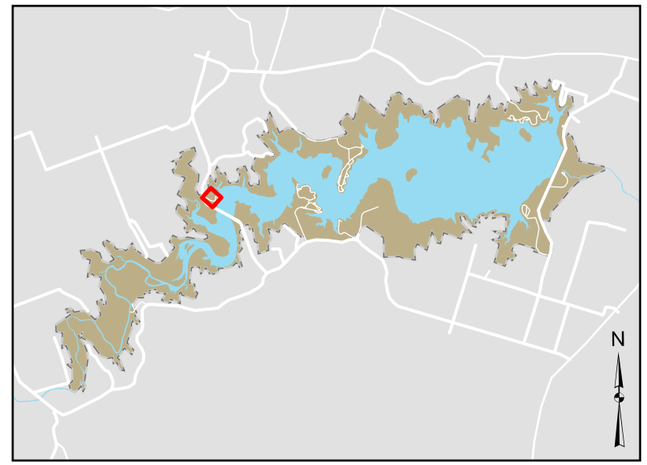
STILLHOUSE HOLLOW LAKE MASTER PLAN

RIVERSBEND PARK PLATE

Feet
100 0 100 200

DATE:	MAP NO.
May 2021	SH20MP-0R-03





FEE PROPERTY
WATER SURFACE AREA
PAVED ROAD
SIDEWALK
BOATRAMP
COURTESY DOCK
RESTROOM
GATE

US Army Corps
of Engineers
Fort Worth District

STILL HOUSE HOLLOW LAKE — BELTON, TEXAS

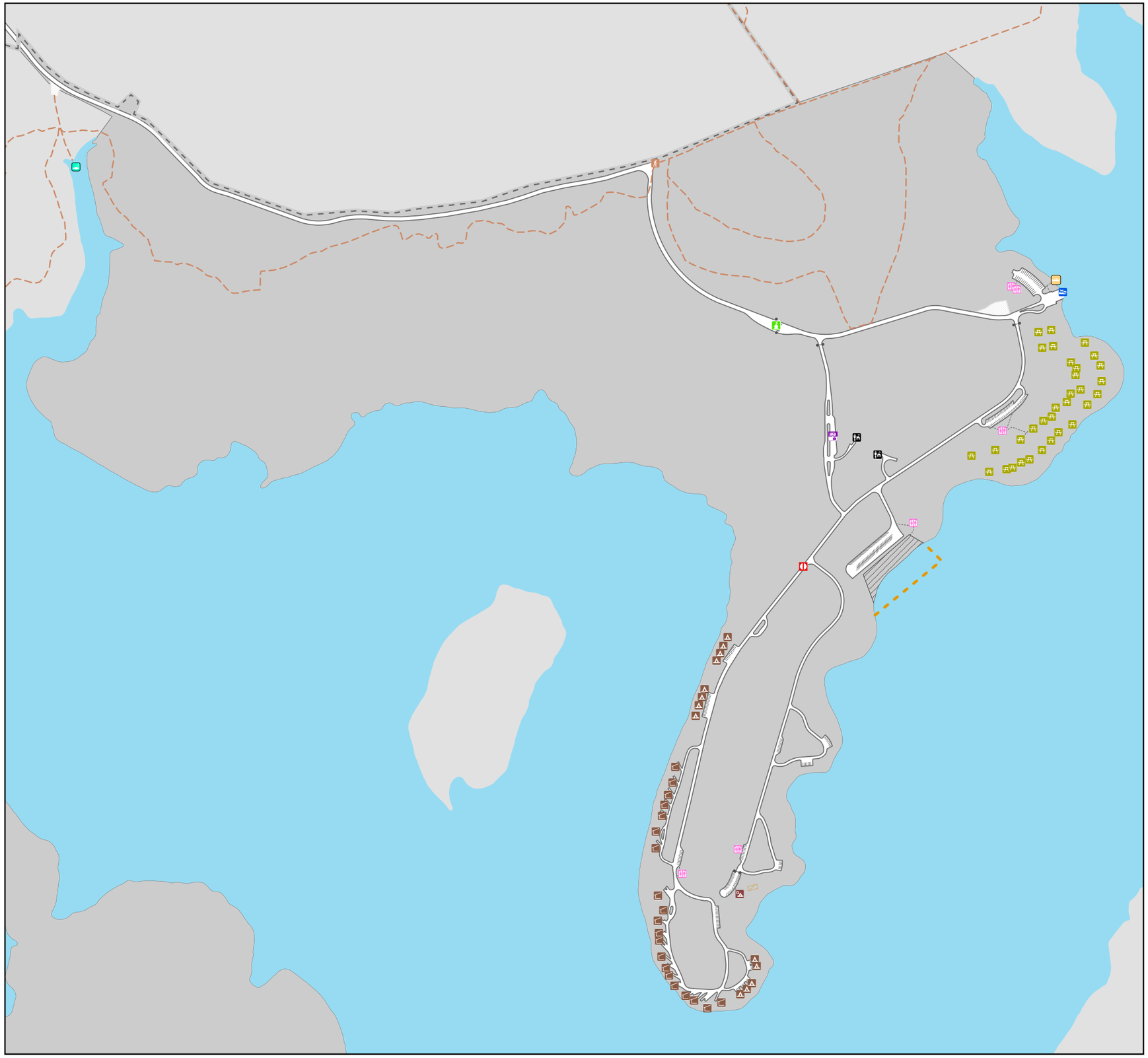
STILLHOUSE HOLLOWLAKE

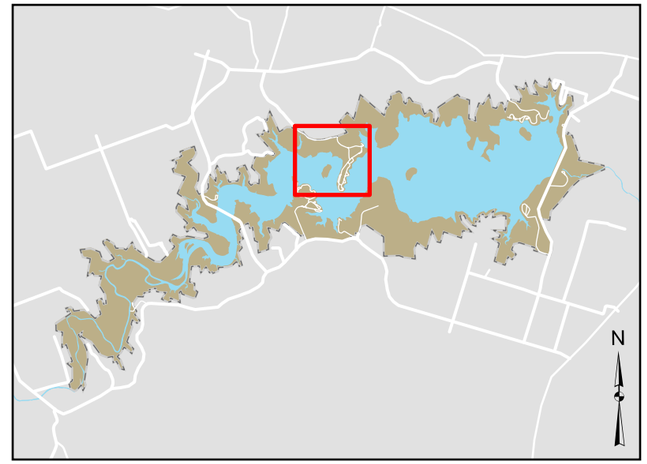
STILLHOUSE HOLLOWLAKE MASTER PLAN

CEDAR GAP PARK PLATE

Feet
100 0 100 200

DATE:	MAP NO.
May 2021	SH20MP-0R-04





FEE PROPERTY
WATER SURFACE AREA
PAVED ROAD
UNPAVED ROAD
SIDEWALK
CAMPSITE
TENT ONLY SITE
PICNIC SITE
GROUP SITE
HOST SITE
BOATRAMP
COURTESY DOCK
FISHING DOCK
RESTROOM
DUMPSTATION
GATEHOUSE
SWIMBEACH
BEACH LINE
VOLLEYBALL COURT
TRAIL
TRAILHEAD
GATE
AUTOMATIC GATE

US Army Corps
of Engineers
Fort Worth District

STILL HOUSE HOLLOW LAKE — BELTON, TEXAS

STILLHOUSE HOLLOW LAKE

STILLHOUSE HOLLOW LAKE MASTER PLAN

DANA PEAK PARK PLATE

Feet
500 0 500 1,000

DATE:	MAP NO.
May 2021	SH20MP-0R-05

APPENDIX E – WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) REPORT

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WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) SUMMARY REPORT STILLHOUSE HOLLOW LAKE MASTER PLAN

BELL COUNTY, TEXAS

OCTOBER 2020

US Army Corps of Engineers®
Fort Worth District

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Table of Contents

INTRODUCTION

Habitat assessments were conducted at Stillhouse Hollow Lake on September 24th-28th, 2020 using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure [(WHAP) TPWD 1995]. WHAP survey points were haphazardly preselected based on aerial imagery from existing Geographical Information Systems (GIS) data and local knowledge of the area. A total of 81 WHAP points were surveyed, all within the U.S. Army Corps of Engineers (USACE) fee boundary (Figures 1, 2, and 3).

The purpose of this report is to describe wildlife habitat quality on USACE fee-owned property at Stillhouse Hollow Lake in Bell County, 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 2021 Stillhouse Hollow Lake Master Plan revision process.

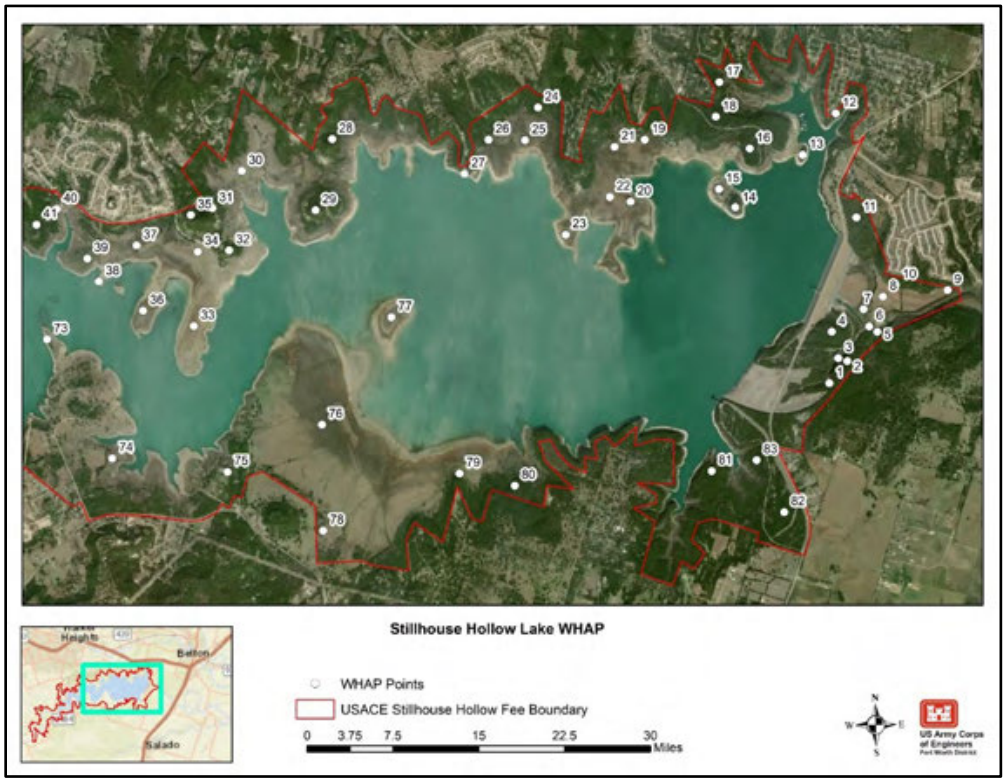

Figure 1. Distribution of WHAP Points - Stillhouse Hollow Lake

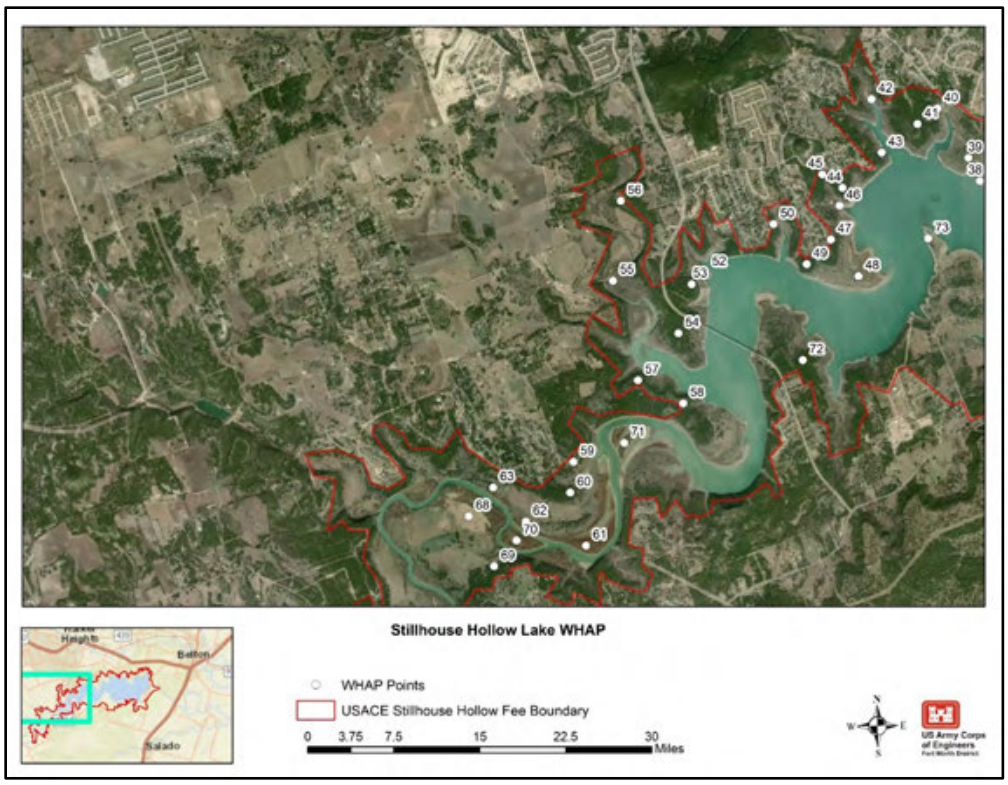

Figure 2. Distribution of WHAP Points - Stillhouse Hollow Lake

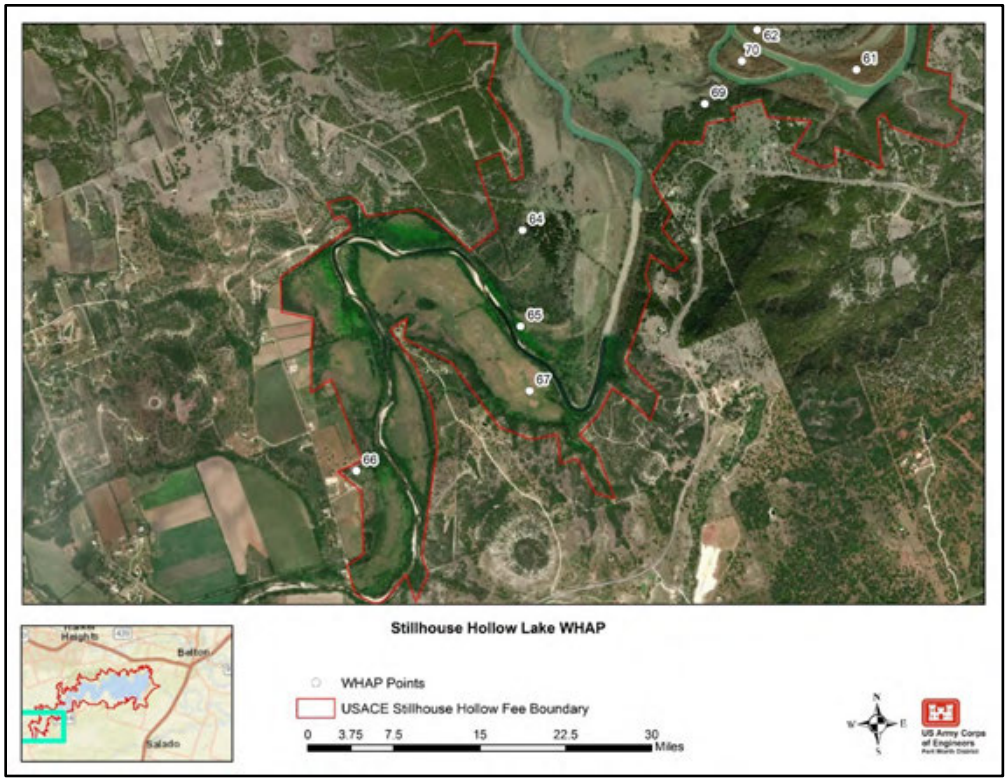

Figure 3. Distribution of WHAP Points - Stillhouse Hollow Lake

STUDY AREA

USACE fee owned property at Stillhouse Hollow Lake, approximately 15,230 acres, is located 5 miles southwest of Belton, Texas in Bell County. The dam was constructed on the Lampasas River, a tributary of the Little River which is a tributary to the Brazos River. The drainage area above the dam is 1,318 square miles.

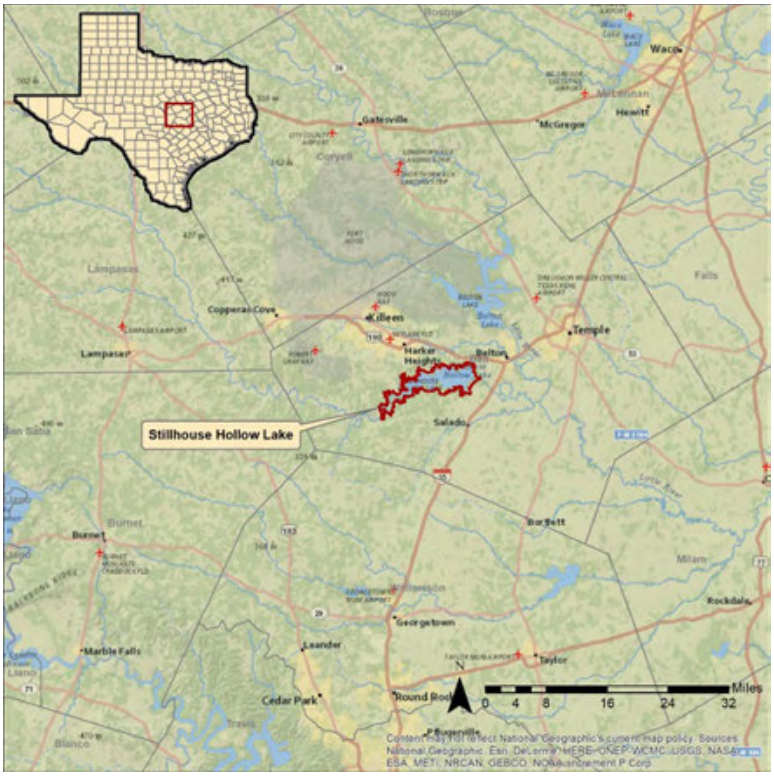

Figure 4. Stillhouse Hollow Lake Vicinity Map

METHODOLOGY

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

The WHAP requires evaluating representative sites of each cover type present within an area of interest. 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 and to complete the Biological Components Field Evaluation Form. 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 (cardinal directions) and are included as Attachment B.

The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for tracts of land statewide without imposing significant time requirements for field work and compilation of data (TPWD 1995). The WHAP is not designed to evaluate habitat quality in relation to specific wildlife species.

The WHAP is based on the following assumptions:

1. Vegetation structure including species composition and physiognomy is sufficient to define the habitat suitability for wildlife.
2. A positive relationship exists between vegetation diversity and wildlife species diversity.
3. Vegetation composition and primary productivity directly influence population densities of wildlife species.

As designed, the WHAP is intended to be used for the following applications:

1. Evaluating impacts upon wildlife populations from specific development project alternatives.
2. Establishing baseline data prior to anticipated or proposed changes in habitat conditions for specific areas.
3. Comparing tracts of land that are candidates for land acquisition or mitigation.
4. Evaluating general habitat quality and wildlife management potential for tracts of land over large geographical areas, including wildlife planning units.

The WHAP protocol can be used to assess a wide range of habitats; however, it was originally developed to assess and develop mitigation requirements for loss of bottomland hardwoods and other aquatic habitats. Scores can skew higher for these habitats based on how the scoring is allotted to each WHAP habitat component. Upland forest and grassland habitat types cannot reach a score indicative of high-quality habitat although they may exhibit high quality features. Subsequently, high quality upland habitat may not be identified or can be overlooked.

Grasslands, in particular, fall into this category. Consider the Site Potential component with a maximum score of 0.25 points, it allocates more points based on higher hydrologic connectivity. In order to receive the highest score for this component, the area must exhibit at least one of the following: at least periodically support predominately hydrophytic vegetation, is predominately undrained hydric soil and supports or is capable of supporting hydrophytic vegetation, and/or is saturated with water or covered by shallow water during 1-2 months during the growing season of each year. In a grassland setting, when conditions become conducive to hydrophytic

plant growth, a successional shift from a grassland to herbaceous wetlands, swamps, or riparian forest is likely to occur. Therefore, grasslands would almost always be limited to a maximum score of 0.12 points (uplands with thick surface layer).

Similarly, grasslands would be limited to a maximum of 0.12 points for the Temporal Development of Existing Successional Stage component, whereas other forested habitats could receive the full 0.25 points.

These two components alone regularly exclude grassland habitat from receiving 0.25 points on the WHAP scale. In order to identify the maximum score each habitat type can receive, USACE environmental staff scored each criterion given ideal conditions for riparian/bottomland hardwood forest (BHF), upland forest (includes all non-riparian/BHF forests), grassland, swamp, and marsh habitats. The maximum values scores, shown in Table 1, were then used to normalize scores for habitats that are prevented from reaching the maximum WHAP score primarily due to arbitrary low scores in the two WHAP components described above. Normalizing habitat scores will identify high quality habitat that would otherwise not be detected.

Table 1. Cover Types and Maximum Total Scores

Cover Type	Component Number								Maximum Total Score
	1	2	3	4	5	6	7	7B	
Riparian /BHF	25	20	20	15	5	5	5	5	1.00
Upland Forest	12	20	20	15	5	5	5	5	0.87
Grassland	12	12	20	0	4	1	5	5	0.59

Riparian/BHF habitats can achieve the maximum score, therefore, no normalization of scores were made for that habitat type. Upland forests and grasslands, however, can only reach within 0.13 and 0.41 points of the maximum WHAP score, even in ideal conditions.

To evaluate all habitat types on an even scoring basis, upland forest and grassland scores were normalized by dividing their original scores by the maximum possible score for their respective habitat types. For example, if a grassland site received an initial score of 0.42, it would be divided by the maximum total points a grassland site can receive, 0.59. The normalized total score used for further analysis for the grassland site would be 0.75.

This adjustment allows habitat type scores to be analyzed and compared to their corresponding habitat type maximum total score. Rather than, for instance, a grassland being evaluated on a bottomland hardwood scoring scale.

All WHAP scores analyzed and discussed from here forward reflect the normalized total scores. As mentioned above riparian/BHF habitat was not normalized because it

already can achieve the maximum score. Grassland scores were normalized by dividing initial scores by 0.59, while all upland forest scores were normalized by dividing the initial score by 0.87.

HABITAT

Using TPWD's Texas Ecological Mapping Systems (TPWD 2020), Stillhouse Hollow Lake lies within the Cross Timbers ecoregions. The most common habitat types include marsh, riparian/BHF, upland forest, and grassland (Elliot, 2014). Table 2 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

Table 2. Survey Points per Habitat Type

Habitat Type	Points Surveyed
Riparian/BHF	14
Upland Forest	47
Grassland	20
Total Points Surveyed	81

Elliot (2014) provided general habitat type descriptions and associated vegetation communities for the Ecological Systems Classification and Mapping Project in support of the Comprehensive Wildlife Conservation Strategy for the Texas Parks and Wildlife Department. These descriptions were meant to be broad and depict typical vegetative assemblages across vast areas as the observable vegetation communities can vary based on local conditions.

Early settlers found the Cross Timbers' woodlands thick and impenetrable. Dominated by post (*Quercus stellate*) and blackjack oak (*Quercus marilandica*), these woodlands were often cleared for farming. Those few remaining woodland tracts can contain trees reaching 200-500 years old. Today juniper (*Juniperus spp*.) and yaupon (*Ilex vomitoria*) are a more abundant component of the Cross Timbers, pockets of prairie are spread throughout agriculture, oil and gas, and urban use areas (TPWD, 2012A). The ecoregion is characterized by moderate but sporadic rainfall. Typical vegetation that can be found in the Cross Timbers include: post oa*k,* blackjack oak*,* black hickory *(Carya texana),* bitternut hickory *(Carya cordiformis),* dwarf chinkapin oak *(Quercus prinoides),* cedar elm *(Ulmus crassifolia)*, oak (*Quercus spp),* little bluestem, sumac *(Rhus spp),* eastern red cedar (*Juniperus virginiana* and honey mesquite (*Prosopis glandulosa).*

Figure 5 displays the distribution of habitat types within the USACE boundary at Stillhouse Hollow Lake. For analysis purposes, habitat types were pooled into one of four categories: marsh, riparian/BHF, upland forest, and grasslands.

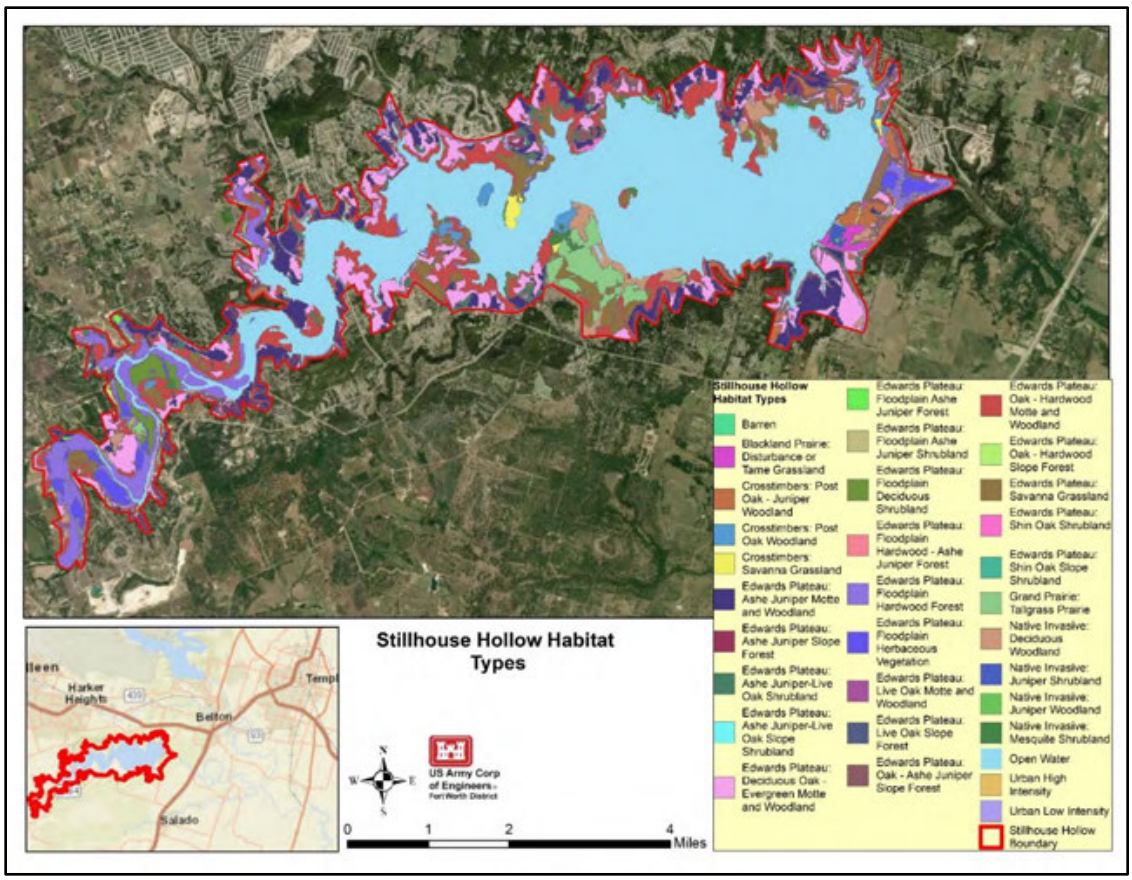

Figure 5. Distribution of Habitat Types - Stillhouse Lake

RESULTS AND DISCUSSION

The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. Data analysis highlights are discussed below, while detailed data for each point surveyed can be found in Attachment A: Stillhouse Hollow Lake WHAP Summary Results of this report.

Upland forest (47 sampled) and grassland (20 sampled) were the most abundant habitat types surveyed. Upland forest scores ranged from 0.54 to 0.72 while grassland scores ranged from 0.67 to 0.88. The lower minimum scores, especially for these normally drier upland habitats, may be partly due to long-term flooding that occurred at Stillhouse Hollow Lake in recent years, thus leading to reduced plant diversity. Flooding at lower elevations in the flood pool of Stillhouse Hollow Lake almost certainly led to mortality of the typically upland species of herbaceous plant growth. This certainly affected survey metrics within the inundated areas. Long-term flooding of federal lands is a routine occurrence at typical USACE lakes having a primary mission of flood risk reduction.

The average, maximum, and minimum total scores observed for each habitat type surveyed are shown in Table 3.

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

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Riparian/BHF	0.59	0.78	0.43
Upland Forest	0.54	0.72	0.34
Grassland	0.67	0.88	0.47

Figures 6 - 8 show the range of total scores for all points surveyed (81 sampled) as well as two points that were skipped due to inaccessibility or multiple points occurring in the same area. Skipped points show a total score of 0 in Figures 6 – 8. Overall, grassland and riparian/BHF habitats exhibited the highest average total score (0.67 and 0.59).

Riparian/BHF and upland forests are very similar in Average Total Scores (0.05 difference), therefore both are considered equal in value. One possible reason to why grasslands scoring higher is that some sites received the maximum value for Site Potential while riparian/BHF sites did not.

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

Table 4. Average Site Potential, Successional Stage, and Uniqueness and Relative Abundance Scores per Habitat Type

Habitat Type	Average Site Potential	Average Successional Stage	Average Uniqueness and Relative Abundance
Riparian/BHF	19.07	10.64	10.36
Upland Forest	8.66	8.30	8.11
Grassland	9.60	5.00	7.00

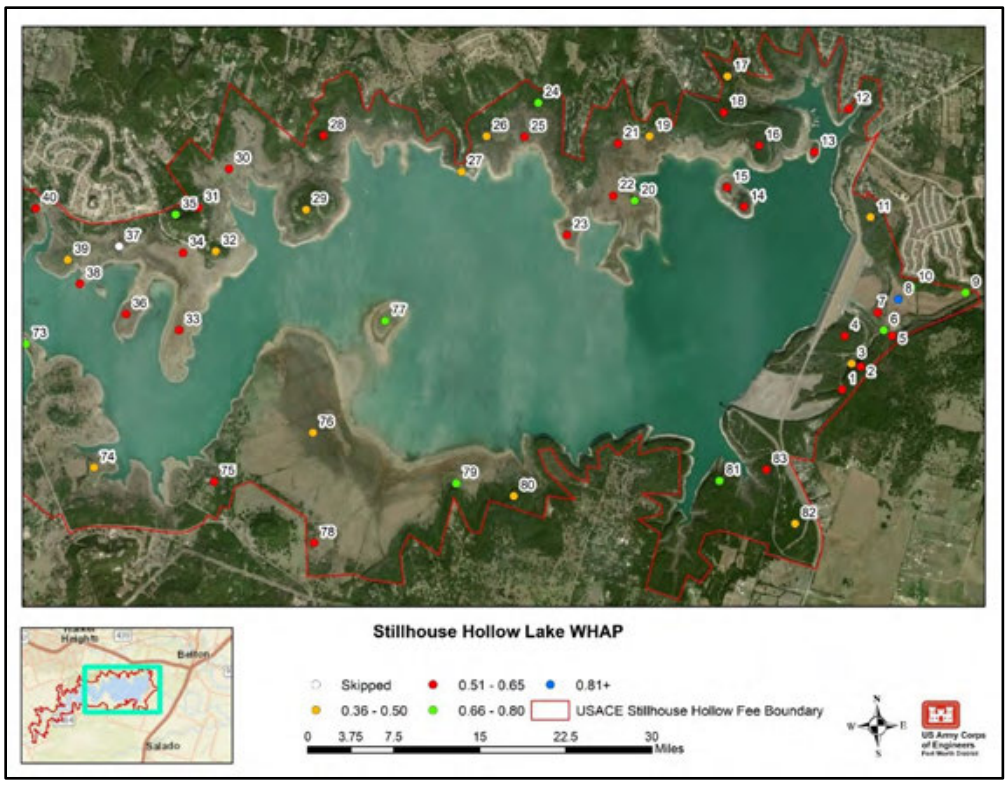

Figure 6. Total Score Range for All Points Surveyed on the Eastern Boundary of Stillhouse Hollow Lake

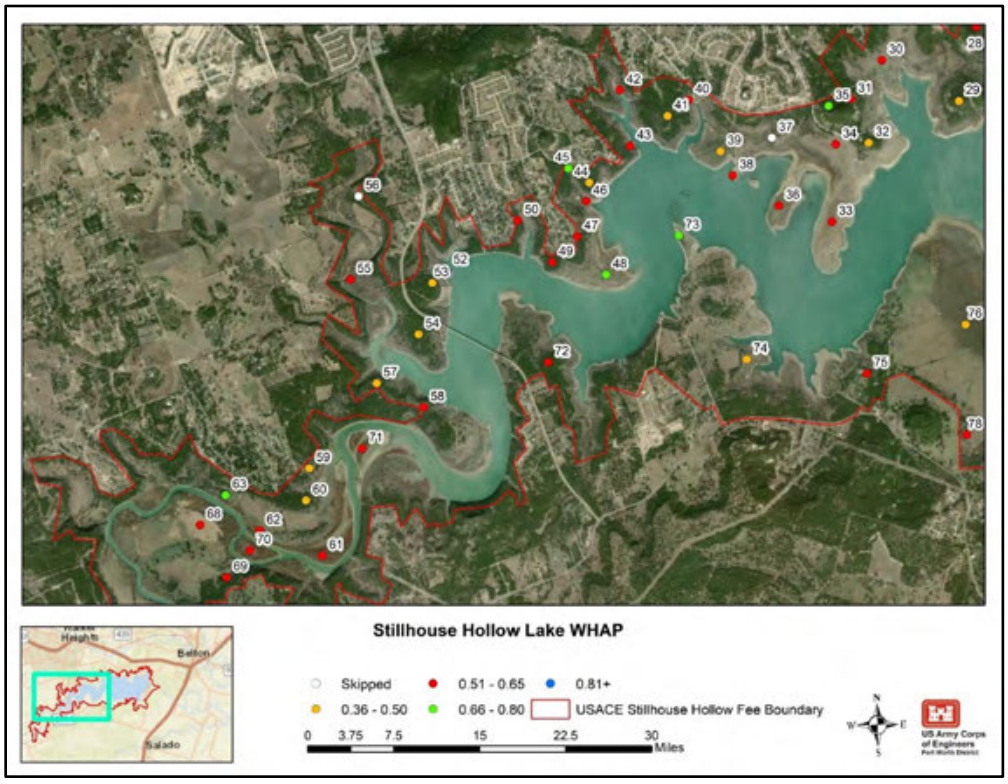

Figure 7. Total Score Range for All Points Surveyed within the Center of Stillhouse Hollow Lake

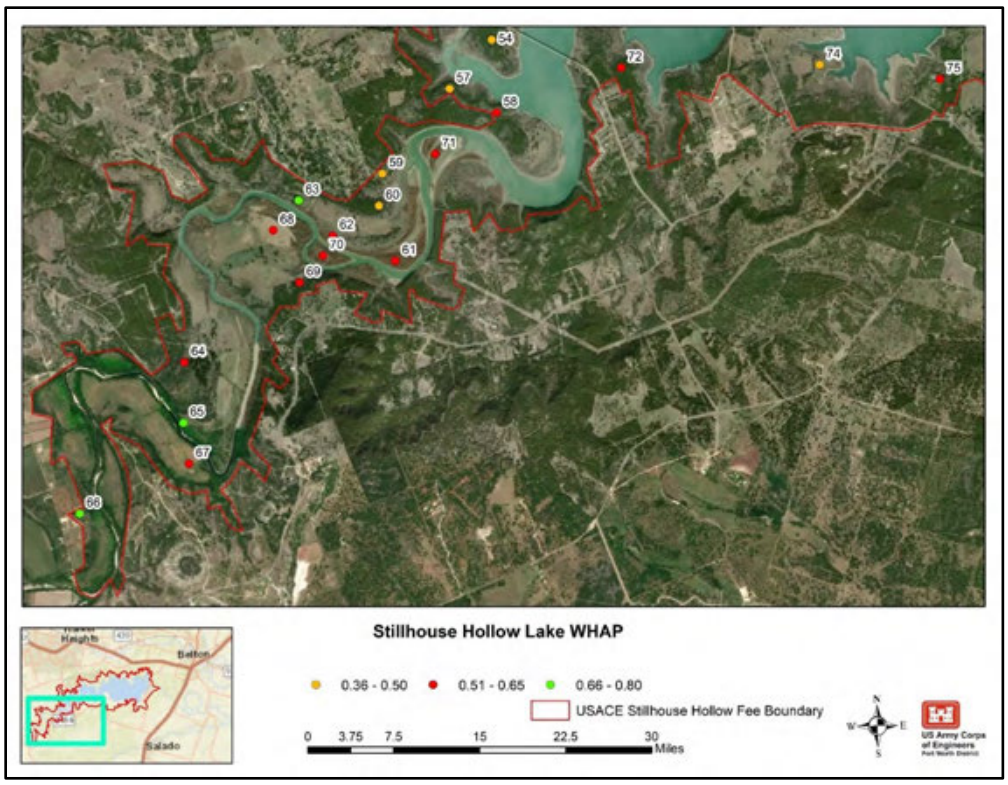

Figure 8. Total Score Range for All Points Surveyed on the Western Boundary of Stillhouse Hollow Lake

Site potential allocates more points based on soil substrates characteristics and hydrologic connectivity that can support hydrophytic habitats, such as marshes, swamps, and bottomland hardwood forests that are often considered to be of higher quality and 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 and climax prairies score higher than younger pole stands or disturbed grasslands because they provide more diverse forage, cover, and niche habitats. These scores are expected to increase across the habitats, except in areas that may not have the soil types to support hydrophytic vegetation or are flooded frequently enough to limit upland forest or grassland growth and development.

Uniqueness and Relative Abundance takes into consideration the rarity of a habitat or vegetative community and its abundance in the region. Stillhouse Hollow Lake's close proximity to Waco and Ft. Hood has resulted in urban expansion that has significantly influenced the region's remaining habitat composition. This expansion will continue in the future, resulting in few large, contiguous patches of habitat remaining in the region. Presently, only one site was identified as having the most unique and rare habitats, land south of Rosaline Drive in Belton, Texas (Figure 9). As a result of increasing loss of native

habitats in the region, the habitat at Stillhouse Hollow Lake will increase in overall wildlife value and uniqueness.

In total, two points (52, and 8) surveyed received a score over 0.80, indicating high quality habitat in comparison to all the other points (Figure 10). Both points are grassland habitat with maximum scores for the site potential criterion. A comparison of Figures 6 - 8 “WHAP Total Scores” to Figures 11 and 12 (sites with maximum site potential criterion scores), revealed three areas identified as having the greatest potential for improvement. These areas can be found around Tahuaya Drive in Harker Heights, in Dana Peak Park, and in between the Narrow Neighborhood and Stillhouse Park.

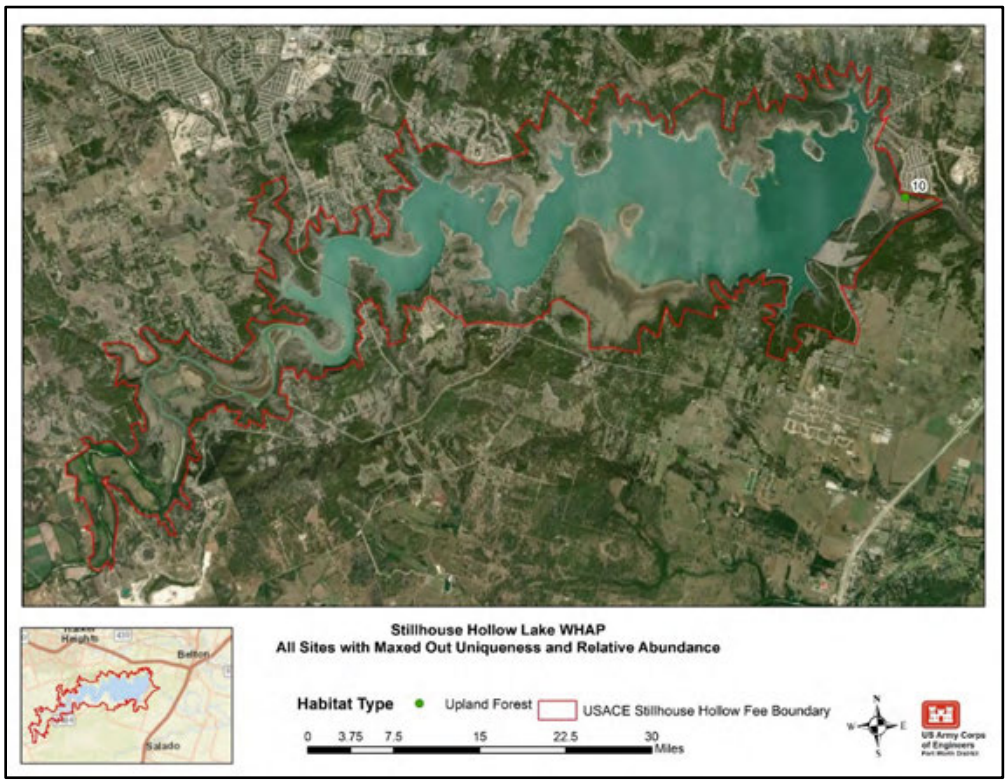

Figure 9. All Sites with Maxed Out Uniqueness and Relative Abundance

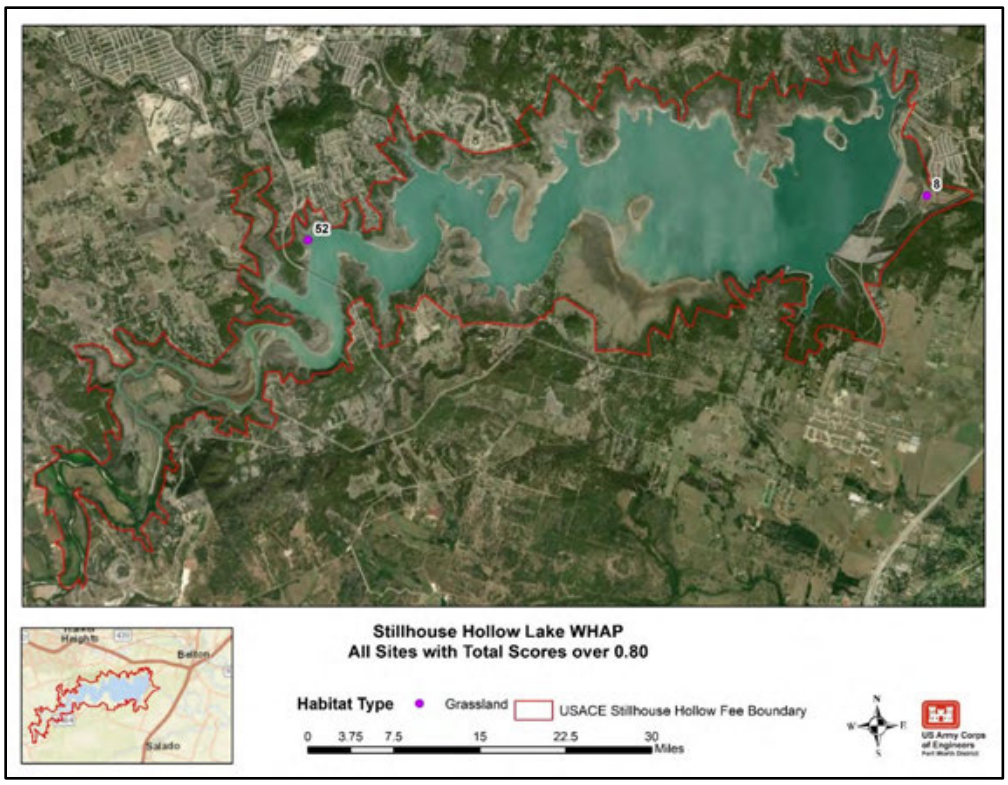

Figure 10. All Sites with Total Scores over 0.80

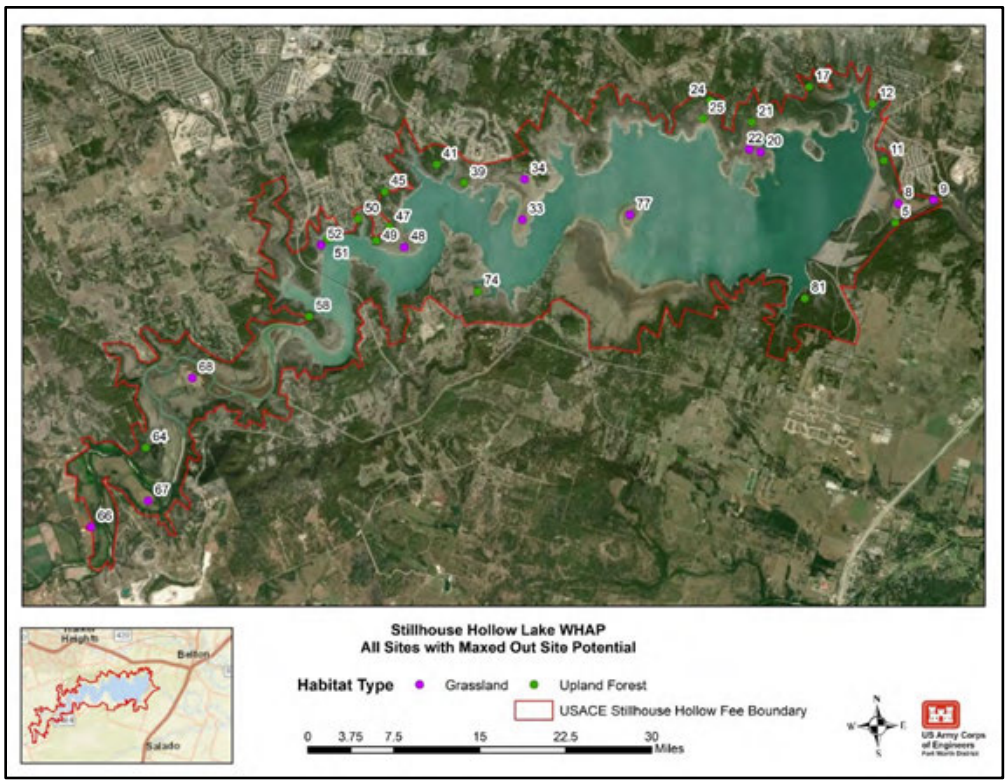

Figure 11. All Sites with Maxed Out Site Potential

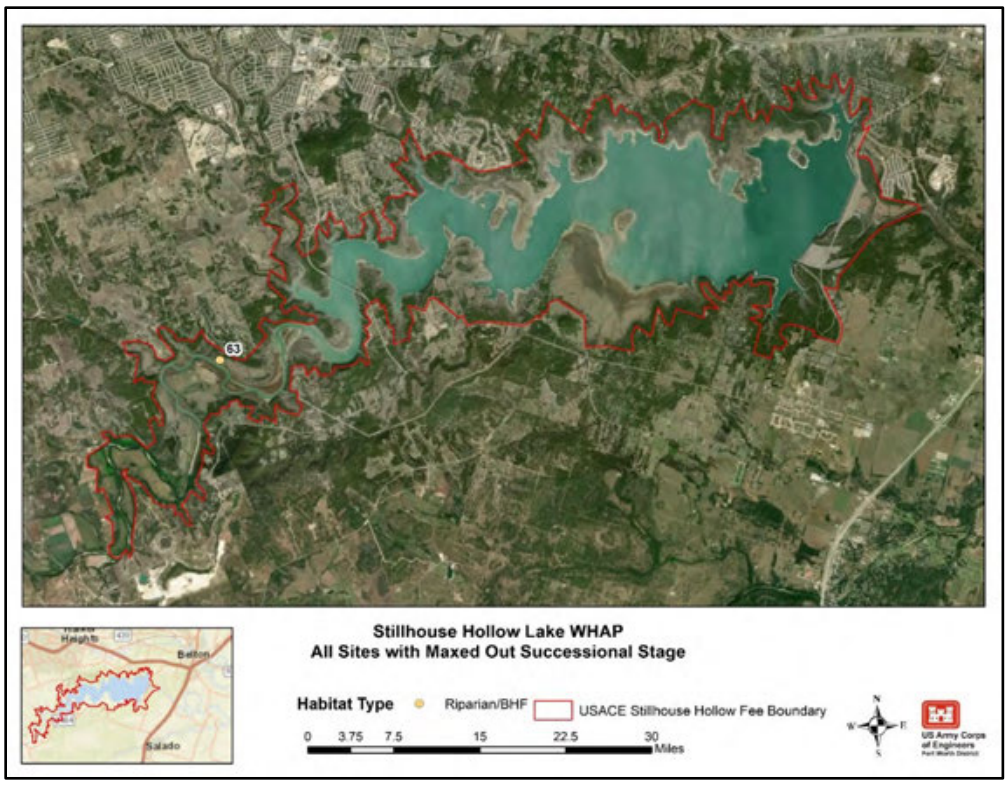

Figure 1. All Sites with Maxed Out Successional Stage

RECOMMENDATIONS

Even with planned and unplanned disturbances, there are numerous areas of valuable wildlife habitat remaining on USACE fee owned property at Stillhouse Hollow Lake. Overall, habitat management has proven effective in maintaining medium- to high-quality wildlife habitat on USACE lands at Stillhouse Hollow Lake.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas with highest maximum scores. The planning team for the Stillhouse Hollow Lake Master Plan revision will consider the WHAP scores when making land classification decision.

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Attachment A: Stillhouse Hollow Lake WHAP Results Summary

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
1	0.6	Upland Forest	Privet, Smilax, Persimmon, Mustang Grape	Eastern Redbud	Oak Spec, Ash, Red Oak	Walnut	NA	Ashe Juniper,	NA	Prickly Pear	Boneset, Buffalo Grass, Beggarslice	NA
2	0.55	Upland Forest	Privet, Sawtooth Hackberry, Flameleaf Sumac	Eastern Redbud	Red Oak	NA	Ash specs., Texas Ash	Ashe Juniper	NA	Prickly Pear, Yucca	Boneset	Prime Golden Cheek Warbler
3	0.44	Upland Forest	Persimmon,	NA	Oak Spec., Red Oak	NA	Cedar Elm	Ashe Juniper	NA	Prickly Pear,	Buffalo Grass, Beggarslice, Croton	NA
4	0.6	Upland Forest	Texas Persimmon, Smilax, Chinaberry	Acacia	Lacey Oak, Oak spec	Walnut	Cedar Elm	Ashe Juniper	NA	Yucca, Prickly Pear,Ball Moss	Buffalo Grass, Croton, Thickweed, Ironweed, Mexican Hat	NA
5	0.63	Upland Forest	Wild Plum, Poison Ivy, Unknown Ivy, Smilax, Privet, Chinese Tallow	NA	White Oak, Bur Oak	NA	Cedar Elm	Ashe Juniper	Sycamore	Ball Moss	Inland Seaoats, Virginia Creeper, Goldenrod, Carolina Wild Petunia	Trails throughout
6	0.66	Riparian/ BHF	Hackberry, Poison Ivy, Mustang Grape, Virginia Creeper, Dewberry,	NA	NA	NA	Cedar Elm, Box Elder	Ashe Juniper	Sycamore	NA	Inland Seaoats, Dandelion, Frost Weed, Virginia Wildrye	NA
7	0.64	Riparian/ BHF	Persimmon, Smilax, Poison Ivy	NA	NA	NA	Box Elder, Texas Ash	Ashe Juniper	NA	NA	Virginia Wildrye, Ironweed, Turkscap, Inland Seaoats	a lot of ash Box Elder
8	0.81	Grassland	Persimmon,	Honey Locust	NA	NA	Texas Ash	Ashe Juniper	Baccharis	NA	Goldenrod, Stinging Nettle, Silverleaf Nightshade, Johnson Grass, Silver Bluestem, King Ranch Bluestem, Virginia Wildyre, Mexican Hat	Johnson Grass & Willow Baccharis taking over
9	0.73	Grassland	Dewberry	Honey Locust	NA	NA	NA	Ashe Juniper	Baccharis	NA	Tall Grama, Mexican Hat, Silver Bluestem, Johnson Grass, Gayfeather, Bee Balm, Dove Weed, Milkweed, Indian Grass, Silverleaf Nightshade, King Ranch Bluestem,	former hayfield, red ant mounds
10	0.71	Upland Forest	Hackberry, Privet, Persimmon, Agarita	NA	NA	Live Oak, Black Walnut	Cedar Elm	Ashe Juniper	NA	Prickly Pear Cactus, Lichen	Virginia Wildrye	NA
11	0.47	Upland Forest	Smilax, Poison Ivy, Flameleaf Sumac	NA	Live Oak	NA	Ash	Ashe Juniper	NA	Prickly Pear	Buffalo Grass, Dove Weed, Beggarslice, Giant Wildrye	NA
12	0.59	Upland Forest	Grapevine, Mulberry, Smilax, Agarita, Glossy Privet, Texas Persimmon	Sensitive Pea,	Live Oak, Bigelow Oak	NA	Green Ash	NA	NA	Prickly Pear Cactus, Yucca	Carex spec., Scribners Panicum, Little Bluestem, Helioma	NA
13	0.55	Upland Forest	Chinaberry, Persimmon, Chinese Tallow, Agarita	NA	Bigelow Oak	NA	Green Ash	Ashe Juniper	NA	Prickly Pear Cactus, Yucca	Oneseed Croton, Lantana, Buffalo Grass, Beggarslice, Sticktight, Canadian Wildrye, Threeseed Croton, Scribner Panicum, Japanese Brome, Milkweed	Overgrazing from deer, a lot of buckrubs
14	0.57	Upland Forest	Mexican Persimmon, Agarita, Mexican Buckeye	NA	Bigelow Oak, Live Oak	NA	Green Ash	Ashe Juniper	NA	Prickly Pear Cactus,	Lantana, Carex spec., Morning Glory, Noseburn, unknown	NA
15	0.59	Grassland	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Salvia Spec., Scribners Panicum, Queens Delight, Japanese Brome, Mexican Hat, One Seed Croton, Beggarslice, Threeawn, Malvaceae, Deer Grass, 2 unknown , Virginia Wildrye,	Trail through the middle

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
16	0.61	Upland Forest	Smilax, Agarita, Poison Ivy	Trailing Lespedeza,	Live Oak, Bastard Oak	NA	Texas Ash, Cedar Elm	Ashe Juniper	NA	Prickly Pear Cactus	Cordgrass, Sedge, Three Way Sedge, Yellow Wood Sorrel	NA
17	0.44	Upland Forest	Smilax, Privet, Masten Grape, Agarita, Poison Ivy, Elbow Bush	NA	Live Oak	NA	Ash, Elm	Ashe Juniper	NA	NA	Carex, Heavenly Bamboo	unauthorized road, thick leaf litter
18	0.59	Upland Forest	Texas Persimmon, Hackberry, Smilax, Agarita	Trailing Lespedeza	Live Oak	NA	Texas Ash	Ashe Juniper	NA	Prickly Pear, Pale Yucca, Twisted Leaf Yucca	Cordgrass, Sedge, Threeway Sedge	NA
19	0.48	Upland Forest	Chinaberry, Mustang Grape, Southern Dewberry, Smilax	NA	Live Oak	NA	Cedar Elm	Juniper,	Willow Baccharis	Buttonbush, Prickly Pear Cactus	Mexican Hat, Dropseed, Indian Mallow, Threeawn,Barley	NA
20	0.69	Grassland	Southern Dewberry, Smilax x2	NA	NA	NA	NA	NA	NA	Buttonbush	Mexican Hat, Frogfruit, Prairie Verbena, Narrow Leaf Marsh Elder, Texas Barley, Snow on the Mountain, Brome, unknown grass, Threeseed Croton, Wild Tartan	NA
21	0.56	Upland Forest	Chinaberry, Southern Dewberry, Mustang Grape, Smilax,	NA	NA	NA	Cedar Elm, American Elm	Juniper	NA	Buttonbush, Prickly Pear Cactus	Texas Boney, Johnson Grass	NA
22	0.64	Grassland	Southern Dewberry	NA	NA	NA	NA	NA	NA	Buttonbush	Mexican Hat, Croton, Narrowleaf Marsh Elder, Silver Bluestem,Horsemint, King Ranch Bluestem, Common Plantain, Frogfruit, Texas Barley, Milkweed	NA
23	0.59	Riparian/ BHF	NA	NA	NA	NA	NA	NA	NA	Buttonbush	Frogfruit, Heller's Rosette Grass, Fleabane, Milkweed, Switchgrass, Bermuda Grass, Boneset, unknown grass,	incredibly thick brush
24	0.68	Upland Forest	Chinaberry, American Beauty Berry, Sugarberry, Rattanvine, Mustang Grape,Southern Dewberry, Smilax, Possum Haw Holly,	NA	Live Oak	NA	Cedar Elm	Juniper	NA	NA	Poison Oak, Croton, Threeawn, King Ranch Bluestem, Beggarslice	NA
25	0.63	Upland Forest	Chinaberry, American Beauty Berry, Southern Dewberry, Sugarberry, Mustang Grape, Virginia Creeper, Texas Persimmon, Chinese Tallow, Gum	NA	Live Oak	NA	NA	NA	NA	NA	Mullein, Sage,	NA
26	0.4	Upland Forest	NA	NA	Live Oak	NA	Fragrant Sumac	Ashe Juniper	NA	Prickly Pear Cactus	Oldfield Threeawn, Heller's Rosette Grass	NA
27	0.43	Riparian/ BHF	Flameleaf Sumac, Mustang Grape, Dewberry, Smilax	NA	Live Oak	NA	NA	NA	Willow Baccharis	Buttonbush	Threeseed Croton, Snap Dragon, Frogfruit, unknown grass, Heller's Rosette Grass, Canada Germander	NA
28	0.53	Upland Forest	Smilax, Poison Ivy, Mustang Grape, Blackhaw	NA	Buckley Oak	NA	Texas Ash, Elm	Ashe Juniper	NA	Twist Leaf Yucca	Carex	Possible Golden Cheek Warbler habitat
29	0.43	Upland Forest	Agarita	NA	Red Oak	NA	NA	Ashe Juniper	NA	Twist Leaf Yucca, Prickly Pear	Carex, Mountain Laurel, Heller's Rosette Grass,	NA

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
30	0.63	Grassland	Persimmon	NA	Live Oak	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Mexican Hat, Curly Cup Gumweed, Wildrye, Brome, Penny Royal, Sedge, Cordgrass, Cordgrass, Frogfruit	NA
31	0.61	Grassland	Smilax	Twoleaf Senna	NA	NA	NA	Ashe Juniper, Salt Cedar	NA	Buttonbush, Prickly Pear Cactus	Mexican Hat, Cordgrass, Milkweed, Brome, Queens Delight, Croton, Frogfruit, Rabbit Tobacco, American Germander, Sida, Broomweed	NA
32	0.43	Upland Forest	Agarita	NA	NA	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Miniture Barrel Cactus	Little Bluestem, Cordgrass, King Ranch Bluestem, Rockflax, Wiregrass, Scarlet Bee Blossom	NA
33	0.59	Grassland	NA	NA	NA	NA	NA	NA	NA	NA	Croton, Tall Boneset, Late Boneset, False Vervain, Snow on the Prairie, Mexican Hat, Brome, Thistle, King Ranch Bluestem, Frogfruit	NA
34	0.63	Grassland	NA	NA	NA	NA	NA	Ashe Juniper	NA	NA	Little Bluestem, Croton Spec., Brome Spec. Mexican Hat, Wildrye, Frog Fruit, Ragweed, Cordgrass, Indian Grass	NA
35	0.7	Upland Forest	Texas Persimmon, Agarita, Mexican Buckeye, Coral Berry, Hackberry, Muscadine Grape, Poison Ivy, Ground Ivy	Deer Pea	Live Oak, Bigelow, Red Oak	NA	Green Ash	Ashe Juniper	NA	Prickly Pear Cactus, Yucca Spec	Carex spec. Panicum spec., Noseburn, Aster Spec.,	High Density Recreation, But great habitat potential, Golden Cheek Warbler habitat
36	0.53	Riparian/ BHF	Chinese Tallow	NA	NA	NA	NA	NA	NA	NA	Maximillian Sunflower, Mexican Hat, Snow on the Prairie, Virginia Wildrye, Boneset, Johnson Grass, Sedge	NA
37	0	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
38	0.51	Riparian/ BHF	Chinese Tallow, Peppervine	NA	NA	NA	NA	NA	NA	NA	Nut Sedge, Marsh Fleabane, Switchgrass, Frogfruit, unknown	NA
39	0.48	Upland Forest	Chinese Tallow	NA	NA	NA	NA	Ashe Juniper	Baccharis	Buttonbush	Snow on the Prairie, Indian Grass, Threeseed Croton, Panicum, Brome, King Ranch Bluestem, Texas Aster, Mexican Hat, Germander, Silver Bluestem, Snap Dragon, Lamb's Ear, Carex Spec., Pasture Heliotrope, Boneset	lots of Buttonbush
40	0.55	Riparian/ BHF	NA	NA	NA	NA	NA	NA	NA	Buttonbush	Snow on the Prairie, Spurge	NA
41	0.49	Upland Forest	Persimmon, Hackberry, Privet, Agrita, Smilax	NA	NA	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus	Milkweed, Dove Weed, Buffalo Grass, Mexican Hat, Grama Spec., Texas Grama, King Ranch Bluestem	NA
42	0.52	Upland Forest	Smilax, Japanese Brome, Vine	NA	Live Oak, Scrub Oak	NA	Sumac, Cedar Elm	Ashe Juniper	Baccharis	Buttonbush	Silver Bluestem, King Ranch Bluestem, Little Bluestem, One Seed Croton, Aster, Snap Dragon, Pasture Heliotrope, Western Ragweed, Mexican Hat, Frogfruit, Sensitive Briar, Panicum Spec.,	NA

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
43	0.52	Upland Forest	Chinese Tallow, Smilax, Possomhaw, Dewberry, Chinaberry, Gum Bumelia	Sensitive Pea,	Live Oak	NA	NA	Ashe Juniper	Baccharis	Buttonbush	Lantana, Aster spec., Mexican Hat, Beggarslice, Brome, One Seed Croton, Threeseed Croton, Little Bluestem, Western Ragweed, Canadian Ragweed, Virginia Wildrye, Snap Dragon, Bee Balm	NA
44	0.41	Upland Forest	NA	Sensitive Pea,	Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Yucca	Carex spec. x 2, Scribner's Panicum, unknown, Penny Royal, Noseburn	juniper thicket, very sever utilization, deer bones
45	0.67	Upland Forest	Smilax spec., Muscadine Grape, Possumhaw, Texas Persimmon, Japenese Privet	Necklace Pod	Live Oak	NA	Cedar Elm	Ashe Juniper	NA	NA	Boneset, Snow on the Prairie, Bluestem, Unknown	Evidence of invasive species from yard trimming
46	0.58	Riparian/ BHF	Chinese Tallow	NA	NA	NA	NA	NA	NA	Willow Buttonbush	Snakeroot, Marsh Fleabane, Camphorweed, Virginia Wildrye, Frogfruit, Aster spec.,	lots of tallow & dead zebra mussels
47	0.6	Upland Forest	Possumhaw, Agarita, Lantana, Smilax Spex.	Texas Mesquite	NA	NA	Cedar Elm, American Elm	Ashe Juniper	Baccharis ,	NA	Scribner's Panicum, Antelope-horns Mexican Hat, Little Bluestem, Switchgrass, Yellow Indian Grass, Queen's Delight, King Ranch Bluestem, Threeseed Croton, Japanese Brome	NA
48	0.78	Grassland	Chinese Tallow, Mustang Grape, Smilax	NA	NA	NA	NA	NA	Baccharis	Buttonbush	Aster Spec., Johnson Grass, Mexican Hat, Canadian Germander, Western Ragweed, Frogfruit, One Seed Croton, Marsh Fleabane, Scribner's Panicum, Low Mercury, Japanese Brome, Virginia Wildrye	large rock wall nearby
49	0.61	Upland Forest	Texas Persimmon, Lantana	NA	Live Oak,	NA	Cedar Elm	Ashe Juniper	Baccharis Spec.,	Prickly Pear	Snow on the Prairie, Virginia Wildrye, Japenese Brome, Mexican Hat, Indian Blanket, Boneset, Johnson Grass, Noseburn, Plantain	NA
50	0.63	Upland Forest	Persimmon, Smilax, Yaupon, Agarita,	NA	Live Oak,	NA	NA	Ashe Juniper	NA	NA	2 unknowns, Scribner's Panicum	NA
51	0.57	Upland Forest	Lilac Chaste Tree, Chinaberry, Mustang Grape, Dewberry, Smilax, Texas Persimmon, Agarita	Mountain Laurel	NA	NA	Cedar Elm, Post Cedar	Juniper	NA	Prickly Pear Cactus, Buttonbush	Horehound, Threeseed Croton, Johnson Grass, Mexican Hat, Bee Balm, Canadian Wildrye, Virginia Wildyre, One Seed Croton, Noseburn, Verbina, Muleins, Beggarslice, Germander, Japanese Brome	deer beds,large Chinaberry, animal burrows
52	0.88	Grassland	Smilax, Chinaberry, American Persimmon, Possomhaw, Grapevine	NA	NA	NA	Cedar Elm, Winged Elm	NA	Baccharis	Buttonbush, Prickly Pear Cactus	Canadian Wildrye, Mexican Hat, Silverleaf Nightshade, Croton, Purple Thistle, Barley, Lamb's Ear, unknown grass	a lot of bedding
53	0.43	Upland Forest	NA	Catclaw Acacia	Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus,	Dove Weed, Oldfield Threeawn, Fall Whichgrass, Panicum	NA
54	0.44	Upland Forest	NA	Japanese Clover	Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Yucca	Sensitve Briar, Vetch, Fleabane, Cordgrass, Trailing Lespedeza	NA
55	0.52	Upland Forest	Chinaberry, Persimmon, Smilax	NA	NA	NA	Cedar Elm	NA	NA	Buttonbush, Prickly Pear Cactus	American Germander, Wildrye, Mexican Hat, Beggarslice, Brome, Ragweed, Croton	NA
56	0	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
57	0.48	Upland Forest	NA	NA	Live Oak, Southern Red Oak, Willow Oak	NA	Green Ash	Ashe Juniper	NA	Prickly Pear, Yucca	Bluestem, Queen's Delight, Croton, Sensitive Briar, Penny Royal, Carex Spec, Noseburn	Potential Golden Cheeck Warbler Habitat
58	0.61	Upland Forest	Agarita, Texas Persimmon, Gum Bumelia	NA	NA	NA	Cedar Elm	Ashe Juniper	NA	Prickly Pear Cactus, Yucca, Desert Rose Cactus	Threeseed Croton, Boneset, Japanese Brome, Beggarslice, Skullcap, Virginia Wildrye, Threeawn, unknown spec.,	NA
59	0.45	Upland Forest	Possumhaw Holly, Texas Persimmon, Agarita,	Honey Locust	Bigelow Oak, Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Yucca, Barrel Cactus	Cordgrass, Texas Lanatana, Threeseed Croton, 2 unknown grasses	NA
60	0.47	Upland Forest	Possumhaw Holly,	NA	Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Yucca	Brome	Normal Cedar thicket
61	0.56	Riparian/ BHF	Chinese Tallow	NA	NA	NA	NA	NA	NA	Black Willow	Smartweed, Wildrye, Sedge, Boneset, American Germander	NA
62	0.56	Riparian/ BHF	Chinese Tallow	NA	NA	NA	NA	NA	NA	Black Willow	Smartweed, Wildrye, Sedge, Boneset, American Germander	NA
63	0.78	Riparian/ BHF	Chinaberry, Muscadine Grape, Smilax, Persimmon, Texas Buckeye	NA	Live Oak	Pecan	Ash, Elm	Ashe Juniper	NA	NA	Virginia Wildrye, American Germander, Mexican Hat, Brome, Threeseed Croton	NA
64	0.63	Upland Forest	Persimmon, Agarita	NA	NA	NA	Cedar Elm	Ashe Juniper		Prickly Pear Cactus	Texas Vervain, Seep Muhly, Croton, Brome, Cordgrass, Mexican Hat, Sedge, Beggarslice, Virginia Wildrye	NA
65	0.66	Riparian/ BHF	Mustang Grape, Smilax	NA	NA	NA	Cedar Elm, Box Elder	NA	NA	NA	Virginia Wildrye, Seep Muhly, Penny Royal, Sedge, Mexican Hat, Wiregrass, Vervain, Croton	NA
66	0.73	Grassland	Muscadine Grape, Chinaberry, unknown vine	Mesquite	NA	Pecan	Box Elder, Cedar Elm	NA	NA	Prickly Pear, Buttonbush	Dove Weed, Johnson Grass, Threeseed Croton, Silverleaf Nightshade, Mexican Hat, 2 unknown grass, Brome, Texas Barley, Thistle	NA
67	0.61	Grassland	NA	NA	NA	NA	NA	NA	NA	NA	Johnson Grass, Silverleaf Nightshade, Kingranch Bluestem, Wildrye, Mexican Hat, Common Mullein	NA
68	0.63	Grassland	Chinese Tallow	NA	NA	NA	NA	NA	NA	NA	Wildrye, Boneset, Thistle, Coastal Bermuda, Wooley Croton, Johnson Grass, Threeseed Croton	NA
69	0.6	Upland Forest	Chinese Tallow, Texas Persimmon, unknown grape	Catclaw	Live Oak, Texas Red Oak	NA	Green Ash, Cedar Elm, Winged Elm	Ashe Juniper, Eastern Red Cedar	NA	Prickly Pear	Smilax, Beggarslice, Wildrye, Cordgrass, Poison Oak, Carolina Snailseed, Threeawn	NA

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
70	0.58	Riparian/ BHF	Chinese Tallow	NA	NA	NA	NA	NA	NA	Black Willow	Smartweed, Wildrye, Sedge, Boneset, American Germander	NA
71	0.56	Riparian/ BHF	NA	NA	NA	NA	Box Elder	NA	Willow Baccharis	Buttonbush	Boneset, Virginia Wildrye, Poison Oak, Fleabane, Smartweed, unknown spec., Morning Glory	NA
72	0.63	Upland Forest	Texas Persimmon, Stretch Berry, Poison Ivy, Smilax	Trailing Lespedeza, Japanese Clover	Live Oak	NA	Texas Ash, Cedar Elm	Ashe Juniper	NA	Prickly Pear, Yucca	Cordgrass, Smilax, Poison Oak, Beggarslice	NA
73	0.78	Grassland	Texas Persimmon	Japanese Clover	Live Oak	NA	NA	Ashe Juniper	NA	Prickly Pear, Buttonbush	Lantana spec., Mexican Hat, Ragweed, Gumweed, Saltgrass, Brome, Croton, Milkweed, Lambs Ear, Silver Blue Stem, Switchgrass, Wildrye, Cordgrass, Indian Mallow	NA
74	0.45	Upland Forest	NA	NA	Live Oak	NA	Cedar Elm	NA	NA	Buttonbush	Oneseed Croton, Threeseed Croton,, Snow on the Prairie, Boneset, Brome, 4 species of grass, Mexican Hat	NA
75	0.54	Grassland	Summer Grape,	Black Senna,	Live Oak	NA	NA	Salt Cedar, Ashe Juniper,	NA	Buttonbush	Cordgrass, Beggarslice, Flat Sedge, Prairie Clover, Frogfruit, White Tridens, Parsley, Yellow Wood Sorrel, Snapdragon	NA
76	0.47	Grassland	NA	NA	NA	NA	NA	NA	NA	NA	Sedge spec., Texas Boney, Snow on the Mountain, Western Ragweed, Horse Mint, Horse Mint, Slender Hedeoma, Mexican Hat, Knotroot Bristlegrass, Penny Royal, Fleabane	NA
77	0.76	Grassland	Smilax spec.,	NA	NA	NA	NA	NA	NA	NA	Mexican Hat, Mexican Blanket Flower, Japense Brome, Virginia Wildrye, Maximillian Sunflower, Lamb's Ear, Frogfruit, Texas Aster, Carex spec., 4 unknown grasses	Dominated by Mexican Hat
78	0.64	Grassland	Gum Bumelia	Mesquite	NA	NA	NA	Ashe Juniper	NA	NA	Bull Nettle, King Ranch Bluestem, Yellow Indian Grass, Texas Croton	NA

Point Number	Final Score	Habitat Type	Berry Drupe	LegumePod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes
79	0.73	Grassland	Possumhaw Holly, Smilax, Southern Dewberry, Gum Bumelia	Mesquite, Sensitive Briar	NA	Pecan	NA	Juniper Spec.,	Willow Baccharis	Buttonbush	Little Bluestem, Prairie Verbena, Boneset, Penny Royal,	NA
80	0.4	Upland Forest	NA	NA	NA	NA	NA	Ashe Juniper	NA	Prickly Pear, Rainbow Cactus	unknown grass, Fleabane, Milkweed	Golden Cheeked Warbler habitat
81	0.72	Upland Forest	Poison Ivy, Black Gum, Texas Persimmon, Chinaberry	Three Flower Tickfoil	Bigelow Oak	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus, Yucca Spec.,	Penny Royal, Carex Spec., Beggarslice Panicum Spec., Unknown	Prime Golden Cheeked Warbler Habitat, Large Ashe Juniper 50/50 mix of oak&juniper
82	0.34	Upland Forest	NA	NA	NA	NA	NA	Ashe Juniper	NA	Prickly Pear Cactus	Dove Weed, Croton spec., Mosquito Grass	Mostly juniper
83	0.51	Upland Forest	Persimmon, 2 species of Hackberry, Poison Ivy, Smilax, Gum Bumelia	NA	NA	Live Oak	Velvet Ash	Ashe Juniper	NA	Prickly Pear Cactus	Dove Weed, Buffalo Grass	NA

Attachment B: Stillhouse Hollow Lake WHAP Point Photographs

Photographs are contained in the full WHAP, available upon request through the Stillhouse Project Office

APPENDIX F – SEAPLANE POLICY

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CESWF-OD-R

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.

Dwight L. Quarles

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	
AQUILLA LAKE 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.	**JIM CHAPMAN LAKE - COOPER DAM** 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.
BARDWELL LAKE Landings and takeoffs are prohibited north of Highway 34 and in all coves off the main body of the lake.	**GRANGER LAKE** 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.
BELTON LAKE 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.	**JOE POOL LAKE** Landings and takeoffs are prohibited in all lake areas west of the Lakeridge Parkway bridges.
BENBROOK LAKE 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.	**LAKE O THE PINES** 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.
CANYON LAKE 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.)	**LAVON LAKE** 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.

SPECIFIC RESTRICTIONS ON SEAPLANE OPERATION	
LEWISVILLE LAKE 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.	**SOMERVILLE LAKE** Landings and takeoffs are prohibited west of tbe west end of Birch Creek Unit of Somerville Lake State Park and in all coves and bays off the main body of the lake.
NAVARRO MILLS LAKE Landings and takeoffs are prohibited west of Wolf Creek Park 1.	**STILLHOUSE HOLLOW LAKE** 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.
PROCTOR LAKE 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.	**WHITNEY LAKE** 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
RAY ROBERTS LAKE 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.	**WRIGHT PATMAN LAKE** Landings and takeoffs are prohibited in all coves and bays off main body of lake and in uncleared and shallow areas of the lake.
SAM RAYBURN RESERVOIR Landings and takeoffs are prohibited west of Highway 147, north of Highway 83, and in scattered uncleared areas of the reservoir.	

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 as amended. - 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 plan 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
BFZ	Balcones Fault Zone
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DC	District Commander
DM	Design Memorandum
DoD	Department of Defense
EA	Environmental Assessment
EAA	Edwards Aquifer Authority
EO	Executive Order
EOP	Environmental Operating Principles
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmentally Sensitive Areas
F	Fahrenheit
FONSI	Finding of No Significant Impact
FS	Fully Supported
GAM	Groundwater Availability Models

GCD	Groundwater Conservation District
GCWA	Golden Cheeked Warbler
GIS	Geographical Information Systems
GMA	Groundwater Management Area
HDR	High Density Recreation
IPaC	USFWS Information for Planning and Conservation
LDR	Low Density Recreation
LEED	Leadership in Energy and Environmental Design
MP	Master Plan or Master Planning
MRML	Multiple Resource Management Lands
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act, 1970
NGVD29/88	National Geodetic Vertical Datum (1929 or 1988)
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRMS	Natural Resource Management System
NRRS	National Recreation Reservation System
NSRE	National Survey on Recreation and the Environment
NVCS	National Vegetation Classification System
NWI	National Wetland Inventory

O&M	Operations and Maintenance
OMB	Office of Management and Budget
OMP	Operations Management Plan for a specific lake Project
OPM	Operations Project Manager
PDT	Project Delivery Team
PL	Public Law
PM	Project Management or Project Manager
PMBP	Project Management Business Processes
PO	Project Operations
RPEC	Regional Planning and Environmental Center
RV	Recreational Vehicle
SH	State Highway
SHPO	State Historical Preservation Office
SMPS	Shoreline Management Policy Statement
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 Commission on Environmental Quality
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TX	Texas

TXDOT	Texas Department of Transportation
TWC	Texas Water Code
VM	Vegetative Management
USACE	United States Army Corps of Engineers
USFWS	U. S. Fish and Wildlife Service
USGS	United States Geological Survey
WDA	Workforce Development Area
WHAP	Wildlife Habitat Appraisal Procedure
WMA	Wildlife Management Area