

CONCLUSIONS

This study sought to determine the "best" method for estimating water use by saltcedar and associated vegetation based on daily diurnal groundwater table fluctuations. Seven methods were investigated and the Draw Down Recharge Method 4 was chosen as the "best" method for the situations at the study locations. However, when the groundwater table fluctuated rapidly in the riparian areas none of the methods evaluated worked for estimating water use.

Several factors (depth to the water table, vegetative characteristics, soil texture, and specific yield) also affected the estimated water use at each location. For example, at the Colorado location, water use was apparently limited due to the low specific yield and the depth to the groundwater table as well as the fact that the plants were young growth saltcedar. Where as at the Canadian and Pecos locations water use was much higher because the water table was close to the soil surface and the specific yield was higher than the Colorado location. The vegetation at the Canadian (Wells 3 and 4) and Pecos (Wells 1, 2, and 3) locations consisted of old growth woody plants resulting in higher water use estimates than the Colorado location which consisted of young growth saltcedar. A dense herbaceous understory at the Canadian location also influenced the water use at this location.

The average daily water use at the Canadian and Pecos locations were higher in the early summer months and declined in late summer. This showed that if the plant water use were only investigated during the high daily water use days (early summer)

and extrapolated for the entire growing season the water use for the growing season would be greatly over estimated or vice versa if measurements were taken in August and October.

The Environmental Protection Agency's Paired Plot Method appears to be another option for determining the amount of water used by saltcedar, however only one location was evaluated with this method in this study. The results indicated a savings of approximately 0.4043 m of water at the Colorado location.

The investigation into whether or not potential evapotranspiration could be used to estimate saltcedar water use was inconclusive. The relationship between these might be better evaluated if a weather station was installed at each study location.

By comparing the water use results for saltcedar presented in (Table 1) to the 163 day growing season at the Canadian (3.6911 m) and Pecos (2.4344 m) locations the water use estimates by the Draw Down Recharge Method were higher than all of those presented in the literature for the Canadian location and only two were higher than the Pecos location.

The results of this study indicate that groundwater monitoring wells are an inexpensive way to determine water use by saltcedar and associated vegetation by both the Draw Down Recharge Method and the EPA Paired Plot Method. However, this study was conducted for only one growing season at the Canadian and Pecos locations and for two growing seasons at the Colorado location. Continued monitoring of the wells would produce long term data sets that will differ from year to year based on local environmental changes.