Instream Flows Planning Project

October 6, 2010
Instream Flows Planning
Project Overview

- Instream flow study – lower San Antonio River and lower Cibolo Creek
  - Texas Instream Flow Program (TIFP)
  - Senate Bill 2 Project Components
  - Progress to Date
  - Technical Disciplines
  - Focus on draft output for BBEST evaluation
Sound Ecological Environment

- TIFP definition

  “a functioning ecosystem characterized by intact, natural processes, resilience, and a balanced, integrated, and adaptive community of organisms comparable to that of the natural habitat of a region.”
SB2 – Lower San Antonio Subbasin Stakeholders Goal

“a naturally functioning and sustainable ecosystem that supports a balance of ecological benefits and economic, recreational, and educational uses”.
### Instream Flow Components (TIFP)

#### Subsistence flows
- **Definition:** Infrequent, seasonal periods of low flow
- **Objectives:** Maintain water quality criteria

#### Base flows
- **Definition:** Normal flow conditions between storm events
- **Objectives:** Ensure adequate habitat conditions, including variability, to support the natural biological community

#### High flow pulses
- **Definition:** Short-duration, in-channel, high flow events following storm events
- **Objectives:** Maintain important physical habitat features, provide longitudinal connectivity along the river channel

#### Overbank flows
- **Definition:** Infrequent, high flow events that exceed the normal channel
- **Objectives:** Maintain riparian areas, provide lateral connectivity between the river channel and active floodplain
PROJECT STATUS
Stage 1: Identify and Engage Stakeholders

Stage 2: Conduct Sub-basin Orientation Meetings

Stage 3: Establish Sub-basin Workgroups and Conduct Study Design Workshops

Stage 4: Conduct Data Collection Workshops/Field Demonstrations (by request)

Stage 5: Conduct Data Integration Workshops

Stage 6: Review Study Report

Reconnaissance and Information Evaluation

Goal Development Consistent with Sound Ecological Environment

Study Design

Multidisciplinary Data Collection and Evaluation

Data Integration to Generate Flow Recommendations

Draft Study Report

Final Study Report

Peer Review

Next Steps: Implementation, Monitoring, and Adaptive Management

SB 2 Ends Post-SB 2
Holistic Ecological Considerations

- Hydrology
- Biology
  - Instream aquatic assemblages
  - Riparian corridor
- Physical Processes
  - channel processes, flushing flows, etc.
- Water Quality
Falls City Site
Highway 77 Upstream Site
TIFP/SARA Field Efforts

- Habitat and Substrate Mapping
- Hydraulic data collection
  - Discharge, cross-sections, bathymetry
- Habitat measurements
  - Depth, velocity, substrate, cover, etc.
- Water Quality
  - Standard parameters (temperature, dissolved oxygen, conductivity, pH)
- Fish and Mussel sampling
  - Barge electrofishing, backpack electrofishing, seining, gill net, visual surveys
- Riparian sampling
- Sediment transport
Additional Study Efforts

- University of Texas – San Antonio (UTSA) sediment transport study
- University of Baylor – tree and soil coring project
- UTSA Woody debris analysis of Elm Bayou
- TCEQ/SARA Water Quality Study
- TPWD Mussel contract
Fieldwork
Fieldwork
Fieldwork
Fieldwork
Data Reduction and Analysis

- Hydrologic Analysis
- Hydraulic Measurements
- Habitat and Substrate Mapping
- 2-D hydraulic models
- Habitat Suitability Criteria Development and habitat modeling
- Water Quality modeling
- Riparian Analysis
- Sediment transport modeling
Digital Terrain Model
River2D model
Habitat Suitability Criteria Development

- Fish Sampling
  - 249 sites
  - 23,722 fishes
  - 15 families, 43 species
Existing WQ models
Mesohabitat Model - WASP

![Graph showing DO (mg/L) for different sites in July 2009.](image)
Calaveras Site Riparian Community

Calaveras Site Tree Species List

Black willow
Box elder
Cedar elm
Chinaberry
Cottonwood
Green ash
Gum bumelia
Pecan
Red mulberry
Sugar hackberry
Texas persimmon
Western soapberry

Salix nigra
Acer negundo
Ulmus crassifolia
Melia azedarach
Populus deltoides
Fraxinus pennsylvanica
Bumelia lanuginosa
Carya illinoensis
Morus rubra
Celtis laevigata
Diospyros texana
Sapindus saponaria
Riparian inundation
Bedload Analysis
Questions