

ABSTRACT

Saltcedar Management Strategies and Effects on Water Quality and Quantity of the Pecos River (May 2002)

Lindi Ann Clayton, B.S., Texas A&M University

Co-Chairs of Advisory Committee: Dr. Charles R. Hart
Dr. Robert W. Knight

Aerial herbicide treatments initiated in August 1999 on the Pecos River near Orla, Texas, were evaluated for saltcedar density, vegetation cover and soil salinity pre-treatment and one and two years post-treatment. Saltcedar density was used to determine the effectiveness of treatments. All treatments with the exception of Treatment 2 resulted in significant saltcedar mortality compared to the control (Treatment 1). Treatment 6 was determined to be the best treatment for control of saltcedar in this study. Treatment 6 provided the highest mortality of all treatments ($93.8 \pm 2.2\%$) and lowest variability. Herbicide treatment showed no significant effect on vegetation cover. Vegetation changes that occurred were due to drought conditions. No effect on soil salinity was found following treatment of saltcedar. Average electrical conductivity of the saturated paste extract (mmhos/cm) increased from pre-treatment to one and two years post-treatment periods for 0 to 5 cm depth, but cannot be attributed to control of saltcedar.

Water quality was characterized by current and historical electrical conductivity (EC) data. Electrical conductivity from Red Bluff to Girvin doubled in concentration for current and historical data. A trend toward decreasing EC in the Pecos River appears to

be occurring. However, at this time the decrease cannot be attributed to control of saltcedar.

Water quantity was characterized by historical release and delivery data from the Red Bluff Power Control District. Losses occurring during release and delivery from Red Bluff to irrigation districts are influenced by evaporation by riparian vegetation and from the river and accuracy of release and delivery. Water levels and delivery appear to be influenced by seasonal release from Red Bluff and by the level of a shallow water table underneath the river. The highest average percent loss (67%) occurs during the first month of release for the average delivery year. This indicates that during the irrigation off-season the water table drops and during the first month of release, recharge occurs. Average percent loss decreases to 39% during the growing season, indicating that the water table is recharged. Late season average percent loss increases to 43% following low releases that allow the water table to retreat.