

Farmers vs. Fish: The Battle of the Rio Grande Silvery Minnow

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With seven species, the genus *Hybognathus* is distributed across a large portion of North America, from the Atlantic Coast to the Rocky Mountains, and from southern Canada to the Rio Grande Valley of México. The rarest member of the genus is the federally endangered Rio Grande silvery minnow, *Hybognathus amarus*. It was once one of the most abundant and widespread fishes in the Rio Grande basin, ranging from northern New Mexico south to Tamaulipas, México. Now the species is extirpated from 95 percent of its historic range, occurring only in a 275 km (170 mi) stretch of the Middle Rio Grande in New Mexico from Cochiti Dam downstream to the headwaters of Elephant Butte Reservoir (FWS, 2001). In fact, it's the only native minnow that survives in New Mexico's stretch of the Rio Grande.¹ Efforts to save it have culminated in one of the lengthiest legal and political battles in endangered species history.

The Battle Lines Are Drawn

In simple terms, the battle is between farmers and fish. On one side are 10,000 or so farmers who depend on water from the Rio Grande to irrigate hay and alfalfa, both water-thirsty crops. They and farmers of other crops account for 90 percent of the water consumption in the region (FWS, 2001). Their water is managed by the Middle Rio Grande Conservancy District (MRGCD), which operates the diversion dams that deliver water to the farmers.

On the other side are environmentalists, who sued the federal government to take steps to save the endangered minnow. The most critical—and contentious—of these steps is to use water that might otherwise go to the farmers to maintain habitat for the minnow. Farmers and the MRGCD refuse to give up their water. It's theirs, they say, granted to them under state law. Setting aside water for the minnow would hurt their crops and cost them hundreds of millions of dollars a year. Their livelihoods should not be sacrificed to the existence of a small, drab, silvery fish. "Hungry? Out of work?" asks a farmer's sign. "Eat a silvery minnow" (McLellan, 1996).

Environmentalists argue that species preservation is a beneficial use of river water, and that water rights should also extend to the river. "This is not about the minnow," said Steve Harris of Rio Grande Restoration, one of the environmental groups party to the federal lawsuit. "It is about the river's right to life, about an entire ecological system of which the minnow is a part. . . . Will [the Rio Grande] be given a portion of its own water to sustain itself, its life and its living things?" (Hoffman and Spohn, 2000).

At the legal center of the battle are two conflicting statutes: New Mexico state law, which doesn't mandate minimum stream flows to preserve wildlife, and the Endangered Species Act, which does.

The Minnow and its River

To understand the conservation challenges facing *Hybognathus amarus*, one must first understand certain basic facts about the fish's biology. The Rio Grande silvery minnow lives in a desert stream system characterized by seasonal variations in water level, including periods of torrential flow and extended drought. Spawning is triggered in late spring

¹ Other Rio Grande minnows were phantom shiner (*Notropis orca*), extinct; bluntnose shiner (*N. simus simus*), extinct; Rio Grande shiner (*N. jemezianus*), extirpated; and speckled chub (*Macrhybopsis aestivalis*), extirpated.

and early summer when snow runoff and thunderstorms create surges in the river's flow. It appears likely that spawning occurs several times during the summer, perhaps in response to spikes in water flow (FWS, 2001). Eggs are released directly into the water (pelagic spawning) and remain suspended as long as current is maintained. Pelagic spawning allows the minnow to replenish downstream populations that may have been reduced during times of drought (Platania, 1995). Each female can spawn 3-18 times in a 12-hour period, producing thousands of eggs (Propst, 1999). Eggs float downstream and hatch within 50 hours, whereupon the larvae continue to drift for at least another day. Eventually they are swept into backwaters and other low-velocity habitats where food (primarily plankton) is abundant. Growth is rapid, reaching about 4 cm (1.5 in) by late autumn. Many adults die after spawning. Lifespan is 1-2 years.

The near extinction of *H. amarus* has been caused by a number of factors (FWS, 1994). The diversion and regulation of the Rio Grande for agricultural and municipal purposes have led to severe reductions in flow and the frequent drying out of extended portions of the river's channel. The alteration of the river's natural seasonal high and low flows disrupt the environmental cues the minnow needs to spawn.² Meanders and oxbows have been eliminated, courses straightened, and channels dredged in order to move water as efficiently as possible. The sandy substrate the minnow prefers has been replaced by gravel and cobble. As eggs and larvae float downstream, they become "entrained" in canals, conveyance channels, and other diversion ditches from which they do not escape. Without sufficient flow during the breeding season, eggs sink to the bottom, where they are covered with silt and die. Diversion dams prevent adults from migrating upstream to spawn. And the introduction of non-native fishes has simply made a bad situation worse. In the Pecos River, a tributary of the Rio Grande that begins in Texas, *H. amarus* is now extirpated due to the 1968 bait bucket release of its cousin, the plains minnow, *H. placitus*. The plains minnow is more tolerant of disturbed habitats and was therefore able to replace *H. amarus* in the dam-modified reaches of the Pecos River. In this instance, the wholesale replacement of a native species with an exotic took less than a decade (FWS, 1994).

Many farmers and water managers believe that saving water for *H. amarus* is not just unfair and illegal, but also

unnecessary. They point to the fact that many old timers say the river dried up regularly in the past, and that the minnow always managed to survive.

"That little minnow is not going anywhere," one hay farmer said. "It's been there for hundreds of years. . . . I don't think it'll go extinct. It used to go through harder times than it is now" (Soussan, 2000d).

Biologists and environmentalists tell a different story. While it's true that *H. amarus* is a scrappy fish that can withstand periods of drought by retreating into pools and backwater refugia, it's also true that the river has been substantially altered from what it was decades ago. Times are indeed harder for the minnow. Much more water is being taken for human use. The backwater refugia have been replaced by miles of dry river bed. And 95 percent of the minnow's surviving population has been squeezed into an area just above the Elephant Butte reservoir (FWS, 2001). This precarious stretch of river is prone to drying in the summer and is adjacent to the cold, deep, exotic predator-laden waters of the reservoir.

Biologists worry that the minnow's range is now so greatly restricted that a drought would kill the minimum number of individuals required to repopulate the species. For a short-lived fish such as *H. amarus*, a healthy annual spawn is key to its survival.

The Battle Heats Up

On a Friday afternoon in an especially dry April in 1996, the MRGCD quietly diverted the *entire* flow of the Rio Grande River into its irrigation ditches. The next morning the dry river was littered with the bodies of beached silvery minnows. Drying muddy pools were filled with trapped survivors, gasping for oxygen and falling prey to great blue heron and bobcat. Over 10,000 minnows died that weekend, an estimated 40 percent of the population (Hanscom, 1999).

The Rio Grande silvery minnow might have gone extinct had not three federal agencies—U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation—acted quickly to locate an emergency source of water from the City of Albuquerque, which agreed to give up some of its municipal water supply in spite of near-drought conditions.

In the wake of the fish kill environmentalists stepped up their efforts to force the federal government to mandate minimum stream flows. Farmers and the MRGCD likewise stepped up their intransigence. The battle was moving to the courts and, eventually, to Washington, D.C.

² Dams hold back spring runoff and summer water, which would normally cause high flows, and release this water back into the river over a prolonged period of time, often during the winter when low flows would normally occur.

Suit, Countersuit

In 1997, environmentalists filed suit seeking a court order that would force the U.S. Fish and Wildlife Service (FWS) to designate critical habitat for *H. amarus*, as it is legally mandated to do within two years of a species' listing.³ (It had now been three years since *H. amarus* was listed.) After much legal wrangling, FWS eventually reached a court-ordered critical habitat decision in July 1999, designating almost all of the minnow's current range as essential to the species' conservation. FWS concluded that in order to save the minnow, the Rio Grande must run as a continuous river, not a series of isolated pools.

Before the week was out, the MRGCD and the State of Mexico filed countersuits, claiming that FWS inadequately considered the economic impact of its designation, as it is required by law to do.⁴ In November 2000, a federal judge remanded the critical habitat decision back to FWS, charging that the agency never considered whether a smaller portion of the river might sustain the species. The judge also rebuked FWS for ignoring the simple fact that all of the Rio Grande's water is spoken for, and that saving water for the minnow means taking water from people (Linthicum, 2000).

The Silvery Minnow Goes to Washington

In July 2000, the U.S. Bureau of Reclamation (BuRec), the federal agency that owns and operates the three reservoirs on the middle Rio Grande, shocked the MRGCD when it announced that the dams and ditches used to divert water from the river are owned by the federal government and must therefore be operated in compliance with the Endangered Species Act. BuRec ordered the MRGCD to maintain a 300-cubic-foot-per second flow (BuRec, 2000). The MRGCD, stating that a federal agency has no jurisdiction over state-owned water, refused to follow the order.

In Washington, reaction was swift. U.S. Sen. Pete Domenici (R-NM) attached an amendment to an appropriations bill that would effectively block BuRec's order. "If I

³ Critical habitat is the specific area(s) on which are found physical or biological features essential to the conservation of a species, and that may require special management considerations or protection. Unlike the listing of a species, designating critical habitat must take into account the economic impact of such designation.

⁴ Environmentalists also sued, claiming that the habitat designation did not go far enough by excluding the southern reaches of the Rio Grande and the Pecos River (Linthicum, 2000).

have to favor thousands of farmers and their families over the minnow, then I favor the thousands of families," Domenici said (Coleman, 2000). The Clinton Administration threatened to veto the bill because of the minnow provision. Domenici later dropped the amendment when Secretary of the Interior Bruce Babbitt agreed to delay enforcing BuRec's order. Environmentalists charged that Babbitt compromised his principles and cut a politically expedient deal (Soussan, 2000b).

Rescue Operations

As the politics heated up, so did the temperature. With summer monsoons a no-show and evaporation taking its toll, FWS officials monitored river flow gauges over the Internet, and scanned the river from airplanes, looking for drying pools. When a pool was located, minnow-rescue teams were dispatched, netting stranded minnows, putting them in coolers, and hauling them in water trucks to upstream reaches that were expected to remain flowing.

For two days in July 2000 rescue operations were halted for fear of violence. A group of angry farmers attempted to seize control of a diversion dam that was being used to release a small amount of water for the minnow. "They told us to get off the river and get back to the office," said Jude Smith, FWS minnow rescue coordinator. "We were warned of possible violence" (Hanscom, 2000).

Over a three-day period 98 minnows were rescued; another 38 were confirmed dead with who knows how many being eaten by birds (Soussan, 2000c).

Some of the rescued minnows were taken to the Albuquerque Biological Park, which had begun a city-funded captive propagation program. These minnows, and others that had been collected, were injected with hormones to stimulate spawning. In addition, FWS biologists collected tens of thousands of *H. amarus* eggs, some to be hatched in captivity, others relocated to flowing upstream reaches. By May 2000 the Albuquerque Biological Park had cultured 150,000 silvery minnow larvae (Soussan, 2000a). In July 2000, 3400 captive-raised minnows were released in the upper Rio Grande (Casman, 2001; this issue). Another scheduled release was canceled when 400,000 gallons of treated sewage were accidentally flushed into the river (Casey, 2000).

A Temporary Truce

As biologists battled in the field to save stranded minnows, water managers and government officials battled each other

in 10 days of court-ordered negotiations. In early August 2000 a temporary truce was reached. The parties agreed to the release of 85,900 acre-feet (30 billion gallons) of previously reserved upstream Rio Grande water that would extend the farmers' irrigation season from September 10 to October 31, and provide sufficient flow to prevent minnow habitat from drying up. BuRec agreed to pay the City of Albuquerque and the MRGCD for the water, and to install additional pumps to pump groundwater seepage back into the river. Severe drought conditions forced the parties to amend the agreement a few weeks later, ending the irrigation season sooner to guarantee enough water for the minnow (Soussan, 2000f).

Some environmentalists were unhappy with the agreement—one newspaper editorial described it as a “Band-Aid on a hemorrhage” (Anon., 2000)—but went along with it because the minnow desperately needed water to survive the drought. Indeed, credit for the survival of the minnow that year can be given to the August agreement. Despite summer casualties, biologists believe enough fish larvae survived to assure spawning in 2001 (McAllen, 2000).

“Save the Valley, Move the Minnow”

Far from the anti-minnow bad guy that some have made him out to be, Sen. Pete Domenici earnestly tried to solve the crisis by proposing what he called a “non-water” solution. Noting that expensive and controversial water releases do little for the long-term survival of the minnow, Domenici said “We should take the minnow to the water instead of taking the water to the minnow” (Soussan, 2000e). Domenici proposed that conservation efforts be focused on maintaining refugia populations in wet areas of the Rio Grande and its tributaries upstream of the diversion dams.

Farmers applauded the initiative. One local politician, happy and no doubt relieved that Domenici's plan would remove the controversial minnow from his district, passed out 2,000 “Save the Valley, Move the Minnow” bumper stickers to his constituents (Soussan, 2000g).

Environmentalists and biologists applauded the gesture but not the objective. Although restoring upstream habitat is vital, it's impossible to recover the species by moving its population from one isolated area to another.

The Compromise

By 2001, negotiators had returned to the bargaining table to hammer out a long-term strategy that would somewhere,

somehow, find water to protect the minnow indefinitely. They failed. In July 2001, the State of New Mexico and the federal government reached a settlement to protect the minnow for only three years. The State agreed to release 30,000 acre-feet of water per year in 2001, 2002 and 2003 if the minnow needed it. The federal government agreed to buy the water for \$4.1 million. The State in turn would spend the money on habitat restoration, water quality studies, and captive breeding and reintroduction projects (Clark, 2001). In addition, FWS would continue its minnow rescue operations, develop ways to prevent minnows and eggs from getting trapped in irrigation canals, and consider either eliminating the one dam that blocks the most spawning-age minnows or building a fish ladder around it. In no way does the settlement guarantee that the Rio Grande stays wet. At best, all it promises is that the river won't dry too quickly.

Environmentalists, who were not involved in the drafting of the settlement, are not pleased. They contend that 30,000 acre-feet per year is insufficient and would allow the surviving minnows' stronghold to go dry. “We are worried that if you do this for three years, the minnow will have passed the point of no return,” said Letty Belin, a lawyer representing the minnow. “It may be unsalvageable by then” (Reed, 2001).

Environmentalists plan to press on with their suit, arguing that the Endangered Species Act mandates that Rio Grande water be used to save the minnow *before* it is used for anything else.

A Question of Values

With captive breeding efforts established and producing good results, it's clear that *H. amarus* will not completely vanish. What isn't clear is whether the species will continue to live out its evolutionary heritage in the wild. As with all endangered species battles, this one comes down to values. Which is valued more? A flowing Rio Grande that's healthy enough to support native wildlife? Or the money that can be made by diverting nearly all of its water to grow crops in arid land? It's not an either/or proposition.

According to environmentalists, farmers will *not* go out of business if they are *not* entitled to every last drop of water. Farmers usually get in two alfalfa crops before a late-summer drought threatens to dry the river. Squeezing in a third crop, especially in a drought year, is never guaranteed (ESC, 2000). Is giving up the chance to grow a questionable third crop a reasonable sacrifice to ask farmers to make when the fate of a species is at stake? Again, it comes down to values.

Environmentalists should also give in a little. They could tone down their “save at all costs” rhetoric, which tends to divide people when cooperation is the only way to achieve an effective conservation program. Let’s say environmentalists get what they want, which is for the federal government to have eminent domain over Rio Grande water, and to use that water to benefit the minnow before a single drop is diverted to a farmer. It’s not far-fetched to imagine that angry farmers would take to the river and “solve” the silvery minnow problem for good. Granted, farmers may be the minnow’s worst enemy, but they can also be the minnow’s best friend. Farmers, after all, have first dibs on the water. Convincing them to voluntarily give up some of it may be a better tactic than suing the government to simply seize it.

Of course, it wouldn’t hurt if Mother Nature stepped in with an emergency water supply of her own. If there’s one thing farmers, environmentalists, biologists, lawyers, water managers, and politicians can all agree on, it’s that more rain and more snowmelt would go a long way to ease tensions, and give a non-descript silvery minnow a better shot at hanging on while things are sorted out.

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