

Water Review

A Perspective on Western Water Issues Prepared by the Family Farm Alliance and Its Members

COLORADO AND THE WEST

Getting Out in Front of Invasive Mussels

In the past year, water managers in the Western United States have encountered yet another challenge in their efforts to deliver reliable water supplies to agricultural and urban customers. This time – it’s not climate change, drought or litigation that’s hampering their efforts. Instead, a tiny mollusk called the quagga mussel – and its cousin, the zebra mussel – have suddenly appeared and spread rapidly in Western water bodies, particularly in the Colorado River Basin. Water agencies are scrambling to find ways to control further migration of the pesky critters, which are clogging waterways and infrastructure, and robbing native aquatic species of crucial food supply. This edition of the Family Farm “Water Review” addresses this growing problem, and highlights the efforts of one rural water agency – the Mancos Water Conservancy District (COLORADO) – to get in front of this challenge.

This edition of the Family Farm Water Review was prepared with assistance and input provided by Mancos Water Conservancy District and Southwest Hydro-Logic, the consulting firm hired to assess the potential for intro-

duction of quaggas in Jackson Gulch Reservoir, the primary source of water to the District.

A Primer on Zebra and Quagga Mussels

While zebra and quagga mussels are native to Eastern Europe, they were likely introduced to the Great Lakes in the late 1980’s in the ballast water of European trade ships. The main distribution of these is in the Great Lakes region and within the major rivers of the Central United States. However, in the last two years, quaggas have been discovered at several key locations within the Colorado River system, and zebra mussels have been found in Colorado’s Pueblo Reservoir (see Figure 1). The mussels can attach

themselves to almost any surface – including the hulls of boats – and can survive out of water for up to two weeks. This explains why the mussel has spread through the West as fast so quickly. “Quaggas have

[Continued on Page 2](#)

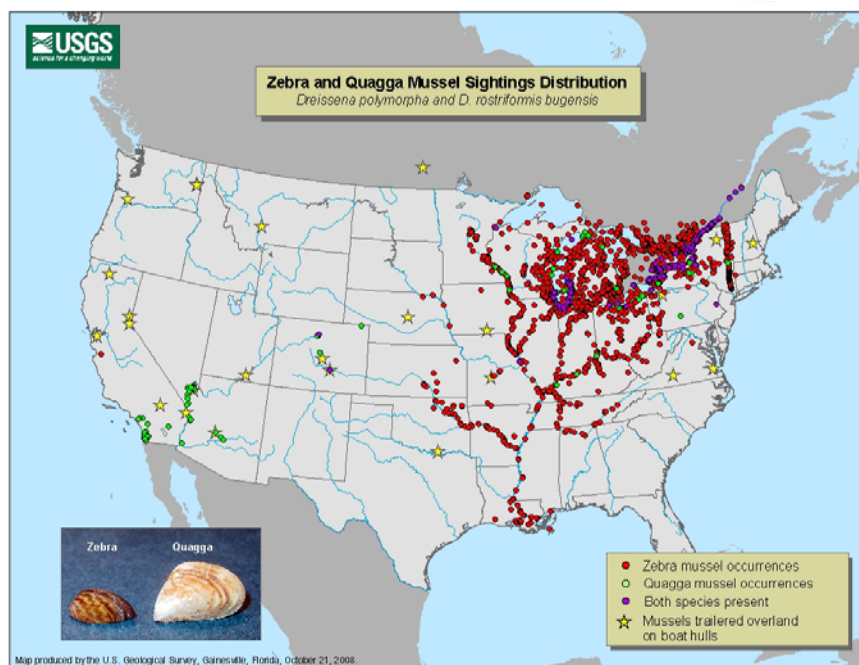


Figure 1:
Mussel Distribution in United States
Source: USGS

Recent Mussel Outbreaks in Colorado River

(Continued from Page 1)

spread to Arizona, Southern Nevada, California, and beyond,” Karl Wirkus, Deputy Commissioner for the Bureau of Reclamation (Reclamation), told a Congressional subcommittee hearing in June 2008.

These small barnacle-like mollusks (see Figure 2) smother aquatic organisms, such as crayfish and native clams and out-compete other organisms for food and aquatic habitat. They damage equipment by attaching to boat motors or hard surfaces and clog water treatment facilities. They filter phytoplankton from the food web which are necessary for the survival of other aquatic organisms.

The sudden appearance of these mussels in the West, beginning in early 2007, has generated intense attention within the Western water community, since the mussels can colonize water-supply systems and hydroelectric power plants to the point of disrupting operations.

While these invasive mussels have not prevented the delivery of water to any Reclamation customers, there are several ways that mussels can impact efficiency at Reclamation’s water facilities. Flow restrictions are a primary concern to Wirkus, as well as chemical degradation.

“That basically means rust on our infrastructure,” said Wirkus.

Urban water users dependent on Colorado River supplies are treating the recent mussel invasion very seriously. In testimony submitted at the June congress-

sional oversight hearing, Ric De Leon, Ph.D., Microbiology Unit Manager for Metropolitan Water District of Southern California (MET) warned that the the presence and spawning of quagga mussels in the Lower Colorado River and in reservoirs located in southern California poses an immediate threat to water and power systems serving more than 25 million people in the Southwestern United States.

“The recent spread of zebra mussels into a northern California lake and a Colorado lake further indicates that if these invasive mussels are not controlled, the entire Western United States could be impacted,” Leon testified. “The potential cost implications for the Western United States are likely to be even higher due to rapid growth and proliferation of these mussels in the extensive waterway networks of the West.”

Due to the risk of infrastructure colonization, MET has undertaken rapid actions for control of quagga mussels including aqueduct shutdowns, facility inspections and facility upgrades for chlorination of water entering the Colorado River aqueduct and leaving two of its water reservoirs, Lakes Mathews and Skinner which are already colonized.

Dr. De Leon believes that, based on the experiences in the Great Lakes region, the potential for widespread mussel infestation in the California

[Continued on Page 3](#)

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Ric De Leon
Metropolitan Water District of Southern California



Figure 2: Quagga Mussel USGS

Mancos WCD

(Continued from Page 2)

and other parts of the West is high.

“The State Water Project moves approximately 3 million acre-feet a year and the Central Valley Project handles approximately 6 million acre-feet,” he testified. “If quagga and/or zebra mussels began to proliferate in these systems, the cost of control measures would be significant.”

While large agencies like MET and Southern Nevada Water Authority are taking aggressive measures to combat the recent mussel invasion, smaller rural water entities want to do everything they can to prevent introduction of these pesky marauders to prevent future problems.

Local Solutions at Mancos WCD

The Mancos Project in the southwest corner of Colorado consists of the Jackson Gulch Dam and Reservoir, the Inlet Canal, and the Outlet Canal. The greater part of the distribution system was constructed by local interests prior to 1900. Facilities constructed by the U.S. Bureau of Reclamation furnish supplemental water to 13,746 acres of agricultural lands, and provide a domestic water supply for Mesa Verde National Park, Mancos Rural Water Company and the town of Mancos.

Jackson Gulch Dam is a rock-faced earthfill

structure 180 feet high with a concrete cutoff wall. The reservoir is located off-stream on Jackson Gulch, five miles north of Mancos, and has a total capacity approaching 10,000 acre-feet. The dam does not have a spillway. The outlet works consist of piped pressure conduit. The offstream reservoir is fed by the 2.6-mile-long Inlet Canal from the West Mancos River, which is tributary to the San Juan and Colorado Rivers. Water from the reservoir is returned to the original streambed at a point higher than the project lands through the 2.2-mile-long Outlet Canal.

The Mancos Water Conservancy District assumed operation and maintenance responsibility for the project in 1963. The project provides a dependable supplemental water supply for locally grown crops such as alfalfa, grass hay, pasture, wheat, oats, barley and corn silage. Mesa Verde National Park – which has averaged nearly 600,000 annual visitors in recent years – the community of Mancos and the Rural Water Company have subscribed for reservoir storage to ensure a permanent source of water for future growth of the Mancos Valley.

“The Mancos Project is a vital cornerstone underpinning the economy and well being of an entire community and region, home to world famous national historic resources,” says Gary Kennedy, District Superintendent.

Jackson Gulch Reservoir (Figure 3) is stocked with

[Continued on Page 4](#)



Figure 3: Jackson Gulch Reservoir

Source: Colorado Department of Natural Resources

Local Solutions Pushed By Mancos WCD

(Continued from Page 3)

trout, and there are many good camping and picnicking sites, as well as opportunities to hunt deer and elk. With the numerous travelers coming to this area, there is potential for invasion of quagga and zebra mussels. The District earlier this year hired Southwest Hydro-Logic, a Durango consulting firm, to assess the potential for mussel introduction into Jackson Gulch Reservoir, and to outline recommendations to prevent said introduction.

Win Wright, the certified professional hydrologist who authored the recent study, believes that, after sampling conditions in September, cool water temperature seems to be the only limiting factor for growth and survival of quagga mussels at Jackson Gulch Reservoir.

“However, we should not underestimate the ability of these persistent creatures to adapt to cooler conditions,” Wright warns.

The report identifies a range of measures that could be implemented to prevent spread of quaggas into the Mancos water supply. One option would be to establish requirements to clean and dry anything – boats, trailers, equipment, clothing, dogs, etc - that comes in contact with reservoir water. The most drastic solution discussed to possibly slow the advance of a threat is to eliminate boating from Jackson Gulch Reservoir.

The District is now working with the local community to implement quagga safeguards.

“Taking this report into consideration, the directors agreed that it is by far too risky and financially irresponsible to ignore the advance of this threat to our district,” said Kennedy. “The Board will do whatever we deem necessary to protect this important drinking water and irrigation water resource.”

Big-Picture Solutions

The challenge associated with controlling impacts and further spread of quagga mussels is getting the attention of policy makers in Washington, D.C. Rep. Grace Napolitano (CALIFORNIA) chaired the House Water and Power Subcommittee oversight hearing on quagga mussels last June. Chairwoman Napolitano stressed the need coordinate mussel research efforts underway by private, federal, state and local entities.

“We must share technological advances and work towards a collaborative focus to best defeat and control aquatic invasives,” Chairwoman Napolitano said in her opening statement at the hearing. “We can and must balance keeping our water supply safe from invasives while also keeping our recreation sites safe and open to the public. We must have boaters and

water agencies working as partners, being vigilant in public outreach, education and awareness to stop the spread of these invasives.”

In a September 10, 2008 letter to leaders of the House Appropriations Committee, Chairwoman Napolitano specifically requested

funding to fight the spread of quagga mussels in Western water bodies. It is possible that legislation introduced in the lame-duck post-election Congress could include this funding.

“The Board will do whatever we deem necessary to protect this important drinking water and irrigation water resource.”

Gary Kennedy Mancos WCD

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