

## **Invasive Mussels Found in Lake Mead**

On January 6, live quagga mussels were discovered in Lake Mead at the Las Vegas Boat Harbor. Like its infamous cousin the zebra mussel, quagga mussels are biofoulers that can obstruct pipes in municipal and industrial raw-water systems, costing millions of dollars annually to treat. Their presence can also have serious impacts on native wildlife, fisheries and the local ecosystem. And for the unsuspecting boater, these diminutive creatures can be the cause of some real headaches.

Since that initial discovery, other infestations have been confirmed at Lake Mead Marina, Callville Bay Marina, Kingman Wash and at the Lake Mead Hatchery in the Boulder Basin. Outside of Lake Mead, additional colonies of quagga mussels have been identified at Katherine Landing on Lake Mohave and in locations on Lake Havasu.

Does the quagga's presence mean you can no longer go fishing, swimming or boating in the affected bodies of water? No, that isn't the case at all, but by taking just a few minutes to learn about these demons from the deep, you can protect your own equipment while doing your part in the fight to keep them from spreading to other waters.

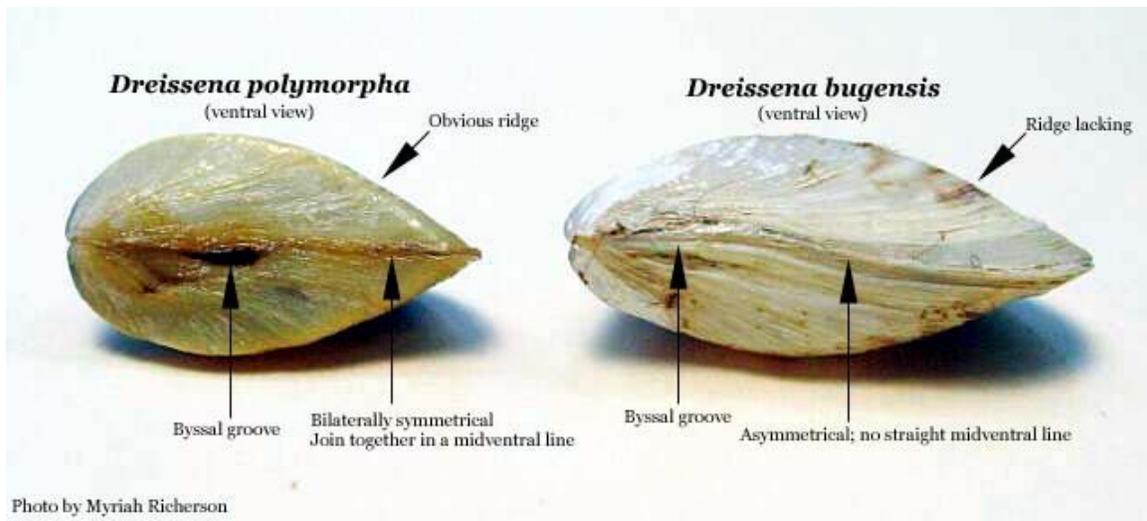
FAST FACTS about quagga mussels:

(The following information was compiled from the information available through the US Geological Survey, 100<sup>th</sup> Meridian Initiative, and the Arizona Department of Game & Fish.)

### **What are quagga mussels?**

Quagga mussels are a small freshwater bivalve mollusk with a triangular, rounded shell. They usually have dark concentric rings on the shell and are paler in color near the hinge, and can reach a size of up to 1.6 inches (4 cm). They are closely related to the zebra mussel but quaggas are rounder and usually lighter in color. The zebra mussel gets its name from the black (or dark brown) and white markings that appear on its shell. It is generally smaller than the quagga.





Zebra mussel

Quagga mussel

### Where did quagga mussels come from?

Quagga mussels are native to the Dneiper River drainage of Ukraine in Eastern Europe. They were first identified in North America in 1989, in Lake Erie, and have since spread throughout the lower Great Lakes, the St. Lawrence River and connected canal systems. Ballast water discharge from oceangoing shipping is the likely source of introduction. Unlike the zebra mussel, which has spread throughout the Great Lakes and the Mississippi River, the quagga has been found only in a few locations outside the Great Lakes prior to its discovery in Lake Mead.

**Where on Lake Mead have quagga mussels been found?** Since their initial discovery at Las Vegas Boat Harbor, quagga mussel infestations have been confirmed by divers at Lake Mead Marina, Callville Bay Marina, Kingman Wash and at the Lake Mead Hatchery in the Boulder Basin. Outside of Lake Mead, additional colonies of quagga mussels have been identified at Katherine Landing on Lake Mohave and in locations on Lake Havasu.

### How were quagga mussels introduced to Lake Mead?

The primary method of overland dispersal of both quagga and zebra mussels is through human-related activities. Because they have the ability to attach to hard surfaces and survive out of water for several days, many infestations are the result of adult mussels hitching rides on watercraft. The microscopic larvae (their young) can be transported in bilges, ballast water, live wells, or any other equipment that holds water. Currently, quagga mussels are not widely distributed so the likely source of the introduction was an

improperly cleaned watercraft that came to Lake Mead shortly after leaving the Great Lakes area.

### **What do quagga mussels eat?**

Quagga mussels are filter feeders and use their cilia to pull water, algae and plankton into their shell cavity. Each adult mussel is capable of filtering one or more liters of water each day, where they remove phytoplankton, zooplankton, algae, and even their own larvae.

### **Are there any predators that will eat quagga mussels?**

Some species of fish and diving ducks are known to feed on quagga mussels but are unlikely to control the typical high densities of mussel infestations. Chemical toxicants for lake-wide control of mussels have not been developed mainly because they would be deadly to other aquatic life forms. Mechanical and chemical controls have been developed for water supplies and industrial uses but can only be used in limited areas. Biological control so far has proven to be ineffective in controlling both quagga and zebra mussels.

### **Why should we be concerned about quagga mussels?**

Quaggas are prodigious water filterers that remove substantial amounts of phytoplankton and suspended particles from the water. By removing the phytoplankton, quaggas in turn decrease the food source for zooplankton and alter the food chain. This filtration increases water transparency. Improved water clarity increases light penetration causing an increase in aquatic plants that can change species dominance and even alter the entire ecosystem. These changes in plankton abundance and water clarity have had significant negative impacts on sport fisheries in the Great Lakes.

Quagga and zebra mussels can affect recreational boats by clogging water intakes and have the potential to attach themselves to the propeller and other areas – both inside and out – of boat motors. That, of course, can affect engine performance. Steering performance can also be affected when mussels attach themselves to equipment within the steering system.

If that doesn't catch your attention, consider this. Quagga mussels can settle in colonies large enough to block water intakes and affect municipal water supplies, agricultural irrigation and power plant operation. Congressional researchers estimated that zebra mussels alone cost the power industry \$3.1 billion in the 1993-1999 time period. Their impact on industries, businesses, and communities? More than \$5 billion.

In our natural world, everything is connected to everything else. When one aspect of an ecosystem is affected, it creates a domino affect resulting in many unforeseen changes. Quagga and zebra mussels provide a good example of how aquatic hitchhikers can cause pronounced ecological changes. In the Great Lakes, these mussels' rapid reproduction,

coupled with their consumption of microscopic plants and animals, has affected the fragility of this system's entire aquatic food web

### **Are quagga mussels likely to spread?**

Both quagga and zebra mussels have spread rapidly in other waters where they were unintentionally introduced. They can live up to four years and are prolific breeders. For example, one fully mature female mussel is capable of producing up to one million eggs per season. After fertilization, microscopic larvae, or veligers, develop within a few days. These free-swimming veligers drift with the currents for three to four weeks while looking for suitable surfaces on which they can settle. Unlike zebra mussels, quaggas can colonize soft substrates like sand and sediment and have been found at depths up to 430 feet (130 meters) in the Great Lakes. That is much deeper than zebra mussels. The water quality and temperatures in Lake Mead and the lower Colorado River basin appear to be suitable for quagga mussel survival.

### **What's being done?**

Federal, state and local agencies with an interest in water and wildlife resources in the lower Colorado River Basin have created an interagency response team. Member organizations include the Arizona Game & Fish Department, Bureau of Reclamation, California Department of Fish & Game, National Park Service, Nevada Department of Wildlife, Southern Nevada Water Authority, and the US Fish & Wildlife Service.

Team members are currently assessing the situation to determine the full extent of the mussel infestation and creating plans for containing the further spread of quagga mussels. These plans will address public information and education, boater education, monitoring, fish culturing, containment, treatment and ecological concerns.

### **What can we all do to help?**

There are effective ways boaters and fishermen can ensure their boats, vehicles, trailers and other equipment do not become the means of infecting other waters. Some of those are listed here.

When taking your boat out of the water:

- Drain the water from your motor, live well, and bilge on land *before* leaving the immediate area of the lake, river, etc.
- Completely inspect your vessel and trailer, removing any visible mussels, but also feel for any rough or gritty spots on the hull. These may be young mussels that can be hard to see.

Before leaving the local community:

- Flush the motor and bilges with hot, soapy water or a 5% solution of household bleach.

- Wash the hull, equipment, bilge and any other exposed surface with hot, soapy water or a 5% solution of household bleach.
- Clean and wash your trailer, truck or any other equipment that comes in contact with a water body where either the quagga or zebra mussels have been found. Mussels can live in small pockets anywhere that water collects.

When you return home:

- Air-dry the boat and other equipment for at least five days before launching in any other waterway.
- Do not reuse bait once it has been exposed to infested water and allow all fishing tackle to air dry for 5 days before fishing in other lakes and streams.
- Take similar precautions with waders, bait buckets, and other equipment that can hold water or comes into contact with water. Both quagga and zebra mussel veligers have been known to attach themselves to monofilament fishing line. Even fishing reels should be thoroughly cleaned and not used in different water bodies without disinfection and drying.

For more information about quagga and zebra mussels, check out the following websites: [www.protectyourwaters.net](http://www.protectyourwaters.net) and [www.100thmeridian.org](http://www.100thmeridian.org).