

## 8<sup>th</sup> Grade: Why Share, Why Care?

Students work in groups representing our community's municipal water users to develop an understanding of the complex issues relating to the competition for drinking water.

### Science

| Str/std/bch | Performance Standard  |
|-------------|---|
| II.II.I.    | 8.1 Describe how matter moves through ecosystems, e.g., water cycle, carbon cycle.  |
| II.III.II.  | 8.2. Understand the unique role water plays on Earth, including: <ul style="list-style-type: none"> <li>• properties of water related to processes in the water cycle: evaporation, condensation, precipitation, surface run-off, percolation</li> <li>• dissolving of minerals and gases and transport to the oceans (<i>river running</i>)</li> <li>• fresh and salt water in oceans, rivers, lakes, and glaciers</li> <li>• reactant in photosynthesis.</li> </ul> |

### Social Studies

| Std/std/bch   | Performance Standards   |
|---------------|---|
| Geog.II.II-C. | 8.1 Explain and evaluate how changing perceptions of place and the natural environment have affected human behavior   |
| Geog.II.II-D. | 8.1 Explain how human activities and physical processes influence change in ecosystems.   |
| Geog.II.II-F. | 8.1 Describe the differing viewpoints that individuals and groups have with respect to the use of resources.  |
| Econ.IV.IV-A. | 8.2 Analyze the full costs and benefits of alternative uses of resources that will lead to productive use of resources today and in the future.<br>8.3 Explain that tension between individuals, groups, and/or countries is often based upon differential access to resources. |
| Econ.IV.IV-C. | 8.7 Describe how “cost benefits” are determined by individuals, groups, societies, and nations in capitalist systems.   |

***Extension*** – Read (as a whole group so that you can help with unfamiliar vocabulary) the following 2007 Executive Summary about the silvery minnow, written by the Southwest Region, U.S. Fish and Wildlife Service, Albuquerque, New Mexico. Ask students to discuss the importance of the silvery minnow and whether or not we should invest money and water to save the fish. After the discussion, students should write a paragraph stating their views.

### Science

| Str/std/bch | Performance Standard   |
|-------------|--|
| III.I.I.    | 8.2. Describe how scientific information can help to explain environmental phenomena (e.g., floods, earthquakes, volcanoes, fire, extreme weather). <i>the health of our river</i> |

# After an upstream battle, the silvery minnow's future is looking brighter

By [Sue Vorenberg](#)

The Albuquerque Tribune

Saturday, December 1, 2007

Four years after a critical low, and with the help of some good rain years, Rio Grande silvery minnow populations are growing again in the Land of Enchantment. It's been a rough road for the endangered minnow, fraught with lawsuits and arguments by a variety of state agencies, environmental groups, farmers and others, each with their own idea of how to deal with the tiny fish . . .

It's hard to get an exact number of fish in the river — but there are many indications that populations are growing and healthy, said Jennifer Parody, the Middle Rio Grande Endangered Species Act coordinator for the Fish & Wildlife service. "We don't have an actual count of fish in the river, but we can see a change in our long-term monitoring," Parody said. "We've been monitoring 20 sites for over a decade, and sites that in the early 2000s weren't occupied at all now have fish in them. It's been a massive increase over the low."

Still, the fish is far from saved — and another prolonged drought could put it at severe risk again. "The water issues are only going to get worse as resources become more stretched with global climate change and population growth," Haggerty said. "We've had some favorable water conditions in the last four years after a prolonged drought, which has helped, but that doesn't mean those favorable conditions will continue." And the fish is still only in about 7 percent of its historical habitat areas along the river, she said.

Several efforts are under way to ensure the silvery minnow will survive even if the river runs very low or dries up in spots because of future droughts. The newest of those efforts — set to be open and stocked with fish in late spring of 2008 — is an innovative type of minnow breeding facility under construction in Los Lunas. The Interstate Stream Commission is building it with the help of several other groups. It will cost about \$2 million, Haggerty said. The site — called a refugium — has a concrete winding river, several places for water to pool and flood, and a variety of environments for fish to meet and breed naturally, said Doug Tave, manager of the Los Lunas Silvery Minnow Refugium.

The facility will provide natural conditions, such as flooding events, so the fish can decide where ideal breeding spots are. And food will be built into the ecology so the fish will learn to fend for themselves when released into the wild, Tave said.

The site also won't use much water — about 2 acre feet a year, which is equivalent to what eight homes would use in that time span, Tave said. The biggest program for the minnow so far has been the one operated by the city of Albuquerque and the Albuquerque Biological Park, called the Rio Grande Silvery Minnow Rearing and Breeding Facility. That program has its own refugium, about a third the size of the new one in Los Lunas, which was built in 2005.

The city also breeds fish at the Biological Park and collects silvery minnow eggs from the wild to assure genetic diversity in its populations, said Chris Altenbach, head aquarist at the park. "We're producing large numbers of healthy, genetically-diverse fish," Altenbach said.

The city releases about 75,000 fish into the Rio Grande a year from its programs, and also maintains a captive population of about 35,000 silvery minnows — which stay in the refugium as an insurance policy in case a drought or other incident occurs on the river.

The Bureau of Reclamation is also working on several projects through its collaborative program — which combines efforts from a wide range of groups including government agencies, environmental activists, farmers and community members. That agency is involved in both the city's and the ISC's facilities, and it is working on a new development called the Silvery Minnow Sanctuary, a \$4 million site near the Rio Grande Nature Center, said Connie Rupp, Albuquerque area manager. "That project was actually a vision of Senator Domenici," Rupp said. "It's an offstream area that protects the minnow. When we're in critical drought years, this is a place where the minnow can survive and be nourished." That facility should be finished next fall, she said.

The bureau is also working on several habitat restoration projects, modifying banks along the Rio Grande so the fish can find healthy spots to breed in spring. And the collaborative program is working on passages that will let the fish travel freely around the Isleta and San Acacia conversion dams. Overall, if efforts continue to be successful, there's hope the Rio Grande silvery minnow could be delisted from the Endangered Species Act in 25 years, Parody said. . .

One day, maybe the refugiums will all be shut down — or switched to help some other endangered fish, Tave said. That's his dream, anyway, he said.

"The reason you want to save any species — and you can say anything else you want — but it's simply the right thing to do," Tave said.

<http://www.abqtrib.com/news/2007/dec/01/web-after-upstream-battle-silvery-minnows-future-1/>