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Water wells draining rivers at their source

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Among the major rivers that begin or end in Arizona, only the Verde flows on its own from start to finish. But like all the state's rivers, it is running out of water and running out of time.

The water that fills the Verde is in danger of being sucked away by wells, and no one is moving to turn off the pumps.

In the first of six stories examining the health of Arizona's rivers, The Republic looks at the 150-mile Verde River. The cities want to use water in the underground aquifers that feed the Verde to quench the thirst of their growing cities.

Thousands of other unmonitored wells already are drawing water from the same sources. State laws are virtually powerless to protect the Verde and other Arizona rivers from the pumping.

The situation is dire for Arizona's dying rivers. But desert rivers are resilient and, given water, recover with remarkable speed.

Thirsty cities press the search for water

CHINO VALLEY - Alfalfa grows in irrigated squares and circles across hundreds of acres of the old JWK Ranch, an isolated slice of Yavapai County that has emerged as the epicenter in a battle for the Verde River's survival.

By July 2009, the first of eight new wells will bore into the ground where hay bailers now spit out twine-tied bricks of the newest crop. At full capacity, the wells will pump 2.8 billion gallons of water a year from the ground and send it through a 36-inch pipeline to thirsty cities 30 miles away.

About 18 miles in the other direction, across a mesa dotted with growing numbers of new homes, the Verde gathers itself from springs and aquifers, pausing at Sullivan Lake, before entering the rugged canyon it has carved for itself. It is here that the battle's casualties will begin to surface.

Or, rather, where the river will cease to surface if the warnings come true. Hydrologists and conservation groups believe that if Prescott and Prescott Valley move ahead with their plans to drill wells on the ranch, the first 24 miles of the Verde will dry up by the end of this century.

The river already faces an uncertain future, its health weakened by growing demand for water that has resulted in thousands of unmonitored wells. State laws are virtually powerless to protect the Verde and other Arizona rivers from the pumping, and there is little regard among lawmakers or local leaders to impose conservation or other river-saving measures.

The water-export proposal sped up the countdown clock and landed the Verde on a national environmental group's most-endangered rivers list this year. It also honed in on the most basic value of a river: water. The Verde produces one of the most reliable sources of water in Arizona, flowing year-round along its 150-mile path. The question is whether it's possible to satisfy the needs of people who want to drink it, play in it and preserve it without sacrificing the river.

Pat Graham is the Arizona director for the Nature Conservancy, an organization that has taken a lead role in protecting the Verde and other rivers in the state. He uses the word stewardship to sum up the challenge on those waterways. He fears the tug-of-war over water has obscured the more important issue in a desert state: how we preserve the rivers not just for the water, but for the wildlife, the riparian areas, the other values rivers provide.

"When we settled this place, we settled one of the most diverse areas biologically - we are the richest state without a coastline when it comes to biodiversity," he said. "We have an opportunity here to demonstrate that we can grow and live in a way that allows that to persist - or not."

The battle for the Verde, from its Chino Valley headwaters down through its fertile farm fields, turns on whether the river becomes just another channel for delivering water to a growing population or the spine of a larger system that will die if it is left without an adequate share of its own flow.

Counting acre-feet and measuring well outputs are important, Graham said, but "if you can keep the habitat functioning, the rest will take care of itself."

Gaining supporters, foes

The Bible for opponents of the pipeline plan is the dryly named "Sources of Base Flow in the Upper Verde River." The 2005 report was written by U.S. Geological Survey scientist Laurie Wirt, who became something of a hero among conservationists for her detailed study of the river's headwaters and her conclusions about their fragile nature. (Wirt was killed in June on a river rafting trip in Colorado.)

Buried deep in Chapter F, 30 pages into a discussion of water chemistry and tracer samples, is a finding the river's defenders say should stop the pipeline now: As much as 86 percent of the upper Verde River's flow originates from within the Big Chino aquifer, the underground store of water that lies beneath the old JWK Ranch.

The study noted that wells have slowed the flow at measuring spots such as Del Rio Springs, just above Sullivan Lake.

Ann Harrington owns the Little Thumb Butte Bed and Breakfast on a ridge less than 20 miles from the ranch. From her kitchen, she can see the canyon below Sullivan, where Granite Creek joins the Verde River. Sometimes she'll spot an eagle gliding into the canyon, perhaps seeking food from the river.

She has read Wirt's most recent study and several before that, and she can't understand why Prescott and Prescott Valley don't see the connection between their pipeline and the river.

"If they don't pay attention to the studies, then we're not going to have a Verde River," she said. "Is that what they want to be known for? It's like they have a shade over their eyes. They say it won't affect the flow, that it won't happen. But it will happen."

Population growth in the Prescott area is expected to drive up demand for water by as much as 50 percent over the next 15 years, state estimates show. Prescott Valley, poised to grow the most, estimates its population will more than double by 2020 and that, by 2050, water demand will increase nearly fivefold.

Jim Holt oversees the pipeline project on what Prescott now calls the Big Chino Water Ranch. He insists the river's health will be addressed long before any well is drilled. The city will complete an environmental assessment, and if it appears the flow will suffer, "we will mitigate."

The city has hired an engineer to figure out what "mitigate" will mean, but Holt discounted suggestions that the wells will dry up the upper Verde: "That's simply not the case," he said. Southwest Groundwater Consultants Inc. studied the ranch and the aquifer, and concluded that drilling on the ranch would draw from a part of the aquifer physically separated from the Verde headwaters.

Moreover, the consultants asserted, the Chino area springs supply only about 5 percent of the base flow below Camp Verde.

That finding has angered conservation groups, which say it fudges words to obscure the issue. Wirt, in her USGS study, says that the upper Verde draws more than 80 percent of its flow from the Chino basin. She measured flow at the headwaters, before any tributaries fed into the main stem. The city's consultants measured the flow well downstream, after the tributaries had boosted the river's levels and diluted the spring-fed share.

The Center for Biological Diversity, a Tucson-based environmental group, has promised to take the cities to court over the pipeline plan and is gathering evidence. The conflicting studies will play a role in the case, but looming larger are Arizona's water laws, which treat surface water and groundwater separately, thus complicating arguments that wells 18 miles from the Verde's headwaters threaten the river's survival.

"The Verde River starts at Sullivan Lake, at the end of a couple of aquifers," said retired USGS hydrologist Winn Hjalmarson, who is helping on the pipeline case. "But legally, it doesn't come out of the ground because state law doesn't recognize the link. The thing is, at Del Rio Springs, you can already see the effects of groundwater pumping."

Protecting the flow

For the Verde, the Prescott project is only the latest assault. In unincorporated Yavapai County, unregulated subdivisions outnumber developments subject to zoning laws and are sucking unknown amounts from aquifers along the river. Some wells have been drilled so close to the river, they're likely either drawing water away from it or intercepting groundwater flowing toward it.

Groundwater pumping long ago helped dry up much of the lower Santa Cruz River and has reduced the flow to the San Pedro.

Salt River Project, which holds the rights to most of the Verde, has tracked wells along the river and counts more than 7,000 in the Verde Valley alone. SRP, the Valley's largest water provider, has found itself allied with conservation groups in efforts to protect the flow of the Verde, which supplies about one-third of the utility's water stock.

Kevin Hauser farms about 1,200 acres along the Verde, on parcels strung out from Camp Verde to Chino Valley. Some of his alfalfa grows on the old JWK Ranch, on land now leased from Prescott. He relies heavily on the river, taking water from Eureka Ditch, one of the oldest irrigation systems still operating.

His barns and farmhouse sit in a narrow valley on the outskirts of Camp Verde, guarded by mountains whose muted colors bring out the vibrant green of the hay and cornstalks. This is a family operation. His oldest son repairs machinery and works the hayfields. The younger ones do their own chores; his daughter will run the roadside corn stand.

"It's an ideal place to farm," he said. "It's got good land, good water. I like to say it's only work if you'd rather be doing something else, and this is what I want to do."

He has followed the arguments about drilling wells along the Verde and about habitat protection. His mother is on the Camp Verde Town Council and Hauser has spoken up at meetings more than once.

"A lot of people feel helpless about what to do," he said. "It doesn't matter if it's Prescott or a construction company pumping water ahead of you. You've always gotta be watching upstream."

The more pressing threats for Hauser are the subdivisions spreading out on neighboring fields that a year ago yielded corn and watermelons. Now he worries that the growth will demand so much more land and water that he'll be forced out.

"We do use a lot of water here, but 100 percent goes to growing something tangible," Hauser said, stopping his truck along a ditch, where he shuts off the flow of water to a field that's had its fill. "It's not wasted."

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