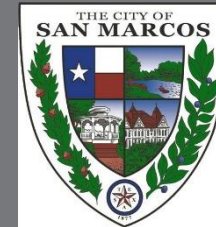




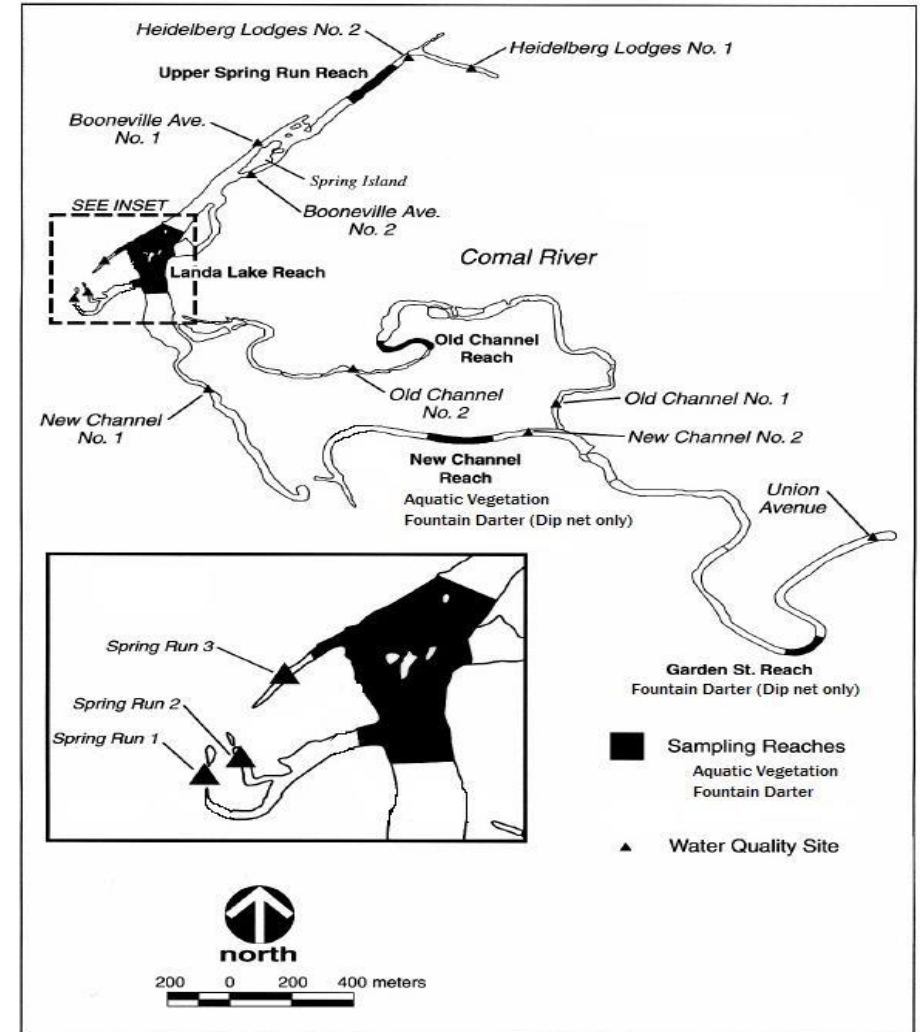
# BIOLOGICAL MONITORING 2016



# Comal Springs Aquatic Ecosystem

## Endangered Species

- fountain darter
- Comal Springs riffle beetle
- Comal Springs dryopid beetle
- Peck's cave amphipod



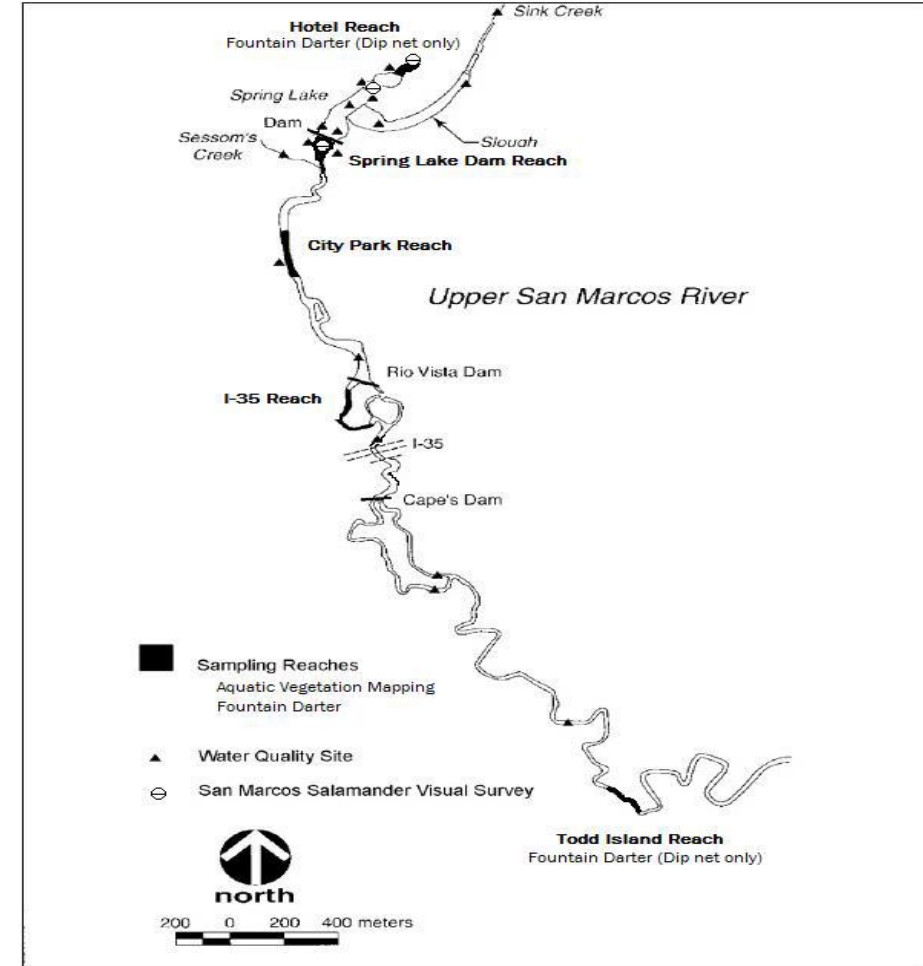
# San Marcos Springs Aquatic Ecosystem

## Endangered Species

- fountain darter
- San Marcos gambusia
- Texas wild-rice
- Texas blind salamander
- Comal Springs riffle beetle

## Threatened Species

- San Marcos salamander



# Monitoring Components

- Comprehensive Sampling
  - Establish baseline and Track ecological condition over time
- Critical Period Sampling
  - Repeat of comprehensive sampling, but under triggered (low and high) flow conditions
- Species Specific Sampling
  - Triggered by low flow conditions
  - Supports Adaptive Management Actions

# Sampling Events

- All sampling is conducted by professional biologists according to established, standard operating procedures to ensure consistent, quality data.
- Spring Comprehensive Sampling (April-May)
- Fall Comprehensive Sampling (October-November)
- HCP Critical Period Sampling
- HCP Species Specific Sampling
  - Weekly habitat assessments
  - Fountain darter and aquatic vegetation
  - Comal Springs riffle beetle
  - Comal Springs salamander
  - Texas wild-rice





# Sampling Parameters

- Aquatic vegetation mapping
- Texas wild-rice mapping
- Fountain darter specific:
  - Dipnet, Dropnet, and SCUBA transects
- Fixed station photography
- Thermistors (Water Quality)
- Fish Community
- Macroinvertebrate Food Source
- Comal Springs Salamander
- Comal Springs Discharge
- Comal Springs Invertebrates
- San Marcos Salamander
- Texas wild-rice physical measurement
- Landa Lake Flow Partitioning



Drop net sampling – Comal River



Salamander sampling  
– Spring Lake