



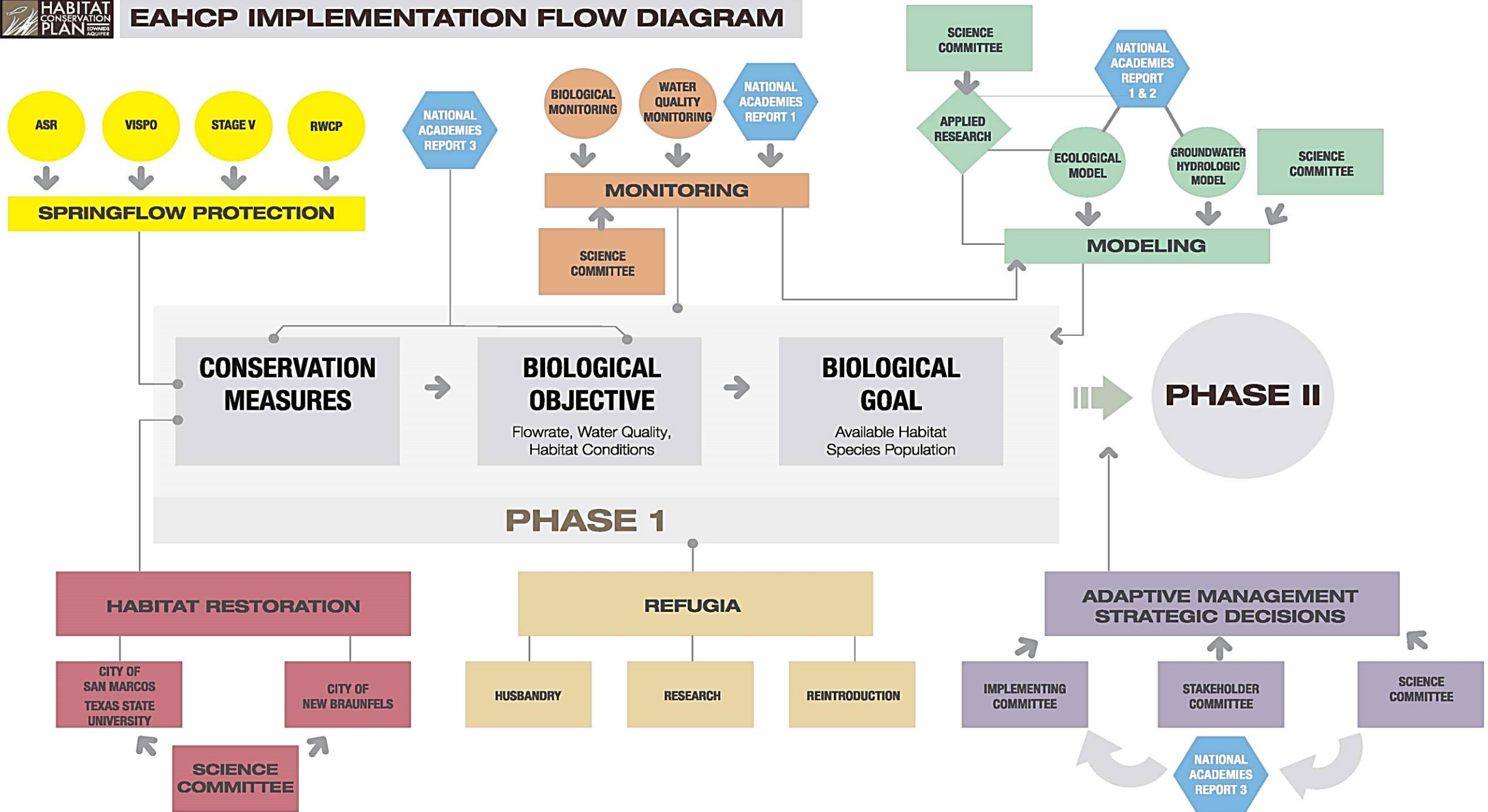
# Update on the Edwards Aquifer Habitat Conservation Plan

*2016 Guadalupe River Basin and Lavaca-Guadalupe Coastal Basin  
Clean Rivers Program Steering Committee Meeting*

**March 24, 2016 | Shaun Payne & Daniel Large, EAHCP**



# EAHCP IMPLEMENTATION FLOW DIAGRAM



# Springflow Protection Measures

- ▶ **Voluntary Irrigation Suspension Program Option**
  - > 40,000 acre-feet
- ▶ **Aquifer Storage and Recovery**
  - > 20,000 acre-feet enrolled
- ▶ **Regional Water Conservation Program**
  - > 10,000 acre-feet will be committed to the Groundwater Trust by 2020





# EAHCP Habitat Restoration Efforts

## ► Comal Springs Ecosystem

- 2015: Aquatic Vegetation restoration
  - All non-native *Hygrophila* had been removed from Landa Lake and Old Channel
- 2016: Bank Stabilization and riparian restoration

## ► San Marcos Springs Ecosystem

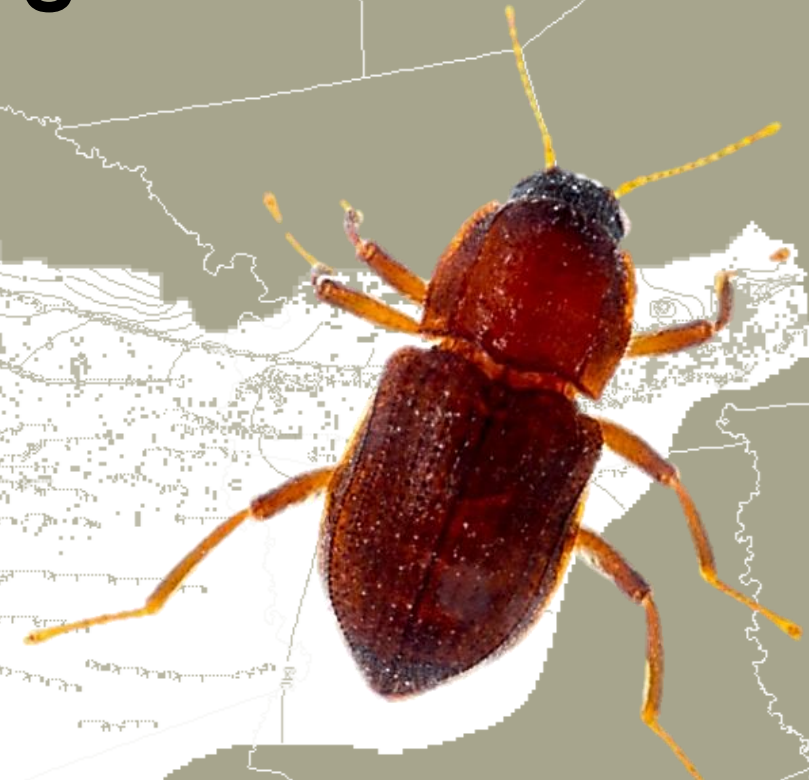
- 2015: 540,000 ft<sup>2</sup> of restored riparian zone
  - Removed 29,000 linear feet of elephant ears
- 2016: Texas Environmental Excellence award for riparian restoration work



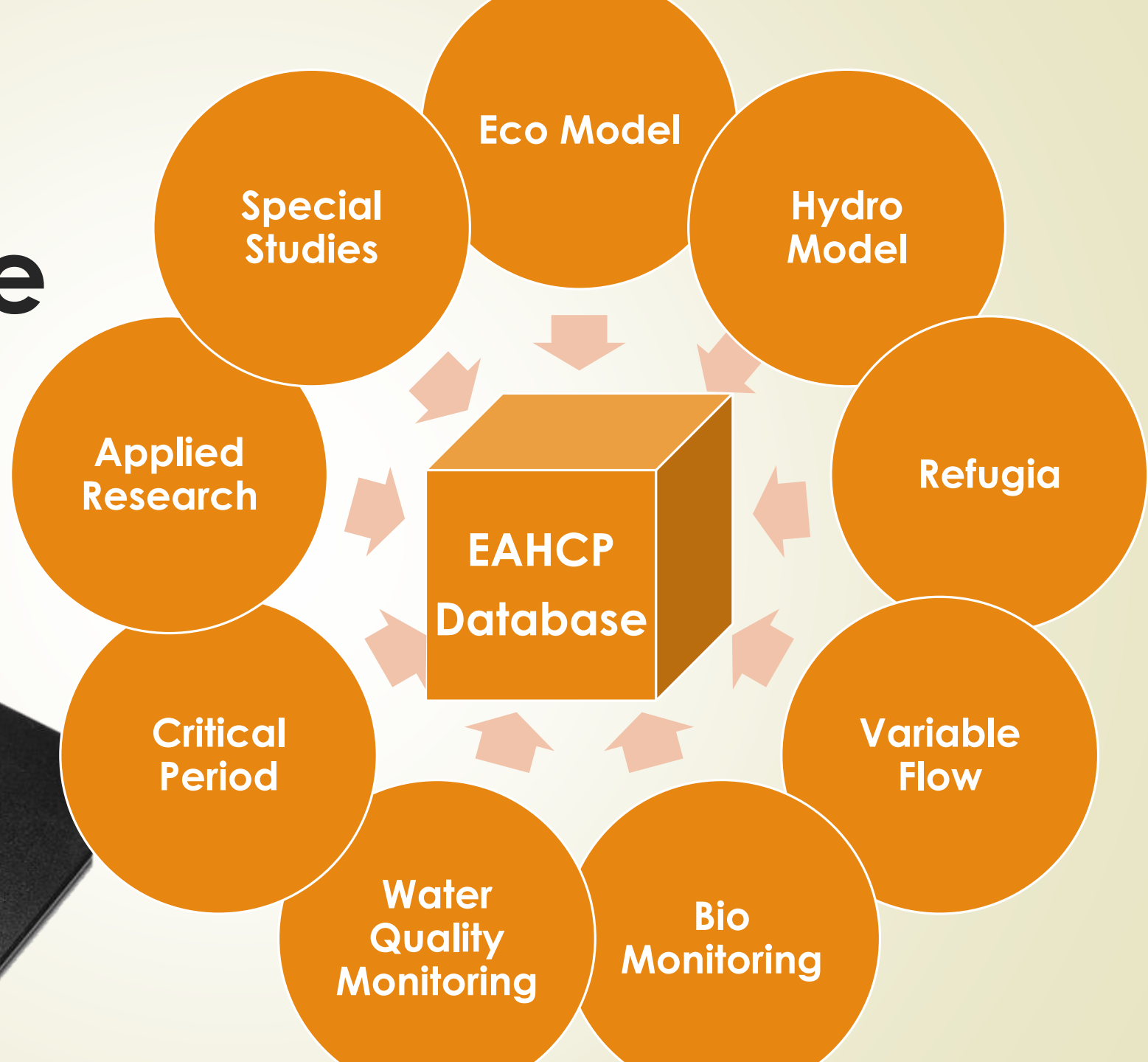
# Modeling & Research Efforts

- **Applied Research:**
  - 5 Research Projects in 2015
  - 2016 Projects will focus on the Comal Springs Riffle Beetle

- **Ecological Modeling and Hydrological Modeling**



# EAHCP Database



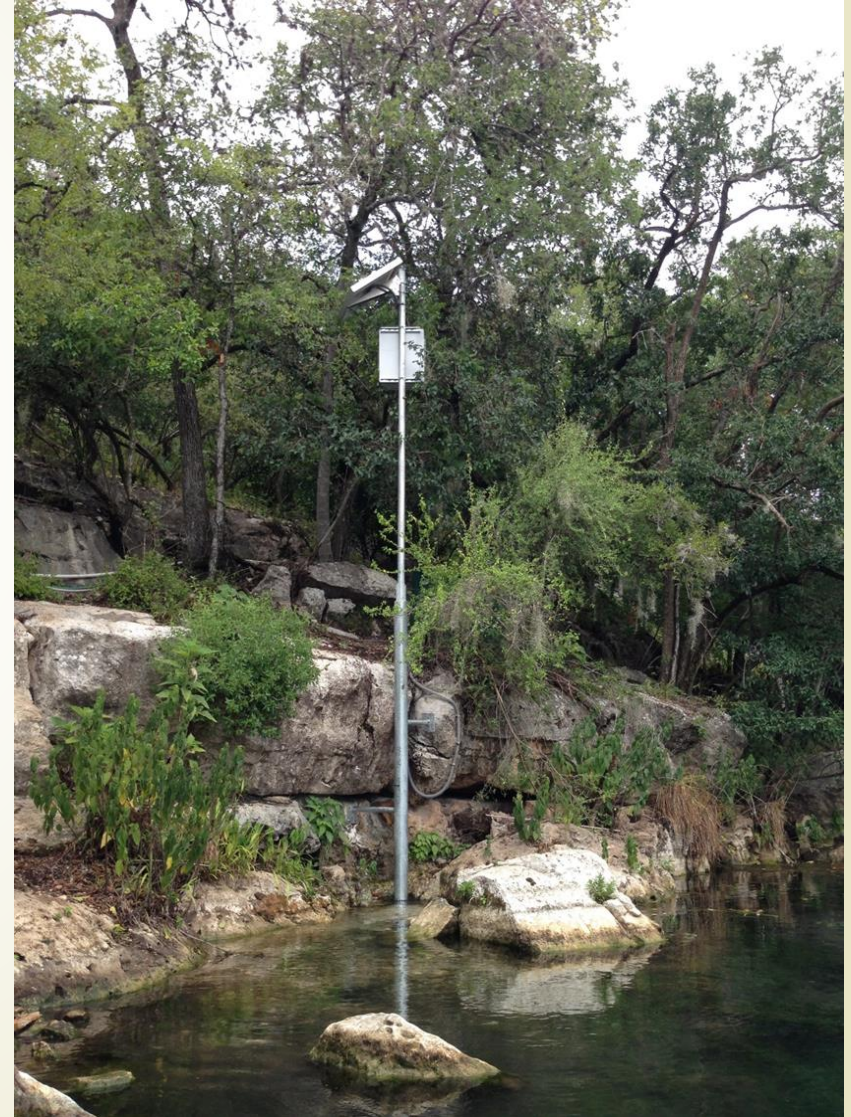
## BIO MONITORING, PARTIAL DATA OVERVIEW

Sampling Component	System	Date	Format
Standard Operating Procedures	Comal and San Marcos	2015	Report - pdf
Aquatic Vegetation Maps	Comal and San Marcos	2001 - 2015	GIS files
TWR Maps	Comal and San Marcos	2001 - 2015	GIS files
TWR Physical Observations	Comal and San Marcos	2001 - 2015	Excel files
Fixed Station Photography	Comal and San Marcos	2001 - 2015	Photos organized by date
Fountain Darter Dropnetting	Comal and San Marcos	2001 - 2015	Access Database
Fountain Darter Dipnetting			
Timed surveys	Comal and San Marcos	2001 - 2015	Access Database
Randomly selected - 50 sites	Comal and San Marcos	2006 - 2015	Access Database
Fixed station - 50 sites	Comal and San Marcos	2013 - 2015	Access Database
Fountain Darter Visual observations	Comal	2001 - 2015	Excel files
Fish Community Data	Comal and San Marcos	2013 - 2015	Excel files
Macroinvertebrate Sampling	Comal and San Marcos	2013 - 2015	Access Database
Salamander Visual Observations	Comal and San Marcos	2001 - 2015	Excel files
Comal Invertebrate Drift Nets	Comal	2003 - 2015	Excel files
Comal Springs Riffle Beetle lure	Comal	2004 - 2015	Access Database
Comal Springs Riffle Beetle Quadrat sampling	Comal	2001 - 2003	Excel files
Predation Study	Comal and San Marcos	2001 - 2015	Excel files
Water Quality Grab Samples	Comal and San Marcos	2001 - 2015	Access Database
Temperature Tidbits	Comal and San Marcos	2001 - 2015	Excel files
Landa Lake Flow Partitioning Data	Comal	2013 - 2015	Excel file
Spring Run Flow Measurements (Cross-sections)	Comal	2003 - 2015	Excel file
Master Naturalist Data	Comal	2006 - 2015	Excel file
Annual Reports	Comal and San Marcos	2001 - 2015	Report - pdf



# EAHCP 2016 Work Groups

- **Biological Monitoring Group**
- **Water Quality Monitoring Group**





# EAHCP WQ Sampling Program

## *Purpose:*

- Gather baseline WQ data about the ecosystems
- Assess effectiveness & efficiency of the Conservation Measures



# EAHCP WQ Sampling Program

## *Methodology:*

- ▶ Surface water (base flow) samples
  - ▶ Twice annually at each system, April, Oct
- ▶ Sediment sampling annually
- ▶ Real time instrument (RTI) water quality monitoring - DO, Turbidity, Conductivity, Temp & pH
- ▶ Stormwater sampling
- ▶ Passive Diffusion Samplers (PDS) for trace organic compound analyses
- ▶ Groundwater sampling (cfs < 30 cfs Comal, < 50 cfs SM)



Analytical Parameter	Surface Water	Stormwater	Sediment	PDS
Volatile Organic Compounds (VOCs)	Yes	Yes	Yes	Yes*
Semi-volatile Organic Compounds (SVOCs)	Yes	Yes	Yes	Yes*
Organochlorine Pesticides	Yes	Yes	Yes	Yes*
Polychlorinated Biphenyls (PCBs)	Yes	Yes	Yes	No
Organophosphorous Pesticides	Yes	Yes	Yes	No
Herbicides	Yes	Yes	Yes	No
Metals (Al, Sb, As, Ba, Be, Cd, Cr [total], Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Tl, and Zn)	Yes	Yes	Yes	No
General water quality parameters (GWQP), total alkalinity (as CaCO3), bicarbonate alkalinity (as CaCO3), carbonate alkalinity (as CaCO3); Cl, Br, NO3, SO4, F-, pH, total dissolved solids (TDS), total suspended solids (TSS), Ca, Mg, Na, K, Si, Sr, CO3,	Yes	Yes	No TDS, TSS, or TKN	No
Phosphorus (total)	Yes	Yes	Yes	No
Total Organic Carbon (TOC),	Yes	Yes	Yes	No
Dissolved Organic Carbon (DOC)	Yes	Yes	Yes	No
Total Kjeldahl Nitrogen (TKN)	Yes	Yes	Yes	No
Bacteria (E. coli)	Yes	Yes	No	No
Field Parameters (DO, pH, Conductivity, Turbidity, Temperature)	Yes	Yes	No	No
Caffeine	Yes	Yes	No	No

\*Passive diffusion samplers (PDS) samplers are analyzed for a modified set of VOCs, SVOCs, & organochlorine pesticides

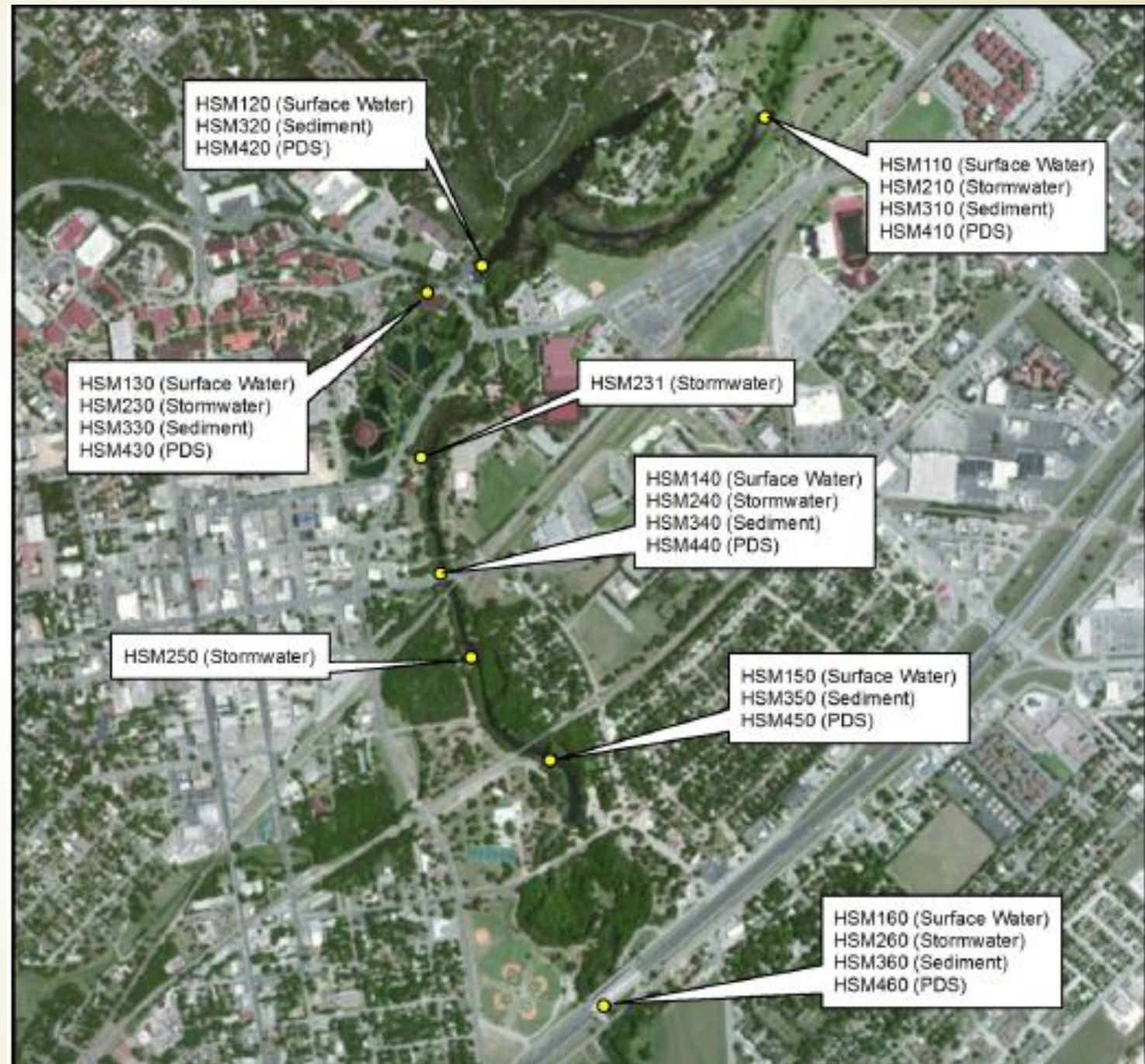


# Comal System - EAHCP Monitoring Locations





# San Marcos System - EAHCP Monitoring Locations





**Questions?**







# HABITAT CONSERVATION PLAN

EDWARDS  
AQUIFER

