

**Pecos River Basin Assessment Program**  
**Texas Cooperative Extension and the Texas Water Resources Institute**  
**FY04 CWA Section 319**

**Quarterly Report Number 3**  
**Covering work accomplishments during April through June, 2005**

**Task 1: Basin Assessment**

**Subtask 1.1—*Aerial Photography, Delineation, and Characterization***

Aerial photographs were used to delineate and characterize watersheds and subwatersheds throughout the Pecos Basin. The photographs were copied and supplied to task and subtask leaders. These data will be used to identify tributaries that will be sampled in this study (Subtask 1.4).

(100% complete)

**Subtask 1.2—*Historical Water Quality, Irrigation Delivery, Rainfall, Red Bluff Lake Levels, and Groundwater Monitoring***

Much of this subtask focused on data gathering and compiling reports and information sources that will benefit project participants. Some of the data that were gathered during this quarter includes the following:

- A natural resources evaluation report (from the Texas Parks and Wildlife Department),
- Information on the Pecos alluvial aquifer and stream gage data (both from the United States Geological Survey),
- Maps and cross-sections of the Pecos alluvial aquifer and the draft of the Far West Regional Water Plan (both from the Texas Water Development Board),
- Information about water rights for the Pecos River in Texas (from the Texas Commission on Environmental Quality),
- Reports about irrigation systems in Balmorhea, Texas, and Carlsbad, New Mexico (from the United States Bureau of Reclamation), and
- Economic issues associated with preserving habitat for the Silvery Minnow in the Pecos River system (from the United States Fish and Wildlife Department).

(25% complete).

**Subtask 1.3—*Aquatic Life and Habitat Inventory***

Discussions continued between project leaders and collaborators with the Texas Commission on Environmental Quality and the United States Geological Survey. The discussions have focused on developing plans about how best to inventory aquatic life and riparian and terrestrial habitats. Substantial work on this subtask will not begin until 2006.

(5% complete)

**Subtask 1.4—*Identify and Characterize the Volume and Quality of Tributaries and Springs***

Texas Cooperative Extension professionals met with staff from the United States International Boundary and Water Commission to discuss potential methodologies to sample springs and tributaries in the basin. Tributaries and springs in the basin that may be sampled have been identified using aerial photography and digital topographic maps. A tentative plan to sample these springs and tributaries has been developed.

(15% complete)

***Subtask 1.5—Identify and Characterize Saline Water Sources Entering the Pecos River***

Project leaders have completed the analyses of United States Geological Survey data relating to flows and salinity from 11 major gauging stations along the Pecos River basin. Results indicate the dissolution of evaporites from the Permian age is the major sources of salt in the river. The analyses also suggest that most of the salt loadings into the Pecos River in Texas occur upstream of Red Bluff Reservoir in New Mexico. Finally, the analysis suggests that high flow events in the Pecos River still occur often enough to ensure that excessive levels of salinity are not found along riverbanks of the region. The analyses are described in a draft report, “Reconnaissance Survey of Salt Sources and Loading into the Pecos River,” which is now under review.

(85% complete)

***Subtask 1.6—Simulate Flow and Salinity of the Pecos River for Evaluating River Management Options***

The research team has analyzed flow and salinity data from the Pecos River and compared this information to salinity levels in Amistad International Reservoir. A draft report, “Influence of Tributaries on the Salinity of Amistad International Reservoir,” has been developed and is now being reviewed. Efforts have been made to implement computer modeling activities, including collecting data about groundwater conditions, rainfall, evaporation, and vegetative conditions. The project will also model the salinity of the Pecos River, and will calibrate and validate modeling results.

(20% complete)

***Subtask 1.7—Economic Modeling of the Pecos River Basin and Assessment of Saltcedar Control Activities***

Historic data about agricultural water use in irrigation districts in the basin is now being collected. Information was obtained from onsite visits to three irrigation districts downstream of Red Bluff Dam. The irrigation data will be compared to historical data on the amounts of water released from Red Bluff

(8% complete)

## **Task 2: Educational Programming**

### ***Subtask 2.1—Publish Written Informational Materials to Educate Private Landowners, Stakeholders, and Policy Makers about the Pecos River basin and the effects of saltcedar***

A brochure that presents an overview of the project was developed by staff from Texas Cooperative Extension and the Texas Water Resources Institute. A total of 2,000 copies of the brochure were printed and this publication is being distributed throughout the basin.

Project leaders cooperated in the development of a news story that was published in several newspapers throughout the basin. The article provided general information about the project and asked readers to participate in an online survey.

The project team worked with the Agricultural Communications Department at Texas A&M to create and distribute news releases about the project. The news releases have led to coverage of the project in the mass media (i.e., radio stations and newspapers) in the region.

Work is progressing on developing a fact sheet that will present a historical perspective of how conditions in the Pecos Basin of Texas have evolved since the region was settled by Anglo-Americans in the 1800s. Interviews have been conducted with residents who have lived in the region for many years and who have observed notable changes in the condition of the river and how water has been used. These interviews have been transcribed. Data from these interviews, along with information from other sources, will be incorporated into a user-friendly fact sheet.

The fact sheet will describe:

- Water conditions in the region before Anglo-American settlement,
- The evolution of farming, irrigation, and ranching in the basin and the impacts of these activities on water use,
- Current water use trends, and
- The future outlook for water resources and water use in the basin.

(40% complete)

### ***Subtask 2.2—Educational Meetings of Interested Parties for Input and Organizational Support***

Texas Cooperative Extension personnel presented the project to several stakeholder groups at seven events including the following:

- The Rio Grande Basin Initiatives Conference;
- The Pecos River Advisory Committee;
- To Terrell County youth and adults at the Independence Creek Preserve; and
- To ranchers and landowners in Rankin, Monahans, and Ozona.

In addition, Extension professionals were interviewed on a Pecos radio station where they asked listeners to take part in an online survey about public perceptions of conditions affecting the river. Project participants with the Texas Agricultural Experiment Station and the International Boundary and Water Commission made presentations to the Pecos River Advisory Committee.

A major Extension activity involved developing, promoting, and asking for input to an online web-based survey to gather public perceptions of water resources challenges in the basin. Extension professionals also organized a meeting with Pecos County officials, contacted local soil and water conservation districts in the basin to arrange to have project leaders speak at their meetings, and mailed a postcard to 565 landowners along the Pecos River urging them to take part in the on-line survey.

(20% complete)

***Subtask 2.3—Develop a Website for Dissemination of Information***

Materials continue to be posted to the website, including updates on progress being made on tasks and subtasks and the posting of the interactive web-based survey. The website will continue to be used to share information within members of the project team and with stakeholders in the region.

(80% complete).

***Task 3—Establish a Monitoring Program to Gather Data About Water Quality and Water Supply Issues in the Basin, As Well As Information on How Saltcedar Affects the Hydrology of the Basin.***

***Subtask 3.1—Develop a QAPP for Sampling Protocol***

The QAPP has been developed, modified, and submitted to the Texas State Soil and Water Conservation Board for approval. The QAPP has been developed with close collaboration between the project leaders, the Texas Water Resources Institute, and agency staff.

(50% complete).

***Subtask 3.2—Water Quality Monitoring, including Total Dissolved Solids (TDS), Total Suspended Solids, Potential Hydrogen (pH), Dissolved Oxygen (DO), and Electrical Conductivity (EC)***

Routine water quality samples were collected at established locations along the Pecos River as part of the Texas Clean Rivers Program.

(10% complete).

***Subtask 3.3—Quantity and Fate of Water Salvage as a Result of Saltcedar Control***

Three additional boreholes were installed to monitor the piezometric surface and to provide more detailed information about the direction of groundwater flow. To-date, 13 boreholes have been installed. The borehole data will also provide insights about how flows in the river are correlated to groundwater flows in the alluvial aquifer and the floodplain. Additional measurements of the geological profile near the river were conducted to provide data to better understand forces that influence the direction of water flows. Preliminary measurements of hydraulic conductivity were performed at the Texas Agricultural Experiment Station laboratory at El Paso.

The research team had planned on measuring the flow of the river during this quarter. However, the flows of the river have been unusually swift (between 200 and 400 cubic feet per second or cfs), while the equipment used in this study can only measure flows of 55 cfs or less. Similarly, conditions in the river basin have not allowed the sampling of water quality in boreholes to be carried out. The best conditions to conduct borehole tests are those in which the river is rapidly rising or falling and that has not been the case at the field sites used in this part of the study.

(30% complete).

***Task 4. Develop a Watershed Protection Plan for the Pecos River Basin that will Identify Strategies to Limit the Adverse Consequences of Issues Related to Saltcedar in the Basin***

(0% complete).

***Subtask 4.1—Develop Annual Reports and a Final Report Summarizing Basin Assessment, Educational Programming, and Monitoring***

(0% complete).

***Subtask 4.2—Produce the Final Watershed Protection Plan for Pecos River Segments 2312, 2311, and 2310***

(0% complete).

***Activities Planned for the Next Quarter***

Subtask 1.1—This subtask is complete. No additional activities are planned.

Subtask 1.2—Efforts will continue to gather data and to share information about the project with stakeholders. Work will also begin on publishing a list of recommended water-conserving plants that may be suitable for the region.

Subtask 1.3—Work will continue on discussing and developing plans to inventory habitats and aquatic life. This subtask is being coordinated between the project team and state and federal agencies.

Subtask 1.4—Plans are underway to purchase water quality sampling equipment. Field visits will be made to springs and tributaries that are being considered as sample sites. Based on these field visits and information from other sources, a list of the sites that will be sampled will be developed. At sites which are selected for water quality sampling, monitoring and sampling equipment will be installed.

Subtask 1.5—If necessary, one additional set of water samples will be collected and used for isotopic analyses. A final version of the report, “Reconnaissance Survey of Salt Sources and Loading into the Pecos River,” will be developed, once review comments are obtained.

Subtask 1.6—Efforts associated with data gathering and model development and application will continue. Review comments will be obtained about a report developed by project leaders, “Influence of Tributaries on the Salinity of Amistad International Reservoir,” and a final version of that report will be published.

Subtask 1.7—Work will continue to develop production budgets for a number of crops, including cantaloupes, onions, grains, grain and forage sorghum, and wheat. Historical trends for dryland and irrigated agricultural production will be developed. A draft survey instrument will be developed to ask rangeland owners and managers about water resources and saltcedar issues they believe are high priorities.

Subtask 2.1—Efforts will continue to develop and distribute written materials about the project. A major task involves distributing the brochure to County Extension Agents and other stakeholders in the basin. A draft fact sheet will be written and designed that will present information on how water resources in the Pecos Basin of Texas have changed over time. The fact sheet will also present insights into how future trends are likely to affect water resources in the region.

Subtask 2.2—Extension leaders will continue to present the project to the public. A meeting with officials from the all the counties in Texas that are within the Pecos Basin will occur on August 23. The objectives are to inform county officials of the project, to receive feedback, and to encourage support from county governments. The results of the online survey will be evaluated and results will be posted on the project website.

Subtask 2.3—Work will continue to publish project updates and other related materials on the website.

Subtask 3.1—Work still needs to be done to review comments and changes that may be submitted by the Texas State Soil and Water Conservation Board before the QAPP is finally approved. Once TSSWCB approval is obtained, work will need to be done to implement this plan.

Subtask 3.2—Routine water quality samples will be collected as part of monitoring activities carried out through the Texas Clean Rivers Program.

Subtask 3.3—Work to describe the morphology of the Pecos River channel will begin. Flow measurements will be conducted, based in large part on whether the volume of flows will facilitate data collection. Work will continue on analyzing soil traits in laboratories and on furthering work on the literature review.

Subtask 4.1—Efforts will begin to develop the annual report for the project.