



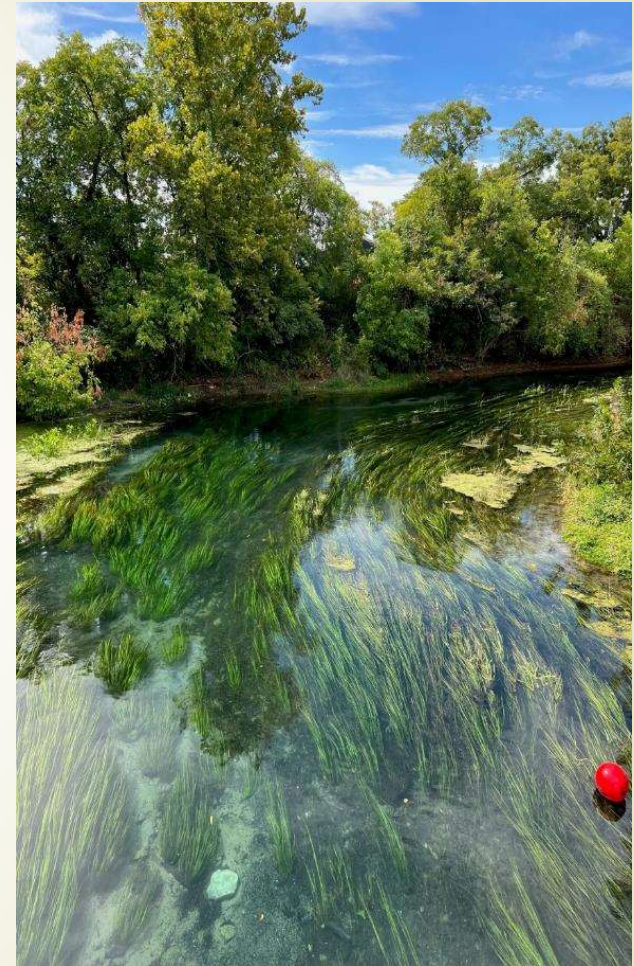
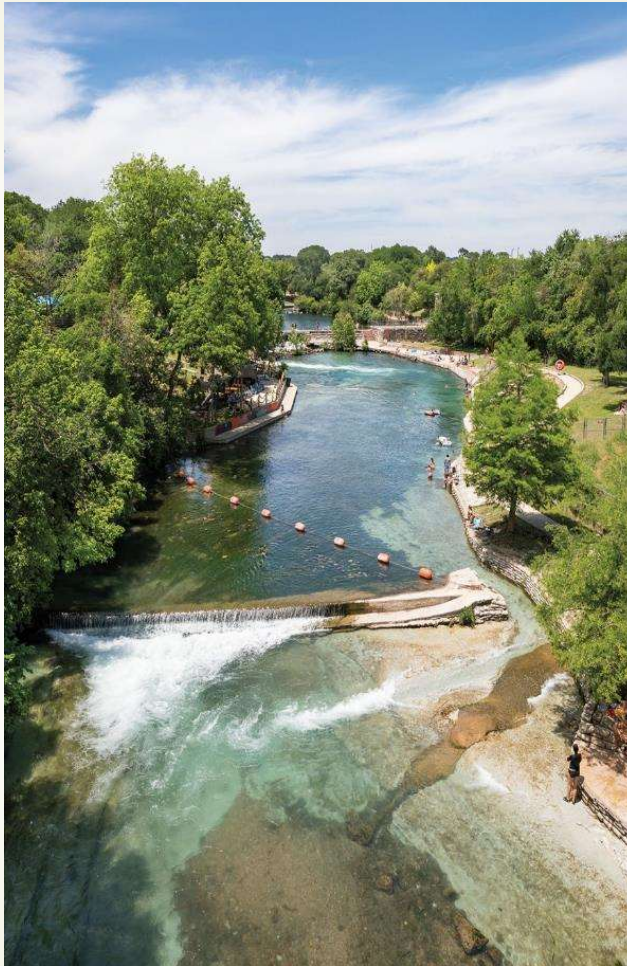
**ENDANGERED SPECIES PROTECTION AND
STORMWATER MANAGEMENT IN THE COMAL AND
SAN MARCOS RIVER WATERSHEDS**

**TEXAS REGIONAL STORMWATER CONFERENCE
JAN 2023**

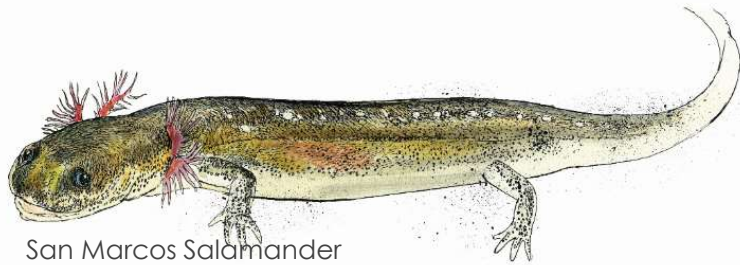


Comal and San Marcos Rivers!

- ▶ Spring-fed by the Edwards Aquifer
- ▶ River recreation
- ▶ Support endangered Species

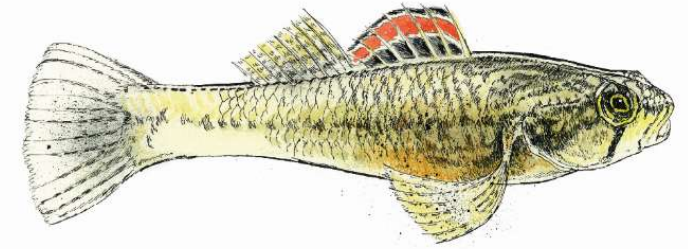


Threatened & Endangered Species in the Comal and San Marcos River Systems

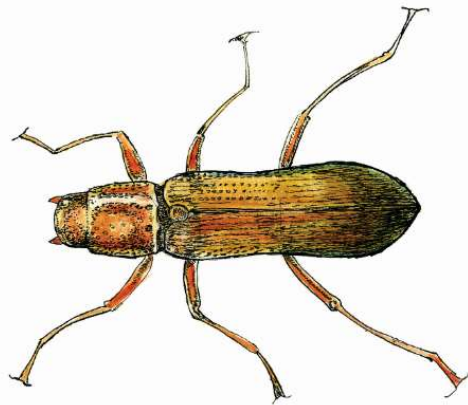


San Marcos Salamander

Peck's Cave Amphipod (Comal)



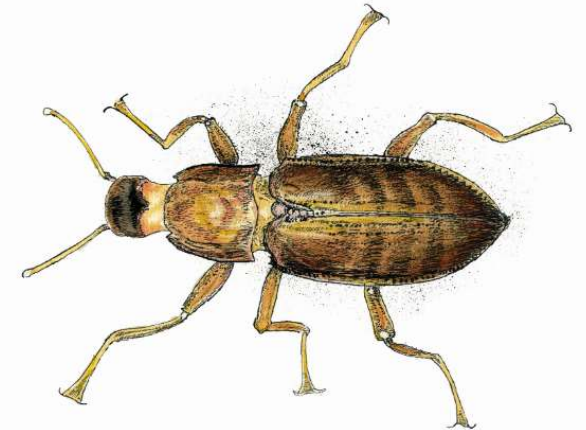
Fountain Darter (Comal and SM)



Comal Springs Dryopid Beetle



Texas Wild-rice
(San Marcos)



Comal Springs Riffle Beetle- Comal and SM

EDWARDS AQUIFER HABITAT CONSERVATION PLAN (EAHCP)

- ▶ The EAHCP is a plan to protect endangered and threatened species in the San Marcos & Comal River systems
- ▶ Key component of an ITP with USFWS
- ▶ Includes habitat and springflow protection measures
- ▶ Includes biological and WQ monitoring
- ▶ Protects permittees from incidental take associated with aquifer pumping, river recreation, maintenance, etc



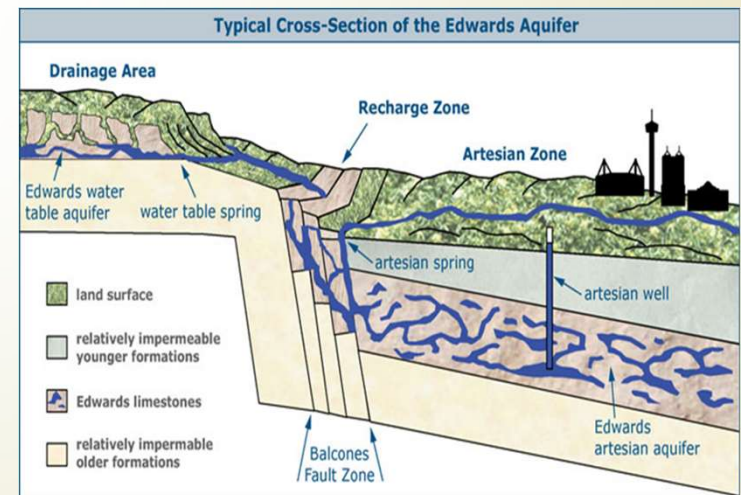
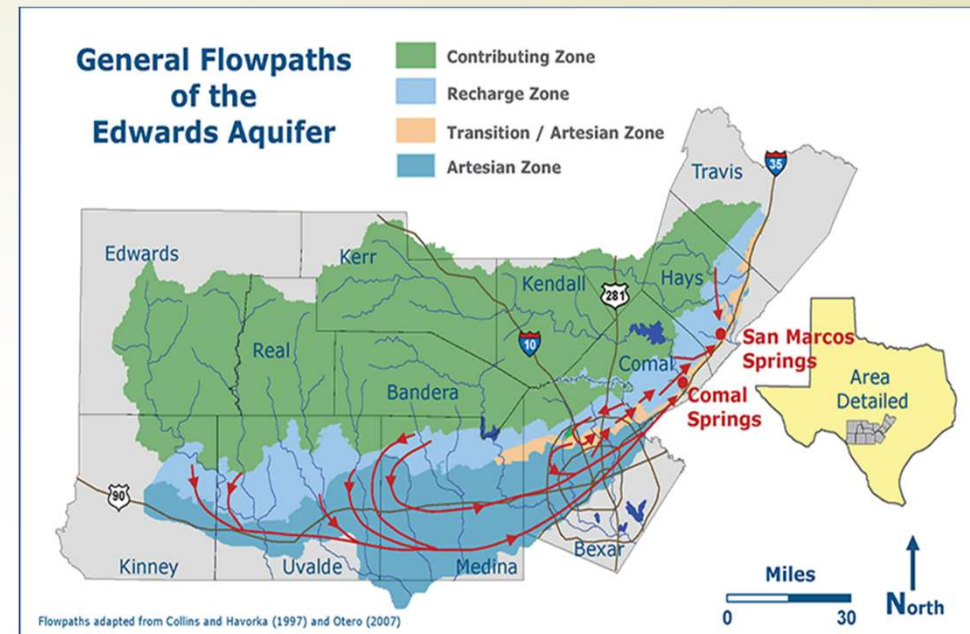
DEPARTMENT OF THE INTERIOR U.S. FISH AND WILDLIFE SERVICE		DATE	
FEDERAL FISH AND WILDLIFE PERMIT		NO. _____	
1. PERMITTEE Edwards Aquifer Recovery Implementation Program Box 15, ZIP 35220 in May's Green San Antonio, Texas 78215		2. AUTHORITY/STATUS IN SPEC. CATEGORY REGULATIONS APPLICABLE SECTION 17.12 (f)	
3. NAME AND TITLE OF PERSONS, OFFICES, or BUSINESS Scott J. Doherty General Manager		4. NUMBER 19-00000-01	
5. TYPE OF PROJECT Subground & Discharge Species - Incidental Take - Habitat Conservation Plan		6. PERIODICITY 1. MAY CONT. 2. J. YES 3. J. NO	
7. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED: Within River, Middle, Instream, Canal, Culvert, Sluice, and Floodgate sections, Texas		8. EFFECTIVE 1. 000001	
9. COMMENTS AND AUTHORIZATIONS			
A. General conditions set out in subject of 19 CFR 17.12, and specific conditions contained in Federal regulations apply to this E.A. permit, and hereby make a part of this permit. All activities authorized herein may be required to conform with and for the purposes specified in the application submitted. Continued validity, or renewal, of this permit is subject to compliance and timely compliance with all applicable conditions, including all terms of all related correspondence and reports.			
B. The validity of this permit is also conditional upon strict observance of all applicable State, state, local or other Federal law. This permit does not relieve the obligator to abide by other State, state, local or Federal law in applying to additional activities.			
C. Yield the use by permittees stated above.			
10. REPORTING REQUIREMENTS: Annual Report due March 31 of each year the permit is in effect.			
APPROVED BY: <i>Michael D. Gagliardi</i>	DATE: 2015	OFFICE: Biological Services	OFFICE: <i>10/10</i>



- Incidental Take Permit**
- *Groundwater Pumping
 - *Habitat Restoration
 - *Aquatic Recreation

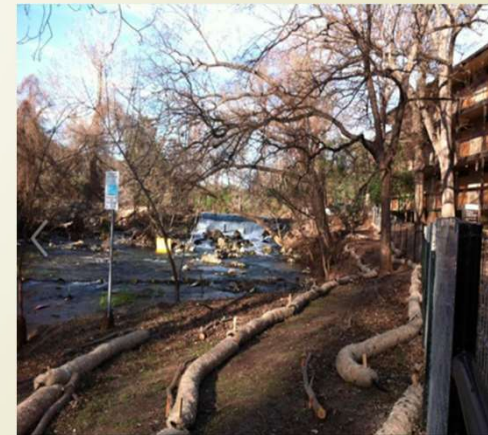
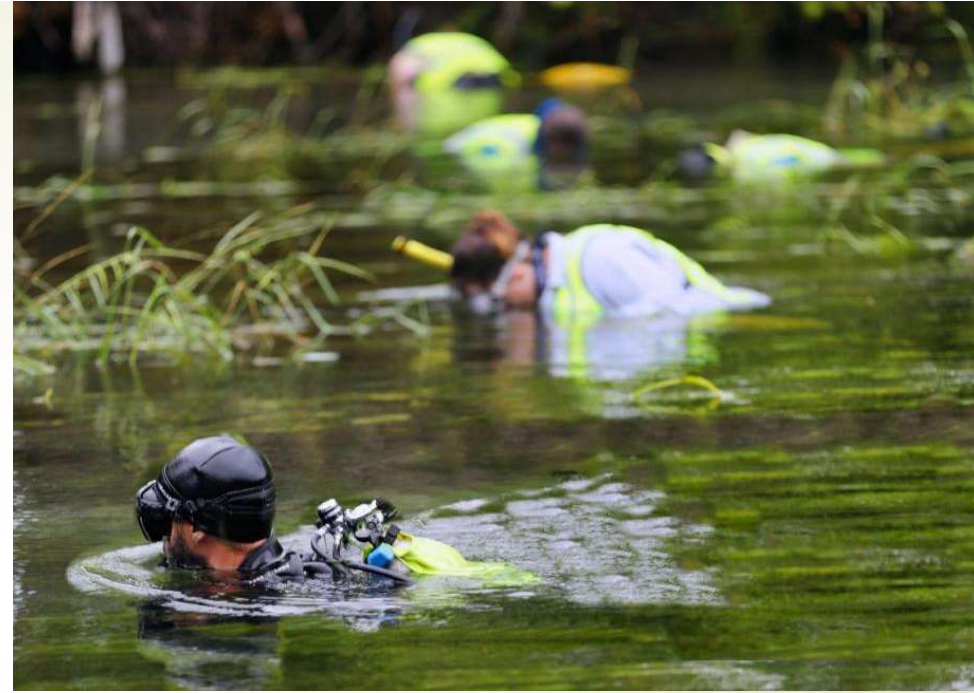
EAHCP SPRINGFLOW PROTECTION MEASURES

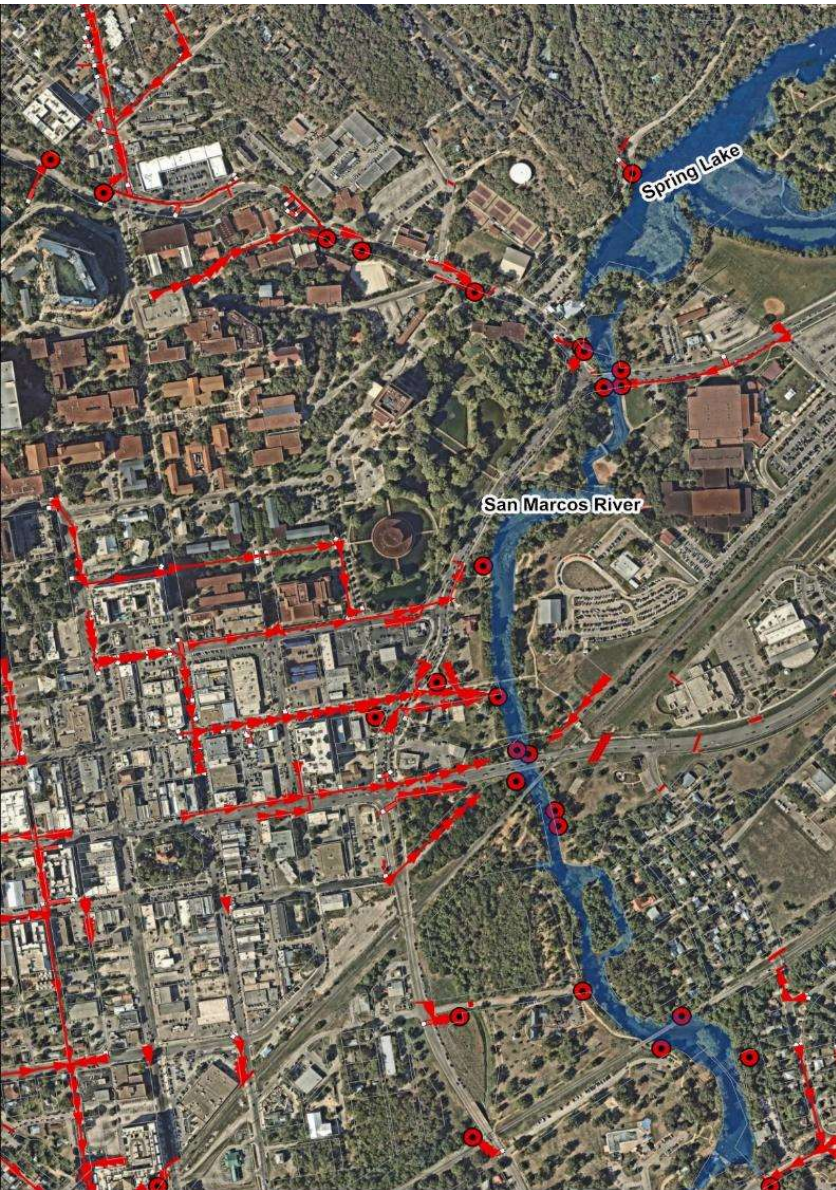
- Measures to help protect and sustain flow at SM and Comal Springs during extended drought
- Voluntary Irrigation Suspension Program Option (VISPO)
- SAWS Aquifer Storage & Recovery
- Stage V Critical Period Mgmt: Required 44% reduction of Edwards Aquifer withdrawals
- Regional Water Conservation Prgm



EAHCP HABITAT PROTECTION MEASURES

- Non-native Species Removal
- Household Hazardous Waste Collection
- Litter Management
- Aquatic Vegetation Restoration
- Permanent River Access Points/
Bank Stabilization
- Riparian Restoration
- **Impervious Cover/WQ Protection**





STORMWATER POLLUTION AND ENDANGERED SPECIES


- ▶ The city-centers of San Marcos and New Braunfels & Texas State University campus drain directly to the Comal and San Marcos Rivers
- ▶ Stormwater runoff = Rain + all that has accumulated on the ground surface
- ▶ Aquatic life, including the endangered species, are susceptible to changes in water quality. Magnified during drought/low-flow conditions
- ▶ MS4 Stormwater Pollution Prevention Program are extremely important in protecting water quality in our rivers!

New Braunfels – Comal River Watershed



San Marcos River Watershed





EAHCP Water Quality Protection Projects

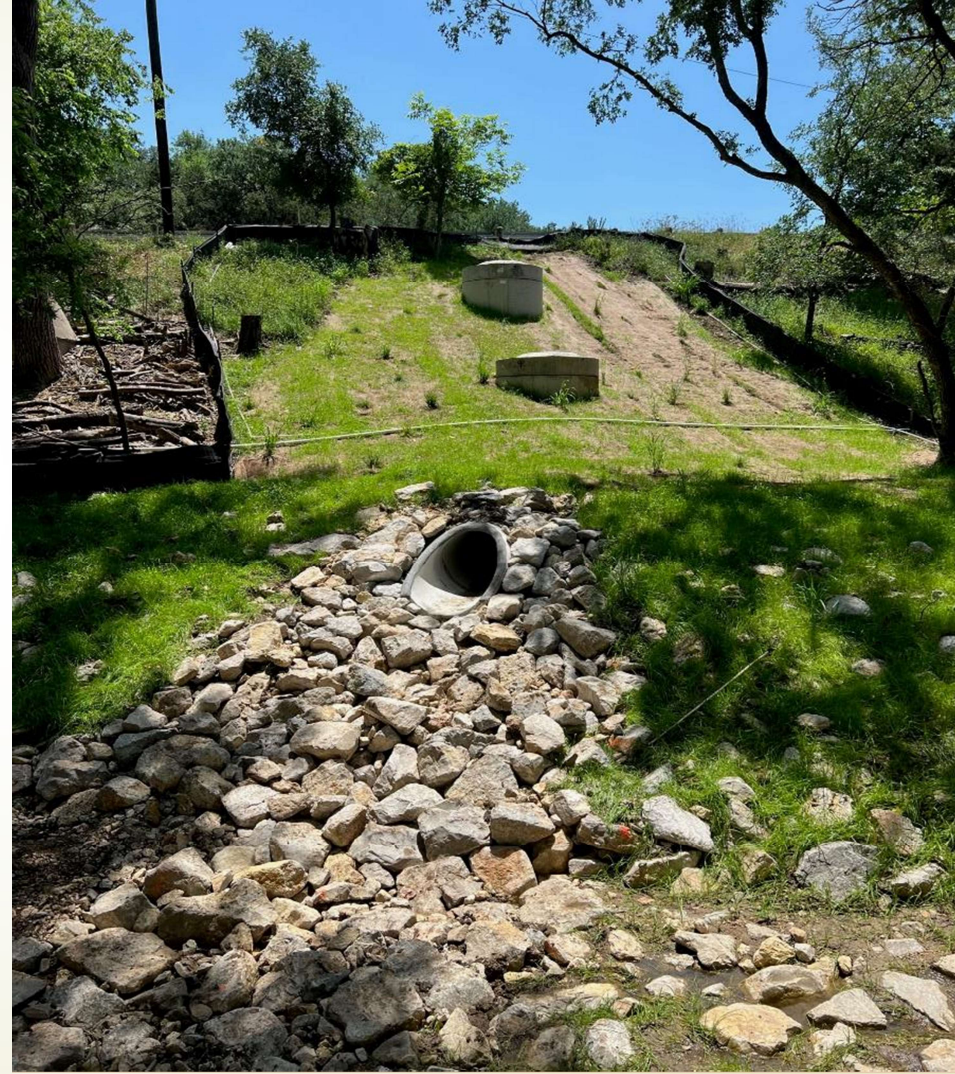
The City of San Marcos, Texas State University and City of New Braunfels have implemented a number of green infrastructure projects as part of the EAHCP to help reduce pollutant loading to the Comal and San Marcos Rivers.



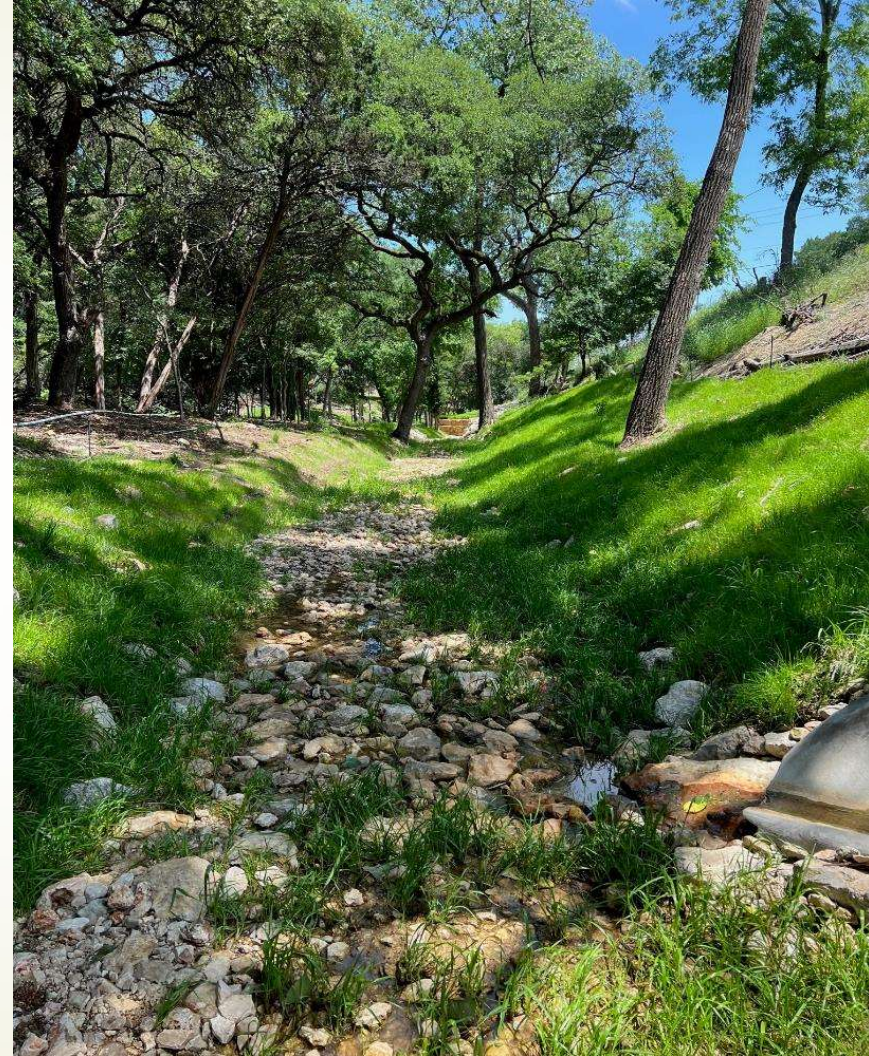
Sessom Creek Stream Restoration Project – San Marcos, TX

- Sessom Creek is a tributary to the Upper San Marcos River. Urbanized watershed with primarily single- and multi-family development. Developed prior to stormwater mitigation requirements.
- Channel degradation/ erosion
- Non-native species
- Phase I complete. Project included sewer line relocation, drainage improvements, stream stabilization, native plant restoration

Sessom Creek Project Photos



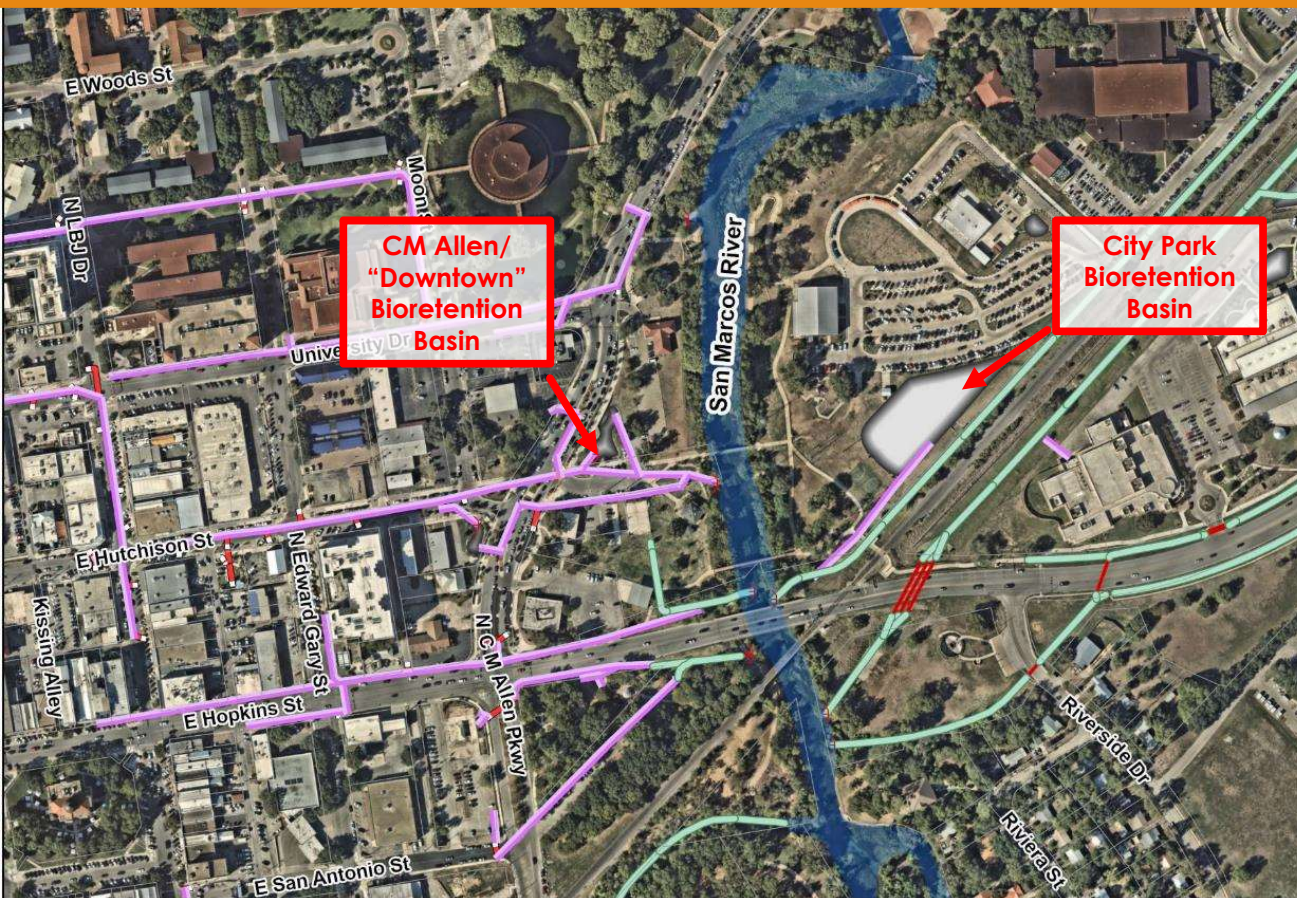
Sessom Creek Project Photos





CM Allen and City Park Bioretention, San Marcos, TX

- Bioretention basins capture stormwater runoff from downtown SM and impervious areas adjacent to the River
- Treat and/ or infiltrate SW prior to discharging to the San Marcos River





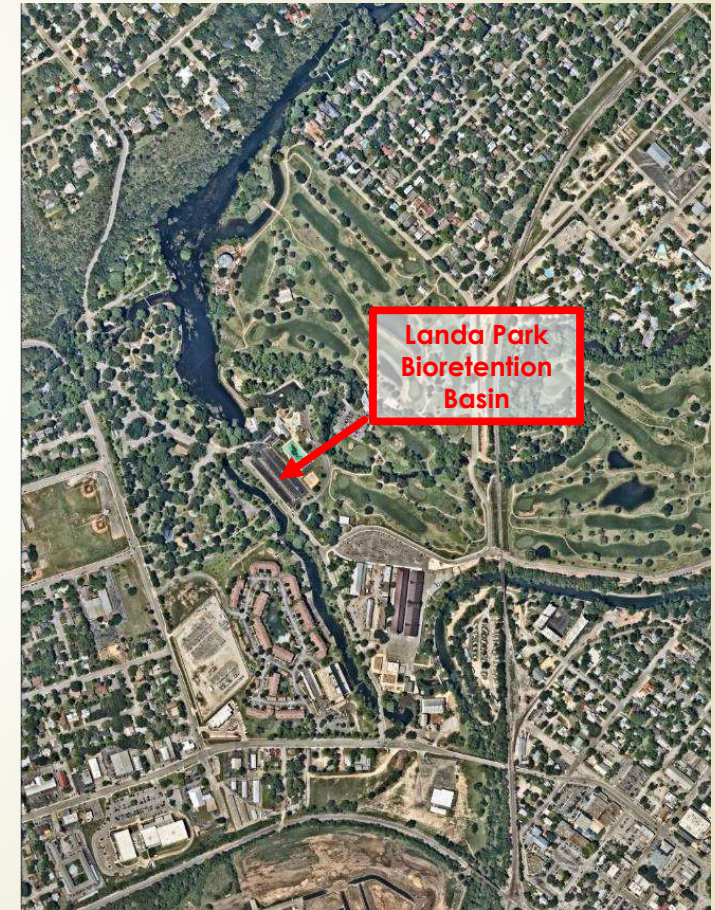
N. Houston Ave Bioretention Basin New Braunfels, TX

- Located immediately adjacent to the upper spring run of Landa Lake



Landa Park Aquatic Center Parking Lot Bioretention Basin New Braunfels, TX

- Located immediately adjacent to the Comal River
- Treats runoff from large parking lot





Importance of MS4 Programs (& threats to Aquatic Life)

- Public Awareness & Education
- Illicit Discharge Detection & Elimination (IDDE)
- Construction Oversight
- Post-Construction Stormwater Mgmt
- Good Housekeeping

Importance of MS4 Programs

- ▶ Illicit Discharge Detection & Elimination (& public awareness)



Importance of MS4 Programs

► Important Components of IDDE Program

- Monitoring and detection program
- Quick response to illicit discharges/ spills
- Education

Only rain down the drain!

Stormwater runoff is drainage from rain that flows onto rooftops and makes its way onto parking lots, driveways, and sidewalks. As it flows, it picks up trash, oils, chemicals, sediment and other pollutants which are deposited into the storm sewer system. The storm sewer system is a drainage system that leads directly to the San Marcos River. Did you know that anything that enters the drainage system remains untreated on its way to the river?

When pollution enters the City's storm sewer system, it is considered a prohibited discharge. Prohibited discharges such as oil, grease, paint and paint rinse water and herbicide/pesticides are banned under the San Marcos Stormwater Management Plan. The City encourages businesses and residents to do their part to help protect the health of the public and the river. Here are a few ways you can help:



Clean paint brushes in the sink, not outdoors. Dispose of paint wastes according to federal, state and local regulations.



Verify that dumpster containers are in good condition, lids are closed and plugs are in place.



Sweep up and properly dispose of construction debris like concrete and mortar.



Do not use soaps or chemicals when power washing. Pour dirty mop water down the mop sink and not outdoors on a hard surface.



Dispose of hazardous wastes (batteries, fluorescent bulbs, antifreeze, hydraulic fluid, oil etc.) according to federal, state and local regulations.



Use pesticides and fertilizers sparingly.



Dispose of trash and litter properly.



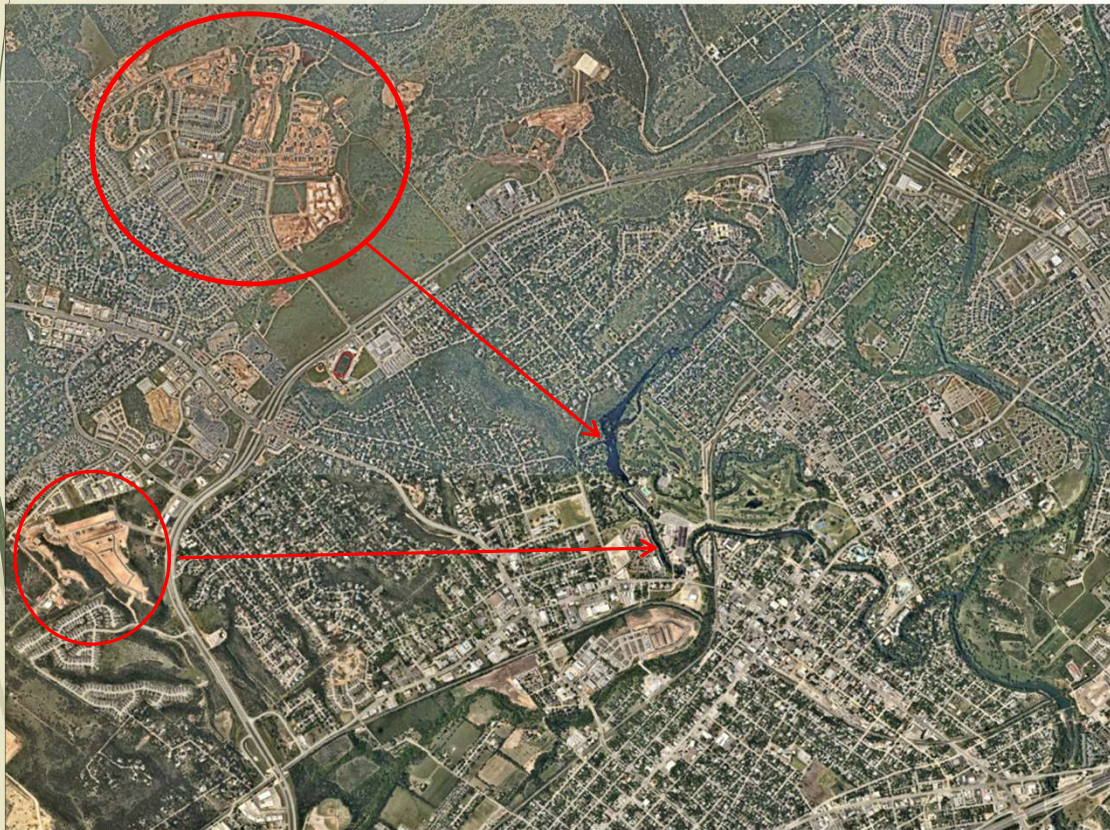
Ensure that grease and cooking oil (new and used) are being managed and disposed of properly.



Compost or recycle yard waste. Sweep up yard debris instead of hosing waste off your property.

Importance of MS4 Programs

- Construction & Post-Construction SW Mgmt



EFFECTS OF IMPERVIOUSNESS ON RUNOFF AND INFILTRATION



Importance of MS4 Programs

Good Housekeeping – Municipal Operations

- Keep it clean!
- Know the weather forecast!
- Staff are the eyes and ears! Report possible pollution issues ASAP.
- Spill Response Training





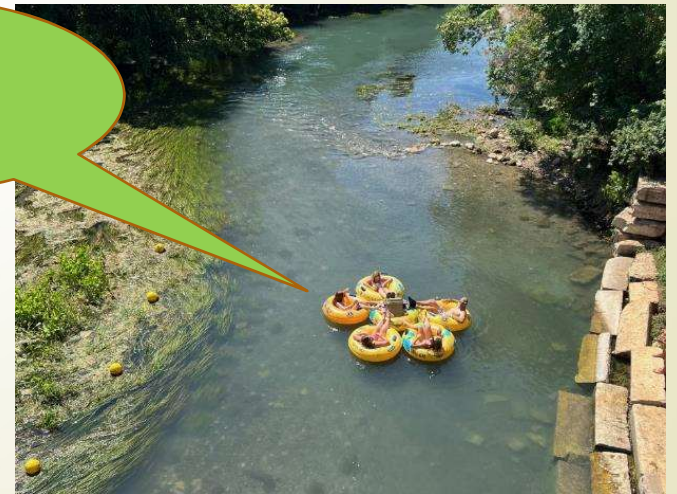
Thank You



Thanks!



Thank You!



Thanks!!



QUESTIONS?

MARK ENDERS

CoSM HABITAT CONSERVATION PLAN MANAGER

MENDERS@SANMARCOSTX.GOV

(512) 757-2136

