

SFGate.com

[Return to regular view](#)

Print This Article

[Mussels a risk to pipelines, delta ecology](#)

- [Glen Martin, Chronicle Environment Writer](#)

Saturday, January 20, 2007



A tiny shellfish native to Eastern Europe has been found in a Southern California aqueduct and could spread throughout the state, threatening to clog the state's water-delivery systems and damage freshwater ecosystems.

Quagga mussels and closely related zebra mussels already have established themselves in the Great Lakes. There, they clog water systems and industrial intake pipes, causing hundreds of millions of dollars in damage annually. They also have eroded native fish and mollusk populations.

State authorities have worried for years that the destructive mussels would someday make their way over the Rocky Mountains. Then, on Jan. 6, quagga mussels were discovered in Lake Mead, which straddles the Nevada-Arizona border and connects to Southern California via the Colorado River and a system of aqueducts and canals.

This week, divers discovered quagga mussels on the intake of the Colorado River Aqueduct, said Bob Muir, a spokesman for the Metropolitan Water District of Southern California, which supplies water to almost 17 million people. More mussels were discovered at the Gene Pumping Plant about 2 miles west of the aqueduct's intake.

"I'd say they're here," Muir said.


California Department of Fish and Game spokesman Steve Martarano said a single mussel also was found on Grass Island in the Colorado River about 15 miles north of Lake Havasu. State and federal officials have created a multi-agency task force to deal with the threat, he said.

The bivalves, which are about the size of a fingernail and have no human food value, could cause widespread damage to Northern California power plants, refineries and water systems if they spread as expected. They also could doom many native species because they are extremely prolific and consume vast quantities of plankton, the basis of the aquatic food web. Though some fish and waterfowl feed on the mussels, experts don't think natural predators will significantly limit their expansion.





The mollusks' intolerance for saltwater will keep them out of San Francisco Bay, but they could easily infest the Sacramento-San Joaquin River Delta.


"Frankly, Californians should be scared to death," said Tina Swanson, a senior scientist with the Bay Institute, a Novato group that promotes preservation of the bay and the delta.

"Once they get established, they're virtually impossible to eradicate and extremely difficult and

 **classmates-com**

I graduated in:

1959 or before	 Wilson High (985)
1960-69	 Jefferson High (1054)
1970-79	 Commerce High (396)
1980-89	
1990-99	
2000-present	 Springfield High (514)

 **START**

very expensive to control," she said.

With dark-banded shells less than half an inch long, the quagga mussel looks much like the zebra mussel, the noxious European bivalve that has been a problem in the eastern United States for decades because it clogs water pipes and fouls power plant and water supply intake systems.

The quagga mussel, native to Ukraine, may be even more troublesome than its relative because it can tolerate deeper, colder water than the zebra mussel, meaning it can invade a wider range of environments. Quaggas were first found in the Great Lakes in 1989, according to the U.S. Geological Survey, and are causing problems identical to those attributed to zebra mussels. Both species are presumed to have come into the United States in the ballast water of ships.

Water delivery systems could be the mussel's main mode of transport in Southern California, but the shuttle of recreational boats between the Colorado River system and California waterways also is a likely avenue. Juvenile mussels can stow away in wet nooks and crannies, said Andrew Cohen, an environmental scientist with the San Francisco Estuary Institute.

"They love pipes," he said.

In Lake Michigan, he said, the mussels at times have completely clogged intake pipes 3 feet in diameter. They're also found in inland parts of New York, Ohio, Michigan and Pennsylvania as well as stretches of the Mississippi River.

Cohen said efforts to control mussel infestations at power plants, water systems, industrial complexes, boats and docks in the Great Lakes cost an estimated \$500 million each year.

"We'll probably see similar costs in California if they become established," he said.

There is also an environmental cost exacted by the exotic mussels. Cohen said their ability to strip most of the available plankton from the water could starve some native species, particularly other mollusks and small fish. For example, the mussels could affect wild salmon populations because young salmon rely on plankton for food.

And the situation could be particularly dire in the bay-delta region. An exotic bivalve known as the saltwater Asian clam already has colonized the bay to the point that it dominates the ecosystem, Cohen said.

"If quagga mussels get established in the delta, you'd have a freshwater counterpart to the clam, possibly with the analogous results," he said.

The USGS reports that large quagga and zebra mussel colonies might be contributing to a "dead zone" in Lake Erie. There could be so many mussels, the agency has postulated, that their wastes might be fueling algae blooms. When the algae dies and decays, it sucks oxygen out of the water to the point that nothing can survive.

But there may be reason for modest optimism. Cohen said studies by the Estuary Institute indicate the mussels are sensitive to water with low calcium levels.

"Generally, most Sierra Nevada streams seem to have insufficient calcium, so that could be a limiting factor," he said. "Also, some of the (large) lakes in the northeast part of the state are probably too salty for them."

However, most of California's other freshwater streams and lakes likely are well-suited for

quaggas, he said.

If and when the mussels do show up, some control measures can be taken.

"Depending on the body of water, you may be able to draw it down to eliminate a colony, or use (certain poisons)," he said. "In other situations, you might be able to chlorinate or filter sufficiently."

Ric De Leon, a microbiologist for the Metropolitan Water District, said staffers will employ a variety of methods to control the mussel, including chlorination and the use of copper sulfate, a chemical poisonous to mollusks.

Drying up canals and aqueducts also will be tried. De Leon said the district had planned to drain much of the 242-mile Colorado River Aqueduct in March for maintenance work.

"We'll use that opportunity to do a thorough inspection and eliminate any colonies we find," he said.

But in any such program, say experts, ambitions must be tempered with a sense of reality: Quagga and zebra mussels can be slowed, but it's unlikely they can be stopped.

"Our objective is control," said De Leon.

Quagga mussels

Species: Quagga mussels, *Dreissena bugensis*

Description: Like their relative the zebra mussel, quaggas are mollusks usually less than half an inch long. Color patterns vary widely with black, cream or white bands.

Native environment: The Dnieper River drainage of Ukraine. Canals and ballast water helped the mussel spread through other parts of Europe. It was discovered in the U.S. Great Lakes in 1989 and eventually spread across the country.

Habitat: Colonies can grow on both hard and sandy surfaces. They like to live in pipes and on screens, which can clog water-intake systems. The mussels can tolerate deep and cold water.

Food: Each adult mussel can filter a liter or more of water each day, robbing the water of tiny plankton and algae that feed native species.

Reproduction: They are prolific breeders. Females can produce a million eggs per season.

Source: USGS

E-mail Glen Martin at glenmartin@sfchronicle.com.

Page A - 1

URL: <http://sfgate.com/cgi-bin/article.cgi?file=/c/a/2007/01/20/MNG96NM0A71.DTL>

©2007 San Francisco Chronicle