

North Concho River Pilot Brush Control Monitoring Project September 1, 2009

On September 1st, 1999, the Upper Colorado River Authority (UCRA) was awarded a contract from the Texas State Soil and Water Conservation Board (TSSWCB) to develop and implement a monitoring and research project to assess the efficacy of the North Concho River Pilot Brush Control Project. The UCRA is currently entering into the final year of the 10 year project.

Thus far, through the implementation of the monitoring and research project, a large assemblage of hydrologic monitoring, observational, and research data have been collected. The hydrologic data that have been collected include the following:

- fixed periodic measurements of main channel and selected tributary base flows and basin-wide (regional) and smaller scale sub-basin groundwater elevations;
- the episodic measurement of the number, frequency, duration and distribution of main channel flood flows and main channel in-stream losses;
- the continuous collection of evapotranspiration data (mesquite paired watershed sites), and storm event runoff measurements (juniper paired watershed sites) for comparative analysis;
- and the periodic measurement of stream flows with resulting water production calculations from the East Fork of Grape Creek sub-watershed and the West Fork of Grape Creek sub-watershed.

Preliminary analyses of the various data collected thus far have resulted in an interim basin report and several published research reports, all of which indicate positive hydrologic responses.

The hydrogeologic and climatic processes that drive hydrologic responses on a basin-wide scale occur over long time periods. The recognition of this fact was the reason that this project was designed to be implemented over a ten year time frame. Specifically complicating the monitoring efforts and undoubtedly slowing the occurrence of hydrologic responses in this particular instance was the basin-wide drought conditions experienced during the first few years of monitoring and data collection. Now that recent climatic conditions are more in line with historical norms, the critical data needed for the successful completion of the project can be acquired. The requested funding is critical to its successful completion and should lead to objective outcomes that will likely establish water production brush control strategies on which future public funding of brush control programs can be based.

North Concho River Pilot Brush Control Monitoring Project and Twin Buttes Surface Flow Monitoring and Analysis

Scope of Work

Task 1: Project Management

Management of all administrative functions of the project including coordination of Sub-Contractor task management and invoicing

Task 2: Data Collections and Analysis

- Paired watershed study (Mesquite Sites) - quantitative measurement of evapotranspiration from upland mesquite trees using Eddy Covariance equipment at two 200 acre paired watershed sites (performed by UCRA staff and the staff of UCRA Sub-Contractor, Texas Institute of Applied Environmental Research (TIAER));
- Paired watershed study (Juniper Sites) - quantitative measurement of effects of brush removal on storm event runoff at two approximately 100 acre drainage basins of similar size, topography and flora (performed by UCRA staff and the staff of UCRA Sub-Contractor, Texas Institute of Applied Environmental Research (TIAER));
- North Concho River surface water flow measurements - manually obtained quarterly flow measurements supplemented with USGS gaging station data; quantification and characterization of storm event runoff flows;
- Sterling Creek surface water flow measurements - manually obtained quarterly measurements;
- Chalk Creek surface water flow measurements - storm event runoff monitoring utilizing USGS gaging station data;
- East and West Forks of Grape Creek surface water flow measurements - periodic manually obtained measurements of East Fork and West Fork of Grape Creek used in conjunction with data from USGS gaging station located near the confluence of Grape Creek and the North Concho River;
- Manually obtained measurements of relative ground water elevations from a basin-wide grid of water wells;
- Analysis of all physical monitoring data and observational data.

Task 3: Reporting

Generation of a final report that will present all monitoring data, observational data, methods employed for data collection and analyses, analytical results, final results of both paired watershed research projects, and the development and presentation of pertinent conclusions and recommendations regarding the efficacy of the North Concho River Pilot Brush Control Project.