

Brush Control / Water Yield Feasibility Studies

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BACKGROUND

During the 1998-99 legislative session, the Texas Legislature appropriated funds to study the effects of brush removal on water yield in eight watersheds in Texas. These watersheds are: Canadian River above Lake Meredith, Wichita River above Lake Kemp, Upper Colorado River above Lake Ivie, Concho River, Pedernales River, watersheds above the Edwards Aquifer, Frio River above Choke Canyon Reservoir, and Nueces River above Choke Canyon. The feasibility studies were conducted by a team from Texas AgriLife Research, Texas AgriLife Extension, U.S. Department of Agriculture Natural Resources Conservation Service (USDA-NRCS), and the Texas State Soil and Water Conservation Board (TSSWCB).

OBJECTIVES

- Predict the effects of brush removal or treatment on water yield in each watershed.
- Prioritize areas by subbasin relative to their potential for increasing water yield.
- Determine the benefit/cost of applying brush management practices by watershed.
- Determine effects of brush management on livestock production and wildlife habitat.

RESULTS

The Soil and Water Assessment Tool (SWAT) model was used to simulate the effects of brush removal on water yield for 1960 through 1998. Landsat7 satellite imagery was used to classify land use based on over 1,100 ground control points that were located and described by NRCS field personnel in November and December 1999. After calibration of SWAT to existing stream gauges, brush removal was simulated by converting all heavy and moderate categories of brush (except oak) to open range (native grass). Simulated water yield varied by subbasin, but all showed an increase in water yield as a result of removing brush. Average annual water yield increase per treated acre varied by watershed and ranged from 13,000 gallons per treated acre in the Canadian to about 172,000 gallons per treated acre in the Medina watershed. Economic and wildlife habitat considerations will ultimately impact actual amounts of brush removed.

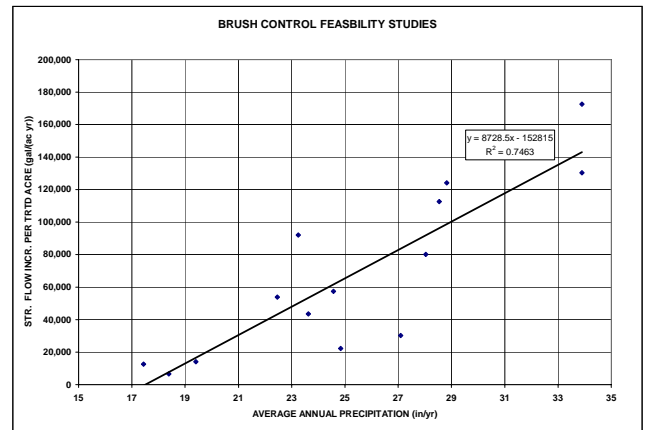


Figure 1. Average annual stream flow increase versus average annual precipitation, 1960 through 1998. Each point represents one watershed.

PARTNERS

- USDA-NRCS
- Texas State Soil & Water Conservation Board
- Upper Colorado River Authority
- Lower Colorado River Authority
- Red River Authority
- Texas AgriLife Research- BREC
- USDA-ARS, Temple

