



## **STAFF REPORT**

**TO:** Chairman and Board Members  
**THRU:** Mark Foree, General Manager  
**FROM:** Ron Penrose P.E., TMWA Project Manager and River Fund Facilitator  
**DATE:** September 11, 2012  
**SUBJECT:** **Presentation on Aquatic Invasive Species in regard to Lake Tahoe and the Truckee River Watershed**

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### **Purpose**

The purpose of this report is to provide the Board members a concise summary of TMWA efforts to prevent the spread of Aquatic Invasive Species (aka AIS) into the Truckee River system and potentially into our treatment facilities. You are aware of recent newspaper accounts of this issue, most notably the Quagga Mussel and efforts to prevent an infestation of this species into Lake Tahoe. After your review of this report it will be very clear that TMWA has been totally engaged in regional efforts to prevent the introduction of the Quagga Mussel and other invasive species.

### **What is a Quagga Mussel?**

The Quagga Mussel is a fresh water mollusk about 1.5 inches in length. Shells typically have dark rings and color patterns that can vary from black, cream or white. It is an invasive species and was introduced from the Ukraine into Great Lakes waters in 1989. They are now found in 16 states, including California and Lake Mead in southern Nevada.

### **Quagga Mussel Biology**

The Quagga Mussel is a prolific breeder and can tolerate a wide range of environmental conditions. Mature females are capable of producing up to 1 million eggs per season. These hatch into microscopic larvae, called veligers. Veligers will drift with the current trying to find a suitable location to attach and evolve. Quagga Mussels are filter feeders in that they use cilia to pull water into the shell cavity where desirable microscopic organisms are removed from the food chain, thereby adversely affecting other native species. The mussel then excretes mucus, called pseudofeces, which is high in phosphorus which can accelerate growth of blue-green algae.

### **What are the Adverse Effects of the Quagga Mussel?**

Because of their biological characteristics, infestations of Quagga Mussels can have a very deleterious effect on water bodies and beneficial uses of that water body. These are:

- Depletion of natural food resources necessary to sustain the native biology and fishery of water bodies.
- Change to the native chemistry of a water body.
- Development and proliferation of blue-green algae which thrive on phosphorus waste excreted by the mussel.
- Encrustation of lake beds and water intake facilities.
- Fouling of shore lines with shell remains.

### **What are the Possible Consequences to TMWA should Quagga Mussels Become Established in the Truckee River System?**

Should Quagga Mussels ever gain a foothold in the Truckee River System, the consequences could be quite severe. Besides the ecological damage which would damage the pristine nature and reputation of Lake Tahoe, TMWA could be faced with expensive improvements and operating costs to deal with fouling of water supply canals, intakes and pipelines serving our treatment facilities and run-of-the-river hydroelectric plants.

In 2007, the Quagga Mussel became firmly established in Lake Mead. This infestation was the first occurrence in the West. The mussel literally “hitched a ride” from the Great Lakes to Lake Mead. As a result, the Southern Nevada Water Authority (SNWA) implemented an intensive monitoring and control program. The control portion included the addition of new chlorine injection points along raw water pipe lines at a cost of \$5 million with annual operating costs of \$1-4 million. An adverse consequence of additional chlorine injection was an increase in disinfection by-product formation, a contaminant regulated under EPA. As a result, SNWA is researching and spending more money on alternative control strategies.

Until recently, the Quagga Mussel was not found in northern Nevada water bodies. This has since changed with recent confirmation of their presence in Lake Lahontan.

### **What is TMWA Doing in Response to the Quagga Mussel Issue?**

Control measures for Quagga Mussels are expensive. Prevention of infestation is the key. As a result, in 2008 TMWA supported the development and implementation of a watercraft inspection and decontamination program at Lake Tahoe coordinated by the TRPA. This program has since evolved into a mandatory program. TMWA, through a grant from the Truckee River Fund, provided much of funds necessary for the early implementation of the program.

Subsequent to the TRPA grant, it became apparent that other water bodies on the Truckee River were at risk. As a result, TMWA (again through the TRF funding mechanism) provided grants

to the Tahoe Resource Conservation District for the development and implementation of voluntary watercraft inspection programs at Boca Reservoir, Stampede Reservoir, Prosser Creek Reservoir and Donner Lake. As a result of these voluntary programs and additional risk analysis, TMWA expects the implementation of permanent, mandatory inspection programs for these waters.

TMWA also has another water supply resource, Independence Lake. Although TMWA owns the water within the lake as a drought resource, the watershed surrounding the lake is owned and operated by the The Nature Conservancy (TNC). In response to the Quagga Mussel threat, the TNC prohibits the use of privately owned watercraft but provides an “in-basin” fleet of motor boats and kayaks for public use.

TMWA is also in support of studies by the University of Nevada concerning the long term survivability of the Quagga Mussel in the Truckee River System. These studies continue.

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# TMWA RESPONSE TO THE AQUATIC INVASIVE SPECIES PROBLEM

September 2012



# POINTS TO BE COVERED

- **What are Aquatic Invasive Species (aka AIS)?**
- **Why are Aquatic Invasive Species a Threat to the Water Supply of Northern Nevada and TMWA customers?**
- **Do Aquatic Invasive Species Exist in Nevada waters and specifically Northern Nevada and Northern Sierra waters?**
- **TMWA Response to the Aquatic Invasive Species Threat**



# WHAT ARE AQUATIC INVASIVE SPECIES AND WHY ARE THEY A THREAT?

- **By Definition an Aquatic Invasive Species is any plant, invertebrate or fish that is introduced into non-native aquatic environment (water body)**
- **Disruptive and Destructive to Biology and Chemistry of water bodies with depletion of natural food resources required to sustain native species**
- **Pose Severe Impacts to Beneficial Uses of Water Bodies: recreational, water supply, economic, environmental and fisheries**
- **Regional Water Quality and Economic Impact-Economic impacts to municipal water suppliers**
- **Examples: Eurasian Milfoil, Zebra Mussel, Asian Clam, Quagga Mussel**



# Do Aquatic Invasive Species Exist in TMWA's Raw Water Supplies and Other Supplies Across the State?

- **Yes**
- **Asian Clams have been found in Lake Tahoe: TRPA is attempting to control the species**
- **Eurasian Milfoil: This AIS plant has fouled the waters of the Tahoe Keys; has periodically caused problems with TMWA's intake facilities; TRPA has implemented a control program moving from north to south in the lake.**
- **Quagga Mussels: Have taken over Lake Mead causing the SNWA to implement costly control measures; have also been found in Lahontan Reservoir; not currently in TMWA Source Waters but there is great concern that they may gain a foothold.**



# What is TMWA Doing in Response to the AIS Issue?

- **Relative to Eurasian Milfoil** have funded projects to test methods to control milfoil- control methods now being used at Tahoe
- **Quagga Mussels-Tahoe:** Funded start-up and development of mandatory boat inspection/decontamination program at Tahoe- program successful and accepted by public
- **Quagga Mussels-other Truckee River Water Bodies:** Funded start up and development of voluntary boat inspection/decontamination programs at Donner, Boca, Stampede and Prosser Cr Reservoirs; Current funding supporting implementation of mandatory program at these water bodies; supported development/implementation of similar programs at Independence and Webber Lakes
- **AIS Science and Research:** Supported research relative to sustainability and control of AIS through the University of Nevada