CASITAS Municipal Water District

Quagga Mussels: Threat to Western Ventura County Water Supplies, Economy and Recreation

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What are Quagga Mussels?

Quagga mussels (Dreissena rostriformis) and their cousin Zebra mussels (Dreissena rostriformis bugensis) are invasive aquatic species that range in size from microscopic to about two inches in length. They are native to the Ukraine and Russia and were first discovered in the Great Lakes in the late 1980s. It is believed they arrived in America on ships from ballast water discharge. Quagga and Zebra mussels are very similar in appearance and in environmental impact. These small freshwater bivalve mollusks are triangular in shape with a ridge between the side and bottom. They have black, cream, or white bands, and often feature dark rings on their shells almost like stripes.

Quaggas differ from Zebra mussels in that they are heartier, produce more prolifically and can live at greater depths and in colder temperatures. Quagga mussels have actually displaced Zebra mussel population in some infested areas.

They will spawn all year if provided the right conditions. A few individuals can produce millions of eggs and sperm. The embryos are microscopic in size. At the larva stage, they will float on the surface and spread throughout a waterway with the currents. Once a mussel becomes an adult it will attach to a hard surface. It has the ability to detach and and move to a new habitat. Typically their lifespan will be up to 5 years.

They will eventually attach to every square inch of hard surface within a water body. They also attach themselves to soft surfaces such as plants. They reproduce quickly and in large numbers. Once established, there is virtually no chance of eradication from a waterway. Their establishment in California waters could result in an environmental and economic disaster.

What is the Status of the Quagga Mussel Invasion in California?

Freshwater mollusks were first detected in California in January 2007, in Lake Havasu on the Colorado River. They were likely introduced to these waters by recreational boaters. In subsequent months, they were found in two Southern California water systems using Colorado River water, the Metropolitan Water District of Southern California (MWD) and the San Diego County Water Authority.

MWD documented the mussels in March and again in July in its 242-mile Colorado River aqueduct, and also at Lake Mathews near Riverside and at Lake Skinner in Winchester, east of Temecula. On August 21, the mussels were discovered in San Diego County, at San Vicente Reservoir near Lakeside. They have also been identified in Dixon Lake and in the Lower Otay Reservoir.

Boats are the main carrier of mollusk.

Thus far, the mussels have not been found in California's State Water Project (SWP), which draws its water from Northern California watersheds. The main risk of mussel introduction in the SWP is from trailered boats.

What is the Threat to Lake Casitas?

The introduction of mollusk to Lake Casitas would pose a significant threat to Lake Casitas' ecology, water supplies and recreational activities. Lake Casitas is the main water supply source for Western Ventura County. It serves a population of 65,000 residents and hundreds of farms. About 750,000 recreational visitors attend the park each year.

Once infected with mollusk, every square inch of hard surface in the lake will be covered.

Lake Casitas' Intake Structures would be vulnerable to mollusk.

Water Supply Impacts:

- Clogging of intake structures, distribution works, including pumps and pipes.
- Management costs are enormous, particularly for water supply agencies due to the need for routine cleaning and repairing of equipment.
- Increase costs to treat and distribute water could have significant impact on local farmers, businesses and residents.

Ecological Impacts

- Disrupt natural food chain as filter feeders they remove food and nutrients from the water column very efficiently, leaving less or nothing for native aquatic species.
- They have the potential of collapsing entire food webs.
- Release toxins that affect other species.

Recreational Impacts

- These species clog pipes, ruin boat motors, and damage aquatic recreational equipment.
- Once established, routine maintenance of docks, boat ramps, recreational equipment and boats would be necessary and perpetual.
- They eat the plankton that fish fry depend on for food, which destroys the fishery forever.
- Recreational boating and fishing could be closed permanently. This would significantly impact the viability of the recreational area to maintain itself as a premiere Southern California recreational facility.
- Ruin boat engines by blocking the cooling system - causing overheating.
- Increase drag on the bottom of boats, reducing speed and wasting fuel.
- Jam boat steering equipment.
- Require scraping and repainting of boat bottoms.
- Reduce fish populations.

Once mollusks are introduced to Lake Casitas they could spread to the Ventura River.

Urgent Action Needed

Statewide Actions Needed:

- Ability to identify boats that have been launched into infected waters prior to entering uninfected waters such as Lake Casitas.
- Require infected waters to record CF numbers of all vessels. These CF numbers would be placed on a website for easy identification by reservoirs that are not infected.
- Require a decal or non-removable sticker be fixed onto boats launched into infected waters.
- Consider closure of infected waters to recreational boating if other measures can not be enforced.
- Early detection measures for all heavily utilized recreational water bodies such as Lake Casitas.
- Continue border check station inspections of trailered boats.
- Encourage appropriate state departments and federal agencies to continue to publicly urge boaters and watercraft users to stop spreading Quagga mussels.
- Boats launched into infected waters could be certified clear of the organism after decontamination. A certificate of decontamination would allow CF number to be removed from the list on the website and the decal or sticker to be removed from the boat.

Local Actions Needed:

Casitas is looking at options and costs of required inspections of all private boats that enter Lake Casitas or the potential requirement that no private launches be allowed.

Casitas is working on an aggressive outreach and public awareness campaign. Signs have been posted at all launch ramps and at each dock.

What can Individual Boaters and Watercraft Owners do?

Individual Boaters are encouraged to do all of the following:

- Inspect all exposed surfaces - small mussels feel like sandpaper to the touch.
- Wash the hull of each watercraft thoroughly, preferably with high pressure/hot water.
- Remove all plants and animal material.
- Drain all water and dry all areas.
- Drain and dry the lower outboard unit.
- Clean and dry all live-wells.
- Empty and dry any buckets.
- Dispose of all bait in the trash.

- Wait five days and keep watercraft dry between launches into different fresh waters.

It is important for boaters to follow these steps and cooperate with vessel inspections that are being conducted at a number of Department of Food and Agriculture border inspection stations and around the state.

What Needs to be Done?

- Preventing downstream invasions is practically impossible.
- Convincing recreational boaters to clean their boats before transporting them to new waters is essential.
- Simple steps are necessary every time a boat is retrieved other water body:
- Remove all aquatic plants, animals, and mud came in contact with water.
- Drain all water, including bilges, live-wells, the motor.
- Clean and dry everything that came in contact
- Dispose of any live bait.
- If mussels are seen attached to a boat or other recreational must be decontaminated using more stringent guidelines.
- A decontamination protocol is attached.

Conclusion

COORDINATION

The District is seeking a more collaborative role from state and federal agencies to assist with the enormous local resources that will need to be committed to prevent the further spread of invasive mussels in California.

Casitas' specific goals include:

- Protect Casitas' existing water supply
- Protect Recreation Activities
- Protect Casitas against increased water infrastructure costs and recreation costs.
- Minimize fiscal impact to Casitas.

Answers to Frequently Asked Questions

What is the economic impact of the Quagga?
Their ability to rapidly colonize on soft and hard surfaces causes serious economic problems. In addition to the hulls, engines and steering components of boats, plants and sediment, Quagga mussels attach to submerged surfaces such as piers, pilings, water intakes, and fish screens. In doing this they can clog water intake structures hampering the flow of water. They frequently settle in massive colonies that can block water intake and threaten municipal water supply, agricultural irrigation and power plant operations. In the U.S., Congressional researchers estimated that an infestation of the closely-related zebra mussel in the Great Lakes area cost the power industry $3.1 billion in the 1993-1999 period, with an economic impact on industries, businesses, and communities of more than $5 billion. California could spend hundreds of millions of dollars protecting the state water system from a Quagga infestation.

How did the Quagga mussels get to California?
The Quagga primarily moves from one place to another through human-related activities. They attach to hard surfaces and can survive out of water for up to a week. The microscopic larvae also can be transported in bilges, ballast water, live wells, or other equipment that holds water.

Do Quagga mussels have predators?
Quagga mussels have few natural predators in North America. But it has been documented that several species of fish and diving ducks have eaten them.

How can we get rid of them?
It may be possible to eradicate Quagga mussels if they are in small masses and

low density. However, preventing their spread is the best course of action. Since their larvae are free drifting, preventing their spread downstream from known infestations may not be possible.

What is being done in response to the spread of Quagga mussels?
State and federal agencies are mounting a unified response using the Incident Command System. The principal involved agencies include Fish and Game, Water Resources, Food and Agriculture, Boating and Waterways, Parks and Recreation, U.S. Fish and Wildlife.

Metropolitan Water District Actions include:

- Increased inspections at California Department of Food and Agriculture border stations.
- Dive surveys of the Lower Colorado River to determine the extent of infestation.
- Training and deployment of survey teams to inspect other California water bodies.
- Public Information and education efforts are underway, especially for boaters.