

Experts testing tactics to keep harmful mussels from muscling their way in

By Bruce Finley, *The Denver Post*



Quagga mussels sit at the Bureau of Reclamation's laboratory in Lakewood. Researchers are investigating ways to stop the spread of quagga and zebra mussels. (Andy Cross, *The Denver Post*)

A Denver-based federal team fighting invasive freshwater mussels is investigating new and hopeful treatments, including poison, blasts of ultra-violet light and shock waves, and the introduction of a mussel-destroying predatory sunfish.

The researchers testing these tactics say some seem to work and, if proved, could save tens of millions of dollars by protecting western hydropower and water delivery facilities against the proliferating Eurasian quagga and zebra mussels.

"Once the mussels are there, this would help control them," said U.S. Bureau of Reclamation mussel program coordinator Leonard Willett, who this week was supervising tests at dams along the lower Colorado River.

Lab tests of the poison are "very

promising," he said. It contains *Pseudomonas fluorescens* — derived from a bacterium that destroys mussels but apparently not fish. The Environmental Protection Agency has been asked to issue an emergency permit allowing open-water tests.

The marble-size quagga and zebra mussels moved from central Asia and use microscopic, sticky hairs to glom onto hard surfaces. Each female produces up to 350,000 eggs — driving an invasion that's choking off other aquatic life and clogging pipes, pumps and intake gates at reservoirs and power plants.

The invasion began in the Great Lakes when ships inadvertently brought in the mussels with ballast water drawn from foreign ports that is used to balance cargo. They spread rapidly during the 1990s and now have colonized waterways from

North Dakota to California, where warmer temperatures favor year-round breeding. The invaders have been detected in five Colorado reservoirs.

An estimated 50,000 mussels now cover every square meter on the bottom of Lake Mead, the reservoir in Nevada and Arizona that is the nation's largest. Clogging of hydropower and water-delivery pumps and pipes is costing tens of millions of dollars — and threatening to force up utility



Technician Kevin Bloom prepares lake-water samples at the Bureau of Reclamation's Engineering and Research Laboratory in Lakewood on Tuesday. The samples were to be tested for mussel larvae. (Andy Cross, The Denver Post) bills.

"This is a new problem dropped on agencies that don't have a budgetary basis to deal with it," said Curt Brown, the Bureau of Reclamation's director of research and development.

More aquatic and other species probably will invade in the future, Brown said. "We're mixing the whole world now," he said. "It means any species that is susceptible to disease will soon see every disease in the world."

The testing of counter-measures this summer is part of a government effort — benefiting from the American Recovery and Reinvestment Act — to track and control the invaders.

Underwater UV rays

One tactic involves installing underwater UV-ray devices on pipelines. Mussels inside pipes respond to sudden, intense ultraviolet light by closing up, rendering them unable to attach. Testing of underwater cylinders that emit pulses of energy and discourage mussels from attaching is underway at Colorado's Leadville Fish Hatchery.

Teflon-like coatings also are being tested. And, while quagga and zebra mussels have no natural predator in the United States, researchers are exploring the possibility that a type of sunfish, if introduced, could devour mussels.

Any introduction of fish or chemicals would require federal permits, which researchers anticipate will require more than a year of evaluation.

Meanwhile, the Bureau of Reclamation is ramping up water-testing efforts at a lab west of Denver to track mussels' westward spread. Scientists using glass settling cones, microscopes and other devices analyze water samples sent in plastic bottles from 17 states.

Inspection of boats

They coordinate with state wildlife officials charged with ensuring careful inspection of recreational boats — thought to be the main way mussels are spreading.

U.S. Fish and Wildlife Service officials, who have launched a "Stop the Aquatic Hitchhikers" campaign, now are looking for better ways to decontaminate encrusted boats.

"We have to look at all kinds of options, rather than just let the mussel do its thing," said Erin Williams, aquatic invasive species coordinator for the fish and wildlife service. "It is not going to go away."

The new treatment strategy and early detection "may be able to slow them down," said Denise Hosler, a federal scientist who directs the detection lab and oversees state responses.

This year, the mussels' spread in Colorado has indeed slowed. A suspected colonization of Blue Mesa Reservoir, west of Gunnison, was not confirmed. Mussels in Pueblo Reservoir and others appear to be somewhat contained, perhaps due to periodic colder temperatures that inhibit breeding, Hosler said.

"In Colorado, for right now," she said, "it looks like we're winning."

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