Quagga mussels threaten western U.S. waters, researcher reports

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Both quagga, pictured, and zebra mussels originated in Eurasia in the Caspian, Ural and Baltic seas and spread to the United States in ballast water from freighters. Credit: Natalie Muth, Utah Division of Wildlife Resources

Pipe-clogging invasive mussels caused up to $1.5 billion in damage across 23 states between 1989 and 2007. Now, fingernail-sized quagga mussels, a close relative of zebra mussels, have spread to the West and threaten to do even more damage.

The threat was outlined by Chuck O'Neill, a senior extension associate with Cornell and New York Sea Grant, in testimony before the U.S. House of Representatives Committee on Natural Resources Subcommittee on Water and Power, June 24. He discussed the economic and infrastructure impacts of both zebra (Dreissena polymopha) and

quagga mussels (Dreissena bugensis).

First discovered in Lake St. Clair (between Canada and the United States) in 1988, zebra mussels spread to the Great Lakes in 1989 and were found throughout the East and as far west as the Mississippi by the early 2000s.

Quagga mussels showed up in the Great Lakes in the early 1990s and followed a similar path. In the East, quagga mussels are colonizing deeper water and are out-competing zebra mussels, O'Neill told the House committee. Last year, quaggas were discovered for the first time in the West in Nevada's Lake Mead and have since been found down the Colorado River in Lake Mojave, Lake Havasu and in various locations in California.

"[The spread west] is not a surprise," said O'Neill. "It's something that's been expected to happen."

Both quagga and zebra mussels originated in Eurasia in the Caspian, Ural and Baltic seas and spread to the United States in ballast water from freighters.

Zebra mussels filter food as small as 15 microns (the size of a mold spore); quagga mussels can feed on even smaller bacteria and out-compete their relatives. In both species, mature females produce up to one million eggs at a time that turn into free-swimming larvae called veligers. Two to five weeks after hatching, veligers become too heavy to float and search for hard surfaces to attach themselves. Water-intake pipes and similar structures offer ideal habitat for their colonization because the continuous flow of water provides steady food and oxygen and carries away waste; the structures protect the veligers against predation, silt and waves.

As mussels line a pipe or tunnel, they disrupt water flow. A single layer of mussels, 0.1 inches thick throughout a pipeline, can decrease water-carrying efficiency by 5 to 10 percent, said O'Neill. In extreme cases, researchers have measured foot-thick colonies at the bottom of Lake Erie. Great Lakes intake canals have held 2- to 3-inch-thick colonies with three-quarters of a million mussels per square meter.

Quagga mussels' jump to the western U.S. could be from recreational boats moved on trailers, said O'Neill. The mussels can survive up to a week in a cool moist boat hold.

"You could theoretically get a population from one introduction," O'Neill said. Another possibility, "though way down on the list, is purposeful dumping from someone with an ax to grind." Angry people have threatened to introduce quagga mussels into western waters in the past, he said.

Among O'Neill's recommendations to the House committee were immediate monitoring of critically important bodies of water and implementing short-term and long-term preventive measures by owners of pipelines.

"Western infrastructure owners need to learn from the eastern experience," said O'Neill. "There is no need to reinvent the wheel."

He said that the public needs to learn ways to prevent and manage mussel invasions with help from the federal government.

Source: Cornell University