

Quarterly Report for the Basin Wide Management Plan for the Pecos River, Texas

September 1, 2004 through December 31, 2004

Abstract

The purpose of this project is to assess factors that adversely impact water quality and water supplies in the Pecos River Basin of Texas. A major aspect of this project focuses on determining the extent that saltcedar infestation may lessen water supplies throughout the Texas portion of the Pecos River Basin, and to learn the extent to which eradicating saltcedar may increase ground and surface water flows thereby affecting salinity dilution. A second major component of this study involves identifying and assessing sources of salinity that restrict the usable yield of waters in the watershed. Overall, the project will evaluate management methods and technological solutions that have the potential to alleviate water quality problems in the region.

Overall Project Coordination

Accomplishments To-Date

William Hatler was hired as the Project Coordinator in November 2004. He will report to Dr. Charles Hart.

Ric Jensen of the Texas Water Resources Institute will work with Hatler and the project team to assure that deliverables are met and reports are submitted and to assist in communications and education needs associated with this effort.

Comprehensive efforts will be made to fully engage Texas Cooperative Extension and Texas Agricultural Experiment Station personnel in research and outreach activities associated with this work.

Hatler participated in an EPA conference, "Watershed Partnerships: Collaboration for Environmental Decision Making," in November 2004.

A TTVN meeting was held in November 2004 that involved all members of the project team as well as Kevin Wagner of the Texas State Soil and Water Conservation Board. Topics that were discussed included the overall progress of the project, progress in developing the QAPP, the need for a website and communications programs, and budgets.

Members of the project team based in Fort Stockton met in January 2005 to discuss the status of the QAPP and the development and submittal of quarterly reports.

Task 1. Basin Assessment—*Develop a baseline assessment of the Pecos River basin with regards to stream channel morphology, riparian vegetation, land use, salinity mapping, water inflows and outflows, aquatic habitats, historical perspectives, and economic modeling. This phase will identify and evaluate potential problems and solutions. Aspects will be viewed from a historical perspective as well as current conditions..*

Subtask 1.1—Aerial Photography, Delineation, and Characterization (10% complete)

Subtask Leader—Dr. Charles Hart, Texas Cooperative Extension.

Accomplishments To-Date

Aerial imagery of the Pecos River from Grandfalls to the confluence of the Pecos and the Rio Grande (214 river miles) has been captured and processed by Aerial Imagery Services.

The amount of acreage infested with saltcedar has been delineated in ArcView. The images differentiate between different densities of saltcedar.

Future Plans

The project team is now in the process of purchasing the imagery and the delineations, and a purchase order has been requested. Once the imagery has been acquired, the saltcedar acreages delineated will be compared to treated acres to determine the extent of control. Imagery will also be used to assist in other subtasks under task 1.

Subtask 1.2—Historical Water Quality, Irrigation Delivery, Rainfall, Red Bluff Lake Levels, and Groundwater Monitoring (5% complete)

Subtask Leader—Mike Mecke

Accomplishments To-Date

Mike Mecke of Texas Cooperative Extension has made some initial steps in identifying sources of historical information about the Pecos River watershed. Much more work remains to be done in this regard.

Subtask 1.3—Aquatic Life and Habitat Inventory (5% complete)

Subtask Leaders--Wayne Belzer and Ryan Nelson of the Texas Clean Rivers Program.

Accomplishments To-Date

Preliminary work is being carried out to begin developing descriptions of riparian vegetation, riparian and aquatic habitat.

Future Plans

This information will be used to identify sites where data on physical habitats, fish, and benthic organisms will be collected in the future.

Subtask 1.4—Identify and Characterize the Volume and Quality of Tributaries and Springs (5% complete)

Subtask Leaders--Wayne Belzer and Ryan Nelson of the Texas Clean Rivers Program.

Accomplishments To-Date

Preliminary work is now under way to locate and characterize all intermittent and perennial tributaries that flow into the Pecos River, in order to better understand complex processes that affect water quality and water quantity.

The initial work involves reviewing electronic versions of digital elevation maps (hypsography) and hydrography maps from the U.S. Geological Survey and other sources to identify locations of potential tributaries.

Future Plans

Later, this data will be compared to satellite imagery to verify the precise location and magnitude of individual tributaries.

Subtask 1.5—Identify and Characterize Saline Water Sources Entering the Pecos River (10% complete)

Subtask Leaders—Dr. Seiichi Miyamoto and Dr. Fasong Yuan of the Texas A&M University Agricultural Research and Extension Center in El Paso.

Accomplishments To-Date

Work on the literature review has begun and an initial list of references was developed and distributed to project leaders.

Plans are now underway to analyze U.S. Geological Survey streamflow and water quality data for the Pecos River to determine the extent to which water quality and water supplies have changed spatially over time. Preliminary results suggest that salt loading into the Pecos River occurs mainly in the reach of the river between Malaga, New Mexico, and Orla, Texas, although smaller salinity loads may enter the river at other points.

Future Plans

Once the review of existing data is complete, water quality sampling and analyses of river water will begin. This is expected to begin in March 2005.

Subtask 1.6—Simulate Flow and Salinity of the Pecos River for Evaluating River Management Options (5% complete)

Subtask Leaders—Dr. Seiichi Miyamoto and Dr. Fasong Yuan of the Texas A&M University Agricultural Research and Extension Center in El Paso.

Accomplishments To-Date

Preliminary work has been done to prepare for analyses of flow and salinity data in the Pecos River.

Work is now under way to use inflow and salinity data to simulate historical changes in the water quality of Amistad Reservoir.

Future Plans

This analysis will provide data needed to quantify how the Pecos River may affect the salinity of the reservoir. It is anticipated that this analyses will be completed by April 2005.

Subtask 1.7—Economic Modeling of the Pecos River Basin and Assessment of Saltcedar Control Activities (0% complete)

Subtask Leader--William Thompson of Texas Cooperative Extension.

No Accomplishments To-Date

Future Plans

Work on this subtask is not expected to begin until month 18 of this project. Some of the efforts that will be carried out include developing computer models to estimate crop production, using computer models to assess the basin-wide impacts of brush control on rangeland ecosystems, and conducting modeling work to evaluate how best management practices for saltcedar removal may affect the region's economy.

Task 2. Educational Programming—Texas Cooperative Extension and its partners will work with various state and local agencies to assemble a series of written publications targeted at landowners, stakeholders, and policy makers.

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 (5% complete).

Subtask Leaders—Dr. Charles Hart, William Thompson, Will Hatler, Mike Mecke, and Ric Jensen.

Accomplishments To-Date

Publications developed to-date for the project include:

Miyamoto, S., and F. Yuan. 2004. *Selected Bibliography Related to Geology, Hydrology, Soils, and Vegetation of the Pecos River*. Draft.

Hart, C.R., L.D. White, A. McDonald and Z. Sheng. 2005. Saltcedar control and water salvage on the Pecos River, Texas, 1999-2003. Journal of Environmental Management. In Press.

Future Plans

Some of the publications that will be developed include the following:

- A historical perspective of the Pecos River Basin to its current condition.
- A summary of the multi-disciplinary, multi-agency approach that will be employed to monitor and assess issues in the Pecos River basin. .
- A watershed plan for the basin that describes the potential consequences of not adopting a basin-wide management plan and that outlines how the implementation of the plan may change current water use management practices.

Subtask 2.2—Educational Meetings of Interested Parties for Input and Organizational Support (5% complete)

Subtask Leaders—Dr. Charles Hart, William Thompson, Will Hatler and Mike Mecke.

Accomplishments To-Date

Educational resources are being identified that may benefit county Extension agents (CEAs) throughout the region. Work is now underway to identify and procure reports, fact sheets, and educational videotapes that can be distributed to CEA personnel in the region.

Subtask 2.3—Develop a Website for Dissemination of Information (10% complete).

Subtask Leaders—Dr. Charles Hart, Will Hatler, Mike Mecke, William Thompson, Ric Jensen, and Jaclyn Tech.

Accomplishments To-Date

Will Hatler of Texas Cooperative Extension met with Ric Jensen and Jaclyn Tech of the Texas Water Resources Institute in January 2005 to make initial preparations for a project website.

Two web addresses have been tentatively identified—pecosriver.tamu.edu and pecosbasin.tamu.edu.

Elements that may need to be incorporated into the website were identified, including:

- An Abbreviated Version of the Project Work Plan with Tasks and Outcomes.

- Logos and Background Information for Project Sponsors.
- Biographies and Contact Information for Project Team Members.
- Public Relations Materials Developed for the Project (i.e., Newsletters, fact sheets, press releases).
- Maps of the Region.
- Project Databases and Data Files.
- Project Documents the Public Can Access
- Project Documents for Team Members (password protected).
- Updates about the Project, Including Meeting Notices (people can sign up for this via email).
- Brief Summaries of Related Projects and Links to Related Websites.

Future Plans

Hatler, Jensen and Tech will work with the Project team to put the website online and it is expected to be functioning by March 2005.

Task 3—Establish a Monitoring Program

Subtask 3.1—Develop a QAPP for Sampling Protocol (25% complete).

Subtask Leaders--Wayne Belzer, Donna Long and Clint Wolfe.

Accomplishments To-Date

An initial version of the QAPP was developed by Wayne Belzer of the Texas Clean Rivers Program. It is now being reviewed by Donna Long and Clint Wolfe of TWRI and others.

Future Plans

Based on those reviews, the document will be modified and submitted for formal approval. It is expected the QAPP will be finalized and submitted in January 2005.

Subtask 3.2—Water Quality Monitoring, including Total Dissolved Solids (TDS), Total Suspended Solids, Potential Hydrogen (pH), Dissolved Oxygen (DO), and Electrical Conductivity (EC) (0% complete).

Subtask Leaders--Wayne Belzer of the Texas Clean Rivers Program.

No Accomplishments To-Date

Future Plans

Work on this subtask is scheduled to begin in month 4 of the project.

Subtask 3.3—Quantity and Fate of Water Salvage as a Result of Saltcedar Control (10% complete).

Subtask Leaders—Dr. Zhuping Sheng of the Texas A&M University Agricultural Research and Extension Center in El Paso, and Dr. Charles Hart and Alyson McDonald of Texas Cooperative Extension.

Accomplishments To-Date

Ten boreholes have been excavated and sampled.

Six additional monitoring wells were installed.

RockWare software and a HydroLab flow meter were purchased.

Monitoring wells and dataloggers were maintained.

Upcoming Activities

In January 2005, global positioning system coordinates and elevations will be recorded for each well and borehole. Two sets of flow measurements will be taken—a practice run in January 2005 and a later run in which actual flows will be measured for use in this study.

Soil textures will be analyzed in Quarter 2.

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 Leaders—Will Hatler and Ric Jensen will lead all Task 4 activities. They will work closely with Dr. Charles Hart of Texas Cooperative Extension and Dr. Allan Jones and Dr. B.L. Harris of the Texas Water Resources Institute.

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).