

The City of San Marcos and Texas State University 2017 Work Plan Summaries

Section	Conservation Measure	Science Committee Review
I	N/A	Methodology Review and Input
II	Texas wild-rice Enhancement and Restoration	Update with pending methodologies
	Control of Non-native Plant Species	
III	Sediment Removal	Update only
	Native Riparian Habitat Restoration	

No scientific review necessary:

- 5.3.2/5.4.2 Management of Recreation in Key Areas
- 5.3.3/5.4.3 Management of Floating Vegetation Mats and Litter
- 5.3.5/5.3.9/5.4.11/5.4.13 Non-Native Species Control
- 5.3.7 Designation of Permanent Access Points/Bank Stabilization
- 5.7.6 Impervious Cover/Water Quality Protection
- 5.7.5 Management of Household Hazardous Waste
- 5.3.4 Prohibition of Hazardous Materials Transport
- 5.7.3 Septic System Registration and Permitting Program
- 5.7.4 Minimizing Impacts of Contaminated Runoff
- 5.4.5 Diversion of Surface Water
- 5.4.7 Diving Classes in Spring Lake
- 5.4.8 Research Programs in Spring Lake
- 5.4.10 Boating in Spring Lake and Sewell Park
- 5.4.9 Management of Golf Course and Grounds

II. Update with pending methodologies:

5.3.1/5.4.1 - Texas Wild-Rice Enhancement and Restoration

Measure summary:

Texas State University and the City of San Marcos are continuing to partner to enhance and restore Texas wild-rice (TWR) in Spring Lake and the San Marcos River to the San Marcos wastewater treatment plant.

2017 Goals:

Pending completion of the Submerged Aquatic Vegetation Report due in 2016.

Achieved to date:

Reach	Table 4-10 minimum (m ²)	Early 2016	Remainder
Spring Lake	1,000	31	969
Spring Lake Dam to RV	5,810	6,220	(410)
RV to IH-35	910	85	825
Downstream of IH-35	280	0	280
Total	8,000	6,336	1,644

*TWR covered 7,489 m² in late June 2015.

What has worked?

TWR enhancement has proven to be a highly successful program and minimal changes have been made in this methodology. The flood in 2015 uprooted small percentage of TWR stands; these areas have recovered well. Sessom Creek dumped sediment eroded from its banks on TWR stands located from Sessom Creek confluence to City Park; these areas are also showing new growth.

What has not worked?

Texas State encountered issues with propagating native aquatic vegetation in the raceways and have modified their methods accordingly. Mass amounts of algal growth would accumulate on newly planted fragments that reduced the growth and health of the plants. Texas State found installing sunlight barriers reduced the amount of algal growth and in turn, increased survivability of the plantings.

5.3.8/5.4.3/5.4.12 - Control of Non-Native Plant Species

Measure Summary:

The City of San Marcos and Texas State University are partnering to implement an on-going non-native plant replacement program for the San Marcos River from Spring Lake to city limits. Non-native species of aquatic, littoral, and riparian plants will be replaced with native species to enhance Covered Species habitat.

2017 Goal:

Pending completion of the Submerged Aquatic Vegetation Report due in 2016.

Achieved to date:

The below data below does not represent the whole river, only the study reaches. Excludes stargrass (*Heteranthera*).

Estimated area Non-Native Veg reduction (m ²)	
Species	2014-2015
Hygrophila	460
Hydrilla	1,200
Nasturtium	120
Eichhornia	20

Spring Lake Dam Reach Native Veg. Distribution (m ²)			
Species	Table 4-21	Nov. 2015	Remainder
Ludwigia	200	0	200
Cabomba	25	0	25
Potamogeton	1,000	0	1,000
Sagittaria	100	10	90
Vallisneria	125	0	125

City Park Reach Native Veg. Distribution (m ²)			
Species	Table 4-21	Nov. 2015	Remainder
Ludwigia	200	1	19
Cabomba	50	0	50
Potamogeton	2,000	55	1,945
Sagittaria	300	90	210
Vallisneria	50	0	50

IH-35 Reach Native Veg. Distribution (m ²)			
Species	Table 4-21	Nov. 2015	Remainder
Ludwigia	50	10	40
Cabomba	300	35	265
Potamogeton	300	0	300
Sagittaria	100	375	(275)
Vallisneria	25	0	25

What has worked?

SAV removal is working well, but planting strategies have been variably successful. Species such as *Heteranthera* and *Sagittaria* are highly successful, but other species (discussed below) do not propagate well in the river.

A die off of potted *Ludwigia* would occasionally occur and Texas State University (TXSTATE) discovered it was a result of predation from an aquatic moth (Jeff Hutchinson, USFWS). To reduce the risk of moth predation, TXSTATE learned to raise the water levels in the raceways to prevent *Ludwigia* from becoming emergent since that appeared to correspond with the moth invasion. Algal growth on propagated plants was another issue TXSTATE observed in the raceways

What has not worked?

Ludwigia repens, *Potamogeton illinoensis*, and *Cabomba caroliniana* have proven less successful to plant, therefore existing stands of these species are monitored and weeded to encourage expansion. This strategy has been more successful than growing in raceways and planting.

Loss in areal coverage was observed for native species including *Potamogeton illinoensis*, *Cabomba caroliniana*, and *Hydrocotyle*, which is attributed partially to riverbed scouring and sediment deposition that occurred during the October 30, 2015 flood event.

III. Update on progress only

5.3.6/5.4.4 - Sediment Removal

Measure summary:

The City of San Marcos and Texas State University are partnering to remove sediment from the river bottom in support of the native SAV planting program from Spring Lake to IH-35.

2017 Goal:

Remove sufficient sediment to maximize success of TWR and SAV plantings (see TWR Enhancement & Non-native Removal sections). The long-term objective will be modified in response to the decreased funding in Table 7.1.

Achieved to date:

158 cubic meters of removed sediment throughout the system.

What has worked?

The mechanism of removal as described in the EAHCP has been used successfully with minor adjustments since 2013.

What has not worked?

The method is labor intensive and can only remove minimal amounts of sediment.

Methods to achieve 2017 goal:

Sediment removal will only be used to support native plantings and not as a separate measure of restoration. Therefore, no quantitative goal has been independently set for this measure.

5.7.1 - Native Riparian Habitat Restoration

Measure summary:

The City of San Marcos and Texas State University have undertaken a program to increase the area and density of the riparian and water quality buffer zone on public and private lands from the Spring Lake Dam to IH-35 using native vegetation. Upon completion of the riparian and water quality buffer zone on public land, private landowners will be asked to voluntarily participate in the plan.

2017 goal:

Establish a robust native riparian and water quality buffer community that benefits Covered Species and the habitat quality adjacent to and within the San Marcos River down to IH-35 as well as prevent public access in undesirable locations which will decrease bank erosion.

A zone of prohibitive vegetation along the uppermost edge of the riparian and water quality buffer community will be established to encourage river users to access the river via hardened access points and encourage private riverside landowner participation in this program and provide the labor and plants as practical.

Contractor(s) will perform invasive removal and maintenance. Native plantings and maintenance will be done by volunteers during regular planting events. Removal of invasives from the last portion of Ramon Lucio Park (Wildlife Annex), replant with natives, and maintain all treated areas from Spring Lake to IH35. *Arundo donax* removal will be researched for possible extraction.

Achieved to date:

Public and University land from Clear Springs site to Ramon Lucio (by IH-35) have been treated and planted.

What has worked?

The establishment of a strong volunteer program has been the key to success with this conservation measure. Watering is the limiting factor, so in 2015 we switched to planting xeric species along the fence line and littoral plants along river's edge. Additionally, broadcasting seed over the entire area removes the need to continually water until established.

2015 flooding caused damage to all fences and associated signage. Small percentage of plants were destroyed under flood debris; the majority of plants recovered fully.

What has not worked?

Regrowth in the older treated areas is out of control, but we will address this issue over the next two-years and have a maintenance plan in place. Additionally, River users still access certain riparian areas from the river causing some damage.

Method to achieve 2017 goal:

Use staff and volunteers to remove all invasive trees and vines, replant with diversity of native trees, shrubs, grasses and flowering plants, fence to prevent access and add signage to educate public and maintain riparian zone plantings.