Citizens Water Advocacy Group

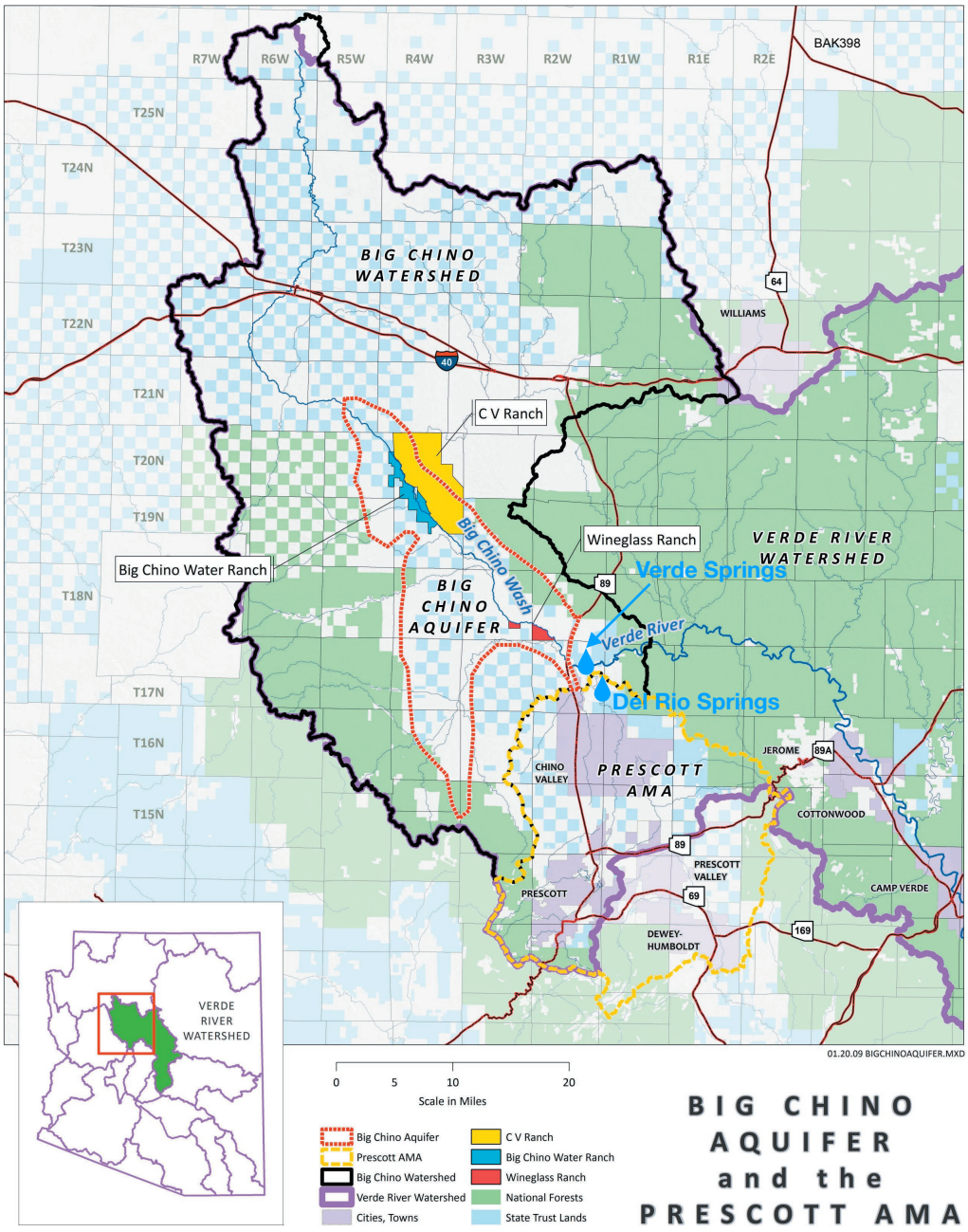
PROTECT OUR WATER

cwagaz.org

2025 CWAG Candidate Forum
Prescott City Council/Mayor Election

Factual Basis For Questions

It is helpful to have a few basic facts in mind to establish why we must address threats to a secure water future and the continued flow of the upper Verde River. The map below displays the regions of concern: the Prescott AMA (PrAMA) and the Big Chino Watershed. Our water issues are larger than the Prescott city limits.

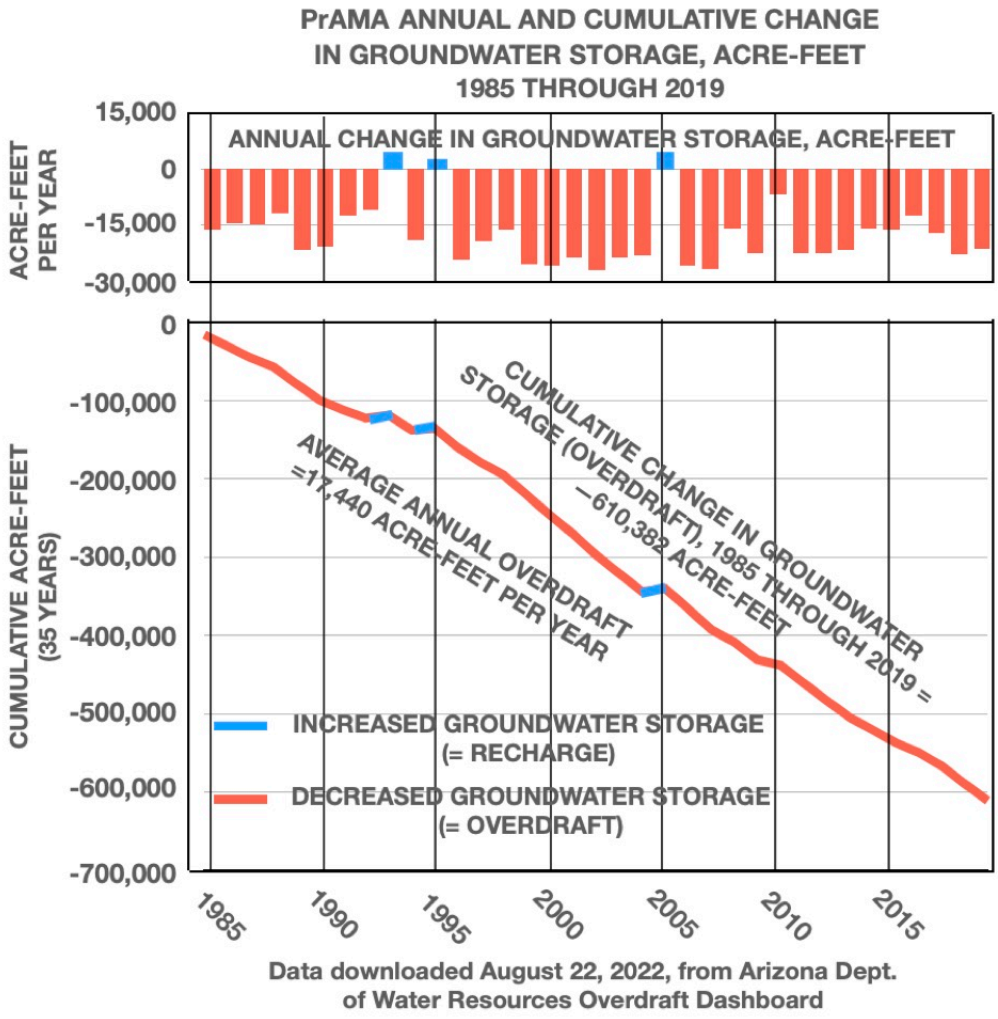


Current Status of the Prescott Active Management Area

Groundwater resources in the PrAMA are managed by the Arizona Department of Water Resources (ADWR). The management goal of the PrAMA is safe yield by 2025.

Safe yield is a long-term balance between recharge and withdrawal of groundwater. The chart uses ADWR data and shows that the overdraft is accumulating, indicating that we are moving away from safe yield. In the recent 5th Management Plan, ADWR admits that, realistically, it is impossible to attain the management goal.

ADWR declared the PrAMA to be out of safe yield in 1999 and then imposed a management plan. Twenty-six years and three management plans later, the annual overdraft remains unchanged and very large. The annual overdraft for 2019 exceeds 21,000 acre-feet per year (afy). To envision an acre-foot, imagine a football field with water one foot deep. The cumulative overdraft now exceeds 600,000 af. In 2019, we removed enough water from the aquifer to flood a football field 4 miles deep, and the cumulative overdraft would fill a football field 114 miles deep in water! This cannot go on forever.

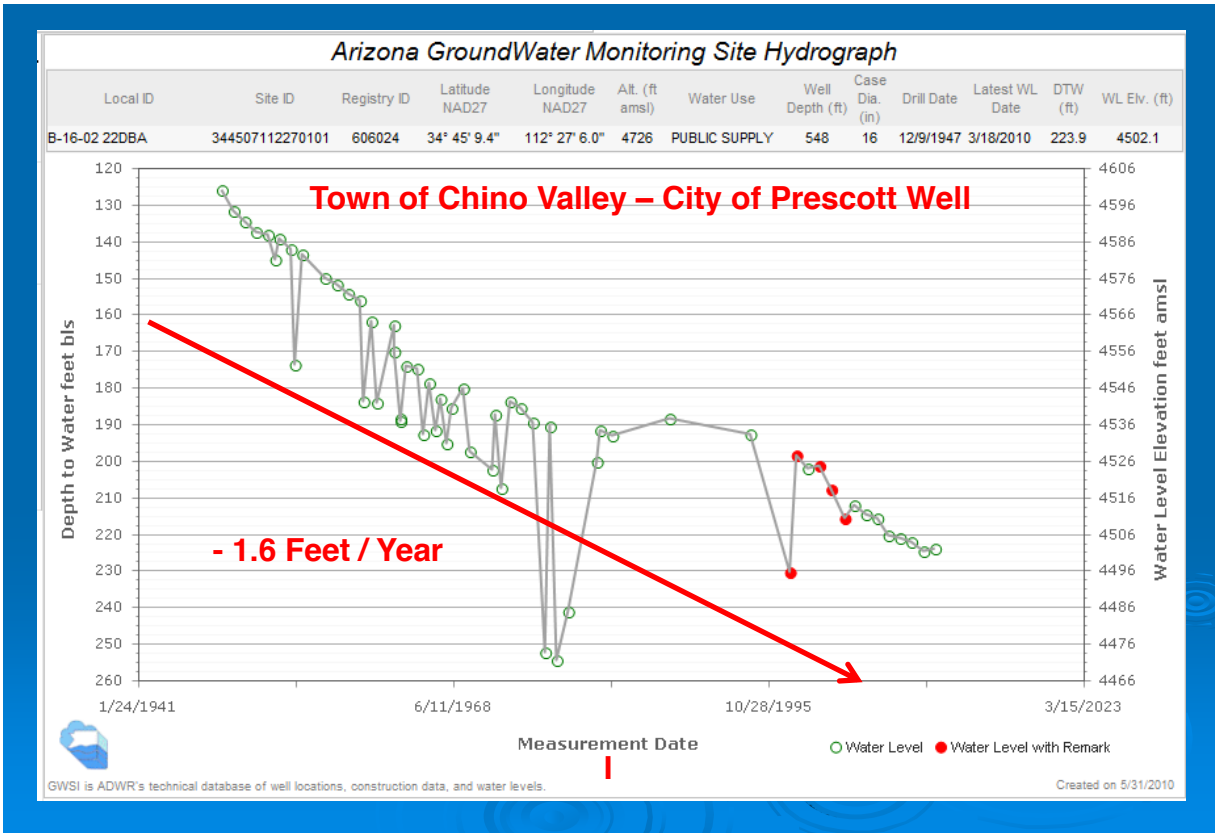


Unfortunately, the PrAMA is moving away from, not toward, the management goal: safe yield. Safe yield is a goal, not a requirement. ADWR places the responsibility for a safe yield plan on elected city officials in the PrAMA. At this time, no plan exists, and there are no planned discussions about a safe yield plan. There are no legal consequences for failing to achieve safe yield. There is no penalty for failure. There are no incentives. Therefore, safe yield is a policy designed to fail. It has not worked in the PrAMA, which ADWR ranks as the worst performing safe yield AMA in the state.

The long-term consequences of failing to reach safe yield are loss of water security and damage to the upper Verde River.

The Source of Our Water

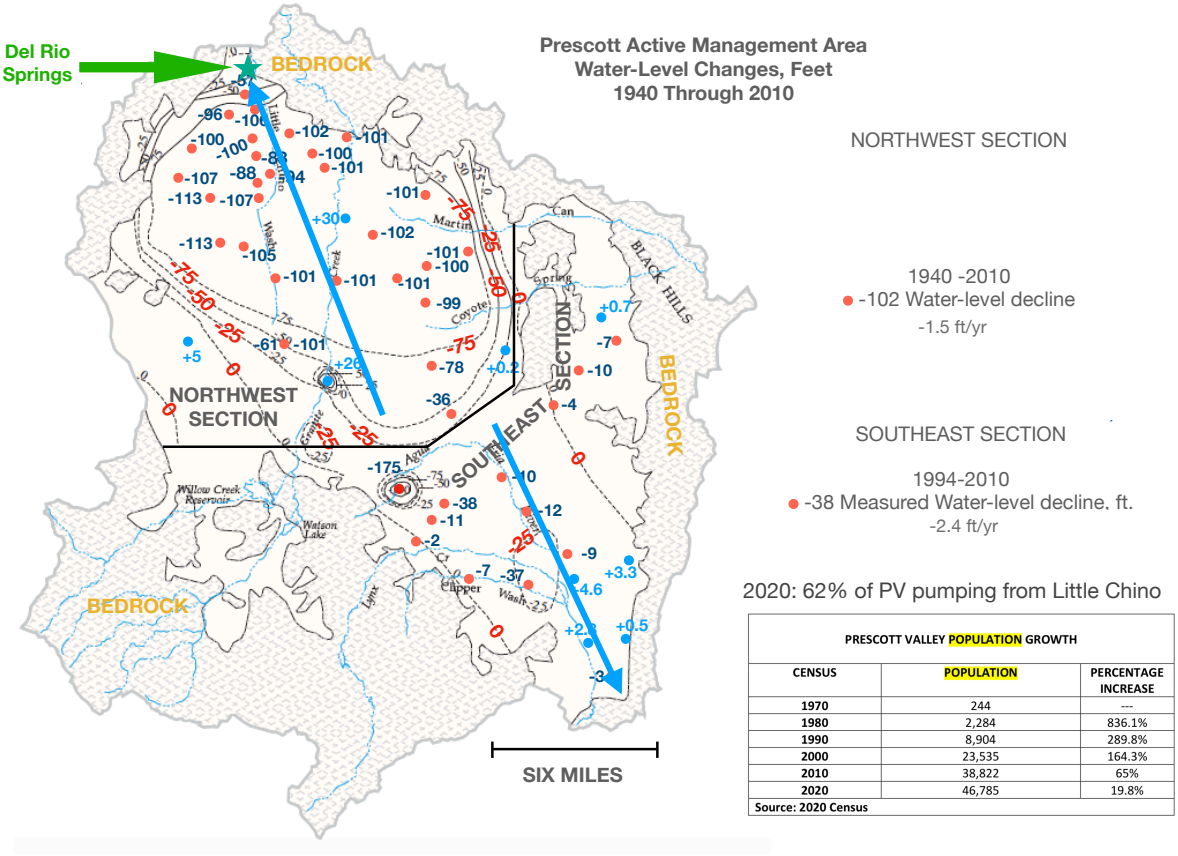
Our domestic and municipal potable water supply is groundwater. The Little Chino sub-basin (within the PrAMA from Prescott north through Del Rio Springs) is our greatest concern because it is the primary source of water for Chino Valley, Prescott, and some Yavapai County residents, plus it supplies over 60% of Prescott Valley's water. Wells in the Little Chino intercept groundwater flowing north from the Prescott basin to Del Rio Springs and the Verde River. The relentless overdraft causes groundwater levels in the Little Chino aquifer to decline. You can see the decline in the plot below showing the declining water level in one of Prescott's production wells in Chino Valley.



Contributors to the Increasing Overdraft

Municipal water use is currently about 75% of the total demand in the Prescott AMA in 2022. Prescott and Prescott Valley each contribute approximately equally to the overdraft because both communities pump much more groundwater than is recharged. ADWR estimates that 14% of AMA pumping is from "exempt" (domestic) wells. The remaining pumping is by agricultural and industrial users.

Overdraft Causes Declining Water Levels



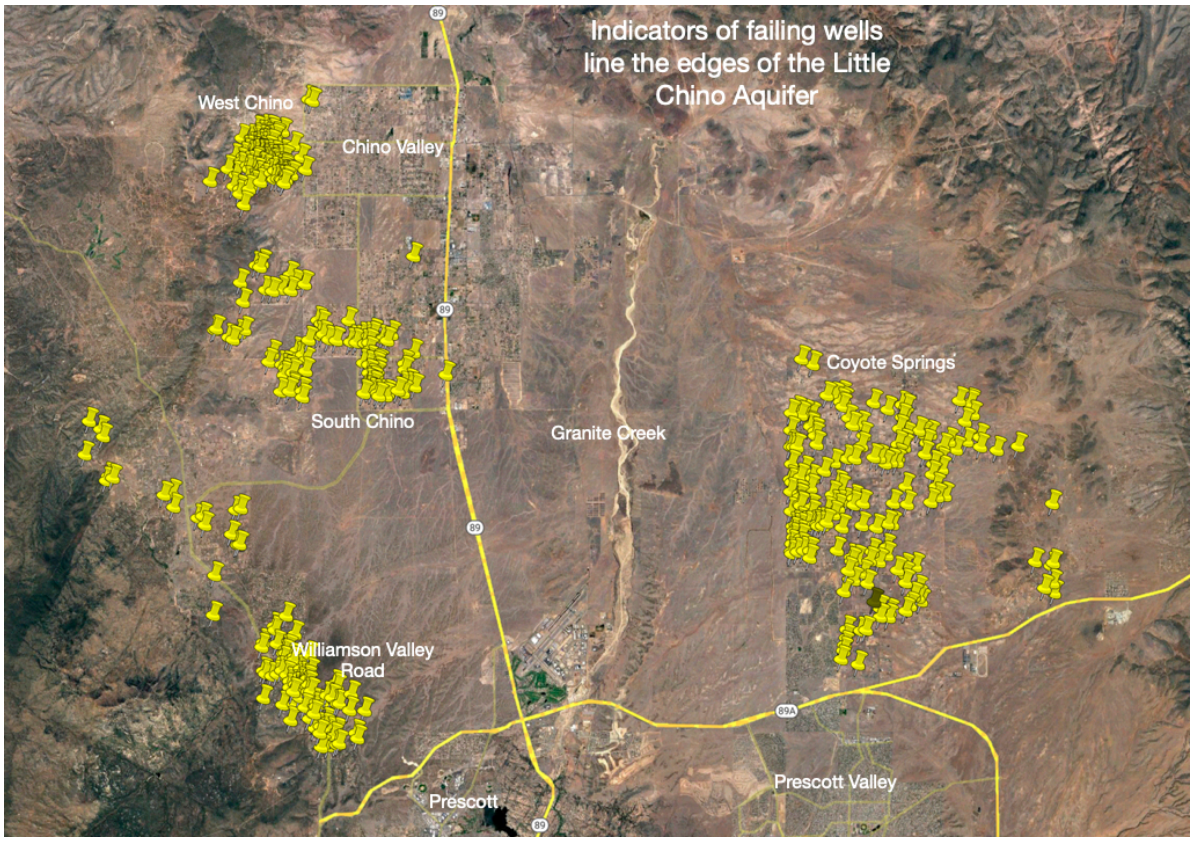
PRESCOTT VALLEY POPULATION GROWTH

CENSUS	POPULATION	PERCENTAGE INCREASE
1970	244	---
1980	2,284	836.1%
1990	8,904	289.8%
2000	23,535	164.3%
2010	38,822	65%
2020	46,785	19.8%

Source: 2020 Census

Declining Water Levels Cause Domestic Wells To Go Dry

By inspecting aerial photos of the PrAMA, CWAG has identified hundreds of large water storage tanks on rural lots not served by a municipal utility. These tanks indicate a failing or dry well that cannot supply enough water for the home, forcing families rely on commercial water haulers to refill the tanks. These failing wells are found on the outside edges of the aquifer: west and south of Chino Valley, in the Williamson Valley Road area (recently in the news), and in Coyote Springs. CWAG expects that there are many more failing wells, and that the number will increase. This is a financially devastating event for the families. A dry well adds hundreds of dollars in monthly water hauling bills and can cut the home property value in half.

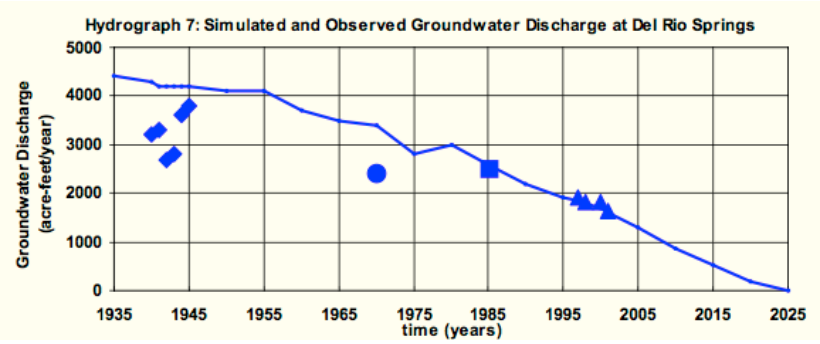


Declining Water Levels in the Little Chino Sub-Basin Cause Del Rio Springs To Dry Up

The Little Chino sub-basin contributes about 14% of the base flow of the upper Verde River; thus, the overdraft in the Little Chino Aquifer reduces the base flow of Del Rio Springs and the river. In 2002, an ADWR groundwater model for the PrAMA projected that Del Rio Springs would cease flow in 2025. The projection is accurate: the spring flow is now only 5% of the predevelopment flow.

Note that Del Rio Springs was the historical headwaters of the Verde River, but now perennial flow begins 6 miles downstream at Verde Springs. We have already lost 6 miles of the river due to groundwater pumping.

The measured flow from Del Rio Springs is declining. Graph from the ADWR groundwater



Why the Verde River Matters:

The first 25 miles of the upper Verde, from Verde Springs downstream to Perkinsville Bridge, is some of the finest surviving wildlife habitat in Arizona. Verde Springs is the only significant source of water for base flow within this part of the river.

Prescott National Forest has declared that the upper Verde River is eligible for Congressional designation as a Wild and Scenic River. A coalition of national and regional conservation groups is now working to request Congress to designate the Upper Verde Wild and Scenic River. The coalition has obtained letters of support from the Councils of Sedona, Camp Verde, Cottonwood, Clarkdale, Jerome, Prescott Valley, Prescott, and Chino Valley. Over 150 businesses and four Chambers of Commerce, plus the Yavapai County Board of Supervisors, Governor Hobbs, former Governor Babbitt, Prescott National Forest, and the Yavapai Apache Nation have also send letters of support. Senators Kelly and Gallegos are very supportive and may soon introduce legislation into Congress. The Coalition continues to collect supporters.

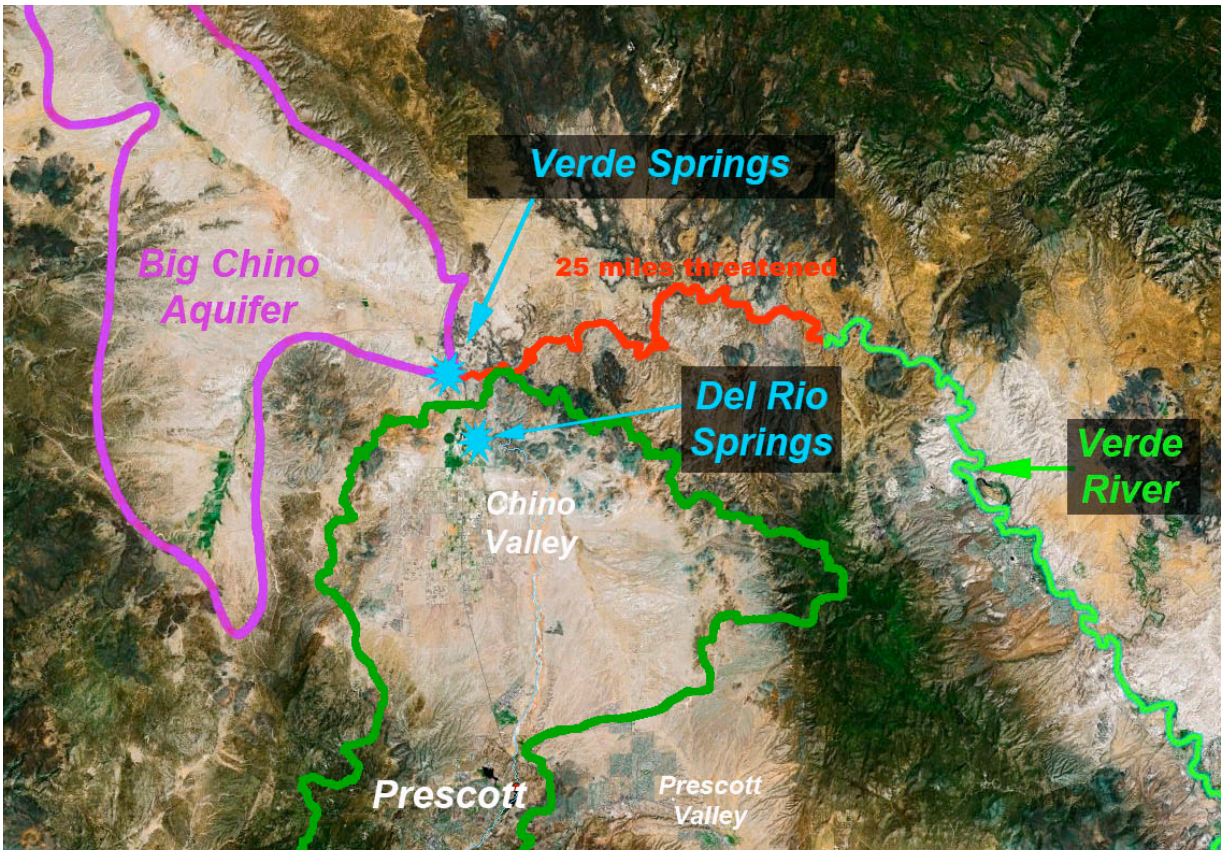
Designation of the Upper Verde Wild and Scenic River will improve the management of this important public resource by requiring that unique river values be maintained or improved. These values include recreation, scenery, cultural and historic elements, wildlife, fish, and botanic resources. The management plan will be created with local public participation.

Current Status of the Big Chino and Verde River

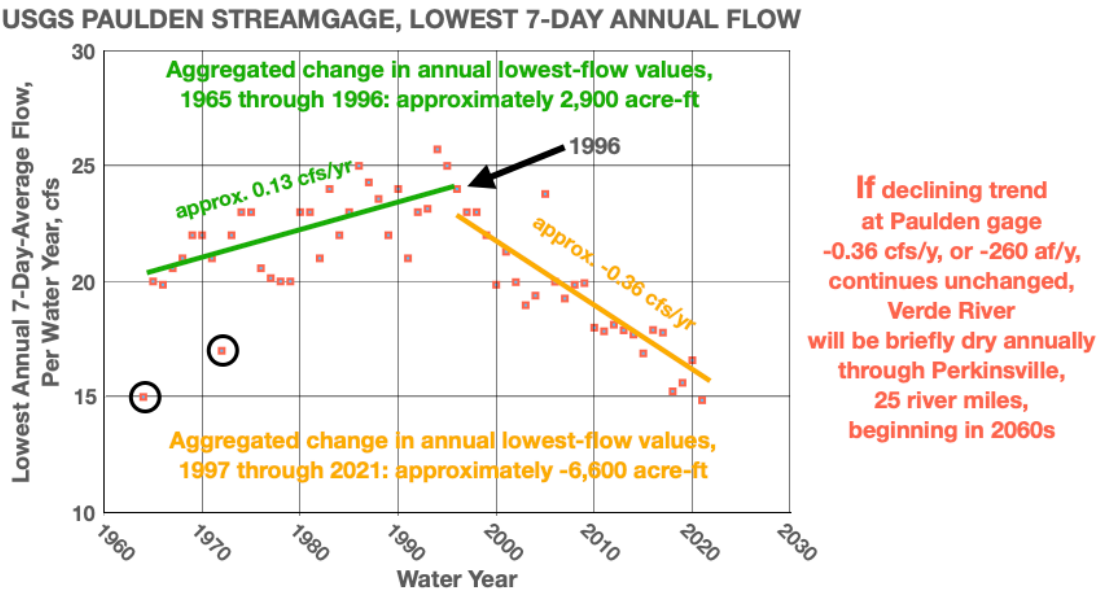
The Big Chino Valley, which overlies the Big Chino aquifer, consists of unincorporated lands within Yavapai County. They are not part of the PrAMA. There is no management, monitoring, or restriction on groundwater pumping. Arizona water law permits any landowner not in an AMA to pump groundwater without limit for a beneficial use, regardless of impacts on surface water or neighboring wells.

A geochemical analysis by the US Geological Survey (USGS) calculated that 80-86% of the base flow of the upper Verde River is groundwater from the Big Chino aquifer. Currently, that groundwater emerges between the beginning of Verde Springs (mile2) and the Paulden stream gage (mile 9.8, not shown on map) to constitute most of the base flow (the groundwater component of streamflow) of the river. Groundwater pumping in the Big Chino will reduce the base flow by the amount pumped.

Unmitigated groundwater pumping from the Big Chino aquifer is an existential threat to the upper Verde River.



The graph below uses data from the USGS Paulden stream gauge. It shows that the base flow (lowest 7-



day flow per year) has been declining since the mid-1990s. In 2023, this lowest annual flow was only 13.4 cubic feet per second (cfs), which is approximately 60% of the lowest flow in the mid-1990s. In 2018 the annual volume flowing past the site of the Paulden gauge was 61% of the estimated pre-development

flow in 1940. In other words, the lowest flow increased minimally and erratically until mid-90's but has declined drastically since then. Scientific models project that future higher temperatures will reduce aquifer recharge, which will further degrade base flow in coming decades. The river is now in an especially vulnerable condition due to groundwater pumping, higher temperatures, and regional drought.

Verde River: Low Flow Causes Habitat Damage

The Sierra Club Grand Canyon Chapter Water Sentinels has measured the flow of the upper Verde River every month since 2007. A recent analysis of that data and studies by the US Forest Service Rocky Mountain Research Service reveal that the upper Verde River is critically endangered and ecologically impaired due to rapidly declining flow. In summary:

- Groundwater pumping in the Little Chino Aquifer has reduced the flow of Del Rio Springs, the historical headwaters of the Verde River, to 5% of the predevelopment flow causing the upper six miles of the river to dry up. Perennial flow now begins at Verde Springs.
- Groundwater pumping and climate change have reduced the 2024 base flow at the USGS Paulden stream gage (river mile 9.8) to a record low of 13.4 cfs. The predevelopment base flow was 28 cfs. This represents a 52% reduction in base flow.
- Since the mid 1990's, the base flow at USGS Paulden has declined 0.36 cfs/yr. At that rate the river will be dry at USGS Paulden in four decades.
- Water Sentinels data from Perkinsville Bridge (river mile 26) indicates that the average flow for 2017-2024 at Perkinsville is 7.6 cfs less than at USGS Paulden. Therefore, a reduction in flow at USGS Paulden of 7.6 cfs may result in a dry river at Perkinsville Bridge. At the current rate of base flow decline, this may occur in two decades.
- The Endangered Species Act lists Perkinsville Bridge as Critical Habitat for three native fish, two snakes, and one bird. A dry river here will seriously affect these species.
- Recent studies of the aquatic habitat and species indicate a profound loss of native fish populations in the upper 19 miles.

Fundamentally, the upper Verde is now in an extremely fragile and vulnerable condition. We are now witnessing the destruction of one of Arizona's last surviving perennial rivers.

Big Chino Groundwater Pumping Threats

The Big Chino Valley is not part of the Prescott Active Management Area, so groundwater is governed by the "beneficial use" doctrine. This permits a property owner to pump groundwater for a beneficial use, without limit. Three classes of groundwater pumping threaten to deplete the Big Chino aquifer, any one of which could dry the Verde River:

Expanded Agricultural Irrigation. It is legal under Arizona law for a farmer to irrigate with groundwater. Big agriculture from out of state has moved into Arizona. The Arizona State Land Department has leased land and water to grow alfalfa that is shipped to other countries. In Willcox,

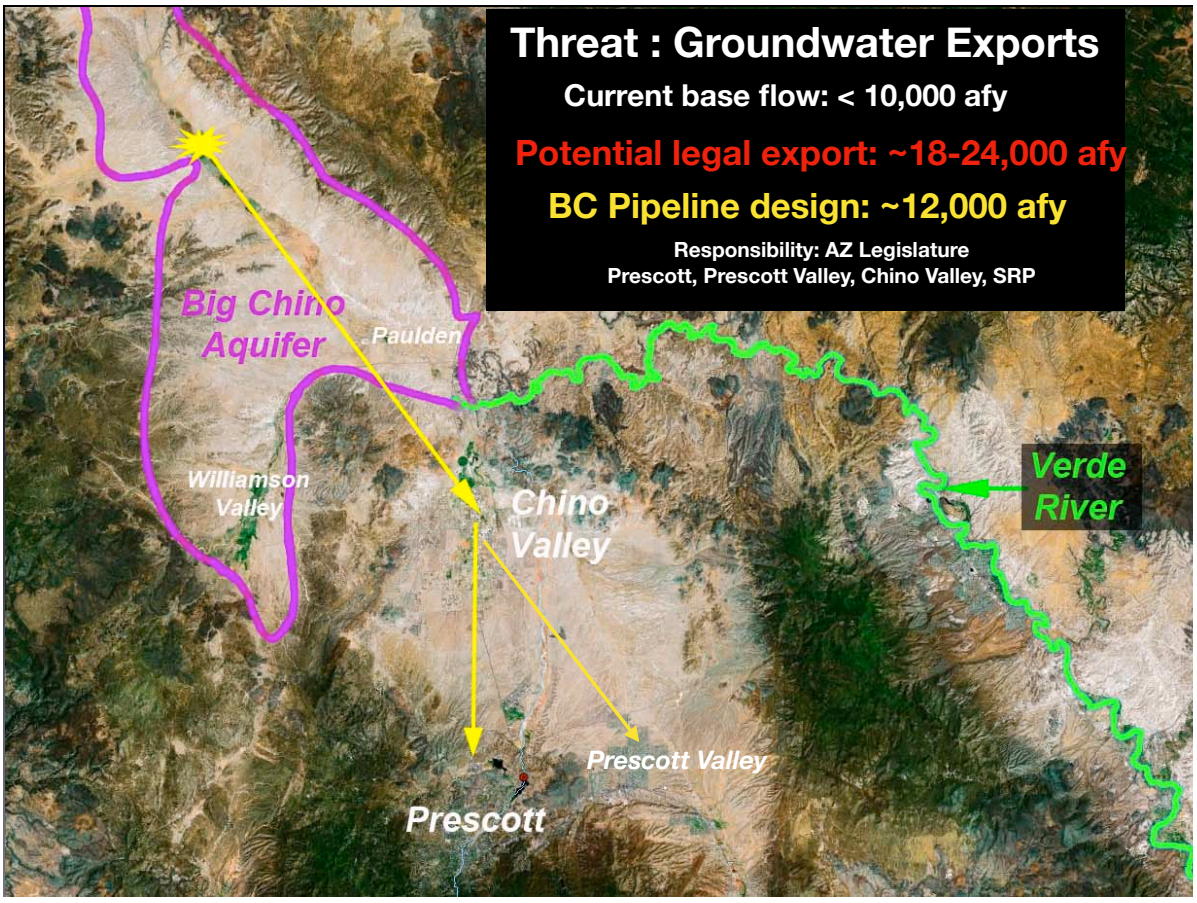
groundwater pumping by big agricultural corporations increased by over 250,000 afy. In Kingman, agricultural pumping increased over 25,000 afy. If only half of the Kingman pumping occurred in the Big Chino, it would dry the upper Verde. The ***Arizona Legislature*** must control agricultural pumping in the Big Chino Valley.

Population Growth. As Paulden grows and expands up the Big Chino Valley, groundwater pumping will increase. At the recent growth rate of 1.3%, population growth will eventually dry the upper Verde. The ***Board of Supervisors*** is responsible for controlling the density and character of land use in the Big Chino Valley.

Groundwater Export. Arizona water law (ARS 45-555) authorizes Prescott to export 8,068 afy of Big Chino groundwater to Prescott via the proposed Big Chino pipeline and to share that water with Prescott Valley. Also, cities may export water (est. 10,000 afy) from historically irrigated but now fallowed agricultural fields. The total legally authorized exportable water is approximately 18,000 afy, far more than enough to dry the Verde River. The cities of ***Prescott and Prescott Valley*** have promised to offset the effects of their pipeline pumping on the river, but no specific construction dates or mitigation plans have been released.

Big Chino Water Ranch & Pipeline

In 1993, the Legislature sacrificed the Big Chino aquifer and the Verde River by creating an exception to water law permitting cities in the PrAMA to export groundwater from the Big Chino sub-basin — enough groundwater export to dry up the upper Verde River twice over — with zero concern for the environmental impacts. This is the legal authority for the controversial Big Chino pipeline project.



In a December, 2004 Intergovernmental Agreement, Prescott and Prescott Valley agreed to jointly develop a project to import water from the Big Chino Valley. Costs and water are shared: Prescott 54%, Prescott Valley 46%. In 2008, Prescott asked ADWR to add the Big Chino water to their water supply portfolio. Strong public concern that the planned groundwater export would degrade the base flow of the Verde River caused numerous parties to object, resulting in litigation.

In February 2010, Salt River Project (SRP), Prescott, and Prescott Valley announced a negotiated settlement of litigation. In the "Statement of Principles," a roadmap for settlement, the parties agreed to settle the litigation, to a monitoring and modeling plan, to an expanded monitoring and groundwater modeling effort, and agreed to mitigate losses of Verde River base flow caused by the pipeline, plus other points. The Monitoring and Modeling plan cost over $5 million over a planned 8-year study to investigate Big Chino hydrology and to create a new groundwater model. The project has installed new monitoring wells and weather stations, measured stream flow, and conducted geophysical surveys. This data feeds into a new groundwater model. The goal of the model is to determine if groundwater pumping will diminish the base flow of the Verde, to establish a means of advance warning for impending base flow changes, and to project the location, timing, and quantity of mitigation water needed.

The groundwater model, originally due in 2021, has been repeatedly delayed and is now promised for summer 2025. Once the model is calibrated and deemed ready for use, the cities need to determine the scenarios that will be evaluated, which could take another year. The monitoring and modeling administrative process is not open to the public, so the public has no information about the cause of the delay or the mitigation measures being evaluated.

Professional hydrologists agree with CWAG that groundwater pumping in the Big Chino Valley will over time diminish the base flow of the Verde River by an amount equal to the pumping volume. Basic hydrology concepts require that to mitigate the effects of groundwater mining, an equal volume of mitigation water must be restored to the aquifer. To date no scientific mitigation plan has been published. At this time CWAG cannot identify enough mitigation resources to adequately protect the river.

In April, 2024 the City of Prescott released an updated the cost estimate for the Big Chino project, increasing it to $360,000,000. This did not include the cost of mitigation. No construction date has been announced. Prescott voters must approve the financing before the pipeline can be built.

The pipeline is sized to transmit 12,000 acre-feet per year - enough water to build approximately 60,000 new homes housing over 120,000 additional population.

CWAG's position on the proposed Big Chino Pipeline is that it must have zero impact on the upper Verde River. We note that there is no evidence that the pipeline is the best choice.

Regional Management

Arizona groundwater management has failed in the Prescott Active Management Area (PrAMA) . The Arizona Department of Water Resources (ADWR) named the PrAMA as the worst performing AMA in the state. Because groundwater overdrafts continue to reduce groundwater levels, Del Rio Springs is nearly dry, the base flow of the Verde River is declining, and domestic wells are failing on the edges of the aquifer. ADWR tells us that they are not responsible for the solution - the solution is up to us.

Logically, because we share the same groundwater supply, we should jointly and cooperatively manage the water resource. Legally, ADWR holds the water users in the PrAMA responsible for achieving Safe Yield. So far, neither logic nor law has generated effective and sustained regional management of groundwater. There have been two previous attempts:

- An early effort by the Yavapai County Board of Supervisors established the Water Advisory Committee (WAC) in the early 2000s. The WAC commissioned the US Geological Survey to publish many fundamental studies of the Big Chino, including a groundwater model. Also, the WAC partially funded the Bureau of Reclamation to conduct a feasibility study of water resources for most of Yavapai County. The Yavapai County Board of Supervisors dissolved the WAC in 2014 due to unproductive dissension between cities.
- Another regional planning effort was the Upper Verde River Watershed Protection Coalition (UVRWPC), formed in 2007. The Coalition had tremendous potential to perform regional planning, and it is unfortunate that, due to poor leadership and financial management, it dissolved in 2024.

Although the cities in the AMA share a common water resource, they continue to compete for more water to facilitate growth. CWAG believes that the cities and the county should begin to work together on regional water planning. CWAG believes that regional planning and management of water resources is the best strategy to preserve a shared water resource and assure long-term quality of life for all current and future citizens. The planning process should include broad stakeholder/citizen participation, have adequate funding, produce a forward-looking plan with scheduled reassessments, and use adaptive management strategies.

A regional water resource management plan should be based on a scientific evaluation and comparison of all available alternatives to assure an economical and sustainable water supply. At this date, no comprehensive study exists. Some prior studies have focused on a single centralized infrastructure solution (e.g., pipelines) while ignoring and failing to evaluate other potential alternative solutions. We do not expect to find a single solution, and a comprehensive study will help identify the optimal combination of solutions.

Potential Solutions Needing Study

- **Improved water conservation:** Although Prescott has the best water conservation program in the PrAMA, it can be improved with better educational outreach, stronger restrictions on outdoor water use, and improved management of commercial and industrial water use. Water conservation alone will not solve the problem, but it is easy to implement and the least expensive strategy - a foundation for all other measures. CWAG recommends that candidates review https://prescottwater.com/ for details on the existing water conservation program.
- **Regional water conservation program:** Except for Prescott, water conservation in the PrAMA is very weak or non-existent. Prescott should become a regional leader, serving as an example and encouraging the rest of the PrAMA by sharing its programs and experience. A regional water conservation program should include:
  - A plan with performance goals;
  - More stringent requirements for new construction;
  - Substantial incentives to upgrade existing devices;
  - Strong landscape water restrictions for new construction;
  - Escalating water rates for higher consumption;
  - Incentive programs dedicated to reducing water use by existing domestic (exempt) wells;
  - On-site collection and use of rainwater;
  - Use of gray water.
- **Investigate new approaches:**
  - Use regional infrastructure to collect stormwater for recharge or direct reuse.
  - Offset programs requiring developers to finance water conservation to compensate for their increased water use;
  - Design new subdivisions for net-zero groundwater use.
  - Advanced water purification (direct potable reuse).
  - Identify and correct unnecessary regulatory barriers to more efficient water use.
  - Land Use: Develop a conservation zoning overlay. This zoning tool can be used to strengthen ordinances and building code requirements for indoor and outdoor water use for areas with sensitive water resources.
- **Importing water:** This should be the last resort after other solutions are deployed. Possible sources include Colorado River, Big Chino, and desalination of ocean water or brackish groundwater.
- **Lobby the State:** Increased pressure on the AZ Legislature and local representatives.

Prescott DAWS

In most of the PrAMA, developers of new subdivisions must prove a 100-year water supply by applying to ADWR to obtain a Certificate of Assured Water Supply - an expensive process. For new developments in Prescott, the city has the ability to certify a 100-year water supply because it is a Designated Assured Water Supply (DAWS) provider. Thus a developer applies to the City for a water allocation and does not need to go through ADWR. The City has developed a Water Management Policy (discussed below) to create a predictable and consistent allocation process.

In 2021 Prescott applied to ADWR to renew the current DAWS designation for 20 years through 2041. Prescott is requesting enough water to support a population of 86,339 in 2041, a growth rate of 4.5%. The extremely detailed and laborious application process is ongoing at this time.

Prescott Water Management Policy

In 2022 the Mayor established the Mayor's Commission on Water Policy Review and Monitoring. The Commission recommendations were approved by the Council on March 26, 2024. The complete Water Management Policy document can be downloaded from https://prescott-az.gov/water-resource-mgmt/water-policy/?highlight=water management policy . The document contains valuable information on city water resources and policies, and CWAG recommends that candidates study it.

Some key provisions:

- A water budget is used to manage awards so that growth continues at a controlled rate that permits the City to provide additional infrastructure services.
- No new municipal water and sewer services outside the city limits shall be approved, with specified exceptions.

The Water Policy Review Commission also recommended that the City prepare a long-range water plan.

Long-range water plan

Prescott city staff has begun to develop a long range water plan using grant funds from the US Bureau of Reclamation and city funds. Plan development is now beginning and is scheduled for completion in December 2026. The plan process will include public and stakeholder participation.

CWAG supports this effort.

Water Quality Issues

Clean and healthy water is a fundamental public service. In general, Prescott's water utility is well managed and the quality meets standards. Prescott municipal water quality is frequently tested to ensure compliance with federal standards. Test reports are published at https://prescott-az.gov/water-ops/water-quality/?highlight=water quality . CWAG recommends that candidates familiarize themselves with these reports.

Arsenic: Some wells in Chino Valley produce water that exceeds the Maximum Contaminant Level (MCL) for Arsenic. That water is diluted with water produced from low Arsenic wells to deliver water that complies with the MCL.

PFAS: The acronym represents a large group of chemicals known as the "forever chemicals" because they are not biodegradable. They are now persistent in the environment and in the human body and can bioaccumulate in organisms and food chains. PFAS sources are fire fighting foam, water and stain resistant coatings, anti-stick coatings, food packaging, lubricants, and much more. The risk to human health are cancers, reduced immune response, liver damage, decreased fertility, and more. The US-EPA has published Draft MCL levels of 4 - 10 parts per trillion for various PFAS compounds.

Prescott tested effluent from the Airport and Sundog wastewater treatment plants and found levels ranging from 10 - 30 ppt. The treated wastewater is recharged into the aquifer at the airport and is eventually recovered in municipal production wells. A large drinking water well at the airport - AP5 - was found to produce water significantly exceeding the PFAS MCL. This well is now shut down. Additional Prescott production wells in Chino Valley have also tested over the MCL, but that water is diluted by mixing to meet the standard. Water distributed to customers does comply with all EPA requirements. Prescott has not announced plans to remove PFAS from the treated wastewater for recharge or from drinking water.

Some municipal production wells in Prescott Valley and Chino Valley also exceed the PFAS MCL

However, the disturbing conclusion is that we have contaminated our aquifer.

Eleven Reasons to Protect the Verde

By Gary Beverly (gbverde99@gmail.com)

The Verde River is a green artery pulsing through the heart of Arizona, a jewel of the Southwest, continuously flowing over 190 miles from Paulden to the Salt River near Scottsdale.

The upper Verde, tucked away deep within the Prescott National Forest between Paulden and Clarkdale, is remote, unknown, under-appreciated, and threatened. The upper Verde's future is clouded by unmitigated groundwater pumping in the Big Chino Valley, which threatens to convert 25 miles of a living river into a dead, dry wash.

The Citizens Water Advocacy Group believes that we are smart enough to live here responsibly, enjoying a comfortable lifestyle while protecting our natural areas and our wildlife. The question is: Do we have the political will?

Here are eleven reasons we should protect the Verde:

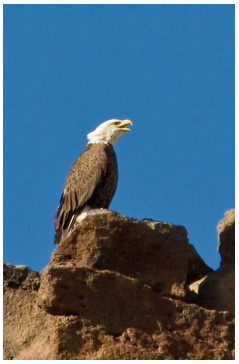
Economy: The Verde sustains over 700 jobs and over $100 million in economic value in the Verde Valley, plus 40% of the Phoenix area's surface water supply. Plus, natural areas are proven to benefit local economies.

Recreation: As our population grows, we require more recreational area. The upper Verde is a wonderful place for people to hike, hunt, fish, camp, backpack, kayak, canoe, view wildlife, photograph, ride horses, climb rocks, and observe birds.

Quality of Life: Clean air, unfettered open spaces and bodies of water, and opportunities to view wildlife enhance our daily living.

Scenery: Primal colors and spectacular rock formations create scenery second to none in the state — red rocks, green plants, blue sky, and white clouds. The Verde displays tremendous natural beauty.

Cultural & Historic Values: The entire river corridor is laced with ancient rock art, campsites, structures, and artifacts revealing the historical lifestyle of Native Americans. The river and its springs are an essential spiritual and cultural foundation for the Yavapai-Apache Nation. Also, remnants of early Arizona ranching history dot the canyon.



Wildlife: Although the Verde River watershed comprises only 5.8 percent of the land area in Arizona, it contains the best remaining riparian areas — lush, green ribbons full of life. The Verde supports a surprisingly large fraction of Arizona's vertebrate species: 78 percent of breeding bird species, 89 percent of bat and carnivore species, 83 percent of native ungulate species, and 76 percent of reptiles and amphibian genera — an impressive concentration of wildlife. Many bald eagles overwinter on the Verde. Seven eagle chicks have fledged at Del Rio Springs in the last five years. The Verde River, the lifeblood of the watershed, supports most of Arizona's wildlife species, a heritage we all share.

Endangered Species: The Verde River supports a rich and diverse variety of plants, animals, and fish. The Endangered Species Act (ESA) lists 21 species in the Verde watershed, including the yellow-billed cuckoo, the southwestern willow flycatcher, native fish and snakes, and more. Wildlife managers monitor an additional 16 sensitive species of concern.

Native Fish: Of Arizona's original 33 native fish, three are extinct, 19 are protected by the ESA, and the Verde supports ten. The upper Verde River sustains four ESA-listed native fish.

Uniqueness: Of Arizona's six major perennial rivers, the Gila, Salt, and Santa Cruz Rivers have been consumed by dams and groundwater pumping, the Colorado is fully diverted and no longer flows to the Gulf of California, and the San Pedro is struggling for life. The Verde River is the longest surviving living river in Arizona.

Stewardship: Because we exploit our forests, rivers, and land for the resources that support our society, some environmental degradation is inevitable. Our challenge is to manage this rich and amazing world sustainably so our kids, and their children, can also live comfortably and enjoy nature and wildlife. We can learn from our local Native Americans, the Yavapai-Apache Nation in Camp Verde. Monica Marquez, a Yavapai, told me: "Water is Life. You never take it all." Vince Randall, past YAN Tribal Chairman and Apache Cultural Chair, asks: "When are you going to learn to share with all living things? When will you learn the true meaning of stewardship? Will it be when there is only one of you left?"

Water is Life: To indigenous people, the land, plants, and animals are alive; they are identified as beings to be respected, not as nouns representing objects to be owned and exploited. When asked "Where is the river?" they reply "The river lives over there."