Water Commitments in the Tri-Cities Region, Arizona's Changing Climate and Threatened Impacts to the Upper Verde — An Overview

The perennially flowing Verde River is a marvelous riparian oasis in our high desert setting. It is one of Arizona's remaining key riparian areas. The part upstream from the Verde Valley supports a diverse mixture of vegetation, fish, and animal wildlife, including several threatened or endangered species. It is a jewel in Yavapai County. Demands for water to support our continually expanding population in the Upper Verde Watershed threaten to reduce perennial flow in the upper Verde River and eventually eliminate perennial flow in the uppermost reaches. Climate change and climatic cycling accentuate the problem.

In order to support continued population growth in the Tri-Cities and meet a State-imposed requirement to achieve safe yield (i.e., cease ground-water mining) in the Prescott Active Management Area (Prescott AMA) by 2025, the City of Prescott is contemplating purchase of the CV Ranch in Big Chino Valley. State law permits the City to import as much as about 11,000 ac-ft/yr of ground water from the CV Ranch. With this imported water, it is possible, with good management and no continuation of the present drought, for the AMA to achieve safe yield and support a population no larger than the approximately 148,000 that the Arizona Department of Water Resources projects for 2025.

Unfortunately, the amount of water that is withdrawn by wells is eventually offset by an equal reduction in discharge to springs and streams. Even under the condition of safe yield, pumpage from the Prescott AMA will eventually reduce to zero all ground-water discharge from the AMA to the Verde River. In addition, withdrawal of approximately 11,000 ac-ft/yr from Big Chino Valley will eventually reduce ground-water discharge from the uppermost reach of the Verde River by the same amount. The inevitable consequence is that perennial flow in the uppermost part of the river will be lost.

Arizonaís climate is becoming warmer and drier. Average daily temperatures at Prescott have increased by 7ºF since 1910, and the average winter snowfall has decreased by 19 inches since the beginning of the 20th century. These observed local trends combined with observed and projected global warming trends indicate that winter snow accumulations will continue to decrease in northern Arizona. Further, trends in sea-surface temperatures in the northern Pacific Ocean indicate that the present drought is likely to continue for another 20 years. Consequences include not only decreased ground-water recharge but also substantially increased water consumption for farms, trees, lawns, and gardens.