

By Aimee Roberson

A Little Fish in Big Bend

Rio Grande silvery minnow showing signs of reproduction in Texas

The Rio Grande silvery minnow flashes silver in sunlight, but it's no trophy fish. Too small in size to be of interest to anglers, the silvery minnow is a little fish with a big story. At one time, the silvery minnow swam in large schools and was one of the most common fishes in the Rio Grande from Española, New Mexico, to the Gulf of Mexico. But the Rio Grande was bigger then, *más grande*. Today, the silvery minnow is an endangered species, and until recently, existed in only seven percent of its historic range near Albuquerque, New Mexico.

The silvery minnow's absence from most of its historic range reflects the fact that the Rio Grande where the silvery minnow once thrived, suffers. The story of the Rio Grande and its silvery minnow is similar to stories all over the world, where people take water out and put pollutants in, dam or otherwise alter natural flows, and manage rivers in a way that is not sustainable. Healthy rivers support

life; they provide clean water and abundant fisheries, and buffer people from flooding. However, people have taken their toll on the Rio Grande—it is fundamentally different than the wild, free-flowing river it once was. Many species, including the silvery minnow, have declined.

In the current chapter of the silvery minnow's story, the U.S. Fish and Wildlife Service returned it to its former home in the Big Bend reach of the Rio Grande, taking a critical step toward the fish's recovery. The Big Bend reach flows through the heart of the northern Chihuahuan Desert, surrounded by nearly three million acres of public and private conservation lands in Texas and Mexico. The river courses through Big Bend National Park and is the essence of the 196-mile-long Rio Grande Wild and Scenic River.

Given the silvery minnow has not been found in the Big Bend reach since 1960, biologists must look



Laden with ripe eggs, this Rio Grande silvery minnow likely contributed to the recent finding of fertilized eggs in Big Bend.



Jason Remshardt/USFWS



Aimee Roberson/USFWS

Dr. Gary Garrett, Texas Parks and Wildlife (l), and Dr. Robert Edwards, University of Texas-Pan American, try to catch Rio Grande silvery minnow in the fish's namesake river near the confluence of Terlingua Creek in Big Bend National Park.

at how the river has changed. To understand the changes, biologists work with experts on the river and the fish and also with people who manage the river's water for human uses. A path to recovery for the fish will meet the needs of people who also depend on the river. It's an enormous challenge.

By the time the Rio Grande flows from southern Colorado, through New Mexico and El Paso, Texas, there's not much water left due to diversions for agricultural and municipal use. Most of the water that flows through the Big Bend reach is from the Rio Conchos which enters the Rio Grande from Mexico near Presidio, Texas. As the river has diminished in size, it has become narrower and deeper and the diversity of aquatic habitat in the river has also diminished. In particular, there are less shallow areas with slow moving water. These areas produce plenty of algae and provide nursery habitat for the silvery minnow.

The Rio Grande silvery minnow releases its eggs directly into the water to incubate as the flow carries them along. One female can release thousands of tiny eggs in a 12-hour period. Fertilized eggs swell to about 3 millimeters and look like clear tapioca pearls. But few eggs are likely to produce minnows. Eggs that eddy out into high quality nursery habitat have a good chance of surviving to become larvae and then juveniles. Many eggs will be eaten by predators or perhaps hatch in areas where there is not enough food to support larval fish. Because there are usually plenty of eggs produced, the limiting factor for the silvery minnow seems to be high quality habitat that supports the growth of the fish. The U.S Fish and Wildlife Service continues to work with partners to improve the health of the river in New Mexico and in the Big Bend reach.



Raymond Skiles/NPS

Bill Williams (l) and William Knight, Dexter National Fish Hatchery and Technology Center net Rio Grande silvery minnow to be released in Big Bend National Park.

We know how to catch silvery minnow eggs in the Rio Grande in New Mexico, where there is still a wild population. We know how to take those eggs and raise healthy fish in captivity. And we have all the equipment we need to move

fish from one place to another. But returning an endangered species to its former range is not that simple. Sometimes people are uneasy about reintroducing an endangered species because they are concerned that certain activities could be hampered

by regulations designed to protect these species. Returning the silvery minnow to Big Bend involved talking to people, listening to and addressing their concerns, assessing the potential effects of the reintroduction, and a lot of paperwork.

The Rio Grande Silvery Minnow Recovery Team identified the Big Bend reach as the first priority for reestablishing the silvery minnow. Beginning in 2004, guided by the Endangered Species Act and the National Environmental Policy Act, the U.S. Fish and Wildlife Service met with numerous representatives of state and federal agencies, non-governmental organizations, private landowners, and elected officials, all interested in the proposal to

put silvery minnow back in the Rio Grande.

At long last, in December 2008, 425,000 silvery minnows travelled several hours in large trucks from the Dexter National Fish Hatchery and Technology Center, and Albuquerque's Rio Grande Silvery Minnow Breeding and Rearing Facility, both in New Mexico, to Big Bend. Work didn't stop there. So far, nearly one million silvery minnows have been released in the Big Bend reach on lands public and private—Big Bend Ranch State Park; Big Bend National Park; and the Adams Ranch del Carmen, a privately-owned conservation area. And just in time for Mother's Day, genetic tests performed at the University of New Mexico confirmed that eggs collected in the Big Bend reach in April 2010, are indeed silvery minnows.

The story of the silvery minnow and the Rio Grande is still being written. Recovering an endangered species in a river that is not as grand as it used to be is an enormous

challenge. We hope that this story's concluding chapters will tell how the silvery minnow was successfully re-established in the Big Bend reach. For now, we are learning about the fish and what we can do to work toward its recovery. Research, monitoring, and habitat restoration continues, and we are developing recommendations for river flows to support the silvery minnow and life that depends on the Rio Grande.

If we can recover the silvery minnow, it will be because we made the Rio Grande healthier. And in the process, we will have learned a lot about ourselves and how to manage our rivers in a more sustainable way. Wouldn't that make a fine epilogue? ♦

Aimee Roberson is a Fish and Wildlife Biologist with the U.S. Fish and Wildlife Service in Alpine, Texas. She is also a yoga instructor and wellness coach and enjoys being of service to people who are creating holistic health, from personal to planetary.

The U.S. Fish and Wildlife Service does not work alone. The Middle Rio Grande Endangered Species Collaborative Program in New Mexico and the Bureau of Reclamation contribute funds to recover the silvery minnow in Big Bend. Partners in Texas and Mexico include Big Bend National Park, U.S. Geological Survey, the International Boundary and Water Commission, Texas Parks and Wildlife Department, the University of Texas – Pan Am, the World Wildlife Fund, Comisión Internacional de Límites y Aguas, Secretaría de Medio Ambiente y Recursos Naturales, Comisión Nacional de Areas Naturales Protegidas, and the Instituto Nacional Ecología.



The Rio Grande upstream of Boquillas Canyon, inside Big Bend National Park. The villages of Boquillas del Carmen, Texas, and Sierra del Carmen (Mexico) are in the background.

Aimee Roberson/USFWS