Spring Lake Management Plan

The Spring Lake Management Plan clarifies 1) the significance of Spring Lake, 2) Spring Lake management, 3) Spring Lake access, 4) governing regulations, 5) general provisions, 6) conservations measures, and 7) operations and activities. The Spring Lake Management Plan establishes a baseline level of protection to be maintained in Spring Lake. The Spring Lake Management Plan aligns with current conservation practices and the biological needs of the Covered Species, ensuring management strategies are based on the best available science. The Spring Lake Management Plan is explicitly referenced in the Edwards Aquifer Habitat Conservation Plan and establishes a baseline for enforceable protections, ensuring consistent implementation. The Spring Lake Management Plan integrates stakeholder input and enhances collaborative conservation efforts. Ultimately, the Spring Lake Management Plan provides a structured framework for maintaining and improving habitat quality in Spring Lake.

Section 1 Introduction

1.1 Significance of Spring Lake

The San Marcos Springs, fed through a fault into the Edwards Aquifer, is the second largest spring system in Texas. The springs have never stopped flowing in recorded history and have more environmental stability and flow of any spring system in the southwestern United States. Archaeological research indicates the area surrounding the springs has been persistently inhabited for more than 8,000 years, serving populations of Paleo-Indians through the earliest European settlers to today.

Edward Burleson, a commander of Texian forces during the Texas Revolution, a vice president of the Republic of Texas, and a co-founder of the city of San Marcos, built a dam in 1848 that created the Lake at San Marcos Springs. Spring Lake constitutes the headwaters of the San Marcos River. The river extends 68.2 miles to its confluence with the Guadalupe River and continues another 196 miles to the Gulf of Mexico. The Edwards Aquifer supplies drinking water for many communities within the watersheds of the San Marcos and Guadalupe Rivers.

Spring Lake provides critical habitat to several threatened and endangered species protected by the Federal Endangered Species Act (ESA). This Act prohibits any actions that jeopardize the continued existence of these listed species or causes destruction or adverse modification of the critical habitat of these species. Substantial civil and criminal penalties, including fines and imprisonment, may be levied against persons who knowingly violate provisions of the Endangered Species Act. Texas State University is a partner on the Edwards Aquifer Habitat Conservation Plan (EAHCP) and incidental take permit; both filed with the U.S. Fish and Wildlife Service (USFWS). Texas State University is required by this federal permit to report activities at the springs and in the river and any incidents of take.

Protection and careful management of Spring Lake is key to minimizing any negative impacts to the unique hydrological, cultural, economic, and biological resources found at the lake and to keep Texas State University in compliance with federal endangered species permits and plans.

1.2 Purpose

The major purposes of the Spring Lake Management Plan are:

1.2.1 comply with the Antiquities Code of Texas, Endangered Species Act, and the EAHCP mandates of federal and state law for the springs;

1.2.2 assure that the University fulfills its commitment to be a good steward of Spring Lake by carefully monitoring, managing, and maintaining the healthy ecosystems that exist in the lake;

1.2.3 manage the lake in such a way as to support and enhance the University's efforts in teaching, research, scholarship, and service;

1.2.4 formalize the process by which decisions are made regarding access to, and use of, Spring Lake;

1.2.5 emphasize the use of scientific data to support management decisions;

1.2.6 provide guidelines regarding access and use of Spring Lake for individuals and organizations wanting to engage in teaching, research, or service activities in the lake; and,

1.2.7 support the strategic initiatives of The Meadows Center for Water and the Environment.

1.3 Geographic Scope

1.3.1 The geographic scope of the Spring Lake Management Plan is highlighted in Appendix B - Map of Areas of Responsibility and Oversite. The map also includes proximate areas of oversite relative to Facilites and Campus Recreation. Areas of responsibility and oversite specific to The Meadows Center for Water and the Environment include Spring Lake and Sink Creek, from the intersection of Bert Brown Street to its confluence with Spring Lake, and the riparian bank surrounding these bodies of water. The original geographic scope is depicted in Appendix A: Texas Rivers Center Memorandum of Agreement Map. An expanded view of Spring Lake can be found in Appendix C – Aerial View of Spring Lake.

1.3.2 Although not directly part of the geographic scope of the Spring Lake Management Plan, the Executive Director, in their role as the University's representative of the Implementing Committee for the EAHCP and as delegated by the President of the University, will seek to be involved in University decisions related to all areas detailed in Appendix B – Map of Areas of Oversite and Responsibility, since activities in these areas have the potential to impact water quality in Spring Lake and might affect the lake or river on University properties. Activities in these areas may be reviewed by the Spring Lake Management Committee at the request of the Executive Director.

Section 2 Spring Lake Management

2.1 Management Goals and Objectives

The management goals and objectives of the Spring Lake Management Plan are to:

2.1.1 comply with the Antiquities Code of Texas, Endangered Species Act, and the EAHCP;

2.1.2 research, develop, and establish baseline data on the existing conditions of the lake and the ecological health of the system;

2.1.3 continually review and perform ongoing monitoring that will indicate the overall conditions and health of the system and identify changes or negative impacts that may occur over time;

2.1.4 manage the lake in such a way that will either enhance or minimally impact critical habitat for the aquatic and riparian resources;

2.1.5 ensure that any impact to Spring Lake from approved activity will not result in long-term impacts or degrade the overall integrity of the lake ecosystem; and,

2.1.6 encourage the use of Spring Lake for educational, recreational, research, and service activities which support the University's mission.

2.2 Spring Lake Management Organizational Structure, Duties, and Responsibilities

2.2.1 Executive Director of The Meadows Center for Water and the Environment:

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- has direct oversight responsibility for Spring Lake and is responsible for the stewardship of Spring Lake and the fulfillment of the Spring Lake Management Plan;
- serves as the representative for the University on the EAHCP Implementing Committee;
- approves any modification to the Spring Lake Management Plan;
- approves all Spring Lake Management personnel and members of the Dive Control Board and the Spring Lake Management Committee; and,
- delegates duties and responsibilities for the management of Spring Lake to the Spring Lake Management Committee, Chief Science Officer, and Director of Spring Lake Operations, among others.

The Executive Director is a designated role at The Meadows Center and reports to the Vice President for Research.

2.2.2 Meadows Center Director of Operations:

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- advises the Executive Director on the management of Spring Lake;
- reviews, approves, and submits all Space Allocation Requests; and,
- along with Spring Lake Management Committee Chair, reviews and makes recommendations to the Executive Director on appeals for access to Spring Lake.

The Director of Operations is a designated role at The Meadows Center and reports to the Executive Director.

2.2.3 Meadows Center Chief Science Officer

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan, and oversees any elevated review of access requests;
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- Oversees recommendations for elevated review;
- advises the Executive Director, Spring Lake Management Committee Chair, and Director of Operations on the management of Spring Lake;
- recommends modifications to the Spring Lake Management Plan to the Executive Director, Spring Lake Management Committee Chair, and Director of Operations.

The Meadows Center Chief Science Officer is a defined role at The Meadows Center and is designated by, and reports to, the Executive Director.

2.2.4 **Spring Lake Management Committee:**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- reviews all proposed modifications to Spring Lake policies, procedures, and management objectives of Spring Lake;
- reviews Spring Lake access requests to Spring Lake;
- assists the Lake Manager in assessing the health of ecosystems in the lake; and,
- consults with the Chief Science Officer regarding access requests and issues necessitating elevated environmental reviews; and,
- consults with members of the Advisory Committee regarding access requests and issues which necessitate additional review and subject area expertise.

Membership of the Spring Lake Management Committee is determined by the Executive Director with recommendations from the Chief Science Officer, Director Operations, and the Spring Lake Management Committee Chair. Membership is open with no term limit. Committee members include the Executive Director, Director of Operations, Chief Science Officer, Director of Spring Lake Education (Chair), Deputy Director of Spring Lake Education, Deputy Director Ecological Research Group, Lake Manager, Dive Coordinator, and Communications Manager.

2.2.5 **Advisory Committee:**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- members are appointed by the Executive Director with recommendations from The Chief Science Officer; and,
- members are appointed from university departments that have a vested interest or are considered a stakeholder in Spring Lake (i.e., Center for Archaeological Studies, Department of Biology, Department of Geography) and/or a representative from Environment, Safety, Health and Risk Management, and Facilities. An additional pool of member representatives should also be considered from other agencies, institutions, or entities from outside The Meadows Center and the University such as the United States Fish and Wildlife Service, Edwards Aquifer Authority, and Indigenous Cultures Institute.

2.2.6 **Director of Spring Lake Education:**

- ensures compliance with the Endangered Species Act, EAHCP, and the Spring Lake Management Plan;
- is an active member and Spring Lake Management Committee Chair;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- recommends elevated review to the Chief Science Officer

- approves or denies Spring Lake access in consultation with the Spring Lake Management Committee, and when appropriate, Chief Science Officer, Director of Operations, members of the Advisory Committee, and the Executive Director;
- oversees educational activities and programs, special events, education research projects, glass-bottom boat operations, and dive operations;
- consults with the Deputy Director Spring Lake Education, Lake Manager, and Communications Manager on any recommendations regarding areas of oversight;
- reviews Annual Summary Report including all Spring Lake Access Requests for the year; and,
- along with the Director of Operations, reviews and makes recommendations to the Executive Director on appeals for access to Spring Lake.

The Director of Spring Lake Education is a defined role at The Meadows Center and reports to the Executive Director

2.2.7 **Deputy Director Spring Lake Education:**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- assists with coordination of educational activities and programs, education research projects, glass-bottom boat operations, and dive operations;
- manages all aspects of special events at Spring Lake;
- manages all aspects of aquaria in Discovery Hall; and,
- consults with Director Spring Lake Education, Lake Manager, and Communications Manager on any recommendations regarding areas of oversight.

The Deputy Director of Spring Lake Education is a defined role at The Meadows Center and reports to the Director of Spring Lake Education

2.2.8 **Deputy Director Ecological Research Group**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee; and,
- recommends elevated review to the Chair of Spring Lake Management Committee.

The Deputy Director Ecological Group is a defined role at The Meadows Center and reports to the Chief Science Officer.

2.2.9 **Communications Manager:**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan;

- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- assesses Spring Lake Access Requests involving media relations and communications;
- communicates recommendations to Spring Lake Management Committee regarding media relations and communication activities at Spring Lake and any facility concerns and needs; and,
- consults with the Director of Spring Lake Education, Deputy Director of Spring Lake Education, and Lake Manager on any recommendations regarding areas of oversight.

The Communications Manager is a defined role at The Meadows Center and reports to the Director of Operations.

2.3 Management and Operational Roles

2.3.1 **Lake Manager**:

- ensures compliance with the Endangered Species Act, EAHCP, and the Spring Lake Spring Lake Management Plan; and,
- is an active member of the Spring Lake Management Committee;
- reviews, and makes recommendations for approval or denial of all Spring Lake Access requests to the Spring Lake Management Committee;
- communicates with Client regarding specifics of Spring Lake Access including approval, denial, and logistics;
- is responsible for the general oversite and management of Spring Lake;
- oversees all activities in Spring Lake;
- consults with Director Spring Lake Education, Deputy Director Spring Lake Education, and Communications Manager on any recommendations regarding areas of oversight;
- monitors the activities and scientific studies conducted by all entities working on, in, or around Spring Lake;
- maintains records of all activity occurring on Spring Lake and submission of required reports as required by the EAHCP. Includes tracking of all EAHCP Covered Activities and Conservation Measures occurring in Spring Lake;
- facilitates the monitoring of the health of Spring Lake in conjunction with Chief Science Officer (key indicators can include flow data, water clarity, prevalence and type of vegetation, fauna and invasive species, erosion and site access, and surrounding influences and impacts on Spring Lake); and,
- maintains a record of any equipment installed in or at Spring Lake.

The Lake Manager is a defined role at The Meadows Center and reports to the Director of Spring Lake Education

2.3.2 **Spring Lake Dive Coordinator:**

- ensures compliance with the Endangered Species Act, the EAHCP, and the Spring Lake Management Plan; and,
- is an active member of the Spring Lake Management Committee; and,
- assists and advises the Lake Manager on all scuba diving activities occurring in Spring Lake;
- monitors all diving activities in Spring Lake; and,

- assures that all guidelines contained in the Spring Lake Dive Operations and Safety Manual are observed; and,
- maintains all diving records in accordance with regulatory and industry standards.

The Spring Lake Dive Coordinator is a defined role at The Meadows Center and reports to the Lake Manager.

Section 3 Spring Lake Access

3.1 Access Request Process

3.1.1 The purpose of the Spring Lake Access process is to (1) review proposed activity in and around Spring Lake that is not part of regular daily operations and currently approved activity and (2) ensure approved access is in accord with the goals and objectives of the Spring Lake Management Plan and the EAHCP.

3.1.2 Any proposed activity in Spring Lake, that is not part of regular daily approved operations must be submitted to the Spring Lake Management Committee for review and approval. Requests are made through the Spring Lake Access Form: https://www.meadowscenter.txst.edu/stewardship/springlakeaccess.html

3.1.3 Spring Lake Access Request procedure is as follows:

(1) the Client submits a Spring Lake Access Request;

(2) the Spring Lake Management Committee reviews the request for any environmental or operational considerations or issues;

(3) the Spring Lake Management Committee Chair assesses the environmental recommendations from the Committee and engages The Chief Science Officer for elevated review if needed. The Chief Science Officer will make their environmental assessment and recommendations to the Executive Director and the Spring Lake Management Committee;

(4) the Spring Lake Management Committee determines if further assessment is needed from the Advisory Committee and engages appropriate personnel for review;

(5) the Spring Lake Management Committee approves or denies access, or requests additional information from the Client;

(6) the Lake Manager contacts the client to inform them of the approval or denial of their request, or to gather additional information needed for approval;

(7) the Lake Manager informs the Director of Operations and the Spring Lake Management Committee Chair of any appeal by the Client;

(8) the Director of Operations and the Spring Lake Management Committee Chair review the appeal and inform the Executive Director of their recommendation;

(9) the Executive Director reviews the appeal and recommendation, and provides their decision to the Spring Lake Management Committee;

(10) the Lake Manager informs the Client of the Executive Director's decision.

3.1.4 The Lake Manager provides a copy of the final report of approved Spring Lake Access requests. This information is included in the annual summary report provided to the Spring Lake Management Committee and in the EAHCP Annual Report.

3.2 Daily Operations and Approved Activity

3.2.1 Educational Programs – includes a variety of programs at Spring Lake for Texas State University students, faculty and staff, K-12 school groups, special interest groups, and the general public. https://www.meadowscenter.txstate.edu/Education.html

3.2.2 Special Events – Special Events requests that are outside of daily operations and approved activity will require the submission of a Spring Lake Access Request. Special Events are coordinated through the Deputy Director of Spring Lake Education: https://www.meadowscenter.txstate.edu/ReserveSpecialEvents/SpringLakeEvents.html

3.2.3 Diving – approved diving activities at Spring Lake include open water checkout dives, dive authorization courses, AquaCorps volunteers, Operation Scuba, general aquatic maintenance, and research diving: https://www.meadowscenter.txstate.edu/Service/Diving.html

3.2.4 Maintenance – all maintenance activities at Spring Lake are managed in collaboration with Texas State University Facilities Department and the Spring Lake Management Committee.

3.2.5 Approved Spring Lake Access Requests – any approved activity at Spring Lake will be vetted through the Spring Lake Access Request process: https://www.meadowscenter.txstate.edu/ReserveSpecialEvents/SpringLakeAccess.html

3.3 Spring Lake Site Equipment and Usage Policy

3.3.1 The Lake Manager must approve all equipment placed in Spring Lake for any purpose in consultation with the Spring Lake Management Committee. The Lake Manager will ensure the approved equipment will have minimal to no impact on Spring Lake or the surrounding area.

3.3.2 All equipment must be properly washed and disinfected prior to being placed in Spring Lake using a USFWS approved protocol.

3.3.3 Any equipment that is left in or at Spring Lake must have responsible party contact information attached to equipment and on file with the Lake Manager.

3.3.4 Equipment must be removed by the responsible party promptly at the end of the project period. Equipment not promptly removed by the responsible party will be removed by the Lake Manager and all associated costs billed to the responsible party.

3.3.5 The Lake Manager will maintain a record of any equipment installed in or at Spring Lake.

Section 4 Governing Regulations

4.1.1 UPPS – Spring Lake and The Meadows Center for Water and the Environment are part of Texas State University and abide by university guidelines and regulations: https://policies.txstate.edu/

4.1.2 Spring Lake Management Plan: https://www.meadowscenter.txst.edu/stewardship/springlakeaccess.html

4.1.3 Endangered Species Act: https://www.fws.gov/law/endangered-species-act

4.1.4 Edwards Aquifer Habitat Conservation Plan: https://www.edwardsaquifer.org/habitat-conservation-plan/

4.1.5 Antiquities Code of Texas: https://www.thc.texas.gov/project-review/antiquities-code-texas

Section 5 General Provisions

5.1 General Provisions

Accompanying the governing regulations detailed in Section 4 of the Spring Lake Management Plan, there are general provisions in place to protect the integrity, safety, and environmental sensitivities of Spring Lake, The Meadows Center for Water and the Environment, and Texas State University. These provisions include but are not limited to no pets other than registered service animals, no fishing, no camping, no fires, no unauthorized swimming or boating, no non-authorized vehicles on trails or green spaces, no firearms, no alcohol with the exception of University sanctioned events permitting alcohol, no collecting of natural or cultural resources unless approved by Lake Manager, no littering, no unauthorized operation of drones. Please see:

https://www.meadowscenter.txst.edu/stewardship/springlakeaccess.html

https://policies.txst.edu/university-policies.html

Section 6 Conservation Measures

6.1 Overview

The overall intent and purpose of the Spring Lake Management plan is to foster and ensure compliance with the Antiquities Code of Texas, Endangered Species Act, the Edwards Aquifer Habitat Conservation Plan, and mandates of all local, state, and federal laws pertaining to covered species and covered habitat. Management strategies to accomplish these goals require a collaborative effort from a multitude of university entities and stakeholders that are directly connected to and in direct proximity to contributing zones that affect Spring Lake. These collaborative efforts are a key and paramount factor to the management strategies and goals of the Spring Lake Management plan.

Conservation Measures at Spring Lake are in accord with the Edwards Aquifer Habitat Conservation Plan and the USFWS recommended management strategies for Spring Lake. Any changes to the Spring Lake Management Plan will be reviewed, and feedback and approval will be obtained from the City of San Marcos and the Edwards Aquifer Authority, as applicable, regarding the conservation measures.

6.2 Texas State University Responsibilities

The San Marcos Springs are located within the jurisdiction of Texas State University. The University has the authority to manage the ecosystems of the San Marcos Springs within its jurisdiction. The use of San Marcos Springs for educational, recreational, research, conservation measures, and maintenance activities, by Texas State University, for the students, faculty and staff of the University, and for public service activities, is managed by The Meadows Center for Water and the Environment. All covered activities and programs are in accordance with all applicable laws and regulations. Texas State University has incidental take coverage for educational, recreational, research, conservation measures, maintenance activities, and public service activities within its jurisdiction, the management of the ecosystems of the San Marcos River and Springs, the permitted use of the Aquifer, the diversion of water from the Springs, and the use of the San Marcos Springs and River. The University has the authorization to implement or oversee the implementation of minimization and mitigation measures. The Covered Activities are described in more detail in Section 7.

6.3 Minimization and Mitigation Measures

The following Covered Activities constitute minimization and mitigation measures that are specifically intended to contribute to the recovery of endangered species and the protection of sensitive habitat under the Endangered Species Act. Texas State University is responsible for implementing these measures as a part of its obligations under applicable conservation frameworks. The specific activities related to each measure are further detailed in Section 7.

6.3.1 Texas Wild-Rice Enhancement and Restoration

Texas State University maintains habitat for Texas wild-rice (*Zizania texana*) within Spring Lake in accordance with the ESA and EAHCP Conservation Measures. Populations of this species are monitored regularly, and habitat conditions are managed to support their persistence. The historical range of Texas Wild-rice in Spring Lake is limited to high-velocity areas, particularly the region just above the dam at the eastern and western spillways; however, its distribution fluctuates in accordance with environmental flows. Texas State University will continue to prioritize habitat quality and flow conditions over coverage metrics, ensuring that the lake remains a viable location for natural population dynamics. Enhancement activities may include removal of floating vegetation mats, coordination with volunteer divers for subsurface cleaning, and flow management to maintain suitable conditions at the western spillway. All activities are conducted in compliance with the Endangered Species Act and current conservation measures directed by the EAHCP or other framework.

6.3.2 Management of Educational and Recreational Programs in Spring Lake

The use of San Marcos Springs for educational and recreational programs by Texas State University, for the students, faculty and staff of the University, and for public service activities, is managed by The Meadows Center for Water and the Environment. Programs include but are not limited to: K-12 educational programs, swimming, snorkeling, kayaking, canoeing, stand-up paddleboarding (SUP), and glass-bottom boat tours. Covered Activities include educational and recreational programs in accordance with all applicable laws and regulations.

6.3.3 Management of Vegetation

Texas State University, in collaboration with the EAHCP and the City of San Marcos, will maintain incidental take coverage for the impacts of its maintenance activities of grounds, intramural fields, and all university properties adjacent to and in Spring Lake, Sink Creek, and the contributing tributary zones of Spring Lake within the boundaries of university properties. Management practices include but are not limited to management of submerged and floating aquatic vegetation, landscaping, turf field maintenance, tree removals, mowing, and application of fertilizers, herbicides, pesticides.

6.3.4 Management of Emergent, Submerged, and Floating Aquatic Vegetation in Spring Lake

Texas State University currently harvests submerged vegetation from Spring Lake with a harvester boat and manually cuts vegetation from around spring openings, the underwater archaeological site, along the wall of Spring Lake Hall and in all the sections identified in the Aquatic Harvester Zones Map (See Appendix D). All vegetation is removed to support the maintenance of viable habitat for the endangered species of spring lake and aid in reducing the amount of sedimentation accumulation in key areas of viable spring openings. These efforts will also provide a secondary benefit of enhancing the viewability of the springs for the Meadows Center's glass-bottom boats, reducing the entanglement of plant material in the boat propellers, thereby further supporting and enhancing the educational and research components of Spring Lake.

6.3.5 Management of Sediment

Sediment removal in Spring Lake is conducted to maintain habitat quality, support endangered species, and ensure access for approved activities. Accumulated sediment can interfere with conservation measures outlined in the EAHCP. Texas State University addresses sedimentation through targeted removal in areas where buildup impedes ecological function or operational access. Upland drainage contributing to sedimentation is assessed and allocated to appropriate treatment strategies to reduce future inputs. All sediment management activities are coordinated with the Spring Lake Management Committee and documented in the EAHCP Annual Report. Any changes to sediment control practices will be reviewed in consultation with the appropriate entities

6.3.6 Overview of Diving and Dive Classes in Spring Lake

Texas State University permits three main categories of diving in Spring Lake: training dives (educational), research dives, and maintenance dives. To minimize the impacts of its diving classes and programs on the habitat in Spring Lake and to ensure compliance with all applicable local, state, and federal laws, all divers must first complete the Spring Lake Dive Authorization Course. Students in training are exempt from this requirement; however, they are required to be accompanied by a certified Dive Authorization Course instructor and are restricted to the Dive Training Area only.

6.3.7 Spring Lake Dive Authorization Course (DAC)

A prerequisite for anyone permitted to dive in Spring Lake and for dive instructors wanting to utilize the Dive Training Area is completion of the Dive Authorization Course. This program trains volunteer divers and dive instructors to SCUBA in a manner that protects listed species in Spring Lake. Upon completion of the course, volunteer divers are utilized to help with various projects and maintenance of the spring openings in the lake. Dive instructors who have completed the course are permitted to bring students to the designated Training Area for continuing education dive training. Students under the direct supervision of authorized Spring Lake Dive Instructors are not required to have completed the DAC, however they are limited to the confines of the Training area and are not permitted outside of the Training Area.

6.3.8 Continuing Education SCUBA Classes

Texas State University allows the use of the designated Dive Training Area for continuing education classes. To minimize the impact of these classes, class size will be limited to 16 students per class and no more than three classes will be conducted per day. These divers will not be allowed outside of the Dive Training Area.

6.3.9 Research Programs in Spring Lake

Research is a primary component of Texas State University's activities in Spring Lake. All research proposals will be reviewed by the Spring Lake Management Committee to ensure there is no impact on covered species or their habitat. Covered Activities include research programs in accordance with all applicable laws and regulations.

6.3.10 Boating in Spring Lake

Texas State University has incidental coverage for the impacts of boating in Spring Lake. The Meadows Center for Water and the Environment oversee educational and recreational programs in Spring Lake, including canoeing, kayaking, and stand-up paddleboarding. Educational and recreational programs occur in areas that are maintained by the aquatic vegetation harvester, thereby not impacting vegetation and

specifically avoiding Texas wild-rice stands. Additionally, the glass bottom boats operate in Spring Lake. Canoes, kayaks, and the dive barge will also be used for research and maintenance projects in Spring Lake.

6.3.11 Management of Non-Native Species

Texas State University works to prevent the introduction of non-native species into Spring Lake through strategies aligned with the EAHCP. These species can disrupt ecological balance, compete with native organisms, degrade habitat for endangered species, and interfere with lake activities. Introduction pathways include aquarium dumping, gear transfer between water bodies, outside watercraft, and improperly cleaned SCUBA equipment. These risks are addressed through signage, operational protocols, and public education. Dumping sites and access points are monitored regularly for signs of contamination. All prevention activities are coordinated with the Spring Lake Management Committee who will review measures annually to ensure effectiveness and compliance.

6.3.12 Control of Harmful Non-Native Plant Species

Texas State University manages non-native aquatic vegetation in Spring Lake to protect habitat quality and comply with the EAHCP. Non-native species, such as Hydrilla verticillata, Hygrophila polysperma, Nasturtium officinale, and Ceratopteris thalictroides, are targeted for removal due to their potential to outcompete native vegetation, alter flow conditions, and degrade habitats for endangered species. Vegetation removal is conducted using SCUBA divers, snorkelers, kayaks, and paddleboards to access affected areas. All removed vegetation is composted in designated locations. Management strategies are reviewed annually and adjusted based on monitoring data and ecological assessments. These activities are coordinated with the Spring Lake Management Committee and documented in the EAHCP Annual Report. Any changes to non-native vegetation control practices will be reviewed in consultation with the City of San Marcos and the Edwards Aquifer Authority. Texas State University will manage non-native submerged and floating vegetation within Spring Lake in accordance with EAHCP protocols.

6.3.13 Control of Harmful Non-Native Predator Species

Texas State University supports the removal of harmful non-native and predator species from Spring Lake in accordance with the EAHCP. These species, including Blue Tilapia (*Oreochromis aureus*) and other invasive fish, pose a threat to native fauna and habitat integrity. Control measures are put in place to reduce competition, predation, and habitat degradation where these organisms cohabitate with native species. Removal activities may include targeted spearfishing and coordination with HCP contractors and trained personnel. All removal activities must be submitted through the Spring Lake Access Request process and approved before they are carried out. These efforts aim to maintain ecological balance and enhance conditions for endangered species.

6.4 Archeological Oversight and Review Process

Spring Lake site is a State Antiquities Landmark (SAL). This means it has been designated by the Texas Historical Commission (THC) as a significant archaeological site worthy of legal protection under the Antiquities Code of Texas. SAL designation establishes that the site is an important part of our State's historical legacy. The Center for Archeological Studies (CAS) has oversight and review authority for all proposed activities, modifications, and proposed projects requiring any type of ground disturbance within the boundaries of the designated Spring Lake Site. Daily approved activities and routine operations that have been approved will not require oversight and review however; Spring Lake management will continually monitor and assess if changes to approved activities may have occurred thus warranting a review of changes by CAS.

Section 7 Operations and Activities

7.1 Overview

The overall intent and purpose of the Spring Lake Management plan is to foster and ensure compliance with the Antiquities Code of Texas, Endangered Species Act, the Edwards Aquifer Habitat Conservation Plan, and mandates of all local, state, and federal laws pertaining to covered species and covered habitat. Management strategies to accomplish these goals require a collaborative effort from a multitude of university entities and stakeholders that are directly connected to and in direct proximity to contributing zones that affect Spring Lake. These collaborative efforts are a key and paramount factor to the management strategies and goals of the Spring Lake Management plan.

Conservation Measures at Spring Lake are in accord with the Edwards Aquifer Habitat Conservation Plan and the USFWS recommended management strategies for Spring Lake. Any changes to the Spring Lake Management Plan will be reviewed, and feedback and approval will be obtained from the City of San Marcos and the Edwards Aquifer Authority, as applicable, regarding the conservation measures.

7.2 Texas State University Responsibilities

The San Marcos Springs are located within the jurisdiction of Texas State University. The University has the authority to manage the ecosystems of the San Marcos Springs within its jurisdiction. The use of San Marcos Springs for educational, recreational, and research programs by Texas State University, for the students, Faculty and staff of the University, and for public service activities, is managed by The Meadows Center for Water and the Environment. Covered Activities include educational and recreational programs in accordance with all applicable laws and regulations.

Operations and Activities at Spring Lake are in accord with the Edwards Aquifer Habitat Conservation Plan and measures: https://www.edwardsaquifer.org/habitat-conservation-plan/ Any changes to the Spring Lake Management Plan will include the City of San Marcos and Edwards Aquifer Authority review, feedback, and approval, relative to the conservation measures.

Generally, approved operations and activities at Spring Lake fall into four categories: research, education, special events, and daily approved operations. The Spring Lake Access Request and subsequent review by The Spring Lake Management Committee, ensures compliance with the Edwards Aquifer Authority Habitat Conservation Plan conservation measures, Texas State University Policy and Procedure Statements, Antiquities Code of Texas, and all city, state and federal regulations pertaining to the site.

7.3 Minimization and Mitigation Measures

The following Covered Activities constitute minimization and mitigation measures that are specifically intended to contribute to the recovery of endangered species and the protection of sensitive habitat under the Endangered Species Act. Texas State University is responsible for implementing these measures as a part of its obligations under applicable conservation frameworks.

7.3.1 Texas Wild-Rice Enhancement and Restoration

Texas State University monitors and maintains two populations of Texas Wild-rice within Spring Lake. These populations are located upstream of the Eastern Spillway and near the Spring Lake headgate on the Western Spillway. Habitat conditions in these areas are managed to support the species' persistence and allow for natural expansion based on environmental flows. The historical distribution of Texas Wild-rice in Spring Lake was limited to high-velocity zones, particularly the area just above the western spillway. Enhancement

efforts will focus on maintaining habitat in this region as determined by the USFWS Endangered Species Recovery Plan. As such, the University will focus on maintaining viable habitat rather than achieving specific coverage targets. Enhancement activities may include strategic planting, vegetation mat removal, and coordination with volunteer divers for habitat maintenance. All proposed activities outside daily operations will follow the Spring Lake Access Request process to ensure compliance with the EAHCP and university policies.

7.3.2 Management of Educational and Recreational Programs in Spring Lake

All educational and recreational programs on Spring Lake and the surrounding grounds are coordinated, managed, and led by The Meadows Center for Water and the Environment. Most of these activities are part of the regularly approved operations at The Meadows Center. Any educational or recreational activity that does not fall into regularly approved operations will be reviewed by the Spring Lake Management Committee via the submission of a Spring Lake Access Request.

K-12 educational programs occur on the grounds at Spring Lake as well as the waters of Spring Lake. Educational programs which specifically utilize the waters of Spring Lake include the glass bottom boat tours, specimen collection, water sampling, and the Discovery Hall tours. These programs are regularly approved operations. https://www.meadowscenter.txst.edu/education.html

Glass bottom boat tours are guided experiences providing educational and recreational opportunities for the students, faculty, and staff of Texas State University as well as the public. Further details about glass bottom boats are discussed in section **7.10** – Boating in Spring Lake.

Discovery Hall tours include aquariums and aquaria that provide participants with a closer view and expanded information about the flora and fauna of Spring Lake. The aquaria include endangered species which are provided to The Meadows Center by United States Fish and Wildlife Service (USFWS). These species include the San Marcos Salamander, the Texas Blind Salamander, and the Fountain Darter. Additionally, there are variety of fish, turtles and aquatic vegetation that are collected from Spring Lake and included in the aquariums in the Discovery Hall. Collections, care, and maintenance of the aquarium and aquaria are conducted by Meadows Center Staff. The Discovery Hall is equipped with an emergency power supply to maintain the aquariums and species in the event of a power outage.

Snorkeling, canoeing, kayaking, and stand up paddleboarding are part of the educational and recreational programs at Spring Lake. These are regularly approved operations which are managed and led by The Meadows Center. Equipment for these programs is provided, maintained, and stored at The Meadows Center and is regularly cleaned through a USFWS approved protocol. Occasionally, participants have special needs which require the use of personal equipment. This equipment is cleaned on site according to a USFWS approved protocol, prior to entering Spring Lake. Participants and leaders must always wear a life jacket during the program.

Educational and recreational programs including snorkeling, canoeing, kayaking or stand up paddleboarding in Spring Lake will be limited to no more than 2 programs per day and each program will be in the water no more than 2 hours. Programs will have a maximum of 20 participants.

Swimming in Spring Lake is permitted in certain circumstances. Generally swimming is associated with staff training activities. All staff and participants are required to wear a life jacket.

Additionally, there are approved special events which vary in the number of participants on the water including the Texas Water Safari and the Texas State Triathlon.

7.3.3 Management of Vegetation

To mitigate the impacts of incidental, take on Covered Species the City of San Marcos and the EAHCP will partner with Texas State University to implement an on-going non-native plant replacement program for all university properties within the contributing tributary zones, property corridors adjacent to Spring Lake and Sink Creek. Non-native species of aquatic, littoral, and riparian plants will be removed and replaced with native species to enhance Covered Species habitat. An aquatic harvester and authorized divers will be utilized to support the management of emergent, floating, and submerged aquatic plants within Spring Lake and adjacent water bodies contributing to Spring Lake. The riparian zones will be restored to at least 15 meters in width where possible. Areas will be planted at an appropriate ratio of hard mast trees to soft mast trees where appropriate. Native littoral and riparian plantings will be selected and placed in their appropriate grow zones with 20 percent of the vegetation consisting of fruit-bearing shrubs. Vegetation such as big bluestem, switchgrass, Indian grass, live oak, Texas red oak, bur oak, pecan, bald cypress, American beautyberry, and buttonbush will be used. Fencing may be required for the first two years to allow for the establishment of the species.

7.3.4 Management of Emergent, Submerged, and Floating Aquatic Vegetation in Spring Lake

To mitigate the impacts of incidental take on Covered Species, Texas State University will manage aquatic vegetation in Spring Lake through use of its harvester boat and through hand cutting of vegetation by divers authorized to dive in Spring Lake. Each week about five springs will be cut, thus returning to cut the same springs every two to three weeks. During summer algal blooms, the springs will be managed more frequently (up to four springs per day), but mostly to remove algae. Texas State employees and supervised volunteers will fin the area around the springs to remove accumulated sediment and then clear a 1.5-meter radius around each spring opening in Spring Lake by hand with a machete or other suitable hand-held cutting tool. Over the next 1.5- meter radius around the spring opening, they will shear vegetation to a height of 30 cm, and then to one meter over the following next three-meter radius. Plant material will not be collected but carried away by the current. Cumulatively, about six meters of vegetation around each spring opening will be modified. The volume of plant material to be removed will vary by the amount of time between cuttings and season. Vegetation management strategies are reviewed intermittently and adjusted based on monitoring data and feedback from the Spring Lake Management Committee. Downstream habitat conditions are considered in planning and implementation to ensure that vegetation removal in Spring Lake minimizes potential negative impacts to downstream habitat conditions in the San Marcos River.

The harvester boat will remove a range of 10-to-20 boatloads of plant material a month from Spring Lake. The harvester will clear the top meter of the water column, cutting vegetation from sections one, two, and three once a week (See Appendix D). The harvested vegetation will be visually checked by the operator for fauna caught in the vegetation. If the operator observes fauna, he/she will stop work and put the animal(s) back into Spring Lake if appropriate. Texas State employees and supervised volunteers are trained to recognize the Covered Species through the Spring Lake Dive Authorization Course (Section 6.3.7) and avoid contact with them.

Vegetation mats will be removed from zones four and five on an as-needed basis (See Appendix D). The total area cut will equal about 22 surface acres.

One permanent full-time person (Lake Manager) is responsible for the management and operation of running the harvester and managing the removal of vegetation around the spring openings. The Lake

Manager also oversees the planning and scheduling of cleanup and removal efforts of nuisance floating species such as water hyacinth and water lettuce from Spring Lake. The floating plants will be collected by mechanical or hand methods and shaken prior to removal from the river lake to dislodge any aquatic species caught in the plant. The plants will be deposited into dump trucks and taken to the Meadows Center-Spring Lake compost area.

Vegetation management strategies are reviewed intermittently and adjusted based on monitoring data and feedback from the Spring Lake Management Committee. Downstream SAV needs are considered in planning and implementation to ensure that vegetation removal in Spring Lake does not negatively impact habitat conditions in the San Marcos River.

7.3.5 **Management of Sediment**

Sediment accumulation in Spring Lake and Sewell Park is managed to maintain access, protect spring integrity and ecological function, and support research, education, and maintenance activities in accordance with section 2.1 (Management Goals and Objectives). If left unmanaged, sediment accumulation can obstruct spring orifices, degrade aquatic vegetation zones, hinder access to boat docks and designated operational areas, while also increasing turbidity and nutrient loading that threaten habitat quality.

Removal methods include hydrosuction, manual extraction by trained divers, and mechanical techniques adapted to the site-specific conditions. Divers use suction hoses fitted with mesh screens to prevent entrainment of aquatic fauna, and finning techniques are employed to gently displace sensitive species prior to sediment removal. The nozzle of the suction equipment is kept low in the substrate to minimize disturbance to the water column and surrounding habitat. In ecologically sensitive areas, physical markers may be placed to delineate boundaries and prevent encroachment into protected zones such as archaeological features or submerged aquatic vegetation beds.

All sediment removal activities are conducted in compliance with U.S. Army Corps of Engineers (USACE) regulations, USFWS incidental take permits, and EAHCP conservation measures. Sediment samples may be collected for contaminant testing in accordance with TCEQ protocols. All removal methods are evaluated on a project-by-project basis by Spring Lake Management Committee to ensure the most conservative approach is used. Whether addressing provenance, accumulation, or functional impairment of sediment zones.

Sediment removal is identified in specific control zones with additional areas that may be evaluated as needed. Removal activities are scheduled based on ecological assessments and operational requirements. Upland drainage contributing to sedimentation is monitored by responsible entities and addressed through appropriate treatment strategies. These may include erosion control, vegetative buffers, and stormwater retrofits. Collectively, these efforts improve water quality, reduce sediment transport, and support long-term conservation goals for endangered species and approved activities within Spring Lake.

7.3.6 **Overview of Diving and Dive Classes in Spring Lake**

Texas State University permits 3 main categories of diving in Spring Lake: training dives (educational), research dives, and maintenance dives. To minimize the impacts of its diving classes and programs on the habitat in Spring Lake and to ensure compliance with all applicable local, state, and federal laws, all divers must first complete the Spring Lake Dive Authorization Course. Any individual teaching dive classes, conducting research, or conducting maintenance dives is required to complete the Spring Lake Dive Authorization Course (DAC) before being allowed to dive or teach in Spring Lake. Students participating in dive training are not required to have the DAC certification. However, they are limited to the Dive Training Area only and must be under the direct supervision of a certified and registered DAC dive instructor. The University has designated an area of 2,140 square meters as its Dive Training Area in Spring Lake; this area was the site of the underwater show of the Aquarena Springs theme park for over 40 years. The natural and cultural resources in this area have long been disturbed, hence diving activities occurring here will have minimal impact, if any, on listed species. Any changes or modifications to standard dive operating procedures must be reviewed by the Spring Lake Diving Management and when warranted additional review by the Spring Lake Management Committee. Texas State University has incidental take coverage for these activities.

7.3.7 **Spring Lake Dive Authorization Course (DAC)**

To minimize the impacts of the Dive Authorization Course (DAC) that trains and authorizes individuals to dive in Spring Lake, individuals authorized through this program must demonstrate a knowledge of listed species found in the lake and their habitat, laws and regulations impacting these species, good buoyancy control, the ability to avoid contact with listed species, the ability to avoid disturbing critical habitat, and the ability to stay off the bottom of the lake. The program is taught as a two-day class with a maximum class size of 16 students and is taught in the Dive Training Area. The program averages 350 trainees per year. Upon completion of this class, divers are allowed anywhere in Spring Lake to perform specific volunteer tasks such as finning spring areas covered with algae and detritus, removal of invasive plants, pruning and management of submerged aquatic plants and picking up litter. Projects are structured to minimize contact with listed species to ensure protection of listed species and their habitat. The Dive Coordinator coordinates and supervises all volunteer diving. No more than 16 volunteer divers will be allowed in the lake per day, with no more than 8 in the lake at one time. Any individual diving outside of the Dive Training Area must have completed the Dive Authorization Course.

7.3.8 **Continuing Education SCUBA Classes**

Texas State University supports Continuing Education dive classes for open water check-out dives. These dives will be conducted in the Dive Training Area only. To minimize the impacts of these classes, class size will be limited to 16 students per class and no more than 3 classes will be conducted per day. All dive instructors bringing students to the lake must have completed the DAC, be registered with, and in good standing with the Spring Lake Diving Management program.

7.3.9 **Research Programs in Spring Lake**

Research programs at Spring Lake include projects internal and external to Texas State University. All research projects require review by the Spring Lake Management Committee via the submission of a Spring Lake Access Request from the research investigators. This review minimizes potential impacts of research on Spring Lake by ensuring there is no impact on Covered Species or their habitat. If incidental take cannot be avoided, it will be minimized by educating the researchers to the area where the listed species are located and by requiring measures to minimize any potential impact. All diving in support of a research study will be provided by individuals who have completed the Dive Authorization Course. Nothing herein is intended to obviate the need for individual research projects to obtain a permit under 16 U.S.C. § 1539(a)(1). Some research projects are ongoing with annual approval of operations and collections. The research teams provide a summary of access, findings, and operations via an annual report to the Lake Manager. Any research equipment utilized in Spring Lake will be cleaned according to a USFWS approved protocol.

7.3.10 **Boating in Spring Lake**

Texas State University seeks incidental take coverage for the impacts of its boating activities in Spring Lake. To minimize the impacts of boating on the Covered Species' habitat in Spring Lake, boats will be confined to areas that are maintained by the aquatic vegetation harvester, including the Sink Creek tributary, thereby not impacting vegetation and specifically avoiding Texas wild-rice stands.

Additionally, glass-bottom-boats and the dive barge operate in Spring Lake. Canoes and kayaks can occasionally be used for research and maintenance. Motorized boats that are used in Spring Lake include the electric powered glass-bottom-boats used for educational tours. The dive barge is an electric powered vessel and is used for diving support and lake maintenance activities. The diesel-powered mechanical aquatic vegetation harvester is used in Spring Lake for aquatic vegetation management purposes.

Individuals will enter and exit boats at specified access points to avoid impacting the flora and fauna along the bank. All boats launched into Spring Lake will undergo a USFWS approved protocol for cleaning.

7.3.11 **Management of Non-Native Species**

Texas State University will continue to enact protocols that prevent non-native species from entering Spring Lake. These protocols focus on known pathways such as aquarium dumping, gear transfer, use of outside watercraft, and SCUBA equipment that has not been adequately cleaned. Protocols in place and enforced targeting the prevention of non-native species introductions include but are not limited to: Access, Equipment and Gear wash protocols. Staff, researchers, and volunteers receive training to identify and report potential risks. Dumping sites and access points are monitored for unauthorized activity and signs of contamination. Spring

Lake shall not be a relocation site for animal control authorities. Preventative measures are updated regularly based on observed trends and input from the Spring Lake Management Committee. Any proposed activity with the potential to introduce non-native species must be submitted through the Spring Lake Access Request process. All requests are reviewed for risk and evaluated under the guidelines of the EAHCP and university policies.

7.3.12 Control of Harmful Non-Native Plant Species

Texas State University facilitates the management of harmful non-native and invasive emergent, floating, and submerged aquatic vegetation in Spring Lake to protect habitat quality and reduce ecological stressors affecting covered species. The low turbidity of this headwaters system creates ideal conditions for diverse aquatic plant communities, which are increasingly threatened by the intrusion of non-native species. Invasive and non-native aquatic plants such as *Hydrilla verticillata*, *Hygrophila polysperma*, *Nasturtium officinale*, *Eichhornia crassipes*, and *Ceratopteris thalictroides* are known to occur in Spring Lake and are considered target species for removal. However, other species may also pose ecological challenges in the future. These species disrupt flow conditions, increase sediment deposition, and outcompete native vegetation.

The goal of management is to reduce these species to the point of functional eradication, where feasible. Aquatic vegetation is manually extracted using low-impact methods, including hand-removal and diver-assisted techniques. Plant material is shaken to release aquatic fauna and bagged for removal. All vegetation must be composted in designated areas to prevent reintroduction. Removal activities are evaluated and approved by the Spring Lake Management Committee and must be submitted through the Spring Lake Access Request process. Use of chemical control methods is generally prohibited in the water but may be considered for riparian vegetation on a case-by-case basis. Riparian and upland vegetation removal or restoration efforts must also be approved and carefully managed to reduce sediment and nutrient inputs from adjacent landscapes. These efforts support long-term habitat stability and contribute to broader conservation objectives for Spring Lake and the San Marcos River corridor.

7.3.13 Control of Harmful Non-Native Predator Species

Texas State University facilitates the removal of harmful non-native and predator species in Spring Lake to protect native aquatic life and maintain habitat quality. Target species include tilapia and other invasive fish that compete with or prey upon endangered species. Removal efforts are conducted through coordinated spearfishing activities and other approved methods. These activities are carried out by trained personnel and HCP contractors. All removal activities must be submitted through the Spring Lake Access Request process and approved by the Spring Lake Management Committee prior to implementation.

7.4 Archeological Oversight and Review process

Spring Lake site is a State Antiquities Landmark (SAL). This means it has been designated by the Texas Historical Commission (THC) as a significant archaeological site worthy of legal protection under the Antiquities Code of Texas. SAL designation establishes that the site is an important

part of our State's historical legacy.

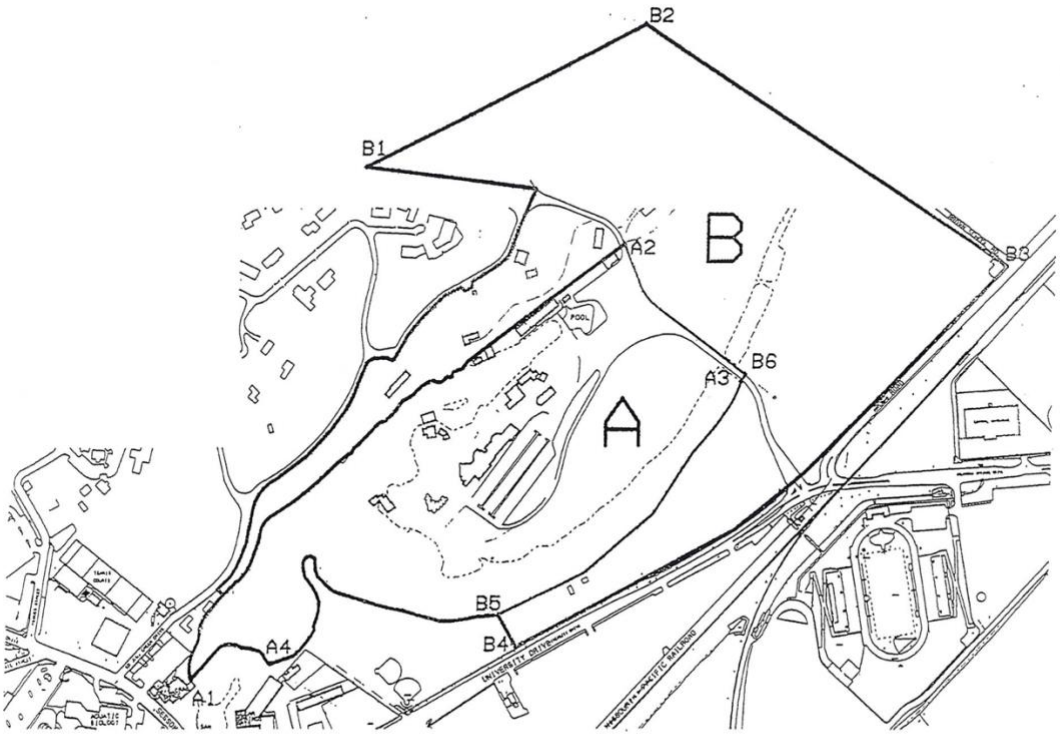
The Center for Archaeological Studies (CAS) is a research center within the Department of Anthropology at Texas State University. CAS has two main functions: 1) to operate as a Cultural Resources Management firm and 2) Serves as an archaeological repository, certified by the state of Texas.

As such, all ground disturbing activities within the boundaries of the Spring Lake Site must be reviewed by the THC, and unauthorized/non- permitted digging or collecting of artifacts is unlawful. Looters or vandals risk fines and imprisonment when they enter public lands to collect artifacts or dig into archaeological sites.

The Director of CAS is responsible for reviewing and determining if planned projects, activities, special events, and/or any ground disturbing activities conducted within the boundaries of the Spring Lake Site will require permit determination from the THC. All Spring Lake Access requests, site modifications and/or improvements must be reviewed by the director or authorized delegate of CAS.

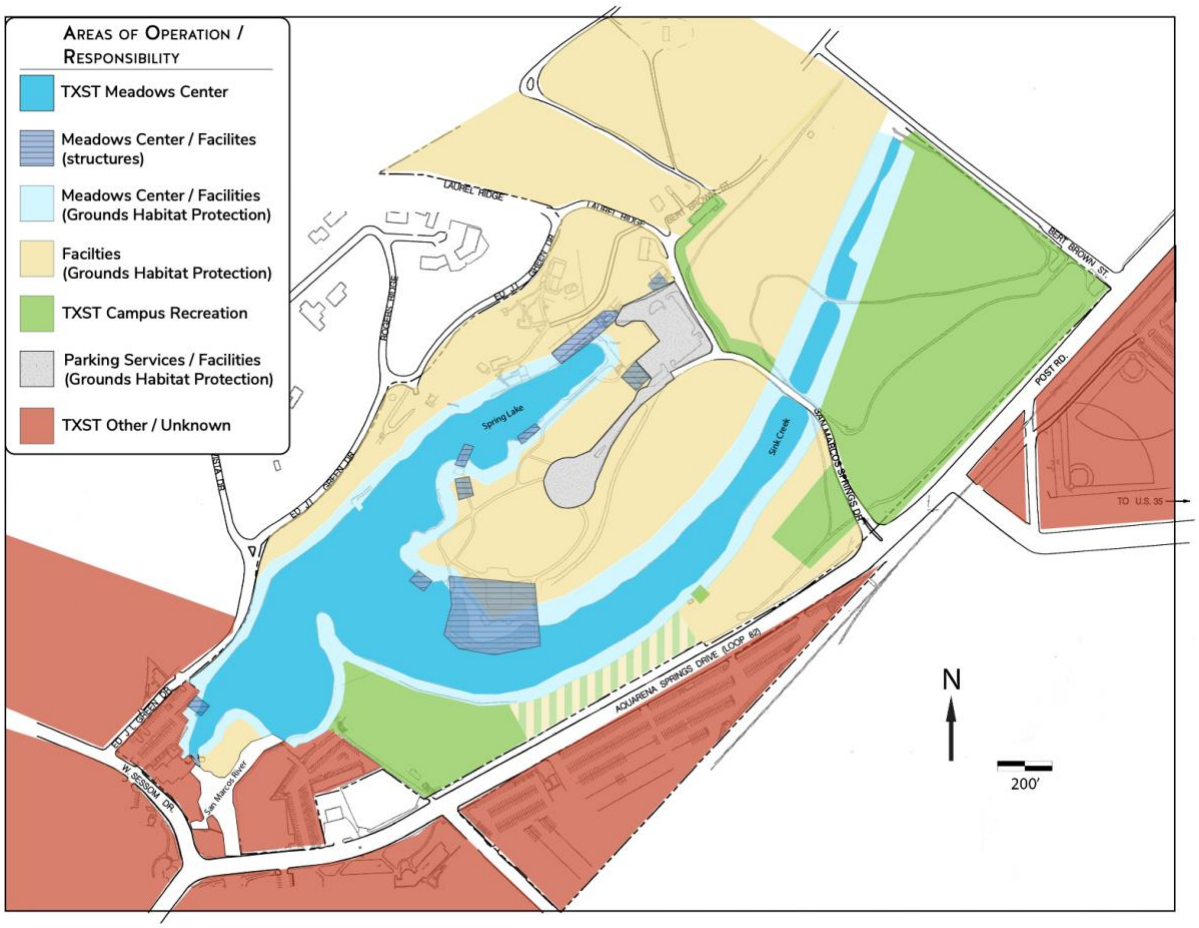
Appendix

Appendix A: Texas Rivers Center Memorandum of Agreement Map



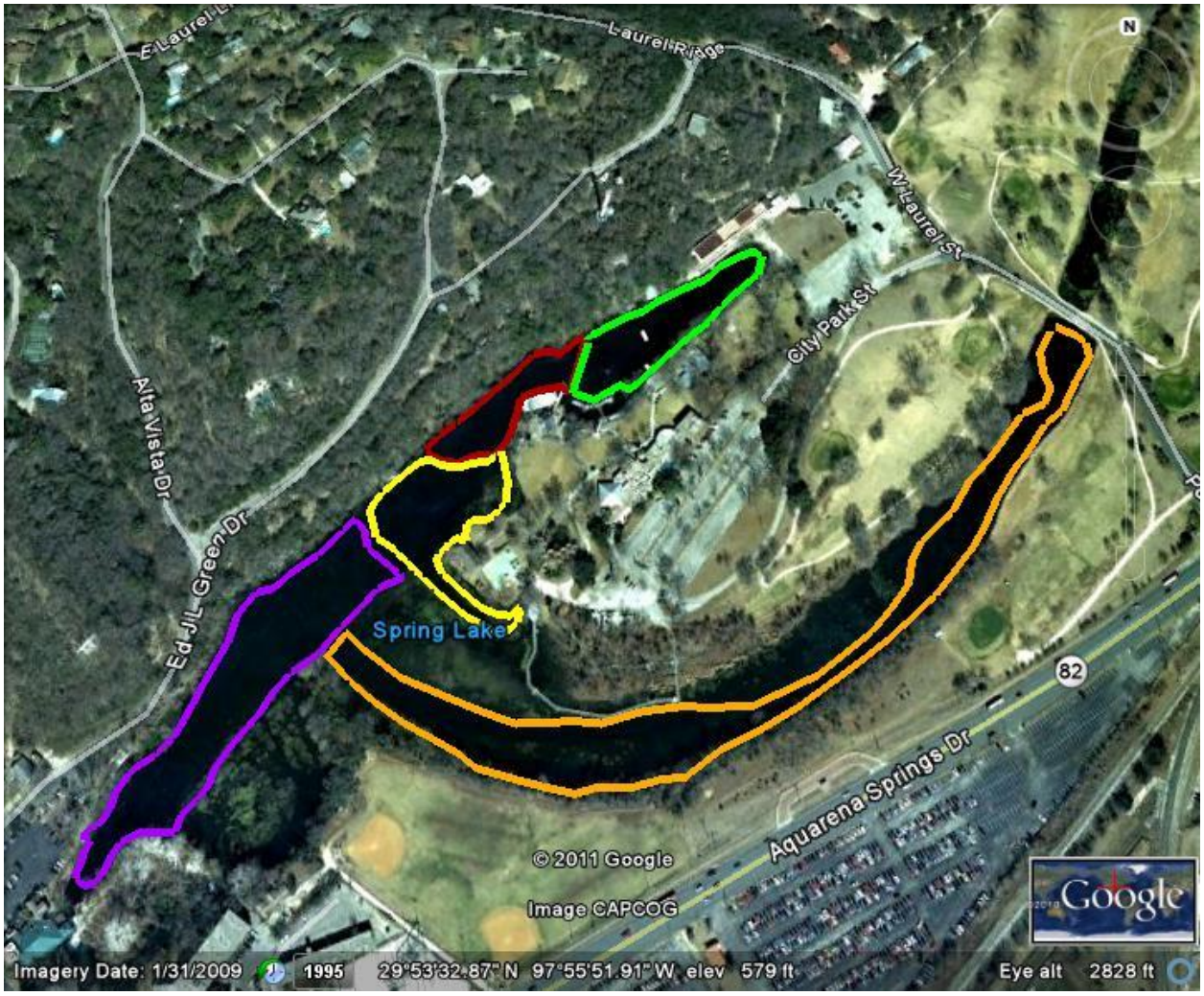
Attachment I

Appendix B – Map of Areas of Responsibility and Oversite



Appendix C – Aerial View of Spring Lake

Appendix D – Aquatic Harvester Zones



- Zone 1_Headwater Springs; Crater Bottom, Salt and Pepper 1&2, Weissmuller
- Zone 2_ Boat Path; Diversion, Cream of Wheat, Ossified Forest
- Zone 3_Boat Path; River Bed, Catfish Hotel, Deep Hole, Harvester Channel
- Zone 4_Boat Path; Archeology Site, Kettleman's, University Seminar Boat Path and Dock
- Zone 5_ Sink Creek/slough channel