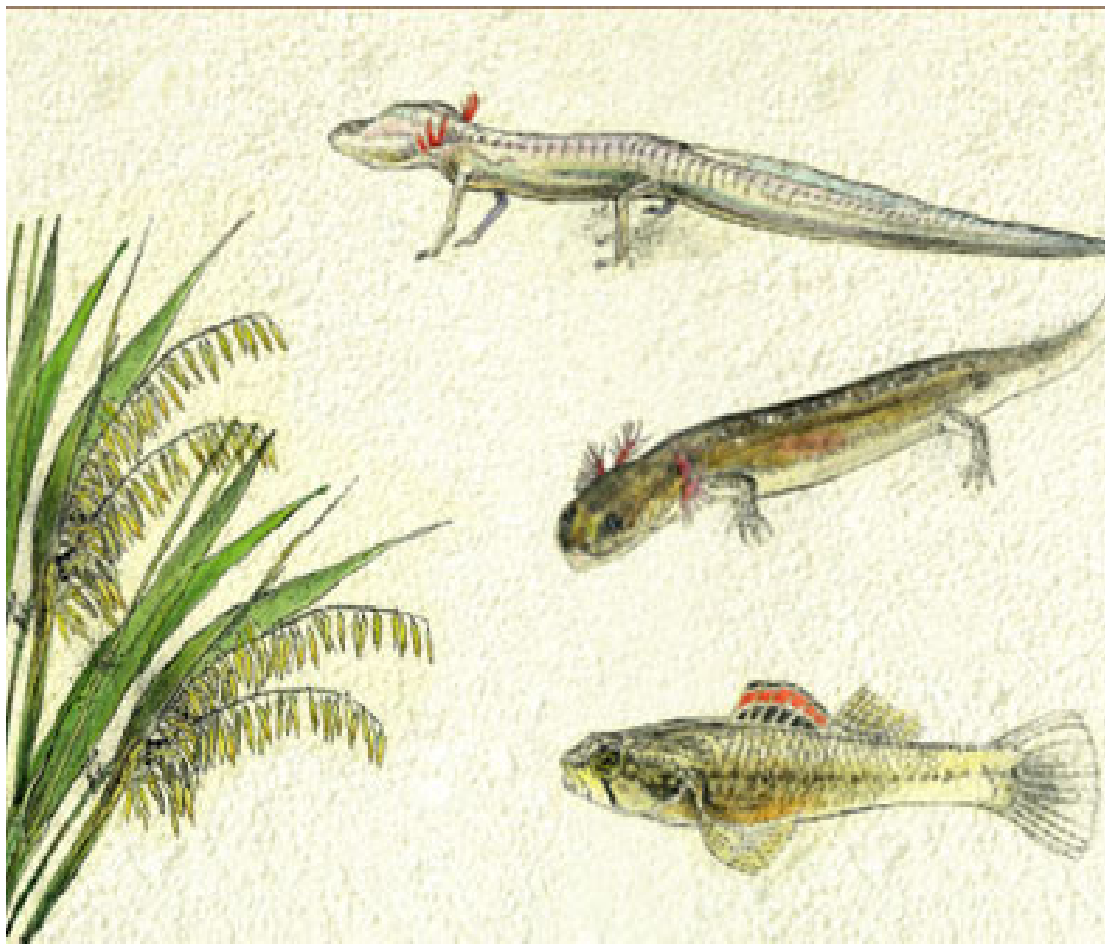




Riparian Restoration as part of a Habitat Conservation Plan



What is an HCP?



The HCP identifies conservation measures that protect endangered species

The EAHCP focuses on species in the Edwards Aquifer-fed Comal and San Marcos spring

The goal of the HCP is to protect those species from harm during the most severe drought to the extent required by state law (EAA Act) and federal law (ES Act)

WHY?

Water needs within the region continue to impact the resource

- The region's stakeholders developed and adopted the HCP as a workable plan for long-term protection for the listed species while still meeting water demands
- Implementing measures to ensure minimum continuous springflows of the Comal and San Marcos Springs

Who are these Stakeholders?



City of San Marcos

Texas State University

City of New Braunfels

San Antonio Water Systems

Edwards Aquifer Authority

Covered Species



Texas wild-rice

Fountain Darter



Riffle
beetle



San Marcos Salamander


Study Area Map

San Marcos Water Quality Protection Plan

San Marcos, Tx

- Highways
- Rivers and Creeks
- Railroad
- Interstate Hwy 35
- Study Area
- San Marcos ETJ
- Watershed (RPS)
- San Marcos River
- Edwards Aquifer (TCEQ)**
 - Contributing Zone
 - Recharge Zone
 - Contributing within the Transition Zone
 - Transition Zone

 **THE MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT**
TEXAS STATE UNIVERSITY

 Miles
0 1.25 2.5 5

Data from TCEQ, TWDB, ESRI, and City of San Marcos

üUrbanized – “fastest in nation”
üRecreation
üEnvironmental regulations
üNo WS protection staff
üNo WS protection plan

Sediment Removal - \$500K

Sediment has accumulated at many locations due to the reduced scouring from installation of flood control dams, urbanization and natural processes.

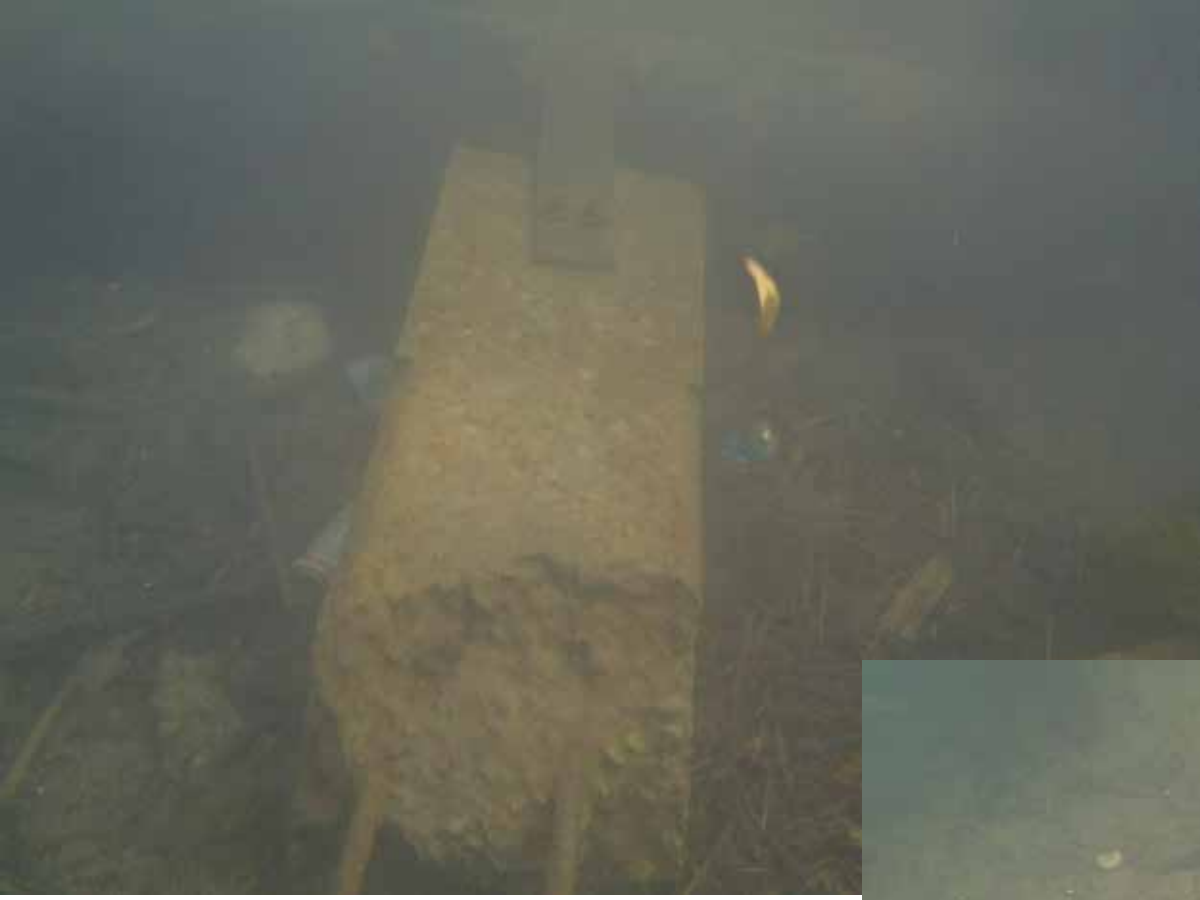
- q Altered the shape and natural dynamics of the San Marcos River
- q Degraded listed species habitat
- q Impacted survival and reproduction



Ground Penetrating Radar







State Scientific Areas (SSA)



State Scientific Areas (SSA)







Texas Wild Rice Enhancement - \$250K

... Texas wild-rice that have a high probability of success

... In Texas wild-rice and non-native vegetation stands, the non-natives will be removed and the original Texas wild-rice stand monitored for expansion.

... In optimal areas for Texas wild-rice that are unoccupied by Texas wild-rice, non-native vegetation will be removed and Texas wild-rice plants planted and monitored.



Invasive Species Removal - \$35K

Non-native, invasive species will be removed from Spring Lake and the San Marcos River.

Species to be removed are:

- ❖ *Plecostomus* (sucker mouth catfish)
- ❖ *Tilapia*
- ❖ *Marisa cornuarietis* (Ramshorn snail)
- ❖ *Melanoides* snails





Elephant Ear Removal

Elephant Ears are an invasive species that dominates from headwaters to Blanco confluence

HCP contractors are removing elephant ears from Spring Lake to I-35 through a drip and pulling process.

Banks will be revegetated with native plants that will help minimize erosion and help to stabilize the river's banks.

First step – willow wattling



Conservation Crew - \$56K

■ The Conservation Crew is a group of student workers for public education

■ Crew works Thursday - Sunday during from May to September

Litter and Floating Mats - \$50K



Household Hazardous Waste - \$30K

Extend outreach and operational ability
to receive and process HHW



Water Quality Protection Plan - \$300K

- The WQPP will address the needs of both the City and University for the following:
- Assessing existing watershed conditions
- Reviewing University and City technical documents that guide future development and construction, including:
 - ✧ Texas State University Construction Standards
 - ✧ City of San Marcos Land Development Code
 - ✧ City of San Marcos Stormwater Technical Manual
- Developing goals, priorities, and cost-effective solutions to water quality problems based on best available technology
- Reviewing proposed development projects on campus and in the city and providing recommendations for potential stormwater mitigation

Bank Stabilization - \$967K

- Permanent access points will be combined with bank stabilization
- Bank is eroding due to clearing of riparian vegetation and intense recreational use.
- Natural rock will be used to create a stone terrace and the bank on either side will be densely planted





**Bank Stabilization & Trail Improvements
San Marcos River · San Marcos, Texas**

Bicentennial Park



Habitat Conservation Project

Why Remove So Many Plants ?

Removal of invasive species helps to restore the ecosystem to its original state and promotes the survival of native species.



Threats

- Invasive species can crowd native trees as seen to the left, preventing them from getting the light they need to survive.
- Plants like the Common Privet and the Chinese Berry are capable of spreading very rapidly due to immense seed production.
- Fast growing invasive plants out-compete native species, eventually decreasing important habitat.
- Shading from invasive trees and shrubs prevents the establishment of understory grasses and plants which are important for songbirds and insects.

Woods Invasive Species

- Common Privet—*Ligustrum lucidum*
- Chokeberry—*Azalea*
- Chinese Tallow Tree—*Sapium*
- Paper Mulberry—*Morus*



Riparian - \$100K





Education & Public Outreach - \$20K



TEXAS
STATE
UNIVERSITY
SAN MARCOS



For More
Information Call
512.393.8400



Texas Wild Rice

Bank Stabilization & Riparian Restoration

- Reach Start/End Point
- Texas Wild Rice Enhancement and Restoration
- Sediment Removal
- Non-Native Plant Species Removal
- Management of Litter
- Season Creek Sand Bar Removal
- Non-Native Species Removal
- Designation of Permanent Access Points/ Bank Stabilization
- Riparian Restoration

Project Title Goes Here



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For more information visit EAHCP.org



We want to get the word out!

And the word is –

Without these protected species,
we wouldn't have a river

