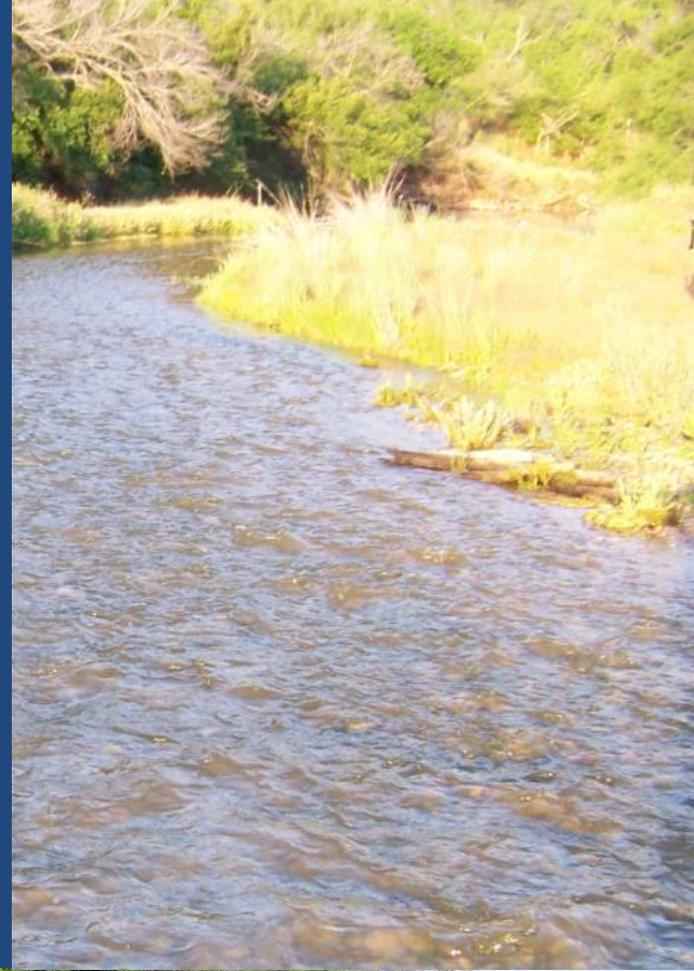


Clear Fork Brazos River – Site Specific Studies

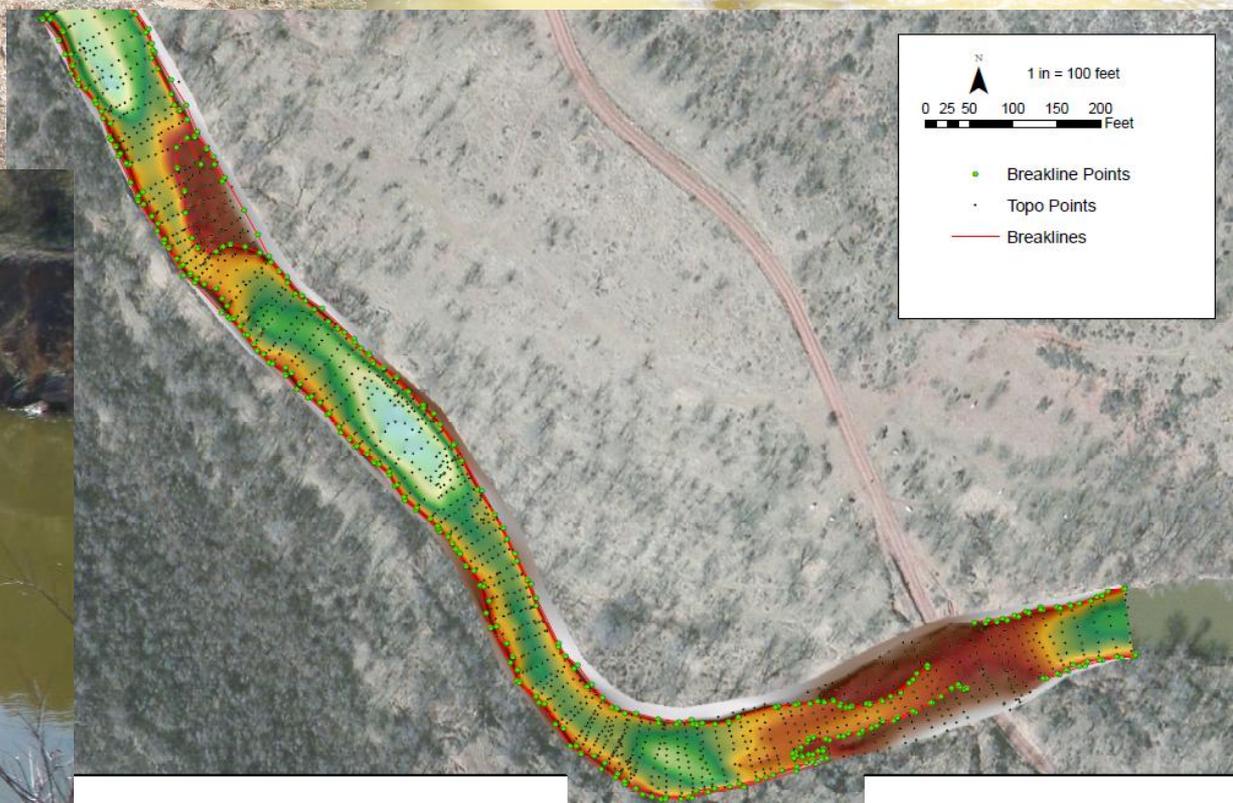


Clear Fork Brazos River

- Physical Measurements
- Biological Data Collection
 - Fish Collection
 - Habitat Mapping
 - Water Quality Sampling
- Hydraulic and Habitat Modeling
- Flow-regime evaluation



Physical Measurements



Biological Data Collection

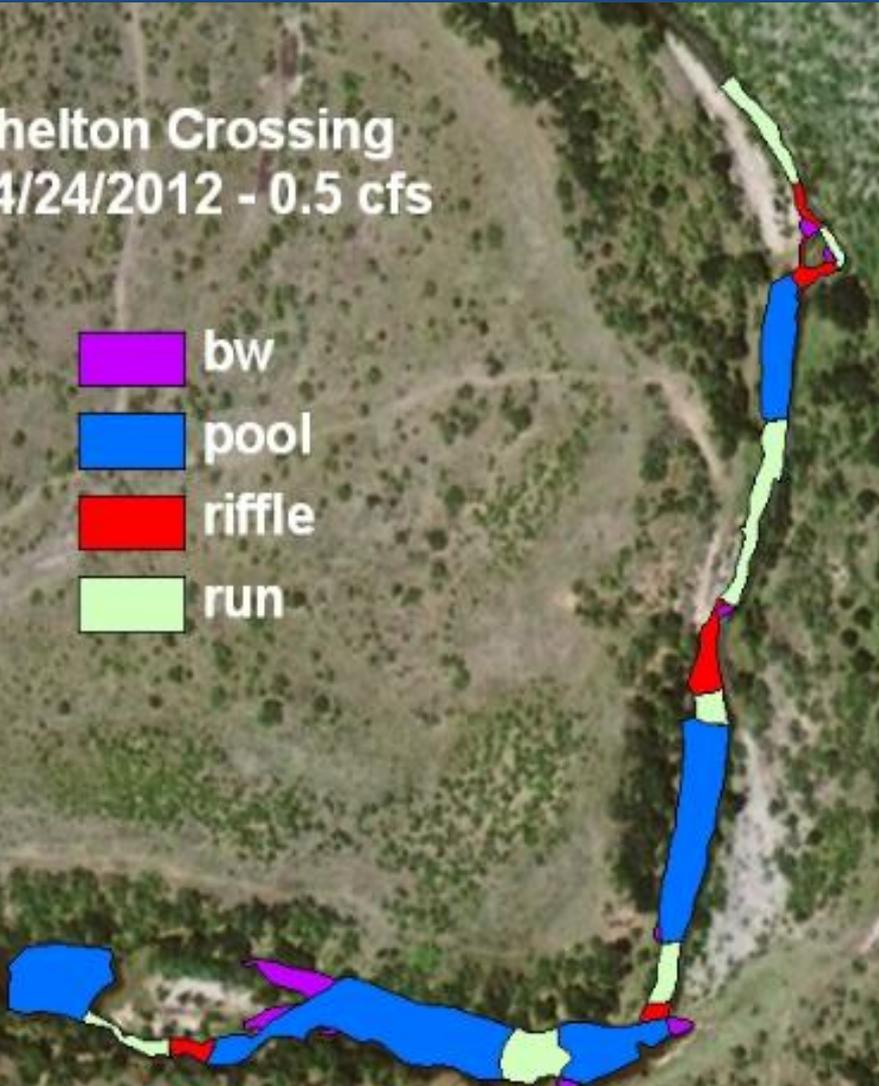




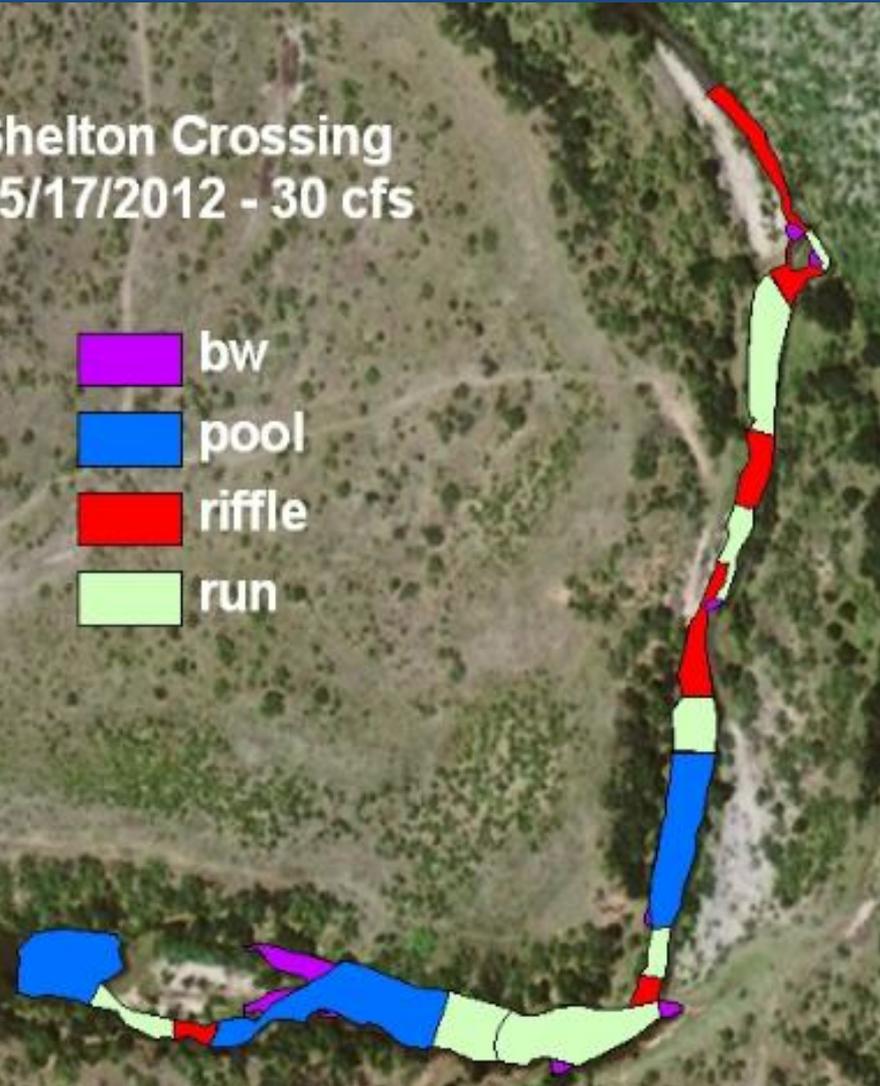


Habitat Mapping

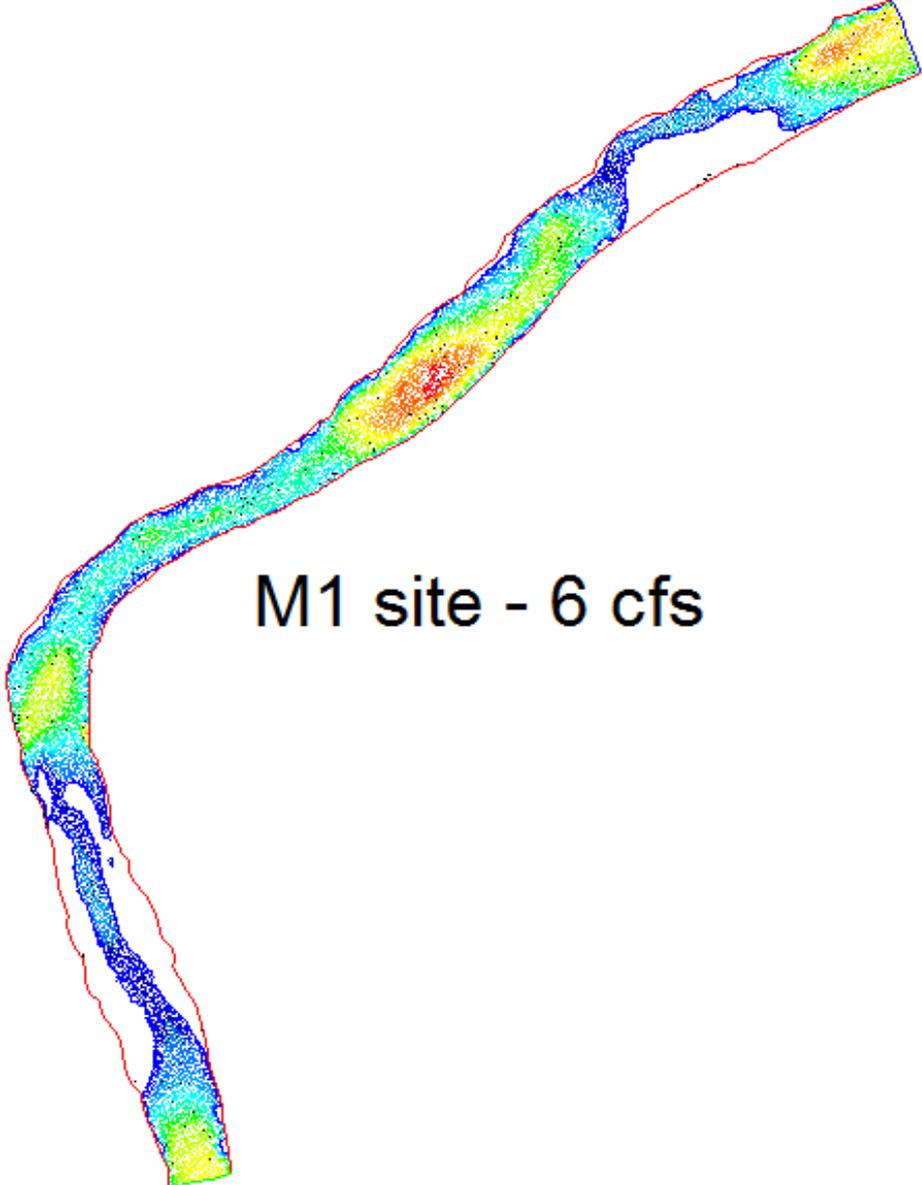
Shelton Crossing
04/24/2012 - 0.5 cfs



Shelton Crossing
05/17/2012 - 30 cfs

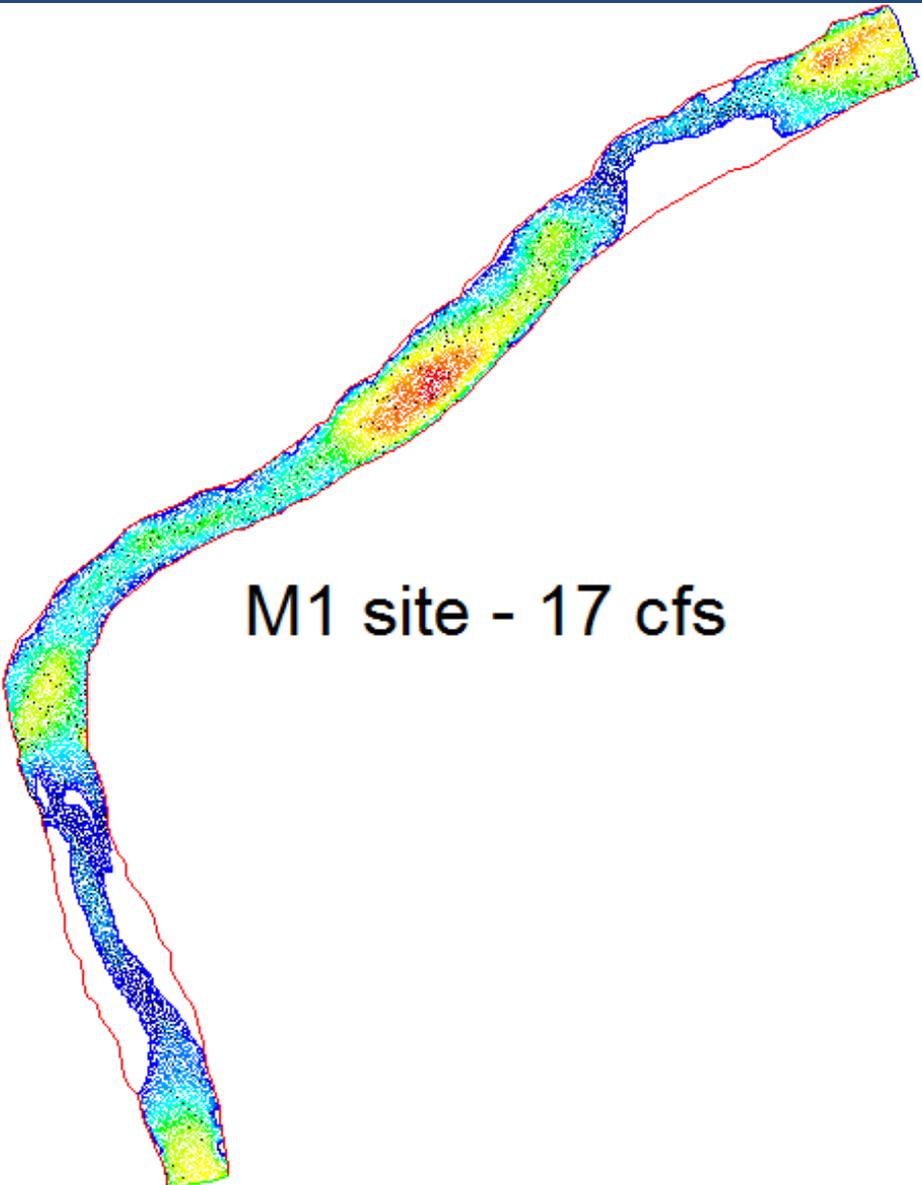


Hydraulic and Habitat Modeling



M1 site - 6 cfs

This map shows a reach of a river with a flow rate of 6 cfs. The river channel is outlined in red. The interior of the channel is filled with a dense grid of colored dots representing hydraulic and habitat parameters. The color scale ranges from blue (low values) to red (high values). The river has a slight curve to the left. A small, irregularly shaped area of white space is visible within the channel on the left side, representing a potential habitat feature or a modeling artifact.



M1 site - 17 cfs

This map shows the same reach of the river as the 6 cfs map, but with a higher flow rate of 17 cfs. The channel outline and the overall shape of the river reach are identical. However, the distribution of the colored dots representing hydraulic and habitat parameters is significantly different. The high-value areas (red and orange) are more extensive and concentrated in different parts of the channel compared to the 6 cfs flow, indicating a substantial change in the hydraulic and habitat conditions due to the increased discharge.













Summary of Draft Findings relative to Cedar Ridge Reservoir Application

- Water quality stressed below subsistence conditions – isolated pools and completely dried channels – Happens naturally
- Habitat modeling shows limited habitat differences at range of base flows.
 - Base flows are important for maintaining connectivity of pools and providing suitable instream habitat for aquatic species including the Brazos water snake.
- Low-flow pulses in Cedar Ridge Reservoir Application
 - important for restoring periodic connectivity of pools and flushing of water quality during subsistence and lower flow conditions.
 - Important for flushing of pools and cleaning silt off riffles during base-flow conditions.
- High-flow pulses are very flashy based on historical occurrence.
 - Channel is very armored for the majority of the study reach
 - Riparian floodplain habitat is very limited in the majority of the study reach.

Preliminary Observations relative to Cedar Ridge Application

- Subsistence flows appropriate.
- Three tiers of base flows are not necessary as long as seasonal base flows are set at approximately 5 cfs or greater.
 - Why? Channel conditions dictate that only minor changes in habitat occur within the 5-17 cfs range.
 - Below 5 cfs, available riffle habitat becomes quite shallow resulting in less suitable aquatic habitat . Therefore, if a Base-Dry below 5 cfs was recommended for summer or fall, a higher base flow would also be recommended resulting in more than 1 tier.
- Three tiers of pulses proposed based on hydrologic conditions provide flow variability to the base flow component and meets the ecological objectives associated with instream aquatic habitats.
 - Over the course of the study, both Dry and Average pulses slightly less than proposed have been experienced and were affective at achieving the pulse flow objectives (pool connectivity and flushing).
 - Wet condition pulses have not been observed over the course of the study and thus, further monitoring will be recommended for consideration in the SB 3 work plan.

Questions/Comments

