

As Reservoirs Recede, Fears of a Water Shortage Rise

The seven states that rely on the Colorado River confront the possibility of inadequate supplies.

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PAGE, Ariz. — Behind Glen Canyon Dam spreads a vista reincarnated. One of the West's mightiest reservoirs is in steady retreat, the deep turquoise of its waters replaced by the chalky white of canyon walls submerged four decades ago.

Five years of record-breaking drought in the Colorado River basin have drained Lake Powell of more than 60% of its water. Flows on the Colorado are among the lowest in 500 years.

Downriver, Lake Mead, the biggest reservoir in North America and supplier of water to Southern California, Arizona and Las Vegas, is little more than half full. At Mead's northern end, the foundations of St. Thomas, a little town demolished in the 1930s to make way for the reservoir, have reemerged.

The 1,450-mile-long river that greens 3.5 million acres of farm and range land and helps feed the faucets of 25 million people may within a few years lack the water to quench the West's great thirst. For the first time ever, the seven states that rely on the Colorado are confronting the possibility of a shortage.

"They've never had to face a shortage of this consequence," said Pat Mulroy, head of the Southern Nevada Water Authority that supplies Las Vegas, one of the most river-dependent cities in the Colorado basin. "When you're right up against it and facing the possibility of inadequate supplies to municipalities or farmers or jeopardizing recreation values, these are very tough choices."

The states are meeting now to try to figure out how they will deal with a shortage if the drought continues. As with everything else on the heavily regulated Colorado, the answers will be found in a complex tangle of law and politics.

If the law of the river was strictly followed, cuts would be made according to a hierarchy of water rights, with Arizona, Nevada and the upper basin states of Colorado, Wyoming and Utah taking the first hits. California, which gets about 14% of its statewide water supply from the river, has some of the most senior rights on the Colorado and is in a comparatively good position.

But the states may try to avoid triggering cuts. One approach would be for utilities to buy water from farmers and growers — who use 80% of the river's water — and send it to cities.

"With voluntary transfers you can easily take care of the big urban needs in the lower basin with compensation to farmers, and you don't have to dry up agriculture to do that," said Robert Johnson, the lower Colorado regional director for the U.S. Bureau of Reclamation, which operates the dams and reservoirs that make up the river's vast plumbing system.

"I don't want to downplay the importance of the drought," he said. "But my own opinion is we'll figure out how to deal with it."

If the states don't come up with a plan, the federal government will. "The [Interior] secretary will be forced to take action within three years, and potentially within two, if the states haven't solved the problems themselves," Bennett Raley, assistant secretary for water and science for the U.S. Department of the Interior, warned last spring.

Nowhere is the drought as dramatically evident as at Powell, one of the last major reservoirs constructed in the West. As the water recedes, the stunningly blue desert lake, loathed by conservationists for drowning a majestic canyon in the mid-1960s, is disinterring its past. Glen Canyon is reemerging, caked with white mineral salts left by the backed-up waters of the Colorado.

At Warm Creek Bay, one of Powell's many arms, the lake's decline can be measured by the height of the advancing green forests of salt cedar, an invasive shrub that is quickly staking its claim to the emerging lake bottom. The exposed mud has puckered into salt-crustured chunks, a loose puzzle of fudge-like pieces.

The last time it was full, in 1999, the Powell reservoir extended for 186 miles upriver. It is now 145 miles long. The lake level has dropped nearly 130 feet. If it continues its downward creep, there may not be enough water to generate hydropower in two years.

By 2007 or 2008, Powell could sink below the dam's intake tubes. At that point, the lake would be more than three-quarters empty. Releases from the reservoir couldn't be made until nature provided more water. This year, nature delivered half the normal inflow. In 2002, one of the driest years ever recorded on the Colorado, it was a quarter of the norm.

As the reservoir's levels plunge, so does hydropower production. At Lake Mead, Hoover Dam's generating capacity is down 17%. At Glen Canyon Dam, it has dropped 30%. The Western Area Power Administration, which distributes electricity from the dams, is cutting deliveries and expects to spend more than \$30 million this year buying power to replace the lost Glen Canyon energy.

Meanwhile, the National Park Service is spending millions of dollars chasing the retreating waters at Mead and Powell, moving stranded recreation facilities and extending boat ramps that now end in cracked mud.

It could get worse. The drought is the most severe to hit the river since record-keeping began in 1906 and among the worst in 500 years.

Ancient tree rings tell of dry periods that persisted along the Colorado for decades. In the late 1500s, two major droughts gripped the region back to back.

"It seems like it's reasonable to assume it could happen again," said David Meko, an associate research professor at the University of Arizona's Laboratory of Tree-Ring Research. "We could have a few years off and dive into another one of these."

Even if bountiful snowfall and rainfall return, it will take years for Powell and Mead to refill. And even if the Colorado's flows return to normal, that wouldn't match what the states were experiencing when they divvied up the river's water in the early 1900s.

The early part of the last century was unusually wet. The annual flow on the Colorado was then estimated at 18 million acre-feet (one acre-foot is enough to supply two average households for a year). But the average since then has been closer to 15 million acre-feet. Tree-ring studies suggest that over the last 1,500 years, the average has been even less, between 13 million and 14 million acre-feet.

"They divided a very large pie, and we may have a smaller pie," said Jeanine Jones, the Colorado River chief for the California Department of Water Resources.

Even without the drought, population growth has been pushing use levels closer to the limits of what the river can give. In that sense, the drought may be an early warning.

"The worst thing that could happen now is if the drought goes away and we don't do anything. Shame on us," said Dennis Underwood, who oversees Colorado River issues for the Metropolitan Water District of Southern California.

Doing something is not easy on the river, which in times of abundance has been marked by court fights over who gets what.

"What concerns me about the current situation," said Scott Balcomb, a water attorney who represents Colorado in the state drought talks, "is it's a competitive environment. Each of us is guarding their allocation, and as a result there seems to be some inertia."

Because they lack the huge downriver reservoirs that supply the lower basin, Colorado and the other upper basin states feel they've already suffered more than their neighbors to the south. Low irrigation flows on the upper tributaries of the Colorado have resulted in millions of dollars' worth of lost crops and livestock sell-offs.

"In the upper basin there's been pain going on for some time, and that's of concern to people," said Don Ostler, executive director of the Upper Colorado River Commission.

But the upper basin, where the river fills with snowmelt, is legally obligated to deliver a certain amount of water to Arizona, California and Nevada. If it didn't, the lower basin could make a "call on the river," and the upper basin could be forced to reduce deliveries to farms and cities in order to send water south.

That would be a politically difficult move. To avoid it, upper basin interests are expected to argue that if total water deliveries over the last decade are taken into account, they have more than met their obligation to the lower basin.

The big grower-controlled irrigation districts that pump enormous quantities of water from the river are also likely to feel the squeeze to sell some of their crop water to urban areas.

"If the drought gets worse, you're going to get a lot of pressure on those communities to fallow land," said water attorney Bill Swan, who represents the Imperial Irrigation District in southeastern California, the river's single biggest user.

In the lower basin, Nevada and Arizona would be the most vulnerable if a shortage was declared. The huge project that Arizona built in the 1970s to ship Colorado water to the state's interior farms and to Phoenix and Tucson has some of the most junior rights on the river. Nevada also developed many of its rights after California.

"We will take the hits first," said Sid Wilson, general manager of the Central Arizona Project. "Agriculture in Arizona will be hurt. We will not be able to continue storing water underground, and we'll have to start pulling water out of the ground. But the point is, we're not going under because of this drought."

The most worried of all is fast-growing southern Nevada, which gets most of its water from Lake Mead. Even before the drought, the region needed more than its share to keep pace with its exploding population.

The region's water agencies are proposing a mammoth project to pump groundwater from rural parts of the state, spending millions paying homeowners to tear out their lawns to reduce consumption and praying that the states will work out a deal. "I'd like to avoid if at all possible a call on the river," said Mulroy of the Southern Nevada Water Authority. "That makes no sense. To me, that's a declaration of war. We're going to wind up in the courts, and going to court isn't going to solve the problem.

"This drought is real. It's difficult," she said. "But I'm going to be optimistic that there is enough flexibility and enough possibility to avoid extraordinary pain."