QUAGGA/ZEBRA MUSSEL
FREQUENTLY ASKED QUESTIONS

What are quagga and zebra mussels?

Dreissena rostriformis bugensis (quagga) and *Dreissena polymorpha* (zebra) are two species of freshwater mussels with D-shaped, triangular shells. The shells are smooth or shallowly ridged and can be variable in color, from solid light to dark brown, or have alternating dark and light stripes. At various stages of life mussels range in size from microscopic up to two inches. The two species are very similar in appearance. Quagga mussels are more adaptable than zebra mussels, and can live at greater depths and in colder water.

Where are quagga/zebra mussels native, and where were they first detected in the U.S.?

Quagga/zebra mussels are native to Eurasia. In 1988, zebra mussels were first discovered in the Great Lakes. In 1989, quagga mussels were also discovered in the Great Lakes. It is believed they were brought to the United States in the ballast water of trans-oceanic ships.

What are the environmental impacts of quagga/zebra mussels?

Quagga/zebra mussels are filter feeders that can consume large quantities of the microscopic plants and animals that other species depend on. As a result the ecological balance of an entire waterbody can be disturbed, displacing native species and sport fish.

What are the economic impacts of the quagga/zebra mussels?

Quagga/zebra mussels pose an economic threat to California's infrastructure and recreation industries. Mussels may impede water distribution clogging water intakes, fish screens, impede distribution of municipal water supplies, agricultural irrigation, and power plant operation. Mussels can also impact recreation by limiting recreational opportunities, encrusting docks and beaches, colonizing recreational equipment including watercraft hulls, engines, and steering components.

How are quagga/zebra mussels spread?

In addition to moving downstream with the flow of water, quagga/zebra mussels are moved by humans, who move objects on which mussels are attached from one waterbody to another. Adult quagga/zebra mussels can survive out of water for a week or longer, and the microscopic larvae can be transported in water in bilges, ballasts, live wells, or any equipment that holds water. It is suspected that quagga mussels were brought to the western U.S. on the hull of a recreational boat.

Where have quagga/zebra mussels been detected in California?

Quagga mussels were first discovered in 2007 in the Colorado River at Lake Mead, Lake Mohave, and Lake Havasu. Mussels spread downstream in the Colorado River, the Colorado River Aqueduct, and waterbodies receiving raw Colorado River water. To date, quagga mussels are known in waterbodies in San Diego, San Bernardino, Orange, Riverside, Imperial, Ventura, and Los Angeles counties. In 2008, zebra mussels were found in San Justo Reservoir, San Benito County and are currently the only known population of zebra mussels in the state. For the most up-to-date listing of confirmed mussel finds, go to http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/CaliforniaDreissenaMap.jpg

How can we get rid of them?

Eradication of quagga/zebra mussels is possible if they are in low density; however, eradication can be very expensive. Preventing their spread is the best course of action. However, since their larvae are free drifting, preventing their spread downstream from known infestations may not be possible. In North America, quagga/zebra mussels have few natural predators but it has been documented that several species of fish and ducks have been known to eat them, but these species are not an effective control.

What is being done in response to quagga/zebra mussels?

State and federal agencies have initiated a unified response to the quagga/zebra mussel invasion in California. The involved agencies include the California Departments of Fish and Wildlife (CDFW), Water Resources (DWR), Food and Agriculture (CDFA), Division of Boating and Waterways, Parks and Recreation, Cal Fire, CalTrans, State Water Resources Control Board, State Lands Commission, and the Natural Resources Agency; U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Army Corps of Engineers,

U.S. Geological Survey, National Park Service, and Bureau of Reclamation; Metropolitan Water District of Southern California; and multiple local authorities. Actions include:

- Increased watercraft inspections at CDFA Border Protection Stations.
- Development and implementation of monitoring plans for high risk waterbodies in the state.
- Training of state, federal, and local agency staff to conduct watercraft inspections and monitoring.
- Public outreach and education including mailings to watercraft owners, posting of signs, distribution of informational cards, attendance at public events, and media events.

What is CDFW doing to stop the spread of quagga/zebra in California?

CDFW, in cooperation with many other state, federal, and local agencies, has been working together to contain and control the quagga/zebra mussels since their discovery in Lake Mead in January 2007. As part of its response, CDFW has taken the following specific actions:

- At Headquarters, hired staff to guide statewide efforts including prevention, monitoring, and outreach and education. In addition, hired staff in regional offices to serve as leads for local quagga/zebra mussel efforts, and to provide guidance to local authorities, water mangers, and the public.
- Developed a watercraft inspection and decontamination training that it is offered statewide.
- In cooperation with DWR, developed monitoring protocols available on the website.
- In cooperation with U.C. Extension and U.S. Fish and Wildlife Service, developed a monitoring training program as an additional resource for local authorities.
- Developed a communications plan and networked with many state, federal, and local agencies to create a coalition that shares information, resources, and consistent messages.
- Works with local agencies to develop Control Plans for infested waterbodies.
- Trained Warden/K-9 units to assist in the detection of quagga/zebra mussels.

Is recreational boating allowed in infested waterbodies, and if so, why is public access not restricted?

Public access varies upon the waterbody because each waterbody has a unique position in its city or county. A unilateral closure of infested waters can have devastating economic impacts upon a community. CDFW works with the authority in charge of each infested water to determine the best control and containment methods. Some options include requiring all watercraft to be “Clean, Drained, and Dried” when exiting, allowing only slipped and moored watercraft, or reducing all watercraft access. Staffing and resources can affect these decisions and the ability to implement some of these options.

Where can I find information on boat inspections or cleaning stations?

Boat inspection programs are implemented by the water managers and are varied. Please contact the particular waterbody directly for information regarding their program and requirements prior to your visit.

Do all watercraft, including kayaks, inflatables, and fishing gear need to be cleaned between waterbodies?

Yes. CLEAN, DRAIN, and DRY all surfaces that come into contact with water after every use.

Can you launch a watercraft in saltwater as a way to decontaminate it?

A conservative estimate of the lethal salt concentration for quagga/zebra mussels is 10 to 15 parts per thousand (ppt). The average ocean salinity is 35 ppt. However, the duration of exposure necessary for the salt water to kill the mussels is unknown.

Does the state use a database to track watercraft leaving infested waters?

CDFW has given this suggestion consideration, and determined that it would not be feasible or effective at this time.

For more information
Hotline – 866-440-9530
www.wildlife.ca.gov/mussels