

ON THE GROUND

Quaggas Muscle into Western Waters

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The quaggas are coming! The quaggas are here! In January, quagga mussels were discovered in Lake Mead, Lake Havasu, and Lake Mohave on the Colorado River, a sighting viewed as very bad news by ecologists, utilities, and recreationists.

What's the Problem?

According to the U.S. Geological Survey's Nonindigenous Aquatic Species Database, a primary reason quaggas are unwelcome is because they are "prodigious water filterers, removing substantial amounts of phytoplankton and suspended particulates from the water." While this might improve the clarity of the water, the removal of phytoplankton reduces the amount of food sources for zooplankton and ultimately alters the entire food chain. Increased transparency in the water also means more and different aquatic plants move in, further affecting the ecosystem. Waste products from the quaggas use up oxygen during decomposition and reduce the pH to acidic levels. The intense filtering action of the quaggas concentrates organic pollutants in their tissues to levels more than 300,000 times greater than what occurs in the environment. These concentrated pollutants are released in their waste products where they can be passed up the food chain.

Quaggas, formally known as *Dreissena rostriformis bugensis*, are not terribly large, typically measuring one-half to one-and-a-half inches across (see photo), but they are abundant. Aside from their biological impacts, quaggas rapidly colonize on hard surfaces, clogging water intake structures, reducing pumping capacities for power and water treatment plants, and taking over docks, breakwalls, buoys, and boats. They appear able to quickly adapt to extreme

environmental conditions and can colonize on both hard and soft surfaces, suggesting they will be here for a while.

Where Did They Come From?

Quaggas are indigenous to the Dneiper River drainage of Ukraine. They spread by canals throughout that region, and were discovered in the Great Lakes in 1989, likely through ballast water discharged from transoceanic ships. The quagga

to treat drinking water supplies, but are not environmentally sound solutions. Oxygen deprivation, thermal treatment, exposure and dessication, radiation, manual scraping, high-pressure jetting, mechanical filtration, removable substrates, molluscicides, ozone, antifouling coatings, electric currents, and sonic vibration have all been attempted with mixed results. Ducks, fish, and crayfish consume some quaggas, but with negligible impact.

Other biological controls being researched include using selectively toxic microbes and parasites, disrupting the reproductive process, and inhibiting the planktonic life stage of the quaggas from settling.

In response to news of the quaggas' arrival, the Metropolitan Water District of Southern California (Metropolitan) launched a control program in February. The program's initial detection phase began immediately with the purchase of portable decontamination units, deep-water surveillance equipment, automatic water samplers, and a polarizing microscope. During a week in

March, Metropolitan inspectors found nearly 800 quaggas in siphons that direct Colorado River water into the California aqueduct system, reported the *Riverside Press-Enterprise*. The detection phase is expected to be completed by late summer, at which point Metropolitan will prioritize infrastructure upgrades and develop control measures.

Salt River Project, Arizona's largest power and water provider, also isn't waiting around. Last spring, the utility stocked its canals with 38,000 redear sunfish, which eat mussels, in hopes of slowing the spread of the quaggas and delaying maintenance issues caused by dense mussel populations. The fish are native to the southeastern



Quagga mussels attached to a plastic dock cart that had fallen into Lake Mead, and (below) quaggas to scale. Photos by David Britton, U.S. Fish and Wildlife Service, courtesy of 100thMeridian.org.

mussel was not recognized as a species distinct from its similar-looking cousin, the zebra mussel, until 1991. The new species was named after an extinct African relative of the zebra. In 1995, quaggas were identified in the Mississippi River. Their recent discovery in the Colorado River basin was viewed as a large leap to their range and special cause for concern.

What Can Be Done?

Can quaggas be controlled? According to the USGS, although they have plagued Europe and North America for years, a chemical poison has not been developed because it would also harm other organisms. Prechlorination and potassium permanganate have been used



United States to as far west as Texas. The Central Arizona Project plans to stock them as well, a spokesperson told the *Cronkite News Service*. Both providers expressed doubt about how much good the fish can do in the long run. Russell Cuhel, a University of Wisconsin-Madison

scientist who has been battling quaggas in the Great Lakes, expressed even less optimism. He told *Cronkite News* that “the idea of introducing a predator in order to control another species in an ecosystem is the single most failed management practice in the history of humans.”

References.....

Benson, A.J., M.M. Richerson, and E. Maynard, 2007. *Dreissena rostriformis bugensis*. In the USGS Nonindigenous Aquatic Species Database at nas.er.usgs.gov/queries/FactSheet.asp?speciesID=95.

Also see www.mwdh2o.com, www.pe.com, cronkite.blog.asu.edu, and www.srpnet.com.

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Sewage Treatment Intrigue on the Border

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The rapid growth of Tijuana, just south of the U.S./Mexico border from San Diego, has resulted in sewage treatment problems for both cities for decades. Tijuana does not have sufficient facilities to treat all its waste. Consequently, raw sewage flows into the Tijuana River, its estuary, and eventually to the beaches of southern San Diego, creating environmental and public health concerns. But the proposed solution is mired in its own cesspool of controversy with accusations of corruption and undue political influence.

In 1990, the International Boundary and Water Commission (IBWC), the binational body responsible for applying boundary and water treaties between the United States and Mexico, signed Minute 283 (a binding international agreement) providing for the construction, operation, and maintenance of an international wastewater treatment plant on the U.S. side of the border. The first stage of the South Bay International Wastewater Plant, which provides advanced primary treatment, was completed in San Ysidro in 1997, but the second stage has never been built and the plant has never met U.S. water treatment standards.

In 1996 a private company called Bajagua proposed to build a privately financed secondary treatment plant in Mexico operated under a joint public-private partnership. According to the Project on Government Oversight (POGO), both IBWC and the U.S. EPA rejected the proposal in 1999 because the plant was to be in Mexico (contrary to Minute 283), would take longer to build in Mexico, was not detailed enough in its plans, and was not supported by the Mexican government. Bajagua did have support from some members of Congress.

Congress Takes Charge

In 2000, Congress passed the Tijuana

River Valley Estuary and Beach Sewage Cleanup Act. It instructed IBWC to negotiate a new Minute or an amendment to Minute 283 to build and operate a secondary treatment plant in Mexico, and to enter into a fee-for-services contract with the owner of the Mexican facility. According to POGO, Mexico had not agreed to have the facility built on its side when the U.S. law was passed, and over the next several years objected to “unilateral decisions made by the United States to award a contract for the construction and operation of a facility in Mexico.” IBWC awarded the contract to Bajagua without a competitive bidding process.

Then hints of possible bribery started to appear. *Bajagua.org*, a website sponsored and managed by the National Security Whistleblowers Coalition, claims politicians have aggressively supported Bajagua for more than a decade and allowed a sole source contract to be awarded without competitive bid. Among the politicians are California congressmen Randall “Duke” Cunningham, Bob Filner, and Brian Bilbray. *Bajagua.org* found evidence that Cunningham tried to coerce IBWC into giving Bajagua the project and that Filner received significant campaign contributions from Bajagua principals or their families. Bilbray’s name appeared on Bajagua’s payroll as a lobbyist shortly after he was voted out of his House seat in 2000. Admittedly, *Bajagua.org* has no

direct evidence that the congressmen took bribes to press Bajagua’s case.

Bajagua’s “Advantages”

According to Bajagua, its project will address the problem of raw sewage entering the United States. The private partnership may eliminate the up-front need for federal U.S. money for capital costs (although U.S. taxpayers will ultimately pay the bill). Bajagua will sell the reclaimed water to Mexico, providing a much-needed “new” water source in the region. By doing so, it will free up capacity in the U.S. outfall pipe. And according to *Bajagua.org*, it will make some private investors rich—\$600 million to as much as \$1 billion over 20 years.

Mexico has subsequently decided that having someone else finance and build a badly needed sewage treatment



Due to its proximity to the U.S./Mexican border, Tijuana’s raw sewage problems are a concern to both countries.

plant and provide recycled water for its use would not be such a bad thing. Bajagua's company website now flashes "Mexico Endorses Bajagua."

But the controversy continues. A federal court has ordered IBWC to ensure that U.S. water quality standards are being met along the border by Sept. 30, 2008, and Bajagua has fallen behind schedule. Bajagua missed a May 2 deadline for having financing in place and awarding a construction contract, and requested an extension, according to the *San Diego Tribune*. Subsequently, Carlos Marin, IBWC chief commissioner, "suspended all activities" relating to the Bajagua project pending a federal judge's decision on the request, reported the *Tribune*. One IBWC spokesperson admitted that upgrading the existing IBWC plant in San Ysidro would be more cost-effective, the newspaper said; that option appears to still be on the table.

The Real Issue

Detractors on both sides of the border say that the project does not address the issues of who will use, store, deliver, and control the quality of the recycled water, nor will it address the unconnected sewage that crosses the border from some Tijuana neighborhoods and is a major source of the pollution on San Diego's beaches, said the *Tribune*.

In May, Briggs Law Corporation released a report on the Bajagua debate prepared for the San Diego Foundation. It stated that uncollected, untreated sewage in Tijuana is a far greater environmental problem than the current undercapacity for treating the sewage that is collected. The report placed much of the blame for the sewage crisis on the fact that IBWC is not an environmental or planning agency, yet the oversight of such an agency is what has been needed.

Visit www.bajagua.com (the company website), www.nswbc.org (the National Security Whistleblowers Coalition), www.pogo.org/p/contracts/Bajagua/060301-Bajagua.html, and www.signonsandiego.com. Briggs Law report is at www.briggslawcorp.com/sewagecrisis/Bajagua_Report_FINAL.pdf.

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