

QUAGGA MUSSEL RUNNING HISTORY 11/21/07

In January 2007, quagga mussels were discovered at a marina in the Nevada portion of [Lake Mead](#). Mussels from Lake Mead were sent to University of Texas, Arlington and examination indicates that they may have been in the lake as long as 4 years. Following the discovery of the mussel in Lake Mead, mussels were also identified in two other lakes on the [Colorado River](#), [Lake Mohave](#), NV and [Lake Havasu](#), CA.

Quagga mussels were found at the United States Fish and Wildlife Service's Willow Beach National Fish Hatchery. Nevada Department of Wildlife is developing a monitoring plan for waters that may have been stocked with fish from the hatchery and is examining possible ways to treat the water in the hatchery.

New test results indicate the presence of an extremely small number of veliger quagga or zebra mussels in Lake Powell. Two cooperative research and monitoring efforts, conducted on July 19 and 30 by the U.S. Geological Survey, the National Park Service, and the Utah Division of Wildlife Resources, detected three individual mussel larvae at the Wawheep Marina and near the Glen Canyon Dam.

Quagga mussel have been found in California at the following locations:

- Colorado River
- Lake Havasu
 - Grass Bay, south of the Havasu Landing Resort
 - Parker Dam
- South of Parker Dam
- Colorado River Aqueduct's entire 242 mile system
- Whitsett Intake, at the south end of Lake Havasu, quantities of mussels near 500 per square meter
 - Gene Wash, approximately 1.5 miles west of Whitsett Intake
 - Copper Basin Reservoir, mile 21 on the aqueduct
- Hinds Pumping Plant, mile 125 on the aqueduct
- Lake Skinner, Riverside County, water source: Colorado River Aqueduct
- Lake Mathews, Riverside County, water source: Colorado River Aqueduct
- San Vicente Reservoir, San Diego County, water source: Colorado River Aqueduct
- Dixon Lake, San Diego County, water source: Colorado River Aqueduct
- Lower Otay Reservoir, San Diego County, water source: Colorado River Aqueduct
- Lake Murray Reservoir, San Diego County, water source: Colorado River Aqueduct

New localities should be reported to DFG at BOTH 866-440-9530 and www.dfg.ca.gov/invasives/inv_reporting/sightingReport.html and USGS at <http://nas.er.usgs.gov/SightingReport.asp>.

According to the City of Escondido, a temporary ban of private vessels continues on Lake Wolford.

AGENCY COORDINATION

Upon the discovery of quagga mussel, an interagency Incident Command System was established. Agencies involved included the California Department of Fish and Game, California Department of Water Resources, California Department of Food and Agriculture, California Department of Boating and Waterways, U.S. Fishing and Wildlife Service, U.S. Bureau of Reclamation.

The Incident Command System was demobilized in mid-March; however, representative from state and federal agencies who were involved in the Incident continue to meet on a bi-weekly basis to continue working on the open actions items identified by the team. All open actions have staff assigned to them.

AGENCY COORDINATION – SUBCOMMITTEES

Three subcommittees have been developed:

- Outreach and Education, contact person: Alexia Retallack, ARetalla@dfg.ca.gov
- Monitoring, contact person: Dean Messer, dmesser@water.ca.gov
- Sampling and Laboratory Protocols, contact person: Jeff Janik, jjanik@water.ca.gov

DIVE TEAMS

Dive teams from a variety of state, federal and local agencies surveyed from the start of the incident through February 7th during which all high potential waterbodies in southern California were surveyed. No quagga mussels were found. Dive surveys were suspended in the State Water Project.

Metropolitan Water District of Southern California (MWD) and the City of San Diego attended dive training at the end of August hosted by MWD.

SURFACE SURVEYS

Surface surveys have been completed for all high priority waterbodies in the state. No quagga mussels were found.

COORDINATION WITH SOUTHERN CALIFORNIA

Metropolitan Water District of Southern California (MWD) and City of San Diego Water Department are not formally part of the State/Federal Quagga Mussel Response organization; however, California Department of Fish & Game (DFG) and California Department of Water Resources coordinates with them and tracks their results.

Metropolitan Water District of Southern California (MWD)

Initial monitoring during the March shutdown by Metropolitan Water District of Southern California (MWD) showed colonization no further than 21 miles into the system with mussel concentrations low, generally in the range of 2 to 10 mussels per square meter. Staff was able to eliminate many of those mussels in the system using the shutdown of the Colorado River Aqueduct in March. During the March closure of the aqueduct, MWD inspected at least 56 siphons, numerous aqueduct sand traps, Iron Mountain Pumping Plant and Hinds Pumping Plant. 778 mussels were found in siphons between miles 11.98 and 20.96. No mussels were found in and around Iron Mountain Pumping Plant, Hinds Pumping Plant, on the sand traps or in the open aqueduct. A total of 114 mussels were removed at the Whitsett Intake, two at Copper Basin and 14 in Gene Wash. Inspection of Diamond Valley Lake, Lake Mathews, Lake Skinner and many additional raw water feeder lines turned up

negative for mussels. All mussels found by MWD were harvested, frozen and returned to the Water Quality Laboratory. This completed the initial investigation to obtain a snapshot of existing mussels within MWD's system.

In early June, MWD divers inspected the Whitsett plant intake structure, the trash racks and Copper Basin to assess mussel infestation resulting from the larvae production in the Colorado River. In addition, divers retrieved concrete blocks placed in front of intake as part of a monitoring program. Very small mussels, 1/16 - 1/8th inch in size, were found at a density of 500 per square meter at 35 feet and deeper and at 300 per square meter above 35 feet deep at plant intake. This represents a density of quagga mussels 100 times higher than that found in February of this year. Mussels at 1/4 inch in size and larger were also observed suggesting that spawning was occurring at periodic intervals perhaps due to multiple sub-ecosystems within the Colorado River. Mussel populations at different locations within the river were apparently reaching reproductive maturity at different times thus extending the season for veliger production and exposure to MWD's system. Mussels were found again at Copper Basin in the inlet structure but densities were still rather low. The Copper Basin outlet structure could not be inspected by the divers due to the six pump flow.

In late June, Metropolitan discovered mussels attached to the inside of pumps at the Eagle Mountain and Hinds pumping plants. This led to a 10-day shutdown of the CRA in early July. Inspections of the aqueduct during this shutdown confirmed the presence of quagga mussels at selected sites throughout the length of the 242-mile aqueduct system, including portions of the 15-mile San Jacinto Tunnel and at the inlet channel at Lake Mathews.

In early August, MWD discovered a couple dozen mussels, ranging in sizes between about 1/8- to 1/4-inch long, at depths of up to 50 feet on Lake Skinner's outlet tower. In addition, two small mussels were found attached to rocks in 13 feet of water near a buoy line at the lake's inlet. During this period, no mussels were found at Diamond Valley Lake.

During this year, the higher pumping rate period coincided with the mussel spawning season, which in turn coincided with the additional infestation of the Colorado River Aqueduct. The greatest density of new infestation is likely to occur between the Whitsett Intake and the outlet of Copper Basin five miles into the conveyance system. Around-the-clock chlorine treatment at the Copper Basin effluent, initiated at startup following the 10-day shutdown, will kill most if not all veligers passing from the Colorado River/Copper Basin system. MWD notified officials at member agencies that divert water directly from the aqueduct-Eastern Municipal Water District, Western Municipal Water District and the San Diego County Water Authority of the most recent findings.

MWD just completed another short 2-day shutdown of the CRA to evaluate the effectiveness of 24/7 chlorination to control veligers at the outlet of Copper Basin Reservoir. The shutdown occurred last week between October 3rd and 5th. Inspections focused on finding newly settled mussels. Young, recently settled mussels were not found along the 70 mile stretch of the CRA in siphons, pumps or sand traps, all an indication that chlorination was working to kill veligers at Copper Basin. Young mussels were found in quantity at one location much further into the CRA indicating another veliger source within the CRA. Reproductive populations were found earlier in sandtraps that could be the source of those veligers.

MWD continues monitoring and clean up of their aqueduct system and continues to support its member agencies.

City of San Diego Water Department

The City of San Diego Water Department is moving forward with setting up a plankton sample program under general direction of MWD. This will be used for early detection surveys. The City Water Departments Laboratory is purchasing a suitable microscope that includes a camera system.

Minus the extreme depths of El Capitan and San Vicente Reservoirs, all dive and surface surveys have found no quagga mussels thus far. The City has purchased a ROV.

The City is also looking at options and costs of required inspections of all private boats that enter their waterways or the potential requirement that no private launches will be allowed within city waterways.

The City is working on an aggressive outreach and public awareness campaign. Signs have been posted at all launch ramps within their waterway systems and at each of the causeways on the docks. Each of the eleven reservoirs within the jurisdiction are distributing quagga mussel flyers produced by DFG.

The City of San Diego Water Department Dive Team cross-trained with Metropolitan Water District Dive Team at Lake Havasu. This involved a dive at the Whitsett Intake structure. Two weeks later both groups were able to again cross-train on a newly arrived ROV (Remote Operated Vehicle).

City Divers have used the ROV for deep depth survey while completing a wet survey of El Capitan Reservoirs in-take tower. No Quagga were located.

To date, (3) reservoirs have tested positive for the presence of quagga mussel:

- San Vicente Reservoir, quagga mussel discovered via plankton tow sampling and identified by the City of San Diego Water Department laboratory;
- Murray Reservoir, quagga mussel discovered via plankton tow sampling and identified by the City of San Diego Water Department laboratory;
- Lower Otay Reservoir, very small settled quagga mussels discovered on the bottom of a buoy line near the dam or in-flow structure.

The City of San Diego Water Department will be moving forward with inspections and notices to boats entering and leaving their waterways. The City will be following the procedures currently used by Casitas Municipal Water District starting October 30. This is to notice to all boats, kayaks and float tube users that if they have been at a waterbody on a list of confirmed quagga mussel infested within the past five days, the vessels will be inspected for mussels and fluids in compartments, and live wells must be dry and clear of debris. Also, when vessels leave City reservoirs that are known to be infested they will be inspected to confirm no reservoir water is on board their boats in any manner. They also will be given Quagga Mussel outreach material.

CDDA BORDER PROTECTION STATIONS

Border check stations at Yermo, Needles, Vidal Junction and Truckee have increased operating hours to 24/7.

As of November 18, 2007, approximately 80,664 trailered boats have been checked. About 8,669 boats contained water that needed to be drained. Over ninety vessels have been quarantined at the BPS.

TRAINING

DFG Office of Training and Development is pleased to offer "Watercraft Decontamination Training" classes. Watercraft Decontamination Training classes will focus on identifying the presence of quagga/zebra mussels on recreational watercraft and techniques and protocols for decontaminating watercraft and equipment, including using the new Grab-N-Go decontamination kits recently produced by the Pacific States Marine Fisheries Commission.

Classes have been held at the Los Alamitos DFG Office with 30 participants, Ontario DFG office with 34 participants, Yountville DFG office with about 30 participants and Konocti Vista Casino with about 50 participants, Stockton DFG Office with about 25 participants, Monterey State Parks Training Center Annex with 5 participants, City of San Diego Water Department with over 70 participants and the Redding Library with over 40 participants

Trainings in Rancho Cordova and Fresno have been postponed for a later date.

COMMUNICATIONS

A quagga mussel web page is available at www.dfg.ca.gov/quaggamussel.

The toll-free call-in information number is (866) 440-9530. Hours of Operation: Mon-Fri. 8am - 5pm.

Quagga mussel flyers and all weather signs have been printed and distributed. Additional reprinting will occur when needed following revision to the materials. Zap the Zebra brochures are also available.

A communication plan is under internal review. This plan is designed to outline the needed outreach for this effort.

SCIENTIFIC ADVISORY PANEL

The quagga mussel scientific advisory panel (SAP) convened April 4, 2007. SAP was charged with considering the full range of eradication and control options without respect to cost. SAP made recommendations for eradication, containment, and monitoring and discussed future research needs based on known conditions as of April 4, 2007. The report is posted on the webpage.

FUNDING

Funding was approved to continue the current operation until June 30, 2007. Funding and positions were approved for DFG and CDFA to enhance the current program for FY 2007-2008 and FY 2008-2009.

MONITORING

Under the direction of DFG, Portland State University Center for Lakes and Reservoirs is collecting water samples from high priority waters in California and using microscopy to determine if veligers are present.

RISK ASSESSMENT

Under the direction of DFG, the San Francisco Estuary Institute is performing a phased risk assessment of California waters in order to rank sites for further monitoring based on the likelihood that quagga or zebra mussels will establish. Phase 1 of the risk assessment includes 160 waters and is available on the website at www.dfg.ca.gov/invasives/quaggamussel/docs/PotentialDistributionZebraQuaggaInCA.pdf.

ENFORCEMENT

A K-9 Program has been added to the DFG as a tool against poaching and a means to detect the invasive quagga mussels, ammunitions and other odors, providing the state with an additional level of homeland security. DFG plans to train up to 24 dogs, all of whom will be trained in detecting quagga mussels. The first dog academy is set to begin in November and will consist of six dogs and handlers who will be trained in obedience and detection. A demonstration of the dogs' abilities was held for the media on Oct. 24 in the Yolo Basin Wildlife Area in Davis.

LEGISLATION

AB 1683, Wolk was signed by the Governor on October 14. AB 1683 authorizes the Department of Fish and Game to conduct inspections, order quarantines, and take other actions necessary to prevent the spread of invasive dreissenid mussels, including quagga and zebra mussels. DFG is developing procedures for implementation.

PANEL MEETING

November 29: ACWA Conference, Indian Wells, CA. Water Trends Program III: "Quagga Mussels Invasion: What Challenges Can the California Water Industry Expect?" will be moderated by Dean Messer, DWR.