

In the second section of the story, Rosner added new material and moved some material from another section.

*First draft:*

On the Lower Colorado, razorback suckers continue to hang on in Lake Mead, to the north, and Lake Havasu, to the south. Those populations are genetic subsets of the Mohave razorbacks, meaning that the genomes found in the other two lakes--and everywhere else on the river--are also found in Mohave, but not necessarily vice versa. Lake Mohave is critical because it contains the motherlode of razorback DNA. In Mead and Havasu, though, repatriated fish have done an ever-so-slightly better job of surviving. Scientists suspect the difference comes down to habitat. Lake Mead and Lake Havasu both contain marshes and murky areas that can provide cover for young razorbacks. Lake Mohave's water, on the other hand, is clear from shore to shore. As Tom Burke, a Bureau of Reclamation biologist, put it, "You can't hide in the mouth of a catfish."

Burke [TK title] has been the linchpin of the Lower Basin's razorback recovery effort for three decades, and is still smitten. "They evolved in a river of extremes," he said. "These fish are capable of withstanding 200-plus million metric tons of sediment a year coming out of Grand Canyon. That's--" he paused, trying to think of an apt comparison. "Well, it's a bunch. So here you are, you have to live in that river. What do you do? Evolution gave them a life span of 40 to 50 years and a long reproductive period, so those adults would have 40 years to have a successful replacement of themselves." In other words, the Colorado River was always "a tough neighborhood." And then we built dams and stocked the whole system with fish from far-off lands.

*Final draft:*

Year after year, biologists and hatchery workers go to the enormous trouble of capturing, transporting, raising and releasing the razorbacks for one simple reason: If the razorback has a future, these Mohave hatchlings carry it in their genes. In the Lower Colorado River Basin -- the section below Glen Canyon Dam -- razorback suckers continue to hang on in Lake Mead, to the north of Lake Mohave, and in Lake Havasu, to the south. Those populations, though, are genetic subsets of the Mohave razorbacks, meaning that the genomes found in the other two lakes -- and everywhere else on the river -- are also found in Mohave, but not necessarily vice versa. "As you go further upstream," said Marsh, "you get less and less genetic diversity, and each population that has been examined is a subset of the Mohave genetic template." Lake Mohave, in other words, is the motherlode of razorback DNA.

A small group of scientists started to issue warnings about the river's fishes in the 1940s, and several seminal research papers were published in the 1960s. But the alarm bell for Lake Mohave's razorback suckers rang out in 1983. W.L. Minckley, an ASU biologist, Marsh's mentor, and one of the godfathers of aquatic conservation on the lower Colorado,

predicted that the lake's suckers were destined to vanish unless something could be done to help the hatchlings survive and grow.

He was right: In the mid-1980s, between 60,000 and 75,000 razorback suckers lived in the lake. By the turn of this century, there were fewer than 3,000. Today, scientists believe only about 50 of those wild fish and their lake-raised offspring survive. Despite more than two decades of research and conservation efforts, the population continues to dwindle. Up to 1,500 "repatriates," the fish raised at Willow Beach from wild larvae, are probably also swimming in Mohave's waters -- but those amount to less than 1 percent of the 150,000 hatchery-raised razorbacks that have been returned to the lake since 1992.

In spite of the unabated decline, Marsh perseveres. "I've spent a 30-year career watching the animals I love and work on go down the toilet despite my best efforts," he said. "I love these fish. I want my children, my grandchildren, to have an opportunity to love these fish the way I do. They were a remarkable creation of Mother Nature. For us, as a species, to allow these animals to be extinguished is fundamentally wrong. It's a philosophical thing."

It's an outlook shared by Tom Burke, the fishery group manager for the Lower Basin's multispecies conservation program at the Bureau of Reclamation, who has been a linchpin of razorback recovery efforts here for three decades. A large, bearded man famous for breaking out his harmonica at meetings, Burke has a tendency to wax poetic about the river, and he's smitten by the razorback's tenacity. "They evolved in a river of extremes," he said. "These fish are capable of withstanding 200-plus million metric tons of sediment a year coming out of Grand Canyon. That's --" he paused, trying to think of an apt comparison. "Well, it's a bunch."

Marsh and Burke began working on the Lower Colorado the same year, as field biologists. Their mentors were lifelong collaborators on endangered species conservation, and Marsh and Burke are close friends and colleagues. Their relationship is partly responsible for the continuing push to save Mohave's razorbacks. "We've had the same outlook," said Marsh. "We've had a lot of disagreements over the years, but we agree to disagree. His goal is the same as mine: to do the right thing for these critters."

The Colorado River was always, in Burke's words, "a tough neighborhood" for fish, not only because of its famous sediment load, but also because of its wide fluctuations in water volume, temperature and salt content. The razorback's 50-year-lifespan, he explained, gave it a fighting chance of producing at least one surviving offspring. But then humans made the neighborhood even tougher: We crisscrossed it with dams, and stocked it with voracious fish from far-off lands.