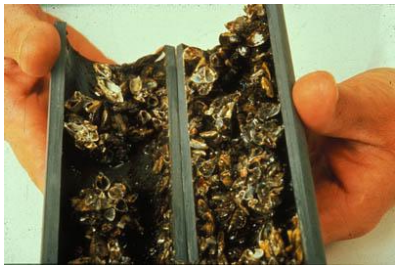
AIS Threats to Nevada's Waters
Quagga/Zebra Mussels and New Zealand Mudsnails

Quagga & Zebra Mussels

The most notorious and economically damaging AIS to invade the U.S. are quagga and zebra mussels. There is no known safe method of eradication once the mussels have become established in a large water body. Quagga and zebra mussels arrived in the U.S. in the late 1980's in the Great Lakes Region. Non native to North America, they are believed to have arrived from the Ukraine through commercial ship ballast tanks or anchor chains or other equipment. Quagga and zebra mussels are close cousins and both species cause significant biofouling (clogging) of water infrastructures including power generation, irrigation and drinking water supplies. They can attach to boat hulls and can even be found inside of motorboat engines. In addition, because they form large clusters of mussels on hard or semi-hard surfaces, they suffocate out native benthic organisms that fish consume and disrupt the ecological balance of waterways. Mussels also filter vital nutrients out of the water leaving less for the fish community and other organisms. There are no known native predators capable of controlling the mussel populations.

In Nevada, zebra mussels are not currently present; however, Lake Mead National Recreation Area discovered quagga mussels in Boulder Basin in 2007. Since that time, the mussels have spread throughout the lower Colorado River system. With the exception of Lake Mead National Recreation Area and the lower Colorado River, adult mussels have not been found in Nevada, however, in
April 2011, Lahontan and Rye Patch Reservoirs in Northern Nevada tested positive for the presence of quagga mussel veligers (larvae). Subsequent sampling since that time has not found any veligers or adult mussels.

Preventing the spread of quagga and zebra mussels through thoroughly cleaning, draining and drying your equipment or having your equipment professionally decontaminated is the best method to prevent the spread of these prolific invaders.



Click on the link below to view a U.S. map showing quagga & zebra mussel infected lakes and reservoirs
http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/current_zm_quag_map.jpg
The links provided below provide additional information on quagga and zebra mussels.
http://en.wikipedia.org/wiki/Quagga_mussel
https://www.westernais.org/moving-a-boat
http://www.dfg.ca.gov/invasives/quaggamussel/
http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/

It is a violation of Nevada State Law to transport Quagga or Zebra Mussels

New Zealand Mudsnails

Originally from New Zealand, the New Zealand mudsnails (NZMS) are a relatively small aquatic invasive species with an average length 4-5mm (1/8") in the western U.S. and up to 11mm in their native habitat. Primarily found in streams, canals, rivers and lakes, they can occupy a wide variety of substrates including silt, sand, mud, vegetation, cobble, rocks

and gravel. NZMS have shells that consist of a right-handed coiling of 5-6 whorls and the shells vary in color from gray to dark brown. The snails reproduce rapidly and most populations are asexual with the females born with developing embryos in their reproductive systems. The adult NZMS may easily be confused with various native and exotic species which can be similar in appearance, and all newly discovered populations should be verified by experts. The shell of the snails is narrower, longer, and has more whorls than most native snails in the U.S. The snails are live bearers as they release embryos and not eggs.

As with most aquatic invasive species, NZMS are a cause for concern where they occur because of their ability to rapidly reproduce and cover the habitat of native invertebrate communities. Since the mid-1980's, some North American population densities in infested streams have reach up to ¾ million individuals per square meter. The species has the potential to impact the food chain of trout and other fish species and have the potential to disrupt the physical characteristics of invaded ecosystems through reductions in the biomass of periphyton and the resulting interactions can have wide ranging affects on stream ecosystem process. They also have the potential to become a pest species of freshwater supplies: for example, the mudsnails have been known to actually emerge from domestic water taps in New Zealand.

Transportation and new infestations are believed to occur through the contaminated equipment of recreational rafters, boaters and anglers. Felt sole waders have been known to provide acceptable habitat for the organisms to attach thereby making them easily transferred from one body of water to another. Recreationalist could unknowingly be transferring the snail and infesting new water bodies. All water users are highly encouraged to Clean, Drain and Dry out all equipment when exiting any body of water.

In Nevada, NZMS occur in the Salmon Falls Creek drainage, Beaver Dam State Park, Lake Mead National Recreation Area and the Lower Colorado River, Maggie Creek and a small portion of the Humboldt River near Carlin.
Provided below are some helpful links for additional information:

http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=1008
http://www.protectyourwaters.net/hitchhikers/mollusks_new_zealand_mudsnail.php
http://en.wikipedia.org/wiki/New_Zealand_mud_snail
http://www.dfg.ca.gov/invasives/mudsnail/
http://seagrant.oregonstate.edu/sgpubs/onlinepubs/g10001.pdf