Running Dry: New Strategies for Conserving Water on the Colorado

Communities along the Colorado River are facing a new era of drought and water shortages that is threatening their future. With an official water emergency declaration now possible, farmers, ranchers, and towns are searching for ways to use less water and survive. Third in a series.

By Jim Robbins / Photography by Ted Wood • January 31, 2019

A canal diverts water from the Colorado River to farms in Palisade, Colorado. Ted Wood

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From the air, the Grand Valley Water Users Association canal — 10 feet wide and 8 feet deep — tracks a serpentine 55-mile-long path across the mountain-ringed landscape of Mesa County, Colorado. It's a line that separates parched, hard-baked desert and an agricultural nirvana of vast peach and apple orchards and swaying fields of alfalfa.

The future of this thin brown line that keeps the badlands of the Colorado desert at bay, however, is growing more uncertain by the day.

Since 2000, the snow that blankets the Colorado Rockies each winter — the source of most of the river's water — has tapered off considerably. Last year it

was less than half of normal. So far, the farmers here have gotten their share of water, but this year could bring the first emergency declaration by water administrators. That would mean that some "junior" water users — those whose allocations came later — may have to forego their share in favor of senior users.

The nearly two decades of low snowpack is being called a drought, and tree rings show it's the most severe in over 1,200 years. The term drought, however, implies it will end someday. But there are serious questions about whether this is a drought or a permanent drying of the West due to a changing climate.

> *If the water crisis deepens, farmers could see their neighbors start to disappear as farms and ranches are abandoned.*

Few doubt that things are building toward crisis. Last year junior water users on the Yampa River, a tributary to the Colorado, were forced to face the new reality when officials ordered them to stop taking their allocated water and allow it to flow to senior users downstream. In places, the river channel was dry; fishing and float trips were also halted.

As things get tighter throughout the Colorado River Basin, irrigators, who control 80 percent of the water on the river, fully expect others to come looking for their water. One place that has been preparing a strategy to try and head off a raid on its water is in Mesa County in western Colorado.

"There is not an active attack on our water at this time," said Mark Harris, general manger of the Grand Valley Water Users Association and a farmer himself, as we walked along a row of peaches in a sea of orchards near Palisade, Colorado. "But we do have a huge target on our back. The crisis will require draconian measures that will savage ag. If municipalities run out of

sanitary water or fire water, those steps are going to have to be taken."

The Grand Valley, a major agricultural zone in western Colorado, depends on water from the Colorado River.
MAP BY DAVID LINDROTH

The Grand Valley Water Users Association was founded in 1905 as part of the U.S. Bureau of Reclamation. It operates the canal, as well as 150 miles of pipe and open ditch that carry water to a little more than 23,000 acres of land. Without water to service this network — and with only 9 annual inches of precipitation — a new dust bowl could be in the offing.

Water law in the West is based on something called the Prior Appropriation Doctrine, or "first in time, first in line." While water is a public asset, rights to it were promised to those who came West to homestead, ranch, and grow crops in the late 19th and early 20th centuries. They have the most senior rights, and these are considered private property rights, enshrined in law. The rights of cities and towns are usually junior to these senior rights, and junior users stand to lose out first if cutbacks are mandated. However, cities and towns have considerable political and economic heft, especially in metropolitan areas in the Lower Basin, such as Phoenix, Las Vegas, and Los Angeles. The fear is that the policy of "first in time, first in line" could be discarded in a time of emergency and replaced with one that adheres to a different adage — "water flows uphill toward money."

The water that many farmers and ranchers use on the Colorado is now cheap. Senior users like those in the Grand Valley pay from $25 to $50 for an irrigated acre for the season. A hundred acres of, say, alfalfa, the single largest crop along the river, needs up to 2 feet of water per acre. Water to irrigate for the season then, would cost the farmer about $2,500 to $5,000. The net profit from the hay is about $300 an acre, so the farmer would make about $30,000 on the 100 acres after costs.

Mark Harris, general manager of the Grand Valley Water Users Association.

Currently water is selling on the open market for about $200 to $250 an acre-foot for a season, well above what farmers in the Grand Valley are paying. The rules of the Grand Valley Water Users Association do not permit separating water from the land; but if the exigencies of the drought were to cause the rules to change, on today's market the value of the water from those 100 acres would be worth about $40,000 for a season. In that case, farmers could make more money selling their water rights than by continuing to farm. And if the crisis were to deepen and junior users such as the city of Denver were to lose their water and needed to look elsewhere, the lease price of an acre-foot for the season could go as high as $1,000, some experts say. That would mean farmers could make $100,000 annually by selling their water rights and fallowing their 100 acres.

"We don't want an unfettered free market for water," said Harris. "That would be a disaster," with a range of unintended consequences.While many farmers could do well financially in the advent of a crisis, those who continued farming would see their neighbors start to disappear as farms and ranches were abandoned. And if the crisis was prolonged or permanent, and more and more water was siphoned off to cities, it could threaten the very existence of farming communities around the basin.

It's happened on a large scale before — most famously in California in the Owens River north of Los Angeles in the early 1900s, as depicted in the fictional 1974 film "Chinatown." William Mulholland, head of the Los Angeles Department of Power and Water, secretly began buying up ranch and farmland with water rights along the Owens River in the eastern Sierras. Officials then built an aqueduct and piped that water to Los Angeles to fuel the city's growth. The Owens Valley is now mostly arid.

Beyond the impact on the rural social fabric, dewatering agricultural areas in the Colorado Basin would cause other serious problems, from reducing food security, to less open space if the land were developed for housing, which would release the carbon sequestered in farm fields and eliminate wildlife

habitat.

> *In the Grand Valley, some farmers are being paid to leave their land fallow and keep the water they would have used in the river.*

That's why places like the Grand Valley are taking unprecedented measures. "It's time for preparation," said Harris. "Preparation not panic, it's a delicate balance."

The Grand Valley Water Users Association has partnered with The Nature Conservancy, which is taking a lead role in helping agricultural interests find ways to survive the future, here in Mesa County and elsewhere in the Colorado River Basin.

In the last several years, an array of projects has been initiated around the basin — from western Colorado, to central and southern Arizona, to the upper Green River of Wyoming, to the borderlands of Mexico — to try to find solutions and, if they work, scale them up all along the Colorado. The Nature Conservancy, for example, has helped create a water bank here in the Grand Valley. Under a two-year pilot program, some farmers are paid to fallow their land — not grow anything on it — and leave the water they would have used in the river.

So far, Grand Valley farmers have fallowed 2,200 acres, which has enabled them to leave 6,000 acre-feet of water flowing in the Colorado. They were compensated for the loss of their crops, plus paid a premium for participating. Saving that water also helped the local irrigation district meet its obligations under the Endangered Species Act to protect fish by keeping more water in the river.

A system of canals, pipes, and ditches irrigate 23,000 acres of farmland in the Grand Valley with water from the Colorado River.

“We created a contract between all these states and Mexico that the hydrology doesn’t support,” said Taylor Hawes, head of the Colorado River program for The Nature Conservancy, referring to the 1922 Colorado River Compact which governs the allocation of water. “Ag and the environment will be the big losers if things continue, so we’re creating a more flexible system that adapts to the reality of our hydrology. Our goal is that whatever solutions we come up with for people also work for nature.”

The states of the compact are also working to find solutions. The Upper Basin states — Utah, New Mexico, Colorado, and Wyoming — have instituted a multi-faceted conservation program that tests ways to reduce water use, including fallowing land with compensation, irrigating crops with less water, and cutting back on municipal water use. The Lower Basin states — Nevada, Arizona, and California — are funding a host of initiatives; the city of Needles, California, for example, was given $500,000 to tear up sod at the city golf course and install drought-tolerant landscaping

The Lower Basin states are also working on a Drought Contingency Plan. As drought conditions continue to worsen, they are coming up with ways to voluntarily give up hundreds of thousands of acre-feet of water to keep Lake Mead, the key reservoir on the Colorado, above crisis levels. This would avoid the imposition of an officially declared emergency, which would force these states to make even larger cuts.

> *Farmers in Arizona’s Verde Valley are swapping out fields of alfalfa and replacing it with barley, which uses about half the water.*

In Arizona’s Verde Valley, between Phoenix and Flagstaff, a different approach is being used. The Verde River is small, but a rare perennial desert river, borne of mountain springs in Arizona’s central highlands — a true oasis. It’s a tributary to the Salt River, which flows into the Gila River and on

to the Colorado. It's hard to overestimate the importance of desert rivers like this to biodiversity — 90 percent of all wildlife in deserts is found within a mile of a river. It's also a critical water source for metro Phoenix.

A decade ago, The Nature Conservancy's Kim Schonek came to the Verde Valley to work with local farmers to improve the river's flow. The meandering, cottonwood tree-lined river is home to several endangered species, including the southwestern willow flycatcher and the loach minnow and spike dace, desert fish that are adapted to natural flows.

The project's goal is to keep the flows no lower than at least 30 cubic feet per second or so, about a third of its natural level, but high enough to protect species. "We're trying to re-establish the natural flow regime to the Verde," says Schonek. "At that level, you have water in all your riffles and no stagnant pools, and that's good for fish."

The Nature Conservancy raised money from Coca-Cola, PepsiCo Recycling, Boeing, and other companies in Phoenix, as well as the city itself, all of which get water from the Verde and who have a stake in a more secure supply. With this funding, they are doing things such as updating irrigation technology to keep more water in the river.

Some of the fixes were simple. There were old-fashioned hand-cranked headgates along the river that farmers used to open or close by turning a wheel on top. Notoriously inefficient, the whole flow of the river was often diverted, and sections were inadvertently dried up for miles. The cantankerous headgates have been replaced with $40,000 electronic ones that neither the farmers nor the ditch companies could afford on their own.

Claudia Hauser is working with The Nature Conservancy to cut water use on her farm in Arizona's Verde Valley.

"I used to have to go out at 2 in the morning and close that gate," said Claudia Hauser, whose family has the largest agricultural holdings in the valley and has partnered with The Nature Conservancy to conserve water. "Now I can do

it from the house with my phone."

Other strategies have been more challenging. The Hausers are part of an experiment to swap out 144 acres of alfalfa and replace it with barley. Not only does barley use about half the water of alfalfa, it uses that water in the spring when the flows are high and doesn't take water out of the river during critical summer periods. The Nature Conservancy has also raised money to build a small barley malting facility, Sinagua Malt, to get the malt ready for beer brewers. Local breweries have snapped up this malt and use it for their beer, and the fact that it is helping save the Verde has become a marketing point. "It's the essence of naturalism and conservation that truly excites this brewery!" the Arizona Wilderness Brewing Company boasts on its homepage.

Zach and Heather Hauser — part of the same Verde Valley farm family as Claudia — have also removed a field of alfalfa that was nourished by flood irrigation and replaced it with a higher value pecan orchard, using micro-jets that spray water in a circle around each tree. It was paid for by one of the project's corporate donors. It not only saves a good deal of water, it's better for the orchard than flooding and creates a more uniform crop. "Alfalfa is a huge issue for the West," says Schonek, "because so much is grown and it takes so much water."

The funding has also allowed the Hausers to install drip irrigation to raise their watermelons and their locally-renowned sweet corn — so good, it's said, that many people eat it raw — with a lot less water.

Farmers in the Verde Valley are increasingly switching to drip irrigation, which is more water-efficient than traditional methods.

The city of Phoenix, which sources water from the Salt and the Verde, is contributing to these conservation initiatives. It pays for forest thinning to prevent wildfires so the river won't be inundated with post-fire ash and mud and become unusable for the city's water supply.

The efforts here are paying off. “We floated the river all year this year,” said Schonek, noting the increase in the flow from the conservation measures. “You couldn’t have done that five years ago.”

Groundwater, too, is an issue that environmentalists are looking to address along the Colorado and its tributaries. The Nature Conservancy has a groundwater-focused project in southern Arizona to protect the San Pedro, the longest undammed free-flowing river in the Southwest and home to an astonishing array of biodiversity: nearly 400 bird species, several dozen reptile and amphibian species, 84 mammal species, including jaguars, and a suite of terrestrial and aquatic endangered species. The San Pedro — one of only two major rivers that flow north out of Mexico into the United States — flows into the Gila, a major tributary to the Colorado.

Groundwater pumping for homes and farms are reducing the San Pedro’s flows so that some sections of the river have dried up, which is impacting biodiversity. Among other strategies, The Nature Conservancy has, with partners, purchased properties that capture stormwater runoff and funnel it into zones where it can seep into the ground and recharge groundwater supplies.

“The important thing now,” said Hawes of The Nature Conservancy, “is to look for innovative ways to reduce demand and learn to live within our water budget.”

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