

Zebra mussels invade Kansas (spread the message – not the mussels)

The media like to report news items that are easy to explain and can also be brought to life with still pictures and moving video. If a topic can't be easily explained, focusing on its mystery or intrigue can make it newsworthy. A threatening disease, when it touches the human emotion of fear, can attract a lot of attention. The West Nile Virus was very real in Kansas a few years ago but doesn't get much attention now. There was also something about an influenza virus in Asia recently, but there was little if anything reported about it during the Beijing Olympics.

The public water community has a new threat that will not get much coverage in the mainstream media. Zebra mussels have



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arrived in Kansas and they are likely here to stay. Because these little clams are not going to make us sick or invade our household plumbing fixtures, they won't be on the six o'clock news tonight. That's why it's important that industry professionals understand this threat to educate everyone who has a role in the control of these invaders.

What are zebra mussels

It is regarded as a fact that zebra mussels were introduced into the Great Lakes when a freighter discharged ballast water

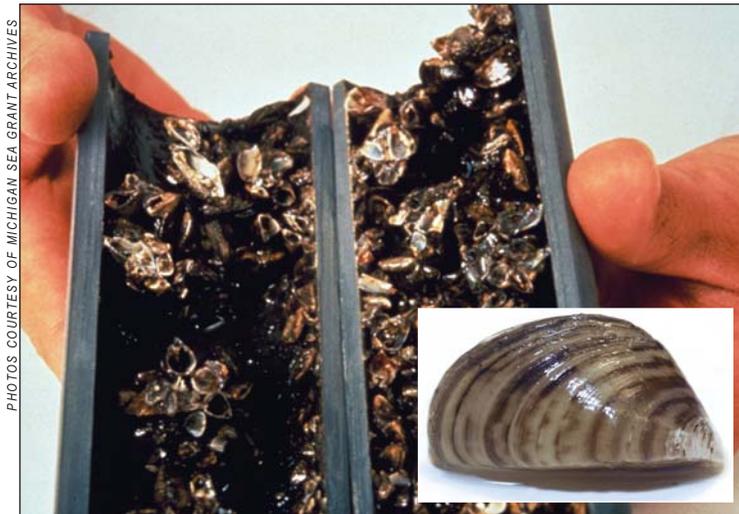
that was transported from the Black Sea (or other infected waters) in the late 1980s. These prolific mollusks have since spread by natural currents and presumably by boats to 20 states

caused by removal of microscopic matter by these mussels can also negatively affect the environment of sport fish and may encourage more growth of aquatic vegetation.

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by November 2000. Biologists are concerned that zebra mussels will negatively compete with native species of clams and fish that rely on the same sources of food. Zebra mussels also threaten recreational facilities like beaches and docks. Because they attach to

Zebra mussels reproduce externally when water temperatures are above 54 degrees Fahrenheit – and may do so continuously. After fertilization, embryos float in the water column and drift with the currents. Veligers, or mussel larvae, feed on microscopic algae and



PHOTOS COURTESY OF MICHIGAN SEA GRANT ARCHIVES

The inside of water intake pipes is ideal for zebra mussel growth, to the extent the mussels can nearly stop the flow of water. A cross section of pipe showing zebra mussel blockage is shown at right. Inset: An adult zebra mussel, usually grows to 0.25 to 2 inches in length..

rocks and other hard surfaces and their shells have razor-sharp edges, serious injuries are possible. Boat motors and the like that are submerged for long periods of time can also become encrusted. Increased water clarity

bacteria while floating in water. As they grow in size, the veligers settle on filamentous material like algae first, undergo metamorphosis, and then move to a hard substrate. These juvenile mussels are too small to be seen (less than 1-mm in



The sign on the left may be seen at Perry Reservoir. It provides important information to boat ramp users regarding zebra mussels. The sign at right is another warning sign used by the partners of the newly formed Protect Your Waters organization. More information may be found at www.protectyourwaters.net.

size) but may be able to be felt like small grains of sand. In optimal conditions, juveniles can reach sexual maturity in less than three months.

In addition to the biological threat to native species and the environmental changes of increased water clarity, zebra mussels pose a significant threat to water intake structures. Because they are filter feeders, the mussels thrive on hard surfaces that are located in areas with high water flow. The inside of water intake pipes is ideal, to the extent the mussels can nearly stop the flow of water.

At the present time, there is a strong effort to control the spread of zebra mussels through public education. Much more needs to be done however. In Kansas, six lakes are now known to have infestations. These lakes are El Dorado Reservoir, Winfield City Lake, Perry Reservoir, Cheney Reservoir, Lake Afton and Marion Reservoir. Further investigation is proceeding at John Redmond Reservoir and Coffey County Lake. Presumably, the streams that receive discharge from these lakes are also infested.

There are Web sites such as Stop Aquatic Hitchhikers, www.protectyourwaters.net, and the 100th Meridian Initiative, www.100thmeridian.org, which attempt to educate boaters about this threat. These sites are funded by the U.S. Fish and Wildlife Service. Some of the partners from Kansas listed on the Stop Aquatic Hitchhikers Web site are the U.S. Coast Guard Auxiliary and Kansas Department of Wildlife and Parks.

The lead agency in Kansas to educate boaters and the general public is the Fisheries Section in the Department of Wildlife and Parks (KDWP). In September of this year, KDWP made an on-line instructional video available on their Web site, <http://kdwp.state.ks.us/news/KDWP-Info/KDWP-TV>.

They have also posted signs at boat ramps where infestation has already occurred. Boats and other equipment exposed to water in infected lakes should be washed with 104-degree or hotter water (typical car wash hot water rinse) or a 10 percent chlorine and water solution, or dried for at least five days to remove or kill species that are not visible.

In the lakes that have zebra mussels, public water suppliers are evaluating the options to control them. A lot of research has been conducted to determine the most cost effective methods of control. It has been reported that

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Boat motors that are submerged for long periods of time become severely encrusted as seen here. It is easy to understand how boats can transport zebra mussels from one lake to the next.

ozone, various chlorine solutions, hot water, electrical sparking and mussel-proof coatings have been effective at removing and preventing attachment of mussels. At Marion Reservoir, the city of Hillsboro uses potassium permanganate to kill any mussels that attach to the intake structure and pipe. The city of El Dorado has hired a consultant to evaluate techniques that will ensure compliance with disinfectant byproduct regulations and control mussel infestation. The preliminary plans propose the use of sodium hypochlorite.

Two smaller water systems know of the possible impacts zebra mussels can cause and are developing plans to mitigate the threat. The city of Valley Falls uses surface water from the Delaware River, and has their intake at the upper reach of Perry Reservoir. Most of the time, water still flowing downstream to the reservoir is what is diverted and treated for use by the city. However, if water is held in the reservoir above conservation pool for a significant amount of time, it is possible that zebra mussel veligers could be transported by

wave action above the river intake. If there are suitable attachment sites for juvenile mussels in the river above the intake, it is possible that the city will have to devise a plan to control mussels at the intake.

The city of Alma has two lakes from which it draws water. One is open to the public for recreation and the other is a watershed district lake with access controlled by a private landowner. Both lakes occasionally have boats. While the delivery of the message may be different for the two lakes, education of the lakes' boaters to prevent the introduction of mussels into the lakes is necessary. The threat of infestation of Alma's lakes will increase if mussels infect popular lakes closer to Alma such as Council Grove, Milford and Tuttle Creek Reservoirs.

Kansas Rural Water Association has joined almost 700 other partners (state, federal and tribal governments, schools, clubs, organizations and businesses) to help stop the spread of aquatic nuisance species at *Protect Your Waters*. Every public water system using surface water in Kansas is threatened by the zebra mussel. By becoming a partner, you will receive information that can be used to keep local lakes or rivers zebra mussel free. Consider joining now.

For more reading on zebra mussels, take a look at this information online:

- "Life History and Ecological Requirements of the Zebra Mussel: North American Experience Through 1992," www.seagrants.noaa.gov/funding/zmlifehistory.html
- "Unusual Conditions Take Toll on Zebra Mussels at El Dorado Lake," www.kwo.org/KWO%20HYDROGRAM/Article_Dec_2007_ZebraMussels.pdf

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K.A.R. 115-18-10. Importation and possession of certain wildlife; prohibition, permit requirement, and restrictions.

A. The importation, possession, or release in Kansas of the following live wildlife species shall be prohibited, except as authorized by terms of a wildlife importation permit issued by the secretary:

1. Walking catfish (*Clarias batrachus*);
2. Silver carp (*Hypophthalmichthys molitrix*);
3. Bighead carp (*Hypophthalmichthys nobilis*);
4. Black carp (*Mylopharyngodon piceus*);
5. Snakehead fish (all members of the family Channidae);
6. Round goby (*Neogobius melanostomus*);
7. White perch (*Morone americana*);
8. Zebra mussel (*Dreissena polymorpha*);
9. Quagga mussel (*Dreissena bugensis*);
10. New Zealand mudsnail (*Potamopyrgus antipodarum*);
11. Diploid grass carp (*Ctenopharyngodon idella*);
12. Monk parakeet (*Myiopsitta monachus*); and
13. Asian raccoon dog (*Nyctereutes procyonoides*).

B. Any live member of a wildlife species listed in subsection (a) and possessed before the following dates may be retained in possession, in closed confinement, by making application to the secretary that provides information detailing the circumstances, including the location, by which the animal came into the applicant's possession:

1. February 1, 1978 for fish and bird species other than black carp, snakehead fish, round goby, white perch, zebra mussel, quagga mussel, New Zealand mudsnail, and diploid grass carp;
2. February 1, 1986 for mammal species;
3. October 1, 2000 for black carp;
4. May 1, 2003 for snakehead fish;
5. August 1, 2004 for round goby, quagga mussel, and zebra mussel;
6. May 15, 2005 for New Zealand mudsnail;
7. February 15, 2007 for white perch; and
8. January 1, 2008 for diploid grass carp.

The manner in which the animal is to be used shall be identified in the application.

C. Wildlife importation permits for the importation or possession of live members of the wildlife species listed in subsection (a) may be issued by the secretary for experimental, scientific, display, or other purposes subject to any conditions and restrictions contained or referenced in a wildlife importation permit.

D. Each individual desiring to import or possess live members of the wildlife species listed in subsection (a) shall apply to the secretary for a wildlife importation permit. The application shall be submitted on forms provided by the department and shall contain the following information:

1. The name, address, and telephone number of applicant;
2. the wildlife species to be imported or possessed and the number of wildlife involved;
3. the purpose or purposes for importation or possession;
4. a description of the facilities for holding and using the wildlife species;
5. a description of plans to prevent the release of the wildlife species; and
6. other relevant information as requested by the secretary.

E. Each wildlife importation permit, once issued, shall be valid during the time period specified on the permit.

F. In addition to other penalties prescribed by law, any wildlife importation permit may be refused issuance or revoked by the secretary if any of the following conditions is met:

1. The application is incomplete or contains false information.
2. Issuance of a permit would not be in the best interest of the public or of the natural resources of Kansas.
3. The permittee fails to meet permit requirements or violates permit conditions.

(Authorized by K.S.A. 32-807 and K.S.A. 32-956; implementing K.S.A. 32-956; effective Dec. 27, 1993; amended Sept. 22, 2000; amended April 18, 2003; amended July 23, 2004; amended May 20, 2005; amended Feb. 9, 2007; amended Nov. 16, 2007.)

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