Nevada Weed Management Association

Newsletter for Sharing Information & Technology on Managing Invasive Plants in NV

Summer / Fall 2013 Issue 3

Photo Courtesy of Nate Weber

In This Issue of NWMA:

Letter from the President

Weeds to Watch: Thistles

Dreissenid Mussels Come to Nevada

NDA's Biological Control Program Update

Management Tools: Telar XP for Perennial Pepperweed

Russian Olive Control Techniques

2013 NMWA Conference Information

Dreissenid Mussels Come to Nevada!

By Andrea J. Minor, Natural Resource Specialist at the Lahontan Basin Area Office

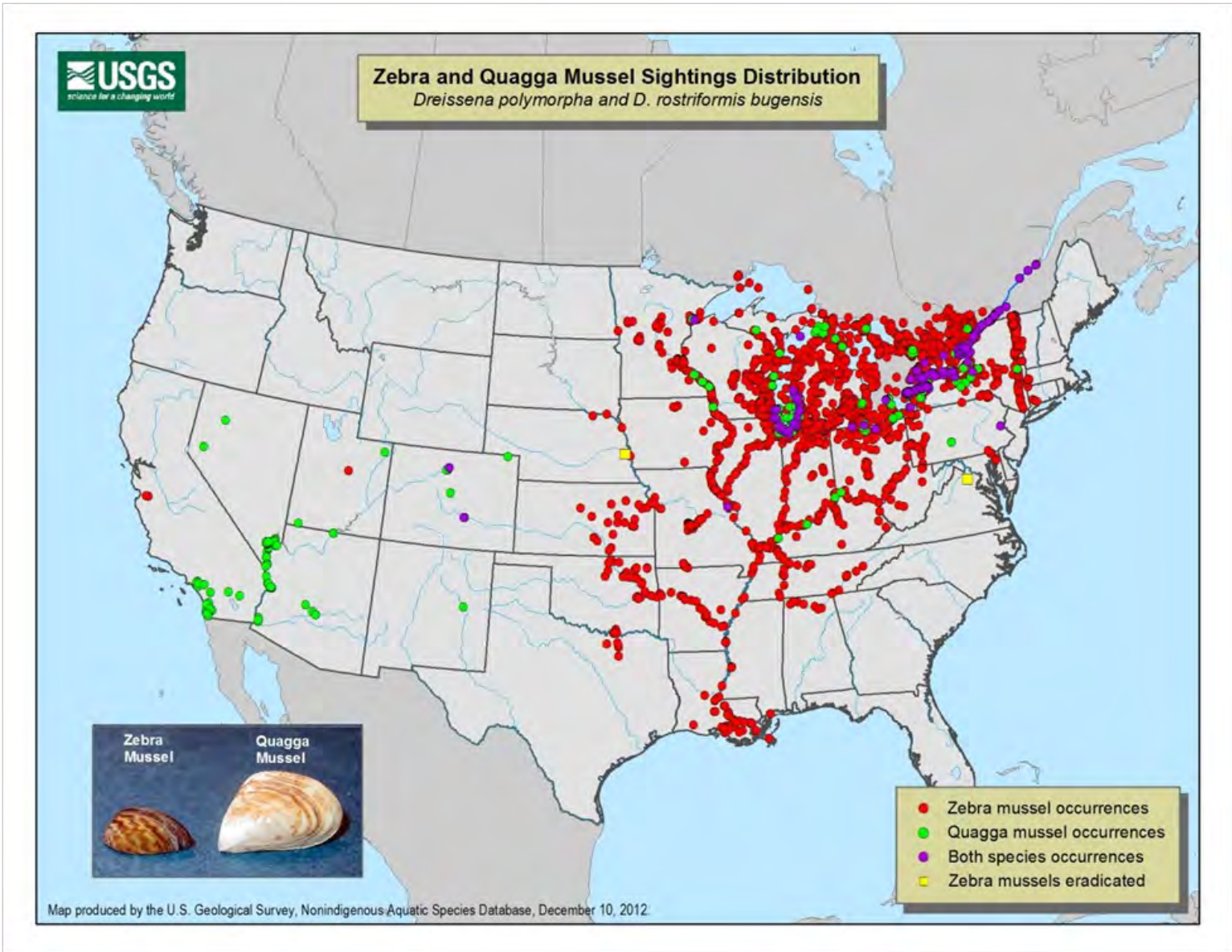
This is normally a newsletter devoted to weeds of the terrestrial nature, but aquatic invasive species (AIS) have the potential to affect everyone. And like terrestrial invasive species, the aquatic nuisances can sneak in before anyone notices they have a large problem. One of the most notorious is the quagga mussel, and its close relative, the zebra mussel.

Figure 1 Quagga mussel (USFWS photo)

Dreissenid mussels include two species of mussels now found in North America, zebra mussels (*Dreissena polymorpha*) and quagga mussels (*D. bugensis*). Both species are native to Eastern Europe, in the area of the Caspian and Black Seas, and it is believed they arrived in ballast water of ocean-going ships. Zebra mussels were discovered in the Great Lakes in 1988, and as a result of this infestation, the potential damage to both native ecosystems and man-made infrastructure quickly became obvious. In 1989, quagga mussels were discovered in the Great Lakes.

Dreissenid mussels are prolific breeders; one female can produce a million eggs in a spawning season. Fertilization occurs in the water column and the immature mussel, called a veliger, is susceptible to predation and unsuitable environmental conditions. It floats with the currents, or can be transported in standing water on boats or in engines, before settling on a suitable surface which can be mud or hard substrates, manmade structures, other aquatic species (such as native mussels or turtles), and even on other invasive mussels. It takes a year to reach sexual maturity, and the average life span is 4 to 5 years.

These species were contained east of the 100th meridian until January 2007, when well-established populations of quagga mussels were discovered in Lake Mead, and then downstream in Lake Mojave and Lake Havasu, AZ. Populations have since been discovered in San Diego and Riverside Counties in California and in Lake Powell, AZ. Zebra mussels have largely remained in the central U.S., but one population has been discovered in San Justo Reservoir in central California. These western populations of invasive mussels most likely arrived on trailered watercraft.



In 2011, veligers were detected in Lahontan Reservoir, and suspect samples have been detected in Rye Patch Reservoir, Wildhorse Reservoir, Topaz Lake, and Ruby Lake, NV. To date, no adult populations have been discovered in these water bodies.

However, the obvious question is: Will they become established as they have in Lake Mead and elsewhere in the Lower Colorado River system?

Dreissenid mussels, especially quagga mussels, can survive in a wide range of conditions, but they require certain environmental parameters to be able to establish and thrive. Calcium seems to be the most critical element for survival. Other parameters, such as temperature, pH, dissolved oxygen, and salinity also are factors.

Why are invasive mussels such a problem? Because of their impacts to both the environment and man-made structures, and the fact they are impossible to safely eradicate once established. A single mussel can filter one liter of water a day, removing nutrients and plankton from the water. These tiny plankton are at the bottom of the aquatic food chain for larger organisms, who are in turn eaten by larger organisms, all the way up the food chain to large game fish. Studies have shown that native fish populations in the Great Lakes are declining in both size and numbers, as these species lose the smaller fish on which they prey. Cleaner water may seem like a good thing, but the extra clarity allows sunlight to reach greater depths, resulting in an increase in aquatic weeds and toxic algal blooms.

In addition, these mussels cause bio-fouling (clogging) of dams, irrigation delivery systems, power generation facilities, and municipal water systems.

Figure 3. Bio-fouling of pipe - photo from NY Sea Grant

The costs to remove these species and keep systems running are phenomenal:

* The Bureau of Reclamation's Lower Colorado office annually spends $1 million at Hoover Dam for quagga mussel control. (NDOW)
  http://www.ndow.org/Boat/Aquatic_Invasive_Species/FAQs/

* Additional costs incurred by Southern Nevada Water Authority: $172,600 annually for chlorination additions; $340,000 for removal of quaggas from one drinking water intake tunnel; $6,000 for routine maintenance and removal; $560,000 for proposed chemical control; $300,000 for research on the invasion. (NDOW)

* The Municipal Water District (of Los Angeles) has spent $30 million over the last five years to fight the quagga and might be spending $8 million to $10 million a year on it into the unfathomable future. (LA Times)
  http://articles.latimes.com/2012/mar/18/business/la-fi-hiltzik-20120318

* An analysis of potential impacts of AIS infestation at Lake Tahoe found the combined losses of recreation visitation value and associated tourism spending to have the potential to reach over $189 million over a fifty year period of analysis (an average annual damage of $10.2 million). Adding private property value losses ($8.7 million in average annual losses), water supply infrastructure costs ($2.0 million in average annual losses), and boat and pier damages ($1.5 million in average annual damages) result in an estimated combined average damage of $22.4 million per year. (TRPA AIS Plan)
http://www.trpa.org/documents/docdwnlds/AIS/LTAIS_Magmt_Plan_Final_11-2009.pdf

How do they spread? Both adults and veligers have been found in live wells, bait buckets, bilges and engines of boats leaving contaminated waters. Adults are relatively hardy out of the water - they can live for over a month in winter in cool northern Nevada, but only a few days in summer in southern Nevada. The larval veliger can float with currents in rivers and lakes and can be transported via recreational and aquaculture activities.

How do you get rid of them? At this time there is no known safe eradication method for Dreissenids once established, because all "solutions" are toxic to the aquatic environment. The best and only fix is prevention. As mentioned before, although veligers have been detected in northern Nevada waters, it is still uncertain if these will be able to develop into thriving adult populations. However, even as veligers, they can still be transported to other non-contaminated water bodies.

What you can do to help prevent the spread? Take the time to clean, drain and dry your watercraft. Take advantage of voluntary inspections and decontaminations. (Only a hot water wash - 60 seconds of contact time at 140 degrees at the surface - will kill quagga mussels.) Be as diligent about not transporting aquatic species as you would with terrestrial weeds!