



Acceptance and Redemption on the Rio Grande

Laura Paskus

Zipped into my sweaty sleeping bag, I'm trying to listen over the whine of mosquitoes to the headwaters of the Rio Grande gurgling and cooing in the night.

Beneath the summer sky, I marvel that here begins a river that pours from Colorado's mountains, carves gorges and canyons, spreads silt across farmlands, nourishes cities, and historically, made its way to the Gulf of Mexico near Brownsville, Texas.

This river rarely reaches the sea nowadays—we take too much of its waters—and I learned only recently that it didn't start flowing into the Gulf of Mexico until sometime between 1.6 million and 600,000 years ago. For much of its 28-million-year lifespan, it stoppered up in inland basins.

I try to peek at the stars, pull the sleeping-bag cord tighter, and eventually fall asleep. Meanwhile, hydrogen and oxygen molecules migrate downstream. They carve out history, ignite imaginations.

Almost 20 years later, I'm standing in the river channel more than 300 miles downstream from the headwaters, and I'm trying not to cry. The channel in San Antonio, New Mexico, should be full, running bank to bank with reddish brown waters. Instead it's sandy and dry. Dead fish fill divots against the banks. They're piled atop one another, where the last hot puddles settled before the sun scorched off the water completely. Desiccated monuments to a winter that had nothing to give.

Since the late 1990s, the Middle Rio Grande has often dried south of Albuquerque during the summer, when the river's flows are diverted into irrigation canals and ditches for the growing season. The summer drying can spread for 30, 50, 70 miles through central New Mexico.

But in early April 2018, the river should have been building toward peak flows for the year, not slowing to a halt. From Bosque del Apache National Wildlife Refuge, the drying spread upstream 20 miles by May.

Throughout the summer of 2018, federal water managers scrambled to keep the drying from moving north all the way to Albuquerque, 120 miles upstream. The U.S. Bureau of Reclamation worked with the local irrigation district, pueblos, and nonprofits to keep at least some water in the river. And in August, the state's largest water utility in Albuquerque sold the bureau 20,000 acre-feet of water stored in an upstream reservoir—water piped into a tributary of the Rio Grande through a series of diversions from the Upper Colorado River Basin. That kept people in Albuquerque from having to see dead fish, from having to watch the birds fly off. From having to see mud transform to sand.

In southern New Mexico, the sandy channel has been a commonplace sight for decades. We barely pause to notice. Snowmelt feeds the Upper Rio Grande, but below Elephant Butte and Caballo reservoirs—through places like Hatch, Las Cruces, and Mesilla—the Rio Grande's channel is completely dry for most of the year. Except when there are flash floods or treated wastewater, more than 100 miles of

In early April 2018, the Rio Grande north of Albuquerque is barely ankle deep to a Canada goose.

the Rio Grande flow only when water is released from reservoirs for downstream users, who immediately divert it onto pecan orchards, alfalfa fields, and rows of chile, onions, cotton, and other crops.

In his 1954 book *Great River*, Paul Horgan wrote, “The river commonly does not carry a great deal of water, and in some places, year after year, it barely flows, and in one or two it is sometimes dry.” But the morphology of the Rio Grande—what the Spanish in the 1540s called *Nuestra Señora*—is different from what it once was. Until very recently, the riverbed wasn’t broken up by dams, diversions, and reservoirs. There were backwaters, oxbows, and dryland lakes that stored water and helped species survive; these were places where fish could hold out during hot, dry times.

Thanks to our thirst, thanks to legal compacts and feats of human engineering, those places are mostly gone now.

And so are many species.

As late as the 1830s, wolves were noted as abundant in northern New Mexico, writes Dan Scurlock in his 1998 environmental history of the Middle Rio Grande Basin, *From the Rio to the Sierra*. Bears and mountain lions moved through the basin. Scurlock’s centuries-long time line also notes that in 1630, Fray Benavides listed the presence in the Middle Rio Grande of fish like bagre (blue catfish), trucha (trout), yellow bullhead, anguila (eel), boqueinete (sucker), sardina (chub), aguja (shovel-nosed sturgeon), and cazon (longnose gar).

Sturgeon, gar, and eel are all extinct from the Middle Rio Grande today, explains Thomas Archdeacon, a biologist with the U.S. Fish and Wildlife Service. Other fish species extinct from the river include roundnose minnow, speckled chub, Rio Grande shiner, Rio Grande bluntnose shiner, blue sucker, and gray redbreast. Phantom shiners used to swim in the Rio Grande, too. But they’re extinct everywhere now.

Today, no species tells the story of the Rio Grande as succinctly as the silvery minnow, a three-inch-long fish that still struggles to survive in New Mexico’s largest river.

Historically, the silvery minnow lived throughout the Rio Grande and its tributary, the Pecos River, occupying more than 2,000 miles of habitat. By the time it was protected under the Endangered Species Act in 1994, the minnow had been extinct in the Pecos for 30 years, and survived only in a 174-mile stretch of the Rio Grande.



In September 2018, the state’s largest reservoir, Elephant Butte, is at just 3.7 percent capacity.

The Rio Grande near Hatch is dry for most of the year, except when it’s used to move irrigation water downstream.

Under the federal Endangered Species Act, water managers, the local irrigation district, and the state needed to take into account how their actions affect the minnow’s survival. For decades, plans for the minnow have been argued over, litigated, altered, and compromised. But the act’s basic premise is this: the most vulnerable species deserve our attention and best efforts. It also acknowledges that collaterally, protecting individual species can benefit entire ecosystems. Keeping water in the river to benefit fish, for example, better connects groundwater and surface water, which helps native cottonwood trees, wildlife, and of course, humans. For years, agencies complied with the Endangered Species Act, sometimes begrudgingly. And over time, even as the Fish and Wildlife Service backed off its original flow requirements for the river, people who’d learned to work together started figuring out ways to keep water in the river.

As the climate changes, that’s going to be harder and harder.

New Mexico has already warmed two degrees Fahrenheit since the 1970s. By the end of the century, it will be four to six degrees warmer than it is today.

Already, climate change affects the amount of snowmelt in the Rio Grande, says Shaleene Chavarria, who in 2018 published a study based on her graduate work at the University of New Mexico’s Earth and Planetary Sciences Department with Dr. David Gutzler. She looked at annual and monthly changes in climate variables and streamflow volume in southern Colorado from 1958 to 2015 and found that big changes are already occurring—changes in winter temperatures, increases in spring temperatures, and decreases in streamflows.

Right now, we know that warming will keep pushing the Rio Grande lower, reducing flows by 4% to 14% by the 2030s and 8% to 29% by the 2080s. Scientists have predicted that the Colorado River—which New Mexico also relies upon—will see a 20% to 30% decrease in flows by 2050. And a 35% to 55% decrease by the end of the century. Even on the Gila River in southwestern New Mexico, warming will decrease flows by about 5% to 10% due to decreasing snowmelt runoff.

These aren’t isolated studies.

Another shows that at the same time the Earth continues warming, multiyear precipitation-driven droughts will continue to occur in the 21st century in the Southwest. In other words, there will still be cycles of wet years and dry years. But recovery from the dry years will be much more difficult in the warmer climate.



Spring flows in 2017 nourished the Bosque near Albuquerque.

The drying riverbed near San Antonio, New Mexico, in 2016.



Continued warming-induced dryness, growing demands for water, and climate change-induced decreases in streamflows may force even large dryland river systems—in particular, the Rio Grande—into “permanent hydrological drought,” according to a 2015 study. Another examination of 421 river basins in the Northern Hemisphere found that 97 river basins—supplying water to almost 2 billion people—have at least a 67% chance of decreased snow supply. Of the 32 basins most sensitive to changes in snowmelt, the authors named the Colorado River and the Rio Grande.

Another peer-reviewed study forecasts that as winters and springs continue to warm, the Upper Rio Grande in Colorado will see lower-than-historic flows in the late winter and early spring. And new reconstructions of runoff ratios for the Upper Rio Grande Basin, stretching back to 1571 CE, show that the declining trend in runoff that has been observed in the basin since the 1980s is “unprecedented” in the last 445 years. The authors write that greater temperature sensitivity over the past few decades implies that “future management vulnerability” will persist.

If any of this seems esoteric, just remember: in arid places, warming means drying.

It’s also useful to remember that fish need water. So do humans.

“In our attempt to save the bigger cogs and wheels, we are still pretty naïve,” wrote conservationist Aldo Leopold a century ago. “A little repentance just before a species goes over the brink is enough to make us feel virtuous. When the species is gone we have a good cry and repeat the performance.”

Indeed, that’s long been the case, even as Americans say they support environmental laws like the Endangered Species Act, which right now is under a particularly cruel and crass assault by the Trump administration.

Spring flows in 2019 were higher than they had been in years. Yet the rivers still dried south of Albuquerque at the end of the summer.

But there’s no time for a good cry. And we can’t keep repeating our performances, eradicating species after species after species from our planet.

While reporting on the Rio Grande for nearly 20 years, I’ve seen the river dry. In good years, I’ve whooped to watch it ripple over its banks, flooding cottonwood saplings and willow seedlings. Farmers have shown me their fields and irrigation ditches; scientists, their data. I’ve been growled at by some sources, shed tears with others. Navigated a kayak through the river; lugged my boat through sandbars, blinked back at coyotes staring from the bank, and watched turkey vultures luxuriate on the bank, spreading their wings in the early spring sun.

Along the Rio Grande, I’ve fallen in love, had my heart broken; also, fallen into the river and had mud suck off my shoes. Held my breath while my daughter climbed too high into gnarly old cottonwoods. I’ve spied coyotes slinking through dry brush the same color as their fur; tripped over roots and stones while keeping my eyes peeled for porcupines feeding or napping within the overstory. I’ve birdwatched with friends at dawn and gone owl-searching after dark; watched tens of thousands of sandhill cranes and snow geese fly overhead at sunset. I’ve sat through countless public meetings, court proceedings, and interviews about everything from reservoir operations to endangered species compliance.

Of all I’ve learned, the most valuable thing is this: ours is a river worth loving for its own beautiful sake.

But don’t take my word for it. Go listen to what the river has to say. Give into the desire for a better world, fall into love with the Rio Grande. Imagine a future where species thrive, rather than barely survive or barrel over the brink. Imagine a future in which we encourage our rivers to run back to the sea.

Laura Paskus has been writing about environmental issues in New Mexico for 17 years, reporting for magazines, newspapers, and public radio, focusing in particular on climate change, water, energy, and southwestern rivers. A former archaeologist and tribal consultant, she currently hosts a monthly show on New Mexico PBS, *Our Land: New Mexico’s Environmental Past, Present and Future*. Her book, *At the Precipice: New Mexico’s Changing Climate*, is forthcoming from UNM Press.