

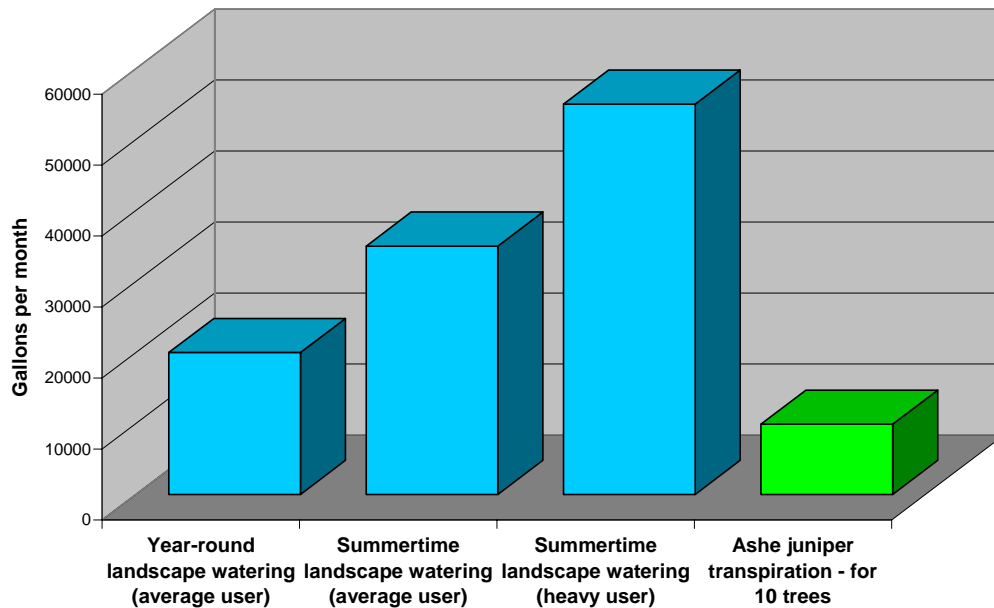
***Preserving Ashe juniper can save water***

According to Bexar Met Water District, an average Stone Oak home uses 35,000 gallons per month for landscape watering in the summer. Some homes use 55,000 gallons per month.

Compare this to the average monthly usage for ten cedar trees, 9,900 gallons, and you quickly realize that preserving Ashe juniper will save water and reduce demand on the aquifer. Furthermore, during times of drought, when landscape watering peaks and water resources are stretched thin, an Ashe juniper uses very little water.

**Stone Oak subdivision landscape watering vs. Ashe juniper water transpiration**

Stone Oak data provided by Nathan Riggs, Bexar Met Water District



***There is considerable uncertainty regarding the amount of water that cedar clearing may add to the aquifer***

**There are no studies quantifying an increase in aquifer recharge from cedar clearing**

Although the EAA is currently conducting rigorous studies to correlate cedar clearing with aquifer recharge, they are incomplete. To my knowledge, these are the only properly designed experiments on the subject. Regardless, the results are not useful for evaluating changes to the tree ordinance, since the experiments involve replacing cedar with native grasses, not development.

## **Even experiments on rangelands have given varying results**

A 1998 experiment<sup>1</sup> using two paired, 40 acre tracts showed that water yield improvements disappeared in the third year after cedars were cleared. This same study concluded that removing juniper by hand cutting had little influence on surface runoff. The only study quantifying an increase in spring flow following juniper removal was by Wright<sup>2</sup>. Another experiment in Uvalde County showed cedar removal had no significant effect on runoff<sup>3</sup>.

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## ***There are no studies where Ashe juniper is replaced with hardscape improvements***

Every experiment measuring the effects of Ashe juniper clearing has been performed on rangeland, where trees were replaced by grasses and soil was mostly undisturbed. There is no justification for assuming similar results will be obtained when trees are replaced by streets, parking lots, and buildings.

Clearly, if Ashe juniper preservation is reduced, impervious cover and development density will increase. It is likely that floodwater runoff to other areas of San Antonio will increase. In fact, the primary desired result of cedar clearing experiments appears to be increasing runoff, and the studies use the terms *runoff* and *water yield* interchangeably.

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<sup>1</sup> Dugas, W.A., R.A. Hicks, and P. Wright. 1998. Effect of removal of *Juniperus ashei* on evapotranspiration and runoff in the Seco Creek watershed. *Water Resources Research* 34:1499-1506.

<sup>2</sup> Wright, P.N. 1996. *Spring enhancement in the Seco Creek water quality demonstration project*. Annual Project Report, Seco Creek Water Quality Demonstration Project. Temple, TX: U.S. Department of Agriculture-Natural Resources Conservation Service.

<sup>3</sup> Wilcox, B.P., M.K. Owens, R.W. Knight, and R. Lyons. 2005. Do woody plants affect stream flow on semiarid karst rangelands? *Ecological Monographs* 70:517-37.

**An Ashe juniper tree does not use an acre-foot of water per year**

On December 2<sup>nd</sup>, the Express-News published this statement: “*The Greater San Antonio Builders Association suggested that ashe juniper be added to the list because an average adult tree consumes an acre-foot of water per year....*” This statement is incorrect according to every study on cedar water consumption.

An acre-foot equals about 326,000 gallons. According to Owens and Ansley<sup>4</sup>, a single tree uses 33 gallons of water per day or about 12,000 gallons per year.

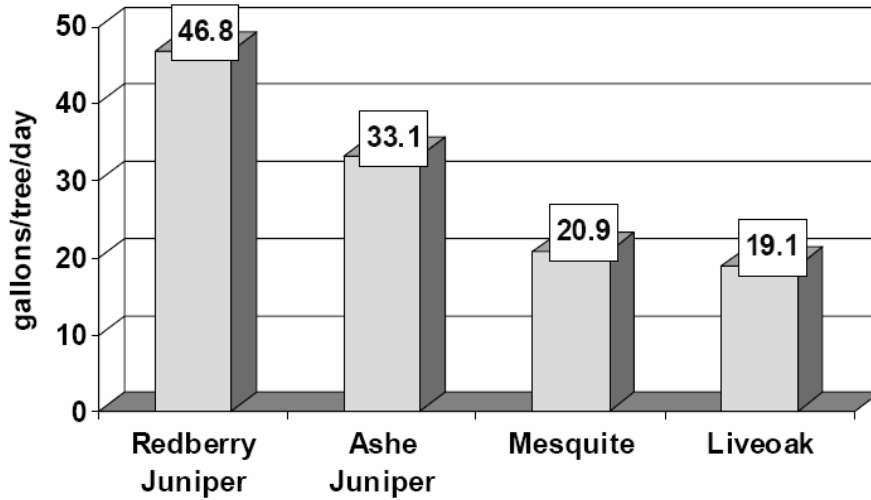


Figure 16-1: Estimated relative plant water use by four brush species in Texas (Owens and Ansley, 1997).

	Owens – Ansley report	GSABA statement	Difference
Water use per year (gallons)	12,045	325,851	+2,605%
Water use per day (gallons)	33	893	+2,605%

However, the same report concluded that *the entire population of Ashe junipers on an acre of land*, not a single tree, uses between 0.34 and 1.4 acre-feet of water per year. This is likely the source of the belief that cedars use an acre-foot of water per year.

<sup>4</sup> Owens, K., and Ansley, J., 1997, Ecophysiology and growth of ashe and redberry juniper: Texas Agricultural Experiment Station Technical Report 97-1

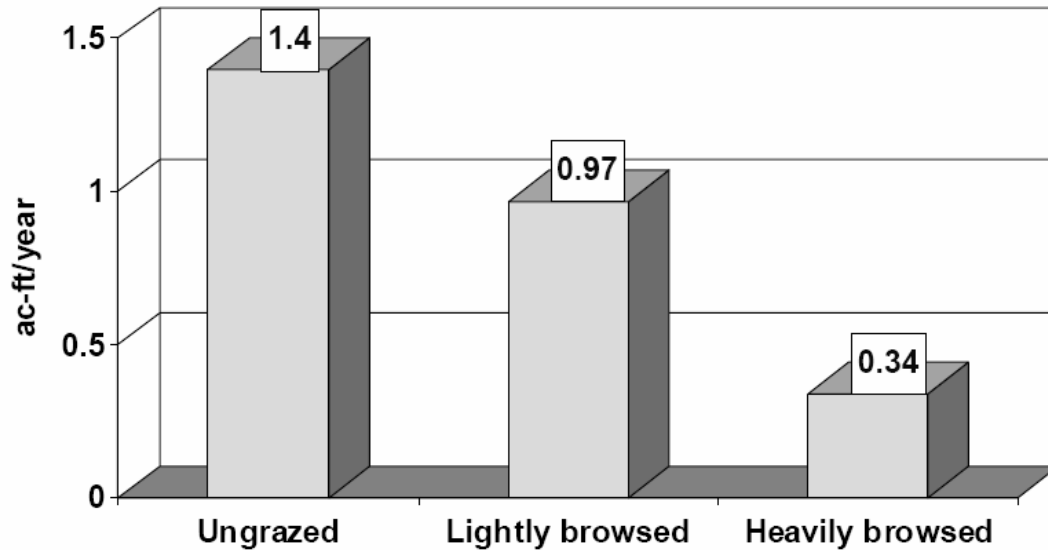


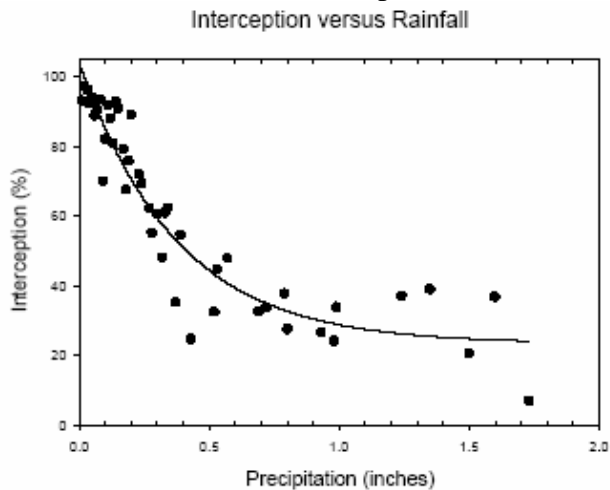
Figure 16-2: Juniper water use in Texas as influenced by grazing history based on preliminary models by Owens and Ansley (1997).

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***Ashe juniper's primary mode of water usage is rainfall interception, not transpiration from soil***

Owens, et. al. showed that between 39 and 67% of rain falling on an Ashe juniper tree is intercepted<sup>5</sup>. Ashe juniper intercepts more rainfall than live oak because it has a higher leaf area index.

Leaf area index, which is a measure of square feet of leaf area per square foot of ground area, is about 3 times higher for Ashe juniper than for live oak. Clearly, this has implications for San Antonio's stormwater runoff problem.




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<sup>5</sup> Owens, M. K., R. Lyons, and C. Kneuper. 2001. *Evaporation and Interception Water Loss from Juniper Communities on the Edwards Aquifer Recharge Area*. Quarterly Report. Texas Agricultural Experiment Station and Texas Agricultural Extension Service.