City of San Marcos/
Texas State University

2027 Work Plan

2027 City of San Marcos/Texas State University Work Plan Budget

EAHCP Section	Conservation Measure	Table 7.1	Estimated 2027 Budget
5.3.1/5.4.1	Texas wild-rice Enhancement	$100,000	$20,000
5.3.6/5.4.4	Sediment Management	$25,000	$0
5.3.8/5.4.3.1/5.4.12	Aquatic Vegetation Restoration	$50,000	$210,500
5.3.3/5.4.3.2	Management of Floating Vegetation Mats and Litter	$80,000	$70,400
5.3.5/5.3.9/5.4.11/5.4.13	Non-Native Species Control	$35,000	$16,200
5.3.7	Designation of Permanent Access Points/Bank Stabilization	$20,000	$0
5.7.1	Native Riparian Restoration	$20,000	$20,000
5.3.2/5.4.2	Management of Recreation in Key Areas	$56,000	$65,000
5.7.6	Impervious Cover/Water Quality Protection	$200,000	$0
5.7.5	Management of HHW	$30,000	$30,000
5.3.4	Prohibition of Hazardous Material Transport	$0	$50,000*
5.4.3.1/ 5.4.5,8,9/5.7.3,4	Unfunded Measures	$0	$0
	Total	***$616,000***	***$482,100***

*Represents a reallocation of unused funds to 2027 that were previously approved in the 2026 CoSM/ TXST EAHCP Workplan and Funding Application.

2027 City of San Marcos/Texas State University Work Plan and Funding Application Amendment Log

Amendment #	Date EAHCP Committee Approved	Conservation Measure Amended	Y/N Funding Application Change	Funding Application Change ($)	Date EAA Board Approved	Comments
0	June 4, 2026	Original 2027 Work Plan	NA	NA	NA	Original 2027 Work Plan
0	October 8, 2026	Original 2027 Funding Application	NA	NA	November 11, 2026	Original 2027 Funding Application
1	October 8, 2026	**Aquatic Vegetation Restoration & Prohibition of Hazardous Materials Transport Across the San Marcos River and its Tributaries**	NA	NA	NA	Updated the activities and budget for Aquatic Vegetation Restoration and Prohibition of Hazardous Materials Transport Across the San Marcos River and its Tributaries

5.3.1/5.4.1 Texas Wild-Rice Enhancement and Restoration

Long-term Objective:
To achieve and maintain 8,000 – 15,450 m^2 of Texas wild-rice (TWR) coverage in the Upper San Marcos River as required by the EAHCP.

Target for 2027:
Maintain at least 8,000 m^2 of TWR coverage, with a goal of maintaining existing TWR coverage (approx. 11,000 – 12,000m^2), within the Upper San Marcos River between Spring Lake and Stokes Park per EAHCP long-term goals for TWR (**Table 1**). Reduce negative impacts to TWR caused by encroachment of non-native floating and submerged aquatic vegetation.

Table 1. TWR long-term biological goals, or EAHCP Table 4-10.

River Reach	Goal Areal Coverage (m^2) *	Goal Percent of Reach**
Spring Lake	1,000–1,500	N/A***
Spring Lake Dam to Rio Vista Dam	5,810–9,245	83–66
Rio Vista Dam to IH-35	910–1,650	13–12
Downstream of IH-35	280–3,055	4–22
TOTALS	**8,000–15,450**	**100**

*Represents a range of minimum long-term biological goal areal coverage over different flow conditions.
**Represents the percent of the total TWR coverage within that reach
***N/A is the goal reach percentage of total TWR coverage for Spring Lake as defined in EAHCP Table 4-10.

Methodology: Monitor TWR stands on an on-going basis in the Upper San Marcos River from Spring Lake to Stokes Park to detect the presence and expansion of non-native floating and submerged aquatic vegetation, including but not limited to *Hydrilla, Hygrophila, Nasturtium* and *Ceratopteris*. Remove, by-hand, non-native vegetation intermixed with and immediately adjacent to TWR stands. Should Condition M be in effect, non-native removal will be limited to areas within a 1-meter radius of TWR stands. Removed non-native vegetation will be captured and removed from the river. The removal, transport and disposal of non-native vegetation will be performed in accordance with Texas Parks and Wildlife Department (TPWD) Exotic Aquatic Vegetation Removal Permit provisions. TWR will be encouraged to expand naturally through the continued removal of non-native species within and around the perimeter of TWR stands.

Due to the current coverage of TWR within the San Marcos River (approximately 12,000 m^2), limited to no planting of TWR is anticipated to occur upstream of IH-35 in 2027. However, supplemental planting may be required if TWR coverage is significantly reduced as a result of flood scouring, low-flow conditions and/or river recreation activities.

TWR will be propagated from both tillers and seeds provided by U.S. Fish and Wildlife Service (USFWS) staff at the San Marcos Aquatic Research Center (SMARC). USFWS staff collect mature seeds from the panicle by gently pulling upwards until seeds are released. Mature seeds are plump, filled out, and either green or brown in color. Seeds are then placed in a plastic bag during collection, counted and potted within 3-6 months following collection. TWR seeds are placed on top of soil in 8-inch pots and covered with pea gravel to secure the seeds from floating in the water. Seeds are spread out evenly within each pot, and gently pushed into the saturated

soil and gravel mixture. Once TWR seeds have germinated they will be separated out and planted in a similar manner as TWR tillers. Tillers of TWR are hand-collected from floating vegetation mats or from fragments attached to mature plants within the river. TWR tillers are transported to the raceways located adjacent to the Texas State University Freeman Aquatic Biology (FAB) building and potted in soil that consists of a bulk mixture containing topsoil and mushroom compost. TWR tillers are planted in 8-inch pots with the soil being highly saturated with water so that the tillers can be inserted without causing damage to the roots. Density of fragments per pot is generally 3-5 individuals. The pots are placed into the FAB raceways with pumps generating a current through the newly planted fragments. Water in the raceways is sourced from a nearby Edwards Aquifer artesian well. Plants remain in the raceways until roots are established in the pots.

The process of planting begins by transporting potted TWR individuals from the FAB to a predetermined planting site in the river. A diver and a handler carry the plants to the designated section, and while the diver digs a hole in the substrate using a trowel, the handler gives the diver a pot of TWR. The contents are removed from the pot and inserted into the hole before returning the empty pot back to the handler for collection. The diver works downstream to upstream in a linear pattern of planting. Individuals are placed about 0.5 meters apart. This process is adjusted as needed to meet the varying conditions of each planting site.

Monitoring:
TWR, as well as non-native aquatic vegetation, is mapped and quantified at least twice annually in the Long-term Biological Goal Reaches (Spring Lake Dam, City Park, and IH-35 reaches) and all TWR are surveyed once a year in late summer as part of the EAA Biological Monitoring program.

Budget:
Table 7.1:
$100,000

Estimated 2027 budget:
$20,000

5.3.6/5.4.4 Sediment Management

The City of San Marcos (COSM) and Texas State University will partner to remove sediment from the river bottom in support of the native aquatic vegetation planting program from Spring Lake to IH-35.

Long-term Objective:
This activity has been suspended as the removal of sediment from the river in support of native aquatic restoration activities has proven to be both ineffective and cost-prohibitive. In 2017, an Adaptive Management Proposal to amend this conservation measure in the EAHCP was approved.

The Sediment Removal and Impervious Cover/Water Quality Protection are now combined into one conservation measure that seek to minimize inputs of sediment and other contaminated runoff in the Upper San Marcos River watershed. The primary focus is reducing erosion in and sediment transport from the Sessom Creek watershed which has historically contributed heavy sediment loads to the Upper San Marcos River.

The COSM has completed sanitary sewer collection line rehabilitation/ relocation and stream restoration in Sessom Creek and in the Windmill tributary of Sessom Creek to help reduce erosion, minimize the potential for sewer line breaks, and ultimately help to reduce sediment and pollutant discharges to the San Marcos River.

Target for 2027:
Monitor conditions in Sessom Creek in the area of the Phase 1 and 2 restoration projects to assess for erosion and subsequent sediment deposition in the San Marcos River in the vicinity of the confluence.

Method:
N/A

Budget:
Table 7.1:
$25,000

Estimated 2027 budget:
$0

5.3.8/5.4.3/5.4.12 Aquatic Vegetation Restoration

Long-term Objective:
To decrease the density of non-native aquatic and littoral vegetation within and immediately adjacent to the upper San Marcos River to enhance fountain darter habitat by increasing the distribution of native aquatic flora as provided in the long-term goals set forth in the EAHCP submerged aquatic vegetation (SAV) non-routine adaptive management.

Target for 2027:
Non-Native Aquatic Plant Removal
Continue efforts towards the systematic removal of non-native SAV from within the Upper San Marcos River utilizing a "top-down approach". Non-native aquatic vegetation maintenance in 2027 will occur from Spring Lake downstream to Cape's Dam. This segment of river will be classified as a "Maintenance Zone" (**Figure 1,** shown in green). SAV maintenance will also occur downstream of Cape's Dam to Stokes Park to maintain areas previously restored as part of recent grand-funded efforts. The intent of maintenance activities is to prevent significant re-growth of non-native submerged and floating aquatic vegetation where intensive SAV restoration has previously occurred and/or where native SAV is currently predominant in order to limit competition between natives and non-natives and reduce negative impacts to native SAV caused by expansion of non-native species.

The segment of river between IH-35 and Capes Dam will be classified as a "Recovery Zone" (**Figure 1,** shown in yellow) and will be monitored and maintained more frequently than upstream Maintenance Zones to more fully remove any re-emergent non-native SAV in preparation for native SAV planting.

Intensive non-native SAV removal will occur in select portions of the San Marcos River between Capes Dam and Cape Road, which will be classified as a "Work Zone" (**Figure 1,** shown in red). Intensive non-native removal in this segment will focus on bulk removal of *Hygrophila* in areas where it remains present in large quantities.

Additional non-native SAV removal will occur downstream of Stokes Park as part of a grant-funded project being completed by the Meadows Center for Water and the Environment/ Texas State University (Figure 2). Non-native SAV removal work will generally include removal of non-native SAV such as *Hygrophila* and *Hydrilla* from Stokes Park to a point downstream of the CoSM wastewater treatment plant. The project will include pre-and post-project SAV mapping within the project work area as well as documentation of work area footprints.

Native SAV Planting
The propagation and planting of native vegetation will be performed in accordance with Texas Parks and Wildlife Department (TPWD) Introduction of Aquatic Vegetation Permit provisions. Native SAV will be planted in areas where non-native SAV has been thoroughly removed and controlled. Native SAV planting in 2027 will be focused in the Recovery Zone between IH-35 and Cape's Dam (**Figure 1,** shown in yellow). Native SAV species to be planted include *Ludwigia repens, Cabomba caroliniana, Sagittaria platyphylla, Heteranthera dubia, Hydrocotyle, Myriophyllum heterophyllum, Zizania texana* and *Potamogeton illinoensis.* Limited

planting will also occur, as-needed, from Spring Lake Dam to IH-35 in areas where native SAV coverage has been reduced by flood scouring or other factors.

Additional SAV planting will occur downstream of Stokes Park as part of a grant-funded project being completed by the Meadows Center for Water and the Environment/ Texas State University (Figure 2). Native SAV such as *Ludwigia, Cabomba Heteranthera, Sagittaria* and *Zizania* will be planted in portions of the river from Stokes Park to a point downstream of the CoSM wastewater treatment plant. The project will include pre-and post-project SAV mapping within the project work area as well as documentation of work area footprints.

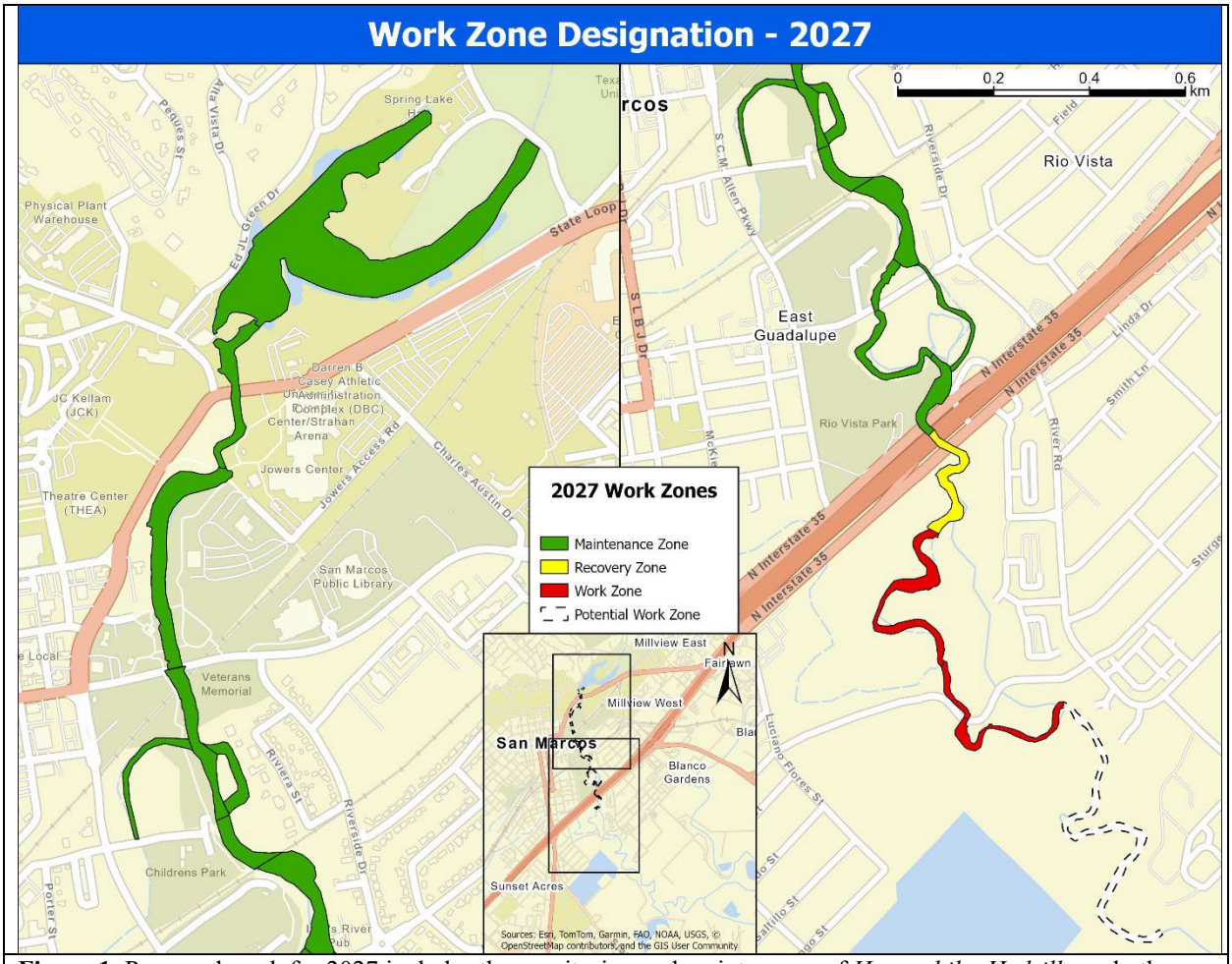


Figure 1. Proposed work for 2027 includes the monitoring and maintenance of *Hygrophila*, *Hydrilla* and other non-native floating and submerged aquatic vegetation from Spring Lake to IH-35 (shown in green), native planting within the "Recovery Zone" (shown in yellow) and intensive non-native SAV removal within the "Work Zone" from IH-35 to Cape's Dam (shown in red). Native SAV is to be planted from IH-35 to Capes Dam (the "Recovery Zone", shown in yellow).

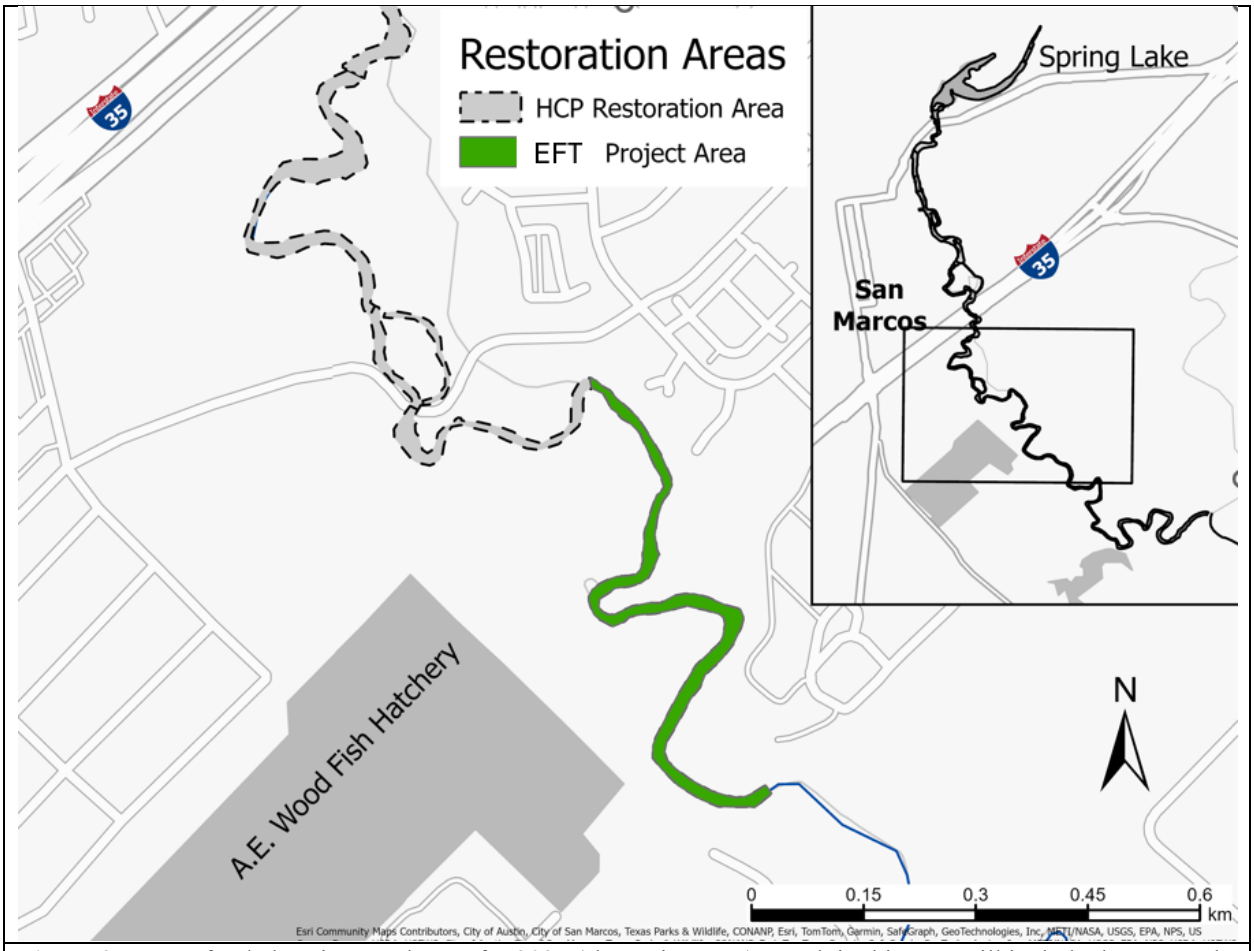


Figure 2. Grant -funded project work area for 2027 (shown in green). Work in this area will include the removal of non-native SAV and planting of native SAV in a manner as EAHCP SAV restoration program efforts.

Non-Native Littoral Plant Removal

Perform monitoring and maintenance of the littoral zone of the upper San Marcos River system where non-native littoral plants have previously been treated and/or removed. The area designated for continued monitoring and maintenance will include the littoral zone within and the riparian zone immediately adjacent to Spring Lake and the San Marcos River between Spring Lake and Stokes Park. This includes maintenance of areas where littoral vegetation (i.e. elephant areas) was previously treated and/or removed as part of the United States Army Corps of Engineers (USACE) San Marcos Aquatic Ecosystem Restoration project and along the property located on the west side of the San Marcos River between IH-35 Frontage Road and Cape Street. Monitoring and non-native vegetation maintenance will also occur in downstream portions of San Marcos River tributaries (i.e. lower Sink Creek, Purgatory Creek, Willow Creek and Sessom Creek) where non-native vegetation may exist and contribute to the introduction and spread of those non-native species into the main stem of the San Marcos River.

Work completed under this task will focus on the treatment and/or removal of non-native littoral zone vegetation (i.e. elephant ears) and non-native vegetation within the riparian zone immediately adjacent to the water's edge. Work under this task will not include treatment of non-

native vegetation within the upper riparian zone which will be managed under EAHCP Task 5.7.1 Native Riparian Habitat Restoration.

Methodology:

Non-Native Aquatic Plant Removal

The removal, transport and disposal of non-native vegetation will be performed in accordance with Texas Parks and Wildlife Department (TPWD) Exotic Aquatic Vegetation Removal Permit provisions. Non-native floating and submerged aquatic vegetation will be removed by hand. Maintenance removal of non-natives is conducted by routinely monitoring and selectively removing re-emergent non-native submerged and floating aquatic vegetation within Maintenance Zones. These maintenance activities will be focused primarily within and immediately adjacent to native SAV stands and are intended to prevent re-growth and spread of non-native aquatic vegetation, reducing competition and negative impacts to native species. Removed vegetation will be immediately placed in a mesh bag or skiff and removed from the river. Intensive, bulk non-native SAV removal efforts within designated Work Zones will focus on the removal of larger, contiguous stands of non-native SAV (i.e. *Hydrilla* and *Hygrophila*). Divers will pull non-native SAV by hand and allow removed vegetation to drift downstream into a pre-placed seine and/or placed directly into a skiff or mesh bag. Any removed vegetation will be shaken to remove any trapped fauna, which will be returned to the river prior to the vegetation being removed from the river and disposed of at the COSM or Spring Lake composting facilities. Initial intensive removal efforts will be followed by multiple sweeps involving the thorough removal of roots, small plants, and tubers. This process will be repeated until no *Hydrilla* or *Hygrophila* re-growth is observed.

The "top-down" approach for non-native SAV involves the systematic removal of *Hydrilla* and *Hygrophila* from upstream to downstream to minimize the potential for non-native SAV to re-colonize downstream areas from upstream sources. Reaches that have been thoroughly cleared of large patches of these species for two or more years are considered "Maintenance Zones" while reaches in which large amounts of these species are being removed are designated as "Work Zones". A "Work Zone" in which all *Hydrilla* and *Hygrophila* have been thoroughly removed during the previous year are considered a "Recovery Zone". "Recovery Zones" may require additional effort over time to ensure the thorough removal of these species' root systems and tubers. *Hydrilla* tubers can remain viable for multiple years despite being buried over 12 inches beneath the sediment. The practice of removing non-native SAV from upstream to downstream helps to reduce labor hours spent gardening non-native SAV regrowth resulting from non-native plant fragments migrating downstream from upstream stands and reestablishing in denuded areas and actively competing with recently planted or established native SAV. This method also allows for increased natural expansion of native SAV in the absence of non-native SAV. Large homogenous stands of non-native SAV will be targeted within "Work Zones". Within "Maintenance Zones" non-native SAV will be removed primarily from within stands of established native SAV and monitored for regrowth.

Native Aquatic Plant Introduction:

The propagation and planting of native vegetation will be performed in accordance with Texas Parks and Wildlife Department (TPWD) Introduction of Aquatic Vegetation Permit provisions. The planting of native SAV will occur once the designation of a Work Zone changes to a

Recovery Zone, as this minimizes the potential and occurrence of non-native SAV regrowth. This is expected to take 3-6 months from when initial intensive removal is completed within a Work Zone, depending on the density and area of non-natives originally present at the site.

Efforts will focus on preservation of existing native SAV cover to allow for the natural expansion of those populations throughout the river system. Portions of the riverbed exhibiting minimal native SAV coverage will be planted with native SAV species best suited to local river conditions with a goal of establishing mixed native SAV stands. Native SAV species that will be utilized for planting include *Ludwigia repens, Cabomba caroliniana, Sagittaria platyphylla, Heteranthera dubia, Hydrocotyle, Myriophyllum heterophyllum, Zizania texana* and *Potamogeton illinoensis.* Planting will not occur in areas commonly impacted by river recreation.

Native SAV to be used for planting will be propagated at the raceways adjacent to the FAB at Texas State University. Fragments and tillers of native aquatic plants to be propagated will be collected by hand from floating vegetation mats or from fragments attached to mature plants in the river.

Native SAV will be planted using a team comprised of one or more divers plus one or more handlers depending on the river depth and location. A planting hole will be made in the substrate using a trowel and the handler will give the diver a pot of native SAV. The contents are removed from the pot and inserted into the hole before returning the empty pot back to the handler for collection. Diver will plant downstream to upstream in a linear pattern of planting. Individuals are placed approximately 0.25 meters apart and gardened as needed to encourage successful establishment. This process is adjusted as needed to meet the varying conditions of each planting site and species.

In addition to the planting of potted and rooted plants, cuttings and/ or salvaged plant fragments of *Cabomba, Ludwigia, Heteranthera, Zizania* and *Potamogeton* will be directly transplanted into the substrate. This method is generally more cost-effective and results in less disturbance of the substrate and reduces downstream turbidity as a result. This method will be utilized when Condition M is in effect in order to increase native SAV coverage while minimizing overall disturbance of the substrate.

Previous experience regarding plant establishment, as well as environmental conditions at the time of planting, will determine which native species will be planted in specific locations within the river. *Cabomba* and *Sagittaria* have generally exhibited greater success in finer substrates (silt) within areas of slower moving water. Both species can be planted in a range of water depths. *Ludwigia* has been planted in a wide variety of habitat types ranging from areas with shallow depths, high velocities over coarse substrates to areas with slack-water habitat over silt substrate to determine which habitat results in greatest rates of expansion and persistence. This species shows greater resilience in different flows and depths, if the substrate is appropriate, and is often used if other species fail to expand within a denuded area. *Potamogeton* is an additional species that has struggled to become established in several reaches, and its coverage decreases downstream of Cypress Island. Like *Ludwigia*, *Potamogeton* has been planted in numerous areas with varying substrate compositions in an attempt to determine the most suitable habitat type. It was observed to exhibit the best growth in the upper reaches with high flow and dense, coarse

substrates (gravel/sand and clay). *Hydrocotyle,* like *Ludwigia,* can become a littoral species, persisting in areas of very shallow water or even in moist areas along the water's edge. Therefore, these species will be utilized to replant river margins, areas exhibiting very shallow water depths and/or in areas that have been observed to become dewatered during low-flow conditions. *Heteranthera* and *Myriophyllum* will be planted, as needed, in test plots within the IH-35 long-term biological goal reach (LTBG reach) in order to evaluate and monitor successful establishment and growth habitats. The test plots will be chosen to offer differing habitat types (depths, substrate, and edge/corridor). *Heteranthera* and *Myriophyllum* individuals will be removed and counted from non-LTBG reaches. The removal sites will be tracked via GIS polygons. These individuals will be re-planted at the IH-35 LTBG reach. Planting sites will be tracked via GIS polygons and the number of individuals planted will be adjusted as needed.

Non-Native Littoral Plant Removal
The littoral zone within and the riparian zone immediately adjacent to Sink Creek, Spring Lake, the San Marcos River (between Spring Lake and Stokes Park) will be monitored on a monthly basis to assess for re-emergent non-native vegetation. Re-emergent elephant ears will be spot-treated with Clearcast aquatic herbicide (Imazamox-based) at a rate of approximately 6oz/ gallon of water with applications made using a hand-held pump sprayer. Re-emergent ligustrum and chinaberry trees in the riparian zone immediately adjacent to the waterway will be spot-treated with Aqua Star herbicide (glyphosate-based) using a hand-held pump sprayer and mechanically removed. Re-emergent Chinese tallow trees will be spot-treated with Vastlan herbicide (triclopyr-based) and mechanically removed.

Monitoring:
Aquatic Vegetation: Newly planted areas will be monitored routinely to evaluate plant establishment and re-emergence of non-native SAV. All planted areas will be gardened to remove re-emergent non-native vegetation and replanted with native SAV, as needed. All planting and removal areas will be monitored via quadcopter imagery and/or visual observation. SAV coverage is mapped at least twice annually within LTBG reaches through the EAHCP Biological Monitoring program. Mapping data will be utilized to evaluate coverage of both native and non-native SAV and the efficacy of SAV restoration efforts.
Littoral Vegetation: The littoral zone along the upper San Marcos River from Spring Lake to Stokes Park, as well as applicable tributaries, will be monitored on a monthly basis. Any observed re-emergent non-native vegetation will be re-treated and/or removed.

Budget:
Table 7.1:
$50,000

Estimated 2027 budget:
$210,500 ($195,500 for SAV restoration and $15,000 for littoral zone non-native vegetation management)

5.3.3/5.4.3.2 Management of Floating Vegetation Mats and Litter

Long-term Objective:
Minimize impacts of floating vegetation and litter on TWR, native SAV and endangered species habitat within the San Marcos River.

Target for 2027:
Management of Floating Vegetation Mats:
Dislodge floating vegetation mats within the San Marcos River, generally from Spring Lake Dam to IH-35, where accumulations have the potential to negatively impact TWR and native SAV.

Management of Litter:
Perform routine litter collection efforts to reduce litter accumulations in the Upper San Marcos River. Litter management efforts will include the routine removal of litter from the littoral zone, riverbed and water column of the San Marcos River from Spring Lake Dam to Stokes Park. Litter collection will occur twice weekly from Spring Lake Dam to IH-35 and once weekly from IH-35 to Stokes Park during the recreation season (June 1-Sept 15) and monthly during the off-season. Litter removal will also occur quarterly within the lower portions of several of the major tributaries to the upper San Marcos River (i.e. Sessom Creek, Purgatory Creek, Riverside drainage channel and Willow Creek).

Methodology:

Management of Floating Vegetation in the San Marcos River: Floating vegetation mats and accumulations observed within and covering TWR and other native SAV will be dislodged and allowed to float downstream. The effort required to mitigate damage and reduce negative impacts to TWR and native SAV associated with accumulation of floating vegetation mats typically increases during low-flow conditions and in areas with significant TWR coverage, as the floating vegetation effectively becomes trapped within stands of TWR as waters recede.

Management of Litter in the San Marcos River: Litter will be collected by underwater divers and/or non-motorized vessel from the substrate, water column, surface and littoral zone of the San Marcos River from Spring Lake Dam to Stokes Park. Litter collection will occur twice weekly from Spring Lake Dam to IH-35 and once weekly from IH-35 to Stokes Park during the recreation season (June 1-Sept 15) and monthly during the off-season. All collected litter will be removed from the river and disposed of properly.

Collect and remove litter on a quarterly basis from portions of four San Marcos River tributaries in the area immediately upstream of the confluence and where access is available (i.e. Willow Creek, Purgatory Creek, Riverside Drive Drainage Channel, Sessom Creek).

Monitoring:
Floating Vegetation Mat Mgmt: The San Marcos River from Spring Lake Dam to IH-35 will be monitored routinely to assess for the accumulation of floating vegetation on TWR and over

native SAV stands. The location and approximate areal coverage of removal floating vegetation accumulations will be tracked and reported.

Management of Litter: The volume of litter collected during each litter removal session will be tracked and reported.

Budget:
Table 7.1:
$80,000

Estimated 2027 budget:
$70,400 ($40,000 for floating vegetation mat management & $30,400* for litter removal)

*The total amount of the CoSM litter removal contract is $50,400, of which the City funds $20,000, to perform the full scope of litter removal work as described in the above section.

5.3.5/5.3.9/5.4.11/5.4.13 Non-Native Species Control

Long-term Objective:
Reduce populations of non-native, invasive species in the San Marcos River to minimize their impacts on Covered Species and the aquatic ecosystem.

Target for 2027:
Continue efforts to remove non-native fish and snail species from the San Marcos River system. The species targeted for removal will include suckermouth armored catfish, tilapia, and two snail species, *Melanoides* and *Marisa cornuarietis.* Minimize the potential for the introduction of other non-native species into the San Marcos River.

Methodology:
The contractor will use methods that have proven to be successful in removal of non-native species from the San Marcos River system from Spring Lake to Stokes Park. Methods for non-native fish removal will include spearfishing within the river and bowfishing & gill netting in Spring Lake. The quantity and weight of removed non-native species will be tracked and reported.

Host two annual volunteer non-native polespear tournaments to increase total removal, while saving costs and providing an educational awareness component. Ensure that all tournament participants adhere to means and methods that avoid impacts to native species and the ecosystem. Tournament participants will be given a packet of information and are required to sign liability waivers.

Effective removal of *Melanoides* and *Marisa cornuarietus* is accomplished by determining the locations of highest snail density and using dip nets to remove the snails during the polespear tournaments. These species are best controlled by diving several hours after sunset to hand-pick the snails from the substrate and SAV.

COSM will continue to uphold an ordinance prohibiting the dumping of aquaria into the San Marcos River (CoSM Code Sec. 58.037) and offer the CoSM Discovery Center Fish Drop Off and Adoption program to accept unwanted aquatic fauna from the general public.

Monitoring:
In order to monitor the reduction of overall non-native species abundance in the San Marcos River ecosystem, the contractor will track the number of individuals removed and compile the weights of the individual animals removed. This information may assist in determining overall effectiveness of this conservation measures impact of species population dynamics.

Budget:
<u>Table 7.1:</u>
$35,000

<u>Estimated 2027 budget:</u>
$16,200

5.3.7 Designation of Permanent Access Points/Bank Stabilization

Long-term Objective:

Provide access points along the river for recreational access. Maintain integrity of structures that serve to control bank erosion, protect TWR and other SAV and listed species habitat in the Upper San Marcos River.

Target for 2027:

Continue to direct and encourage river access to permanent stabilized access points located along the San Marcos River between the Spring Lake Dam reach and Ramon Lucion Park. Deter and minimize river access in locations between the permanent access points with dense riparian vegetation and/or fencing.

Monitoring:

River access points will be visually monitored by City staff on a regular basis. Additional repairs and maintenance to the access points will be performed on an as-needed basis.

Budget:

Table 7.1:
$20,000

Estimated 2027 budget:
$0

5.4.3.1 Management of Submerged and Floating Vegetation in Spring Lake

Long-term Objective:

Management of aquatic vegetation in Spring Lake through the use of the harvester boat and through hand-removal of vegetation around individual spring orifices by trained, authorized divers.

Target for 2027:

Manage nuisance floating aquatic vegetation in Spring Lake through use of the harvester boat. Manage submerged SAV and debris accumulations around select spring openings in Spring Lake with authorized, trained divers to maintain San Marcos Salamander habitat.

Methodology:

Management of Floating Aquatic Vegetation in Spring Lake:

The harvester boat will cut and remove approximately 15 to 20 boatloads of plant material a month from Spring Lake. The harvester clears the top meter of the water column, cutting vegetation from sections one, two, and three once a week. The harvested vegetation is visually checked by the driver for fauna caught in the vegetation. If the driver observes fauna, he/she will stop work and return the animal(s) back into Spring Lake if appropriate. Texas State employees and supervised volunteers are trained to recognize the Covered Species through the Diving for Science program (EAHCP § 5.4.7.1) and avoid contact with them. Vegetation mats are removed from zones four and five on an as-needed basis. The total area treated equals about nine surface acres.

Management of Submerged Aquatic Vegetation and Debris Accumulations around Spring Openings in Spring Lake: Each week approximately five springs will be gardened, with trained divers returning to garden the same springs every two to three weeks. During summer when algal growth has been observed to increase, the springs may be managed more frequently (up to four springs per day), primarily to remove algae. Texas State employees and supervised volunteers 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 with a machete and by-hand. Over the next 1.5-meter radius around the spring opening, they shear vegetation to a height of 30 cm, and then to one meter over the following three-meter radius. Plant materials are not collected and removed, but rather carried away by the current. Cumulatively, approximately six meters of vegetation around each spring opening is managed. Mosses will not be cut. The volume of plant material to be removed will vary by the amount of time between cuttings and season.

Budget:

Table 7.1:
$0

Estimated 2027 Budget:
$0

5.7.1 Native Riparian Habitat Restoration

Long-term Objective:
Establish a robust native riparian buffer along the Upper San Marcos River from the headwaters to City Limits to benefit the Covered Species by minimizing bank erosion and infiltrating/ filtering stormwater runoff. The riparian buffer will also help to minimize public river access which can lead to bank erosion and direct impacts to TWR and aquatic vegetation. A zone of prohibitive vegetation along the uppermost edge of the riparian buffer will be established to encourage river users to access the river via hardened access points. Private riverside landowner participation in this program will be encouraged and the EAHCP will provide the labor and plants as practical.

Target for 2027:
Monitor and maintain the riparian zone of the San Marcos River from Spring Lake to city limits, and within select tributaries of the San Marcos River, to reduce non-native vegetation re-growth, encourage establishment of native vegetation and reduce the seed source of non-native vegetation within the riparian zone of the San Marcos River.

Plant native riparian vegetation, as needed, in areas where non-native vegetation has been adequately controlled and/ or where needed to establish vegetative coverage to control erosion and promote bank stability.

Monitor and maintain existing riparian zone protection fencing as needed.

Methodology:
Manually remove and/or treat invasive, non-native vegetation and regrowth using a glyphosate/triclopyr herbicide mix to treat the stumps and/or roots. On upland trees, shrub stumps and root buttresses, Relegate **(**Triclopyr-based herbicide) is used. Relegate is mixed with glyphosate, Drexel Surf Ac 820 Surfactant and Turf Mark Blue, a blue dye. Roots are scraped and treated with herbicide mix then monitored for regrowth.

Planting of native vegetation will occur as-needed to expand the riparian zone and to promote bank stability and native vegetative coverage. Candidate native plant species for planting will include, but not be limited to, Turks Cap, Inland Sea Oats, switchgrass, Eastern gamagrass, frogfruit, elderberry, beautyberry, buttonbush, American Sycamore, Bald Cypress and Pecan. Protective fencing may be required to be installed around individual plants or planting areas to promote establishment. The CoSM's Discovery Center will continue to grow out and provide at least a portion of the native plants needed for riparian planting efforts.

Monitoring:
Monitoring will occur throughout all previously restored riparian areas on a monthly basis to assess re-growth of non-native riparian vegetation. Re-treatment of re-emergent non-native vegetation will occur as needed.

Monitoring and maintenance will continue to be a combination of contract work funded by the EAHCP and COSM staff, as well as through volunteer efforts. The City will continue to

maintain riparian zone protection fences to prevent trampling and disturbance of the riparian vegetation.

Budget:
Table 7.1:
$20,000

Estimated 2027 budget:
$20,000

5.3.2/5.4.2 Management of Recreation in Key Areas

Long-term Objective:
To minimize the impacts of incidental take resulting from recreation which includes, but is not limited to swimming, wading, tubing, boating, paddle boarding, scuba diving, snorkeling and fishing.

Target for 2027:

1. Hire and manage Conservation Crew members that will perform public outreach, river recreation impact minimization efforts, and assistance with the management of litter, floating vegetation mats and non-native vegetation. The fully staffed Conservation Crew (approx. 8-10 staff) will work approximately 15 hours/week from mid-May to September with a limited number of staff working prior to and after the peak recreation season.

2. Continue the implementation of the following recreational management goals:

    a. Signage. Educational signage has been installed in most TXST and City riverfront parks and along the Upper San Marcos River. Signs help to convey TXST and City park rules, educate the public on the importance of the resource and inform of EAHCP project efforts.

    b. Exclusion barriers/ in-stream SAV/ TWR protection zones will be installed and maintained within pertinent areas of the San Marcos River SSA when flows decrease below 120 cfs to protect TWR stands and habitat areas susceptible to recreation impacts.

    c. Post maps showing trails, access points, and other amenities. River maps are at several locations along the upper San Marcos River between City Park and IH-35 as well as at the Discovery Center which serves as the trailhead to the San Marcos River.

    d. EAHCP information and river stewardship tips have been included on the San Marcos Visitor Bureau's webpage. EAHCP brochures have been placed at the Tourist Information Bureau for visitors.

    e. Park Ambassadors will be hired and funded through the City of San Marcos to routinely patrol and monitor the river and City riverfront parks during the summer river recreation season (Memorial Day to Labor Day). Park Ambassadors will assist with controlled access at Rio Vista Park and generally educate river and park users of Park rules and regulations.

    f. Coordinate with the Texas State University Outdoor Recreation center to help educate river users about endangered species and EAHCP restoration on the San Marcos River.

    g. Continue to perform educational public outreach during volunteer planting workdays and public events.

h. Continue to educate the those engaged in river recreation on sustainable river behaviors that protect listed species and their habitats, primarily through the Conservation Crew.

Document education/ outreach efforts, litter collection, EAHCP program assistance and other river recreation management activities conducted by the Conservation Crew and City/ University staff.

Monitoring:
Monitor recreational impacts to endangered species habitat within the San Marcos River on an on-going basis through visual observations and through EAHCP aquatic vegetation mapping. Adjust recreational management measures as needed to help minimize recreation impacts to endangered species and their habitat.

Budget:
Table 7.1:
$56,000

Estimated 2027 budget:
$65,000

5.7.6 Impervious Cover/Water Quality Protection

Long-term Objective:
Establish a program to protect water quality and reduce the impacts from contaminated runoff based on recommendations listed in the *San Marcos Watershed Protection Plan*.

Target for 2027:
Montor and maintain the Sessom Creek Ph 1 and 2 project areas.

Monitoring:
Inspect and monitor Sessom Creek Ph 1 and 2 project areas during and following significant storm events to assess native vegetation coverage, stream stability and erosion.

Budget:
Table 7.1
$200,000

Estimated 2027 budget:
$0

5.7.5 Management of Household Hazardous Waste

Long-term Objective:
Implement a household hazardous waste (HHW) collection program that provides a place for citizens of San Marcos and Hays County to properly and safely dispose of HHW to minimize the potential for dumping or introduction of HHW into the river or recharge zone and impacts to Covered Species.

Target 2027:
Continue to operate the COSM HHW Drop-Off and Reuse Center to provide a location for the safe and proper disposal of HHW items. Conduct public outreach to educate residents on proper HHW disposal and awareness of the COSM HHW Drop-Off and Reuse Center.

Methodology:
The HHW Drop-Off and Reuse Center is located at 634 E Hopkins in San Marcos, TX. The hours of operation of the center are every Friday from 12-3:30pm and every Saturday from 8am-12pm. The HHW Drop-Off Center accepts cleaning products, fluorescent lights, paint, paint thinners, solvents, degreasers, glues/ adhesives, pesticides, herbicides, lawn chemicals, pool chemicals, automotive filters, car and household batteries, thermometers, cell phones, used cooking oil, propane cylinders and medical sharps. The HHW Reuse Center allows an opportunity for residents to pick-up HHW items such as cleaning supplies, fertilizers, and paint that are dropped off at the HHW Collection Center.

Monitoring:
Track the amount of HHW received and number of participants from San Marcos, Hays County, and surrounding communities. All necessary documentation will be turned in to TCEQ. Identify the HHW that comes from communities with the San Marcos River watershed and the cost of collecting, processing and disposing of HHW from these communities.

Budget:
Table 7.1:
$30,000

Estimated 2027 budget:
$30,000

5.3.4 Prohibition of Hazardous Materials Transport Across the San Marcos River and its Tributaries

Long-term Objective:
Reduce the potential of spill of hazardous materials in the San Marcos River and its tributaries through the designation of a hazardous materials route in COSM.

Target for 2027:

It is anticipated that the proposed designated hazardous materials route will be formally approved by TXDOT and adopted by City Council by the end of 2026 or in early 2027. The final phase of implementation includes installation of permanent signage along major highways and roads to inform hazardous material carriers of the hazardous materials transport route.

Methodology:
Contract with a consultant to provide specifications and design plans for hazardous material transport routing signage. Work with TXDOT to gain approval for proposed signage. Hire a construction contractor to install signage.

It is anticipated that two large signs will be installed along the north- and south-bound lanes of IH-35 and small signs installed on Wonder World Dr, Hwy 123 and Hwy 21.

Budget:
Table 7.1:
$0

Estimated 2027 budget:
$50,000*

*Represents a reallocation of unused funds previously approved in the 2026 CoSM/ TXST EAHCP Workplan and Funding Application.

5.7.3 Septic System Registration and Permitting Program

Long Term Objective:
To ensure an aerobic and anaerobic septic system registration, evaluation, and permitting program to minimize the potential for subsurface pollutants from being introduced to the San Marcos Springs ecosystem within city limits.

Target for 2027:
Maintain a database of new, modified and existing septic systems within COSM's jurisdiction. City ordinance requires all owners of septic systems connect to municipal sewer lines as they become available.

Methodology - It is required by law that all septic systems are permitted by the local Designated Representative (DR), which is currently the COSM's Environmental Health Department. Plans are submitted with the application and reviewed by the DR for TCEQ compliance. Once these requirements are met, the permit to construct is issued. The design, site evaluation, installation and inspections can only be performed by individuals that are licensed by TCEQ. Before the installation or modification is approved, inspections are made by the DR to ensure that the system installed corresponds with the design. Once completed, a license to operate is issued to the property owner by the DR. All DRs are subject to TCEQ Compliance Reviews.

Monitoring:
The COSM Environmental Health Department reviews all applications and inspects the installations of all new and modified septic systems within the City's jurisdiction. The Department also monitors maintenance and responds to all complaints reported or observed.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0

5.4.5 Diversion of Surface Water

Long-term Objective:
Texas State University (TXST) will curtail its permitted surface water diversions as a function of total San Marcos springflow to protect the aquatic resources as specified under the EAHCP flow management strategy.

Target for 2027:
Curtail surface water withdrawals as specified in EAHCP Section 5.4.5. Under TCEQ Certificates 18-3865 and 18-3866, TXST's total diversion rate from the headwaters of the San Marcos River for consumptive use is limited to 8.1 cfs (See EAHCP Section 2.5.5). The total diversion rate from Spring Lake is limited to 4.88 cfs; the total diversion rate from the San Marcos River at Sewell Park is limited to 3.22 cfs (See EAHCP Section 2.5.5.1 and 2.5.5.2 respectively).

Methodology:
TXST will reduce surface water withdrawals during low-flow conditions per Table 5-4 of the EAHCP (Table 2). When streamflow, as measured at the USGS gauge (08170500) San Marcos River, reaches 80 cfs, TXST will not exceed a total diversion rate more than 6.1 cfs. This reduction in pumping will occur at the pump just below Spring Lake Dam in order to maximize the benefits to salamanders, TWR, and other aquatic resources in the San Marcos River below Spring Lake Dam. When the USGS gauge reaches 60 cfs, TXST will not exceed a total diversion rate more than 4.1 cfs. The additional 2 cfs reduction will be made from the pumps located in the slough arm of Spring Lake, and, therefore, maximize the benefits to the aquatic resources within the main stem San Marcos River below Spring Lake Dam. When the USGS gauge reaches 49 cfs, TXST will not exceed a total diversion rate to 1 cfs. This further reduction will be made by restricting the pumps located in the Sewell Park reach. TXST surface water diversions will be suspended when the streamflow declines below 45 cfs.

Table 2. Reductions in Surface Water Diversion Rates Required by TXST during Low-Flow Conditions (EAHCP Table 5-4)

Streamflow (cfs)	Spring Lake Diversions (cfs) Cert. No. 18-3865	San Marcos River Diversions (cfs) Cert. No. 18-3866	Total Diversion Rate (cfs)
>80	4.9	3.2	8.1
80 – 60	2.9	3.2	6.1
60 – 49	0.9	3.2	4.1
49-45	1.0	0	1.0
<45	0	0	0

Monitoring:
The COSM/ TXST Habitat Conservation Plan Manager will monitor San Marcos River streamflow conditions and will notify TXST when reductions in diversion rates are required. TXST will track the volume and rate of surface water diversions from the San Marcos River.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0

5.4.7 Diving Classes in Spring Lake

Long-term Objective:
Maintain the integrity of the ecology within Spring Lake through controlling access to Spring Lake in accordance with federal, state and local laws.

Assumptions: All diving activities in Spring Lake are governed by the Spring Lake Management Plan.

Target for 2027:
Implement the diving protocols as outlined in the Spring Lake Management Plan, EAHCP, and the ITP with the following modifications: no more than 16 volunteer divers will be allowed in the lake per day, with no more than eight at one time.

Methodology - The Meadows Center Spring Lake Manager and/ or Diving Safety Officer will monitor all diving activities in Spring Lake, assuring all guidelines contained in the Diving Safety Manual for Spring Lake, Spring Lake Management Plan, EAHCP, and ITP are observed.

Monitoring:
The Lake Manager, with assistance from the Diving Safety Officer, will compile an annual summary of diving activities conducted in Spring Lake.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0

5.4.8 Research Programs in Spring Lake

City ordinance and state law designate the public waters of Spring Lake as restricted to activities authorized by the University. Proposals for research projects in Spring Lake must be submitted to the Environmental Review Committee, through the Lake Manager, for review and approval.

Long-term Objective:
Maintain the integrity of the ecology within Spring Lake through controlling access to Spring Lake in accordance with federal, state and local laws. All research activities in Spring Lake are governed by the Spring Lake Management Plan, EAHCP, and ITP.

Target for 2027:
Implement the protocols for research as specified in the Spring Lake Management Plan, EAHCP, and ITP.

Methodology - Proposals for research projects in Spring Lake must be submitted to the Environmental Review Committee, through the Lake Manager, for review and approval.

Proposals for research projects must be submitted in writing and include:

1. Name and contact information of the responsible party conducting the research;
2. Purpose and expected outcomes of the activities, including a description of how the project contributes to science;
3. Description of activities, including, if appropriate, measures to be taken to minimize any impact on endangered species or their habitat, or any cultural resources found in the lake;
4. Methodology, including literature review;
5. Type of equipment used, how much; where it will be placed, and for how long it will remain in lake (see Equipment in Lake Section E of the Spring Lake Management Plan);
6. Expected impact; and
7. Timeline of project.

Monitoring:
The Lake Manager will compile an annual summary of the research conducted in the lake, including statements on the impact of these activities on the health of the lake.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0

5.4.10 Boating in Spring Lake and Sewell Park

Long-term Objective:
Maintain the integrity of the ecology within Spring Lake and San Marcos River through controlling access to Spring Lake in accordance to federal, state and local laws. All boating activities in Spring Lake are governed by the Spring Lake Management Plan, EAHCP, and ITP.

Target for 2027:
Implement the protocols for boating as specified in the Spring Lake Management Plan in support of the EAHCP and ITP.

Follow the below protocol for all boats (canoe, kayak, and paddleboards) used for educational activities, excluding glass bottom boats:

1. All boats must be properly washed/disinfected before being placed in lake and once they are removed per the protocol defined in the Spring Lake Management Plan.
2. Participants must receive an orientation prior to boating including instruction on safety, basic boat handling, and on-site rules and regulations. The orientation will cover information specific to Spring Lake's sensitivity and endangered species.
3. All non-glass bottom boat activity must not interfere with routine glass bottom boat operations.

To minimize the impacts of boating on the Covered Species' habitat in Sewell Park, canoeing/kayaking classes in Sewell Park will be confined to the region between Sewell Park and Rio Vista dam. Students will enter/exit canoes/kayaks at specified access points to avoid impacting the flora and fauna along the bank. All classes will be supervised.

Monitoring:
The Lake Manager will compile an annual summary of boating activities conducted on the Spring Lake, including statements on the impact of these activities on the health of the lake.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0

5.4.9 Management of Golf Course and Grounds

Long-term Objective:
Management of the grounds to minimize and reduce negative effects to aquatic ecosystem in Spring Lake and the San Marcos River.

Target for 2027:
Continued implementation of the Grounds Management Plan and Integrated Pest Management Plan. Texas State University completed conversion of the Golf Course to Intramural Recreation Fields. COSM will work with the Texas State Facilities to better understand how the change will affect the Grounds Management Plan and the Integrated Pesticide Management Plan.

Methodology - The grounds will be maintained to meet the recreational function in an environmentally sensitive manner. It is the responsibility of the Grounds Manager to maintain the grounds in accordance with the Integrative Pest Management Plan (IPM). This plan describes the activities and materials to be used to control pests (i.e. insects, weeds, and other living organisms requiring control) in a way that minimally impacts the environment. The IPM is updated as needed by the Grounds Manager, in consultation with the Lake Manager and the Environmental Review Committee. The Grounds Manager will consult with the Lake Manager on any unique situations that may arise outside of routine maintenance that could impact Spring Lake.

Monitoring:
Each year the Grounds Manager will report to the Lake Manager detailed information on maintenance activities and materials used during the year. Documentation of herbicide application is monitored by the Texas Department of Agriculture through unannounced spot checks.

Budget:
Table 7.1:
$0

Available budget for 2027:
$0