
❖ The Water Line ❖

Newsletter for the Lakes of Missouri Volunteer Program

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LMVP EXPANDS but WE STILL NEED VOLUNTEERS

Dan and I have been very excited about the response that the Lakes of Missouri Volunteer Program has received this last year. We have been contacted by several individuals and groups interested in participating in the 2000 sampling season. But we still need several sites covered on The Lake of the Ozarks. If you are interested in sampling or know anyone interested in sampling on the Lake of the Ozarks, please have them call us!

Last season we added volunteers who only collected Secchi depth measurements. This has allowed us to get more information without adding a great deal of cost to the program. Several volunteer programs around the country only collect Secchi measurements. We encourage volunteers to record a Secchi measurement for us any time they are on the water.

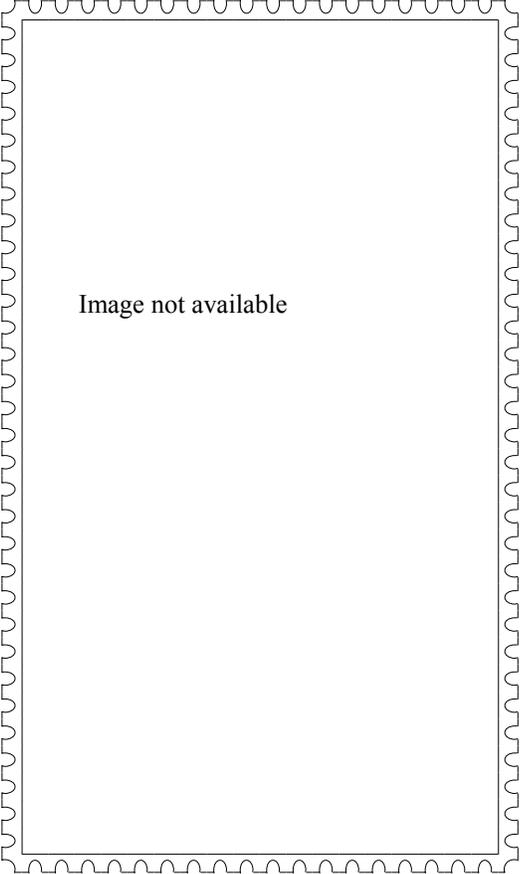


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A volunteer with the Lakes of Missouri Volunteer Program uses a Secchi Disk to take a water transparency reading in Table Rock Lake

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Zebras in Missouri? This isn't the Serengeti!!

by, Dan Obrecht

Because the zebra mussel is an exotic species, it has no natural enemy in our streams and lakes. Combine this with its ability to reproduce in large numbers and we have an invading species that can reach extreme densities.

In the last edition of the *Water Line* we announced that zebra mussels (*Dreissena polymorpha*) had been found in Missouri waters. So far the invaders have been found in the Mississippi River as well as the Missouri and Meramec rivers near their confluences with the Mississippi. Since the mussels first invaded the Great Lakes region, Missouri's resource agencies have wondered when the zebra mussel would make it into the state. That question has been answered. Now we are faced with new questions. Can they spread? How far will they spread? Can we control their spread?

BACKGROUND ON THE ZEBRA MUSSEL

The zebra mussel originally calls Eastern Europe its home. At some point in the 1700's it invaded Western Europe and became a nuisance there. Recently the little mussel made its way across the Atlantic to America. Theory is that a ship containing zebra mussels in its ballast water introduced the species when the ballast water was released in the Great Lakes Region. The transported mussel found the environment to their liking and decided to stay. And stay they did, with a vengeance. That was in the mid-1980's, the zebra mussel has since spread across the region, into the Hudson, Illinois, and Mississippi river systems.

LIFE HISTORY

Zebra mussels are relatively small, about thumb nail size, with lunkers measuring about 2 inches. They tend to be more angular in shape than the "average"

freshwater mussel. Alternating dark and light stripes on the mussel's shell account for the common name. The zebra mussel is very prolific, females can produce 30,000 to 40,000 eggs a year. Eggs develop into a larval stage known as veligers and the veligers spend up to four weeks swimming freely in the water before maturing and settling down. At this time the zebra mussel is extremely small, about the size of a grain of sand. Using thread-like appendages, the zebra mussel attaches to substrate. Hard surfaces such as rocks, wood, cement, metal and other mussel shells are the preferred habitat, but aquatic plants and mud can be colonized if a hard substrate is not available.

POTENTIAL PROBLEMS

Because the zebra mussel is an exotic species, it has no natural enemy in our streams and lakes. Combine this with its ability to reproduce in large numbers and we have an invading species that can reach extreme densities. Detroit Edison on Lake Erie has reported zebra mussel densities of up to 700,000 per square meter (they often attach to each other, forming a layer up to one foot thick). A build up of zebra mussels can cause problems for hydro-power dams, locks in the big rivers, and drinking water intake pipes.

Even more troubling is the impact that zebra mussels could have on Missouri's water resources. The zebra mussel is a filter-feeder. It siphons water in, filters out the particles, and releases the water back into the environment. Plankton such as algae are removed from the water to feed the mussel. This isn't such a problem in itself as we have many filter-feeders occurring naturally in our rivers and lakes. But, zebra mussels have the potential to reach extreme densities which can have a

dramatic affect on the food web of a lake or river. Each adult zebra mussel can filter about a quart of water per day, multiply this by a million mussels and you end up with a lot of water being filtered. A small lake with a large zebra mussel population could literally have its volume filtered in a day or two. This would have a major impact on the ecosystem as food for the higher levels of the food web would be greatly reduced.

HOW THEY GET AROUND

Because zebra mussels have two life stages that differ from each other it isn't easy to sum up how they travel from one waterbody to another. Obviously the adults can move along with anything they have attached to, such as aquatic plants and boat hulls. The mussels and their larval stage can also be transplanted in bait buckets, live wells and bilges. But there is more! The cooling system on your outboard could harbor these little mussels. Your dip net could have veligers on it. The tennis shoes you used for wading could be besieged. Hard to believe? Divers were checked after being in infested waters and as many as 200 veligers were found on each of the diving suits! How do zebra mussels move from one waterbody to another? It seems that any item that comes in contact with infested water can be a potential source of contamination.

*****HOW TO AVOID SPREADING THE ZEBRA MUSSEL*****

The following steps should be taken to make sure you do not help the zebra mussel move from one water to another.

- **Scrape off any mussels attached to your boat, outboard and trailer. Do not release them back into the water. Be aware! Small zebra mussels are the size of a grain of sand. If the hull of your boat feels rough, when it should feel smooth, you might have zebra mussels attached. A high pressure wash should help clean off the tiny mussels.**
- **Drain and rinse all bilges, live wells, bait buckets and engine compartments.**
- **Flush clean water through the cooling system of your motor, boat parts and accessories.**
- **Disinfect all live wells, bilges, anchors, bait buckets, boat trailers and nets with a salt solution (½ cup salt per gallon of hot water) followed by a rinse. Or - use a bleach solution (two tablespoons bleach per gallon of hot water). Do not drain the bleach solution into a lake or stream.**
- **If you've been in waters that are known to contain zebra mussels, let your boat and equipment air dry for four or five days before heading out to a different waterbody.**
- **Do not transfer any aquatic plants, animals, or bottom materials from one water to another.**

The zebra mussel has made its way to Missouri. What happens next will depend on everyone who uses Missouri's waters. Can the mussel spread? There is nothing to suggest that they can't. How far will they spread? In theory, it would only take a few careless boaters to spread the mussel across the state. Can we control their spread? Yes, but it will take educating everyone who recreates on Missouri lakes and streams about how to avoid transporting the mussels from one water to another.

WHAT ELSE CAN YOU DO?

One key to slowing down the spread of the zebra mussel is monitoring. If resource agencies can keep track of where the mussels have invaded, they can target educational efforts in order to reduce the chance of someone spreading the mussels to un-infested waters.

We are asking LMVP volunteers to do their part. When you go out to sample or you are out on the lake, visually check for zebra mussels. In lakes with relatively clear water and hard substrate (rocks, cement boat ramps, etc.) this just means looking into the water at the hard substrate. If your lake is murky or lacks the hard substrate the mussel prefers, you can use a brick with a rope attached to it (so you can retrieve it). Set the brick in 2-5 feet of water and check periodically. If need be, the LMVP will supply you with the latest high-tech zebra mussel sampling brick.

LMVP data sheets will have a space for you to mark if you looked for zebra mussels and if you found any. While LMVP volunteers will be monitoring Missouri's lakes for zebra mussels, the Stream Teams will be monitoring Missouri's streams. We will include a separate data sheet for LMVP volunteers to fill out and

send to Stream Team headquarters so we can have a central data base for zebra mussel monitoring efforts. If you do find what you think are zebra mussels keep them, do not release them back into the water. They can be preserved in a jar with rubbing alcohol until properly identified by resource agency personnel. We also ask that you call the Missouri Dept. of Conservation regional offices at one of the following numbers if you do find zebra mussels in your lake. If we all do our part to avoid transporting the mussel and monitoring for infestations we can greatly reduce the risk of our waters being taken over by this exotic species.

Administrative Office
P.O. Box 180 (zip 65102)
2901 W. Truman Blvd.
Jefferson City MO 65109
573/751-4115
Fax: 573/751-4467

Northwest
701 N.E. College Dr.
St. Joseph MO 64507
816/271-3100
Fax: 816/271-3107

Northeast
2500 S. Halliburton
Kirksville MO 63501
816/785-2420
Fax: 816/785-2553

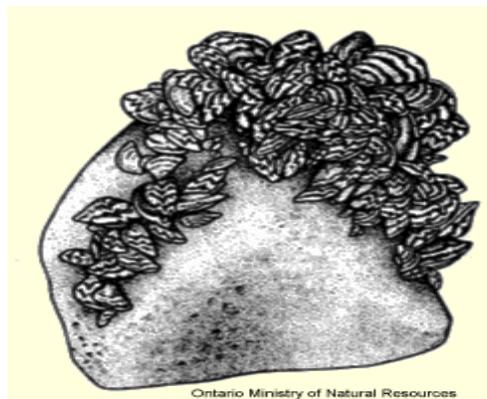
Kansas City
1401 N.W. Park Road
Blue Springs MO 64015
816/228-3766
Fax: 816/228-9243

Central
1907 Hillcrest Drive
Columbia MO 65201
573/884-6861
Fax: 573/882-9807

Southeast
2302 County Park Drive
Cape Girardeau MO 63701
573/290-5730
Fax: 573/290-5736
Fax: 660/885-503



Most adults are 1/2 - 1 inch in length. Note the dark stripes. The byssal threads are used by the mussel to attach itself to substrate.



Zebra mussels may appear as a "build-up" on substrate, including native mussels.

East Central
Jct. I-44 & Hwy. 185 S.
P.O.Box 248
Sullivan MO 63080
573/468-3335

Southwest
2630 N. Mayfair
Springfield MO 65803
417/895-6880
Fax: 417/895-6910

St. Louis
2360 Highway D
St. Charles MO 63122
314/441-4554
Fax: 314/926-9125

Ozark
P.O. Box 138
618 Preacher Roe
West Plains MO 65775
417/256-7161
Fax: 417/256-0429

West Central
2010 S. 2nd Street
P.O.Box 368
Clinton MO 64735
660/885-6981

WATER QUALITY ISSUES EXTEND BEYOND STATE LINES-

On October 27, 1999 a historic meeting took place in Branson, MO. The meeting was the White River Basin Forum. In attendance were about 300 people representing government agencies, University researchers, local businesses, large industries, politicians, and concerned citizens. The meeting brought Missourians and Arkansans together to talk about the problems that the upper White River Basin faces and to discuss potential solutions.

The morning agenda included addresses from Missouri Department of Natural Resources Director Steve Mahfood and Randall Mathis, Director of Arkansas Department of Environmental Quality. Earl Smith of Arkansas Soil and Water Conservation Commission and Martin Maner of Arkansas Department of Environmental Quality gave presentations on water quality in Arkansas while Dr. Jack Jones of the University of Missouri-Columbia voiced concerns about the changes that had taken place in Table Rock Lake. The importance of the meeting was punctuated by an address made by Missouri Governor Mel Carnahan.

Participants spent the afternoon assembled in workgroups. There were three workgroups focusing on Water Quality Concerns in the Watershed, and one group each discussing Sustainable Agriculture, the Tennessee Valley Authority Wetland Project, Joint Missouri-Arkansas Efforts, and Financial Options. A facilitator led each workgroup and encouraged discussion on the topics. Workgroups were composed of people with diverse backgrounds and interests, which led to informative and interesting discussions. Notes were recorded for each workgroup and shared with all in attendance.

At the end of the day a memorandum was signed by agency directors from both states. The memorandum calls for the two states to work together to solve the problems in the White River

Basin, to share information, identify joint projects for bi-state cooperation, and to meet at least on an annual basis. The memorandum may, in itself, not seem like a great accomplishment, but this represents a very large first step. Because the basin is so large and extends well into each state, the communication and cooperation of the two states is extremely important if the problems in the White River Basin are going to be solved.

The LMVP was represented at the meeting. Besides attending and taking part in the workgroups, Fran and Dan staffed an exhibit. The centerpiece of the exhibit was an oversized map of Table Rock Lake color-coded to show Secchi transparency across the lake. Other information on the exhibit included data showing how other parameters vary from site-to-site on the lake and an explanation on how phosphorus, chlorophyll and water clarity relate to each other. Prior to the start of the meeting, during lunch and breaks we were stationed in front of the exhibit to answer questions about water quality. And answer we did, there weren't many moments when one of us wasn't discussing water quality or the volunteer program with someone. A large portion of the information on the exhibit was generated through the Lakes of Missouri Volunteer Program and the program's name was well displayed. The highlight of the meeting for Fran was presenting Governor Carnahan with a Lakes of Missouri Volunteer Program t-shirt.

We would like to thank all of the volunteers who helped gather the data that was presented and attended this meeting. We truly feel that the volunteer data played a notable role in generating concern about water quality in the region prior to the meeting and was extremely useful in explaining problems to those who attended the forum. Thank You

Acronyms

What's the BD (Big Deal) behind all of these letters!?

BMP - Best Management Practices - Techniques designed to reduce soil loss or prevent surface runoff from carrying heavy sediment and nutrient loads into waterbodies.

BOD - Biochemical Oxygen Demand - The amount of oxygen needed or consumed in five days by biological processes that break down the organic matter in effluent.

GIS - Geographic Information System - A system of hardware, software and procedures designed to support the capture, management, manipulation, modeling and display of spatially referenced data for solving complex planning and management problems.

TMDL - Total Maximum Daily Load - The maximum amount of a substance that can be loaded into a system in one day without causing a negative effect on that system.

DNR - Department of Natural Resources -Mission: To preserve and protect Missouri's natural, cultural and energy resources and inspire their enjoyment and responsible use for present and future generations.

MDC -Missouri Dept. of Conservation - Mission: To protect and manage the fish, forest, and wildlife resources of the state, to serve the public and facilitate their participation in resource management activities, to provide opportunity for all citizens to use, enjoy, and learn about fish, forest, and wildlife resources.

NRCS -The Natural Resources Conservation Service, formerly the Soil Conservation Service, is the federal government agency that works hand-in-hand with the American people to conserve natural resources. Using scientific and technical expertise along with partnerships with soil and water conservation districts and others, the NRCS helps people conserve all natural resources on private lands.

PCB - Polychlorinated Biphenyls - a group of organic compounds used in the manufacture of plastics. They are toxic, persistence and bioaccumulate in the environment and are frequently confused with a pesticide.

VOLUNTEER INPUT REQUESTED

The Lakes of Missouri Volunteer Program has made it through eight sampling seasons. And like any other eight-year old, we are still in the process of figuring things out. One refinement we hope to make this year is to rework the Data Report.

Short history of LMVP Data Reports

1992-1996 Data Reports were simply photocopies stapled together. Each region of the state had its own report.

1997 and 1998 Data Reports were bound and contained data from all public lakes in the program. Reports were over 90 pages long. To reduce printing cost, Data Summaries were written each year to be distributed to non-volunteers. Summaries did not go into as much detail about the data and ended up being about half the size of the reports.

This year we are going to make changes again. Instead of putting together two documents, we are going to publish only one. It will be a hybrid of the Data Report and the Data Summary. We hope it will contain enough information to answer everyone's questions about water quality but at the same time not be overwhelming to someone not familiar with the program.

We would like your input! Phone or e-mail us with any comments or suggestions you might have on how we can improve the Data Report. Let us know what you find interesting and what you find confusing. We will start writing the new and improved Data Report in February so get your two-cents in soon!

THANK YOU, VOLUNTEERS!!!

Dear Volunteers,

As we start a new year and new century, we want to thank all past and present volunteers for your hard work and support of the Lakes of Missouri Volunteer Program. Please know your efforts to monitor and protect our state's water resources are having a positive impact.

Dependable baseline water quality data is imperative in determining water quality trends and in making intelligent management and funding decisions for our water resources. Through diligent and careful sampling, LMVP volunteers provide high quality data that is an important part of the data collected on Missouri's lakes. All of the citizens and taxpayers of Missouri should thank you for what you save in state funding and for all you do to protect our environment. Can you imagine the cost to hire state employees to collect all of these samples? Not only do you provide this valuable service, you also become the voices of knowledge in your communities. You take the time to come to data review sessions, educate yourselves on the issues and communicate these issues to your friends and fellow citizens.

When you realize it's time again to gather together all of the equipment, go out on your lake and drag in yet another bucket of water, when perhaps that sofa or quiet hammock looks pretty darn good - **please remember we really do appreciate what you're doing and it is important work.** Thank you very much for your time and energy - you are making a difference. We hope you have a Happy and Healthy New Year.

Sincerely,

Fran Pope

Dan Obrecht

