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AMERICA'S RIVERS AT RISK

The Water Wars

Pressures Mount On The Legendary Waterway, Reducing Its Flow

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TAOS, N.M. -- It happened in late October 2001. The mighty Rio Grande, storied river of cowboy lore, icon of the West, petered out before it reached the sea.

And the same thing happened the next year.

A river that once disgorged a vast plume of fresh water into the Gulf of Mexico was transformed into little more than a brook that finally disappeared in the dry, flat country on the Texas and Mexico border, about 100 yards from the sea.

To be sure, the mouth of the Rio Grande dried up during a drier-than-normal year that parched the western United States. But the drought was not the only reason the Rio Grande ran out of water, or even the major reason.

From Colorado through New Mexico and all along the Texas and Mexico border that the river forms, the Rio Grande is tapped for agriculture and, in places, drinking water; so much so that the river's flow is but a fraction of what it once was - and demand for its water continues to grow.

"A whole series of events contributed to the river drying up," said Robert J. Edwards, a biologist at the University of Texas-Pan American who conducts research in the Rio Grande. "But the bottom line is, there are too many people using too much water."

North and south of Taos, in northern New Mexico, the Rio Grande flows more assuredly through steep canyon walls of pinyon pine and sagebrush. But even here, the river is beleaguered, virtually every drop spoken for. Sit by a bridge long enough and you're likely to see a farmer pull up in a pickup truck, glance furtively over a shoulder to see that no one is watching, fill a tank with water and drive off.

The Rio Grande meets the sea once again these days, though just barely. Scientists assume it will dry up again, and, barring major reforms in water usage, will do so ever more frequently as demands increase.

"In a nutshell, it's headed for a train wreck," said Steve Harris, owner of a Rio Grande rafting

company and a self-described, self-taught conservationist who is executive director of Rio Grande Restoration, a private group. "We've got an over-allocation problem, and it's about to become real obvious to everybody."

`The Limits Of Clean, Fresh Water'

In the arid Southwest, it is almost impossible to overstate how precious river water has become, and how contested it is. On rivers like the Rio Grande, water is practically measured by the spoonful.

Indeed, the Rio Grande is not the only Southwest river with scarcity problems. The Gila, which flows through Phoenix, is sucked dry before it ever reaches the Colorado River, into which it once flowed. The Colorado is tapped by so many interests for so many miles that it, too, no longer reaches the sea.

But the Rio Grande, the Gila and the Colorado are not just examples of what happens to a river in the desert. They are a glimpse of what the rest of the country is beginning to experience.

"We're going to finally butt up against the limits of clean, fresh water," said Rebecca R. Wodder, president of American Rivers, an environmental group. "We take water for granted. We see water as a ubiquitous free good. The 21st century is going to be about hitting those limits."

The National Research Council, a nonpartisan organization that advises Congress on science and technology issues, concluded in a book-length report on water resources four years ago that in years ahead the United States "will be challenged to provide sufficient quantities of high-quality water to its growing population." The council said it was urgent that the nation move quickly to deal with the problem, which it noted is not confined to the arid Southwest.

Battles over water are erupting all over the country.

In northern California and Oregon, farmers along the Klamath River were outraged when they were denied irrigation water during a drought. The river had become so low that a threatened fish species, coho salmon, did not have sufficient water to migrate upstream to spawn. The case has been fought in the courts for four years.

In the Southeast, where the population has grown rapidly and precipitation is comparatively plentiful, Georgia, Alabama and Florida have argued for years over rights to various river flows. Even in the Northeast, where rainfall is abundant - so abundant some scientists liken the region to a rainforest - there are raging battles over river water diversions and withdrawals.

Years of controversy over a diversion in a scenic river in Connecticut, the Shepaug, led to a state Supreme Court decision followed by years of negotiations between Waterbury, which diverts the water, and environmental interests.

During a dry spell last month, a half-mile-long stretch of the Fenton River next to a University of Connecticut wellfield dried up, killing thousands of trout. And in New York state, anglers complain that New York City, which diverts drinking water from the Delaware River, isn't allowing sufficient flow at times to keep trout alive.

"It used to be a problem in the West. And it is gradually moving East," said Edwards, the Rio Grande researcher.

In a paper published in the journal Frontiers in Ecology and the Environment in 2003, nine scientists prominent in river ecology research concluded that population growth and climate change would put great stress on water supplies in the next few years, putting human water needs in increasing conflict with the needs of aquatic life and the overall health of river ecosystems.

"We may expect more such water conflicts, and even environmental water `wars,'" they said. It is imperative, they said, that researchers clearly document the flows that would be needed on American rivers to ensure diversions and water withdrawals do not destroy them ecologically.

"There is no question water is going to be the issue in the 21st century," said **Margaret A. Palmer**, an aquatic ecologist at the University of Maryland. "Right now we have oil shortages. But water shortages are now occurring in parts of the U.S. that have never seen them before. In the future, water will be what oil is. It will be the limiting factor."

Albuquerque's Dilemma

On the Rio Grande, the issue of the moment is Albuquerque's plan to take water for drinking, essentially for the first time. Until now, it relied upon groundwater - only to discover it was rapidly depleting that resource and headed for disaster.

The new plan will tap water now diverted from the Colorado River into the Rio Grande through 26 miles of tunnels dug under the Continental Divide. The city owns 48,200 acre-feet per year of water from this system, known as the San Juan-Chama Diversion Project. An acre-foot is just that; an acre of water a foot deep.

But critics are worried about the withdrawal's impact downriver and have challenged the city's plan, which is now before a court-ordered mediator. Various interests - Harris' group, along with several farmers; Amigos Bravos, another environmental group; and a water ratepayers group - are insisting that restrictions be imposed upon the city, including mandatory monitoring by the state engineer, for example, to ensure downstream interests are protected.

The city argues that it is doing nothing more than using water it owns, and that it is enacting conservation measures. John Stomp, Albuquerque's water resources manager, said the city has reduced water use by 33 percent over the past 10 years, even as the rapidly growing city added more than 40,000 new water customers.

The city just began a 10-year conservation program intended to reduce use by 1 percent each year.

Environmental Demands

Complicating everything is the fate of the silvery minnow, an endangered species now found only in the Rio Grande, and only in a 174-mile stretch of river that includes Albuquerque. The silvery minnow is down to 5 percent of the river miles it once occupied. In a drought, Albuquerque will be required to reduce its withdrawals from the Rio Grande to protect the

minnow.

Whatever the outcome of the city water plan, water is so precious that scientists here are even trying to determine which tree species along the river guzzle the most water.

Since flows were impounded by dams and the river channel stabilized, two invasive, non-native shrubs, saltcedar and Russian olive, have taken over vast sections of riverbank in recent decades. The dams were meant to conserve water, but research suggests that saltcedar in particular takes up large amounts of water. Already, agencies are dispatching crews to yank the shrubs out of the soil.

South of Albuquerque, in a cottonwood forest that had been infested with the two invasive species, University of New Mexico researchers set up highly sensitive monitoring devices that can even measure transpiration from leaf surfaces.

"That is one of the things we want to find out: How do different trees behave? Do they all lose water in the same way, or differently?" said James R. Cleverly, one of the scientists working in the forest.

That this is serious business is clear from the public investment in such work. A University of New Mexico graduate student in biology, Jennifer Follstad Shah, estimates that much of nearly $8 million in river restoration work from 1990 to 2002 went for such projects as removing or controlling invasive species along the Rio Grande, largely to preserve water.

Even as the Rio Grande passes through Albuquerque, hundreds of miles from the Gulf, vast sand bars are exposed for months at a time, as if to ask the question, can the river withstand all the demands placed upon it?

The New Issue: Water Quality

A newly published scientific survey, "Rivers of North America," is unsparing in describing the section of the Rio Grande below the Elephant Butte Reservoir, south of Albuquerque, to the point where it meets the Rio Conches, which enters from Mexico. Here, the Rio Grande "operates largely as a ditch for water delivery for agriculture and rapidly growing municipalities."

Water is so intensively used and reused for agriculture and by cities that when it returns to the river through groundwater or wastewater discharges, it can aggravate river problems.

"When I first moved here, it was all about water quantity," said Cliff Dahm, an aquatic ecologist at the University of New Mexico. "Water quantity, water quantity, water quantity. You can't do anything unless you quantify how much water it requires. You want to change a land use? Add farmland? Or take farmland out of production and build a suburb? It was all water quantity.

"I think water quantity will remain the ultimate issue, but now increasingly water quality has started to emerge, because water is such a precious resource and it is getting used so intensely that it is also changing water quality."

A half-century ago, the novelist and historian Paul Horgan's acclaimed history of the Rio Grande appeared. In the opening pages of "Great River," a sweeping and scholarly work of more than 1,000 pages, Horgan wrote, "The main physical circumstances of the Rio Grande

seem timeless and impersonal."

Impersonal? Perhaps. Timeless?

Oars in hand, working a raft through the rapids south of Taos, where the Rio Grande is a hugely popular recreational resource, Harris said he had seen enough to throw Horgan's assessment into question.

"I think we are starting to see that rivers can die," he said.
