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# Invasive Work Group Report on Zebra Mussels

## PREFACE

Adult zebra mussels were found in Lake Monona in 2001 and 2002. In response, the Dane County Lakes & Watershed Commission established the Invasives Work Group to investigate the matter and report back to the full Commission with findings and policy options. This report contains the findings and policy options from the Work Group to the Lakes & Watershed Commission.

*The Work Group is not recommending any policies for zebra mussel management at this time.* The Lakes & Watershed Commission reminds the public that they may be subject to fines for transporting exotic plants and



*Zebra mussels look like small clams with a D-shaped shell and dark and light stripes. Be sure to report any zebra mussels you find immediately to the DNR at 608-266-9270. DO NOT put them back in the water.*



*Zebra mussels can completely cover beaches. Their sharp shells and decaying flesh are a very unpleasant nuisance.*

animals from one water body to another (see box on page 9). The Commission urges you to follow the cleaning guidelines on page 12. The Work Group recommends a process for seeking public input on what should be done to try to prevent the spread of zebra mussels and other aquatic invasive species and then developing a policy.

Work Group members were drawn from the Commission and included:

- Shary Bisgard, Commission Chair
- Andy Olsen, Work Group Chair and County Supervisor
- John Magnuson, Information and Education Chair, Limnologist, UW Professor Emeritus
- Brett Hulsey, County Supervisor
- John Van Dinter, Vice Chair, Lakes & Watershed Commission, Chair, Town of Westport

Thanks to the county employees who staffed the work group energetically and ably. Sue Jones and Marcia Hartwig deserve credit for shepherding this report through. In addition, Ron Martin of the Wisconsin Department of Natural Resources (DNR); Mandy Beall of DNR and UW Extension; and Jake Vander Zanden of the UW Center for Limnology provided useful information.

## INVASIVES WORK GROUP FINDINGS

Aquatic invasive species displace native species, disrupt ecosystems, and affect citizens' livelihoods and quality of life. They hamper boating, swimming, fishing, and other water based-recreation, and take an economic toll.

The zebra mussel is perhaps the most successful exotic invasive species the world has ever known.

Zebra mussels are native to the Caspian Sea region of Eurasia, and have been in western and central European waterways for nearly 200 years. They have rapidly spread across North America during the past decades. They can coat hard surfaces such as gravel, rock, each other, native mussels, piers, intake pipes, breakwaters, boats and motors. Beds of zebra mussels in some areas of Lake Erie contain between 25,000-60,000 per square yard. Zebra mussels colonize in multiple layers upon hard surfaces.

The habitat and environmental conditions are appropriate in all of the Madison lakes for zebra mussel establishment. Researchers expect zebra mussels to reach high densities on suitable surfaces in all of the Madison lakes, and that densities of zebra mussels may eventually decline.

### Arrival in United States, Wisconsin, and Dane County

Zebra mussels came to the United States from the Caspian Sea region in Eurasia in the ballast



*Zebra mussels are native to the Caspian Sea, Black Sea, and Ural River area of Eurasia.*

water of seagoing ships. Zebra mussels arrived via ship in the Great Lakes system in 1985 or 1986 and first turned up in Lake St. Clair near Detroit. They were found in Racine Harbor, Lake Michigan in 1990, and have since been sighted in Lake Superior. They escaped from the Great Lakes through the Chicago River into the Illinois and the Mississippi drainages; they now occur in the Mississippi system as far north as the St. Croix River below Hudson. As of May 3, 2003 zebra mussel larvae (veligers) or adults have been identified from 54 Wisconsin inland lakes that they have reached primarily on boats trailered from infested to uninfested waters.

Attached adult zebra mussels were found in low numbers by the Department of Natural Resources (DNR) in Lake Monona in 2001 and again in 2002. DNR has monitored the Yahara lakes for several years for both adults and larvae. Zebra mussels turned up in only Lake Monona, but they may also be in other Yahara lakes in very low numbers.

If zebra mussels become abundant in Lake Monona as expected, the planktonic, microscopic larvae will be transported downstream with the current and will likely spread to downstream lakes (Waubesa and Kegonsa) and the Yahara and Rock rivers. They may also be transported by boats trailered to other Dane County lakes or on boats moving up through Tenney locks to Lake Mendota.

### Transport

People can transport zebra mussels from infested waters. The human spread of larvae from water body to water body can occur by transferring water from an infested lake or river in boats, motors, live wells, live bait containers, or other equipment. More commonly, dispersal happens when young mussels are attached to boats and barge hulls or to aquatic plants hanging on the trailered boat, boat motors or the trailers themselves. The young attach to the aquatic plants where they can live until the plants die back in late summer or fall.



Scientists believe that many of these invaders, including zebra mussels, arrived in North America by surviving in the freshwater ballast water of ocean-going ships.

Boaters and fishers can unknowingly transport zebra mussels to uninfested waters because the larvae are microscopic and hard to see. The adult zebra mussels first release larvae when water temperatures reach 60°F in spring, and continue until temperatures fall below about 60°F in fall. Larvae would be most abundant when waters are above 68°F in summer. Adults cannot survive in water temperatures above 87°F.

## Potential Ecological and Economic Consequences of Infestation

While we cannot predict exactly the impact that zebra mussels will have on Dane County waters, we have consulted with experts and have a high confidence that the ecological and economic effects described below are likely.

### Ecological Consequences

Zebra mussels transform the lake from one in which the food web productivity occurs primarily in the water between the lake's surface and bottom to one in which the food web productivity occurs primarily on the lake's bottom. They filter out most of the suspended microscopic plants, animals and debris, consuming the food supply of other organisms, especially young fishes. This typically clears the water and results in excess rooted plant and algal mat growth with associated bottom-living immature insects, snails and other invertebrates.

### Zebra mussel biology

The zebra mussel (*Dreissena polymorpha*) is a species of freshwater mussel that originated in Eurasia.

Adults usually live 2-3 years on average, but may live up to 5. Zebra mussels look like small, barnacle-like clams with a yellowish or brownish "D" shaped shell with dark and light stripes. Typical individuals are about 1 inch long but they can reach lengths up to 2 inches.

They often occur in colonies or encrustations on the bottom. Adults can be abundant on suitable bottoms from shallow water out to 20-foot depths in lakes such as the Yahara lakes. In the Great Lakes, they've been found as deep as 300 feet.

Larvae are free swimming, microscopic forms that remain in the water for 8-10 days after the eggs and sperm are released by the adults (fertilization occurs in the water) and before they attach with their "byssal threads" (durable elastic strands) to a hard surface or aquatic plant. Adult females can produce 1 million eggs per year.

They are the only freshwater mollusk that can attach themselves to solid objects. Zebra mussels are indiscriminate filter feeders, filtering large volumes of water, and consuming microscopic organisms and debris that float in the water.

Blue green algal blooms may also increase and continue to form noxious blooms; zebra mussel cannot eat the larger colonial blue green algae.

The transformation of lake productivity to the lake bottom makes it easier for other invasive species to make our lakes their home, and further interferes with recreational activities,

### ***Aren't zebra mussels good for lakes?***

Zebra mussels filter water and increase clarity in lakes they invade. In Lake Erie, the zebra mussel population exploded around the same time that regulations slashing phosphorus flowing into the lake reduced algae blooms. The result was much clearer water. Many people concluded that zebra mussels are good for lakes.

But water clarity isn't everything. Zebra mussels may bring some benefits but overall they wreak havoc on lakes they colonize. We need to look beyond the surface and get the whole picture. In Lake Erie, for example, zebra mussels consume so much food that walleye, yellow perch and smelt populations dropped dramatically. Rotting, odorous zebra shells accumulated on beaches.

Clearly, the impacts will be a mixed bag. Before reaching a conclusion, we hope you will learn along with us, and consider the good and the bad of this coming change to our lakes. Then, please let us know what you think we should do about the problem as a community.

boating and fishing. For example, the round goby, another invasive species from Europe, is close on the heel of the zebra mussel in Lake Michigan and now the Illinois River. It is a moderate-sized bottom-loving fish. Some bottom-feeding species, like carp, disturb lake bottoms releasing nutrients such as phosphorus that lead to increased algae blooms.

Because zebra mussels are an invasive species, there are not a lot of natural predators. Some bottom-feeding ducks, like bluebills, and bottom-feeding fishes, such as carp, sheepshead (freshwater drum), and suckers, are known to feed on zebra mussels and may benefit from the zebra mussel infestation. Zebra mussel larvae

(veligers) provide food for larval and juvenile fish. Even these predators are not enough to control zebra mussel abundance.

Some diving birds that feed by sight may benefit from increased fish visibility. In some areas these divers have become nuisances, such as the cormorant in Oneida Lake, New York, that feed heavily on young walleye. Walleye and bluegill may suffer in this ecological transformation.

Many fishes, such as northern pike, walleye, perch and bluegill have larval stages that feed in open water on the small microscopic algae and animals that would be depleted by the filtering activities of zebra mussels. Small animals such as water fleas (daphnia) also feed on these small microscopic organisms. Thus, the food supply of many fishes that eat daphnia and their relatives is further harmed. As our game fishes grow, they sequentially change their food habits from the microscopic organisms to larger organisms and in the case of walleye and northern pike to other fishes that feed on the smaller organisms.

Thus, the larvae of many important fishes will not make it through their critical early stages because of the decline in microscopic animals resulting from zebra mussel infestation. In addition, the young fish will be more vulnerable to predation in the clear waters by sight-feeding predatory fishes and birds.



*Zebra mussels can attach to native clams in such large numbers that the clams can't move, open or close their shells, or feed. These clams, many of which are threatened or endangered, eventually die.*

## **Economic and Social Consequences**

Zebra mussels impose costly maintenance requirements when they attach to boats, motors, water intake pipes, pumps, and docks. Operators of power and water treatment plants that rely on water from lakes have reported marked reductions in pumping capabilities and spend significant sums of money and time working to remove colonies of zebra mussels. In the United States, zebra mussels cost the power industry \$3.1 billion from 1993-1999, with its impact on industries, businesses and communities over \$5 billion. Wisconsin's water utilities and power plants have spent over \$5 million from 1990 to 1993 on capital equipment to control zebra mussels, and expenditures for subsequent years are likely to be greater than that. Over \$69 million was spent in North America 1989-1995 in zebra mussel related expenses according to a study by the New York Sea Grant.

Dead zebra mussels wash ashore and accumulate, sometimes shutting down beaches. The edges of zebra mussels are sharp and can cut exposed skin. The odor alone from decaying mussels washed up on shore can diminish beach use and enjoyment. In an extreme case in Green Bay, the piles of dead zebra mussels extended over a quarter mile down the beach and were 15 feet wide and two feet high.

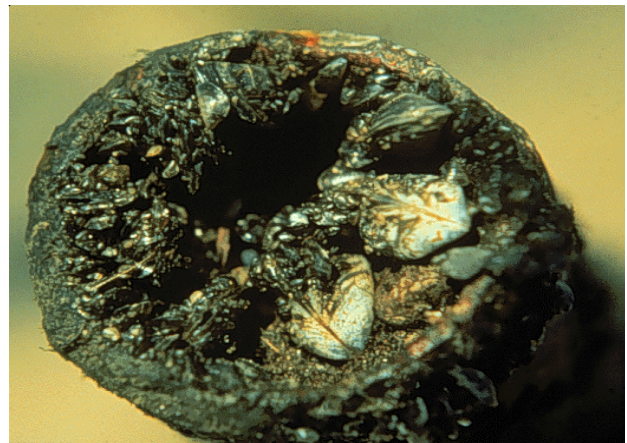
The following, although not a comprehensive list, provides an illustration of the economic and social effects for the public and private sectors and individuals that can be expected within the next ten years based on what has happened in other lakes infested with zebra mussels.

### **For the public sector:**

- Lock and dam maintenance after infestation
- Cost of management efforts to contain zebra mussels to the extent possible
- Increased weeds and harvesting

### **For the private sector:**

- Total cost to Wisconsin water and power utilities in 1993 was \$6.46 million.
- Costs of control for preventing or cleaning water intakes. For example, Lake Geneva



*Zebra mussel colonies can clog water intake pipes at power companies, city water plants, or any facility that uses raw water drawn from infested lakes or rivers.*

Country Club has a water intake from the lake for golf course irrigation. The grounds manager installed a chemical injection pump and this has been effective at keeping zebra mussels from clogging the intake pipe. Fixed cost for the additional pump was \$3,500 and approximately \$6,000 per year is spent on chemicals.

### **For private citizens:**

- Special antifouling paints for boats cost \$70 to \$220 per gallon. For a medium-sized boat, the total cost would be about \$900. Antifouling paints must be applied every 2-3 years to be effective.
- Gage Marine on Lake Geneva charges approximately \$340 for a 20-foot boat to apply antifouling paint. For newer boats they recommend a one-time epoxy primer, adding \$1000 to the cost. So far on Lake Geneva, zebra mussels are not blocking water intakes or causing engine overheating.
- Costs to the boating community (motor damage, time spent inspecting, cleaning and equipment/supplies to clean)
- Costs to the boating community for new equipment, such as purchase of a boat lift to keep a boat dry costs \$2,500 to \$5,000)
- Costs of protecting or cleaning moored boats and lifts
- Costs to fishing are anticipated, but unknown, resulting from shifts or declines in fish populations.

- Reduced beach use and decreased enjoyment due to sharp shells, strong odors from decaying mussels that have accumulated on shore
- Smell from dead/dying mussels on shores and increased blue/green algal blooms.

## Experience of an Inland Lake Community

Lake Geneva is a 5,000-acre lake in Walworth County in southeastern Wisconsin. Boat traffic there exceeds 20,000 boats each year. The Geneva Lakes Environmental Agency began monitoring for zebra mussels in 1994. The Agency checked for colonies of zebra mussels attaching to boats and other hard surfaces and also conducted limited sampling for zebra mussel larvae. In 1996, the first mussel was found in Lake Geneva attached to a moored boat.

Zebra mussels spread quickly to the rest of Lake Geneva. Since then, the Agency has monitored hard surfaces on the lake bottom and also monitored for changes in population dynamics as a result of the infestation. Zebra mussels are now prevalent in the entire lake.

The Agency's education campaign focuses on living with zebra mussels. For example, the Agency advises recreationists to wear aqua socks to prevent foot injuries from sharp zebra mussel shells. Earlier in the infestation, the Agency posted signs at landings on how to prevent transport to other lakes. However,



*Decaying zebra mussels can litter beaches and cause disposal problems for municipalities and shore land property owners.*



*Zebra mussels can damage boat engines by growing in the cooling system, blocking water flow and causing the engine to overheat and are also known to block steering mechanisms.*

zebra mussels have since spread to nearby lakes. The Agency has also worked closely with marinas on boat maintenance issues, for example, asking marinas to check on boat engine water intakes to see if mussels had spread there.

Five years after the infestation began, the Agency re-sampled the lake bottom in the same areas sampled in the earlier study. They documented a loss of some species, and a decline in microscopic organisms serving as prey for young fishes with an increase in bottom-living invertebrates and algae beginning to form green mats or scums on the bottom. The DNR fish manager hasn't seen significant changes in the lake yet but expects to see an impact as the zebra mussel population grows.

The presence of zebra mussels has not negatively affected property values. The Town of Linn (which constitutes 60% of Lake Geneva shoreline) just completed a reevaluation of properties, which showed that values went up by one third. The rate of property value increase has not slowed over the period of zebra mussel infestation. Agency staff pointed out that one of the initial impacts of zebra mussel infestation may be increased water clarity, which is valued by many lake users.

Economic impacts to golf course and boaters using Lake Geneva have been documented above in the section on Economic and Social Consequences.

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# MANAGEMENT OPTIONS TO PREVENT THE DISPERSAL OF ZEBRA MUSSELS INTO AND OUT OF DANE COUNTY WATERS

Unlike chemical pollutants and sediment runoff where cutting off the source to the lake can result in recovery, a clear difficulty with managing the zebra mussel invasion is that once the zebra mussels are in the lake they can reproduce and do not depend on external sources of new mussels. No means are known to control zebra mussels once they are in a lake. Thus, efforts to prevent them from arriving are important. For Lake Monona and the lower Yahara lakes, it is probably already too late. These lakes will become a new source of zebra mussels for other waters and means should be developed to slow their spread from the Yahara lakes and river to waters elsewhere in the county and the state.

Zebra mussel larvae will drift downstream to the lower Yahara lakes. We do not know how to eliminate or control them once they are in the lakes nor can we prevent the downstream drift of their larvae. Adults would be expected to reach a high abundance within about ten years after arrival and then become less abundant some 30 or so years later, based on experience in Poland.

The Dane County Lakes and Watershed Commission is partnering with DNR in their present efforts to slow or prevent the spread of zebra mussels and other invasive species in hopes of preventing or delaying the spread of zebra mussels to Dane County waters such as Lake Mendota, Fish Lake, Crystal Lake and Lake Wingra.

If a decision is made to do nothing about the zebra mussels in Dane County, they will likely colonize all Dane County lakes that have trailered boat access and these lakes will become a source of zebra mussels to other waters in the state via boats hauled from the Dane County lakes.

Once zebra mussels are present in a lake, it is not possible to remove them. Therefore, the only possible goals available for policy makers

are for containment to protect other water bodies from the spread of zebra mussels. Following are three goals the Work Group has identified for Dane County. Options for meeting these goals are discussed in the sections that follow.

## Goals

1. Prevent the spread of zebra mussels into other Dane County waters from Lake Monona and the lower river and lakes.
2. Prevent the spread from Dane County waters with zebra mussels to other lakes and streams in other counties.
3. Understand the impacts of zebra mussels on Madison lakes and on other policy goals such as reducing blue-green algae blooms, reducing the spread of Eurasian milfoil, and in providing a quality public recreational resource for citizens.



*Zebra mussel filtering can also improve water clarity, thus making the water nicer to look at. But, increased water clarity may alter plant and animal communities. Rooted aquatic plants can become established in areas where they have been absent for a long time, become more dense than normal or extend into deeper waters because of increased light penetration. A drastically changed ecosystem results and recreation is impaired.*

## Options for Preventing the Spread into Other Dane County Waters

The Invasives Work Group considered all options for dealing with the presence of zebra mussels in some of our lakes. Due to the different circumstances for each lake, however, different approaches are necessary.

We have tried to consider every reasonable policy option for controlling the spread of zebra mussels. However, there is a legal limit to the actions that may be taken as control measures. Under Wisconsin's Constitution and Wisconsin's Public Trust Doctrine, "All Wisconsin citizens have the right to boat, fish, hunt, ice skate, and swim on navigable waters, as well as enjoy the natural scenic beauty of navigable waters and enjoy the quality and quantity of water that supports those uses."<sup>1</sup> For example, it is not possible to close ALL landings to prevent the spread of zebra mussels by careless boat transport. A possible exception in some limited cases would be through an executive order approved by the legislature and the governor for, as an example, a zebra mussel exclusion lake. Such a project would need public hearings and scientific and policy review.

While the focus of this report is on zebra mussels, it is important to mention that the



*Two to four weeks after hatching, the free-swimming larvae settle and attach to any solid object, including each other. If they attach to a movable object, such as a boat, motor, trailer or weeds stuck on a trailer, they can spread to uninfested waters.*

prevention steps, such as education, will help to prevent future infestations of other unwanted species as well. Recommended actions should be looked at not only with respect to the spread of zebra mussels, but also on a more long-term, big-picture scale.

To consider policy options, we have organized the material below according to the extent of known zebra mussel infestation in each lake.

### Lakes and Connecting Streams for Which Preventing Zebra Mussel Spread is Not Possible

**Lake Monona:** Zebra mussels already present. No known action will prevent them from becoming abundant.

**Lakes Kegonsa and Waubesa:** Zebra mussels will disperse into lake from upstream. No known action will prevent their downstream dispersal from Lake Monona.

### Policy Options

The goal here should be to prevent spread from these lakes.

#### High Intervention:

- Enforce existing transfer law.

#### Low Intervention:

- Boater and fisher education for improved boat cleaning and fishing practices.

### Lake in Which Spread Might Be Prevented but Significant Cost and Policy Issues would Need to Be Addressed

**Lake Mendota:** To keep zebra mussels out, it would be necessary to prevent their arrival on boats from lakes and streams with zebra mussels. This would require preventing their arrival at boat landings or from Lake Monona via Tenney locks.

<sup>1</sup> Wisconsin's Waters Belong to Everyone, Wisconsin Department of Natural Resources, <http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/doctrine.htm>

## Policy Options

### High Intervention:

- Seek approval to close Tenney locks to upstream boat movement.
- Enforce existing transfer law.
- Restrict boat landings and encourage in-lake boat rentals.
- Pursue all lesser intervention strategies.

### Medium Intervention:

- Develop clean boat certification or registration for entering boats based on history of the boat.
- Provide washing stations at heaviest trafficked landings and marinas.
- Pursue all lesser intervention strategies.

### Low Intervention:

- Boater and fisher education for improved boat cleaning and fishing practices.

## ***Lakes in Which Spread Could Likely Be Prevented but at Significant Cost and Policy Issues Would Need to Be Addressed***

**Lakes Wingra, Fish and Crystal** are isolated from downstream flow from other water bodies. As a result, the only way zebra mussels are likely to invade would be through transport by humans in boats or other equipment. Protecting these valuable lakes may preserve valuable long-term natural resources that could become increasingly rare in the future.

For example, Fish Lake has the potential to be perhaps the last zebra mussel exclusion zone (ZMEZ) or lake-scale biodiversity reserve in Dane County. The lake is a seepage lake receiving its water from groundwater rather than from surface streams; thus Fish Lake has more natural protection from invasive species than other Dane County lakes.

Fish Lake has 27 fish species including many game fishes as well as the lake herring, the banded killifish and a number of other small species. These now occur in other Dane County lakes, but if a continuous series of new invaders

### ***Attention Boaters!***

Inland fishing season opened May 4th, and anglers should be aware of a change in state law that requires the removal of aquatic plants and zebra mussels each time a boat is put into state waters. The new law allows game wardens or other state law enforcement officers to prohibit someone from placing a boat in the water if aquatic plants or zebra mussels are attached to the boat. Boaters who violate the new law also face a \$50 fine for the first offense, and up to \$100 for each subsequent offense within the same year. See ss. 30.715, Wis. Stats. which can be viewed at: <http://www.legis.state.wi.us/statutes/Stat0030.pdf>.

Taken from <http://www.dnr.state.wi.us/org/caer/ce/invasives/regulations.htm>.

enter the larger Yahara lakes, Fish Lake could be the last place in the county where a transition to a largely exotic community could be prevented. Two exotics presently occur in the lake—Eurasian water milfoil and common carp—both are nuisances. Preservation of Fish Lake as a ZMEZ would likely require significant “High Interventions.”

## Policy Options

### High Intervention:

- Restrict boat landings and encourage public boat rentals on lake.
- Pursue all lesser intervention strategies.

### Medium Intervention:

- Develop clean boat certification or registration for entering boats based on history of the boat.
- Provide washing stations.
- Pursue all lesser intervention strategies.

### Low Intervention:

- Boater and fisher education for improved boat cleaning and fishing practices.

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## Options for Preventing the Spread of Zebra Mussels from Dane County Waters to Uninfested Lakes and Streams Throughout Wisconsin

- Boater education
- Provide cleaning stations to remove vegetation
- Provide cleaning station to clean boat hulls.
- Enforce existing transfer law.

## Understanding the Impacts of Zebra Mussels on Madison Lakes

We must continually monitor and evaluate the impact of zebra mussels on our lakes to respond in the most appropriate way. Given the research that has already been performed on the Yahara lakes and other Dane County lakes, a significant base of data on pre-zebra mussel conditions exists. Dane County should encourage and join ongoing studies of our lakes. Dane County is already making investments in lake quality that we can most likely use to leverage federal, state and foundation funding for further study.

## Possible Educational Activities Related to the Goals

The Work Group and staff have identified the following educational activities that could be pursued in implementing any combination of policy options described in the previous sections:

- Use DNR materials and other resources that are already developed; distribute through

watershed and “friends” groups, Yahara Lakes Week, and at displays at the annual Garden and Fishing Expos.

- Issue press releases and public service announcements to remind public to clean boats.
- Provide interviews to media to elaborate on what is at stake, and what boaters and the general public can do
- Post alert notices at private marinas and private access sites, focusing on Lake Mendota.
- Host demonstration projects on how to clean boats.
- Build a portable washing facility, and train volunteers to use it and demonstrate to boaters how to clean their boats
- Work with fishing clubs, marinas, boater groups and others to share information and demonstrate boat cleaning



*Zebra mussel larvae cannot be seen with the naked eye. Neither can most newly attached mussels. Often, they're felt before they're seen. On a smooth surface like a boat hull, young mussels feel like grains of sand.*

## WHAT THE COMMISSION HAS DONE SO FAR

In addition to convening the Invasives Work Group, the Lakes and Watershed Commission issued a press release in the fall of 2002 informing citizens about the presence of and possible consequences of zebra mussels in our waters. Staff distributed information about invasives at the Madison Fishing Expo, held in February 2003. Recommendations for boaters on preventing the spread of zebra mussels and other

invasives was included in the February 2003 reprinting of the maps of Lakes Mendota, Monona, Wingra, Waubesa and Kegonsa. Commission members and staff continue to partner with DNR on these efforts. Commission staff has compiled a number of references on zebra mussels and other invasives species, much of which is available on the Commission web site at [www.co.dane.wi.us/commissions/lakes](http://www.co.dane.wi.us/commissions/lakes).

## CITIZEN ACTIONS TO PREVENT THE SPREAD OF ZEBRA MUSSELS

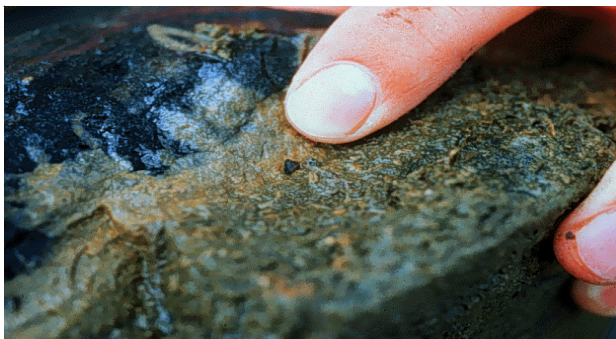
It is against state law to transport exotic plants or animals from one water body to another. When leaving a lake, boaters should conduct the following zebra mussel prevention steps, in the following order, *every* time they remove their boats from the water:

1. Inspect your boat, trailer and boating equipment and remove any visible plants and animals.
2. Drain water from the motor, live well, bilge, and transom wells while on shore and before leaving any water body.
3. Dump unused bait in the garbage. Never release live bait into a water body, or release aquatic animals from one water body into another.

When boats have been moored for **more than 1 day**:

- Rinse boat and equipment with hot water high pressure, especially if moored for more than one day, OR dry *everything* for 5 days.

Boaters and other citizens should learn to identify zebra mussels and be on the lookout for them. If gear feels gritty or grainy, young microscopic mussels may be attached. They are the **ONLY** freshwater mollusks that attach themselves to solid objects. Identification cards are available from the Wisconsin Sea Grant (920-683-4697), DNR (608-266-9270) or the Lakes and Watershed Commission (608-266-4296).



*Newly settled individuals feel like fine sandpaper on smooth surfaces, such as a boat hull. As they grow, they look like coarse grains of pepper. During the next stage, they begin to take on their characteristic brown to black striping.*



*To do our part, we, as recreational users and shore land property owners, must view our boats and equipment, driftwood, aquatic plants, rocks and shells as potential carriers of zebra mussels.*

### If Any Zebra Mussels Are Found...

If any zebra mussels are found, call either the Wisconsin Sea Grant Zebra Mussel Watch (920-683-4697) or the Wisconsin Department of Natural Resources (608-266-9270). They'll want to know the date and exactly where they were found. Mussels must be stored in either water or rubbing alcohol and refrigerate, if possible, until they are turned in for identification. **DO NOT** put the zebra mussel back in the water where you found them or any other water body.

*Photos and captions courtesy of Minnesota Sea Grant Program*

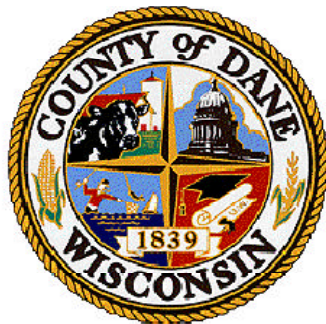
## BEFORE launching.....BEFORE leaving

- **Remove** aquatic plants and animals
- **Drain** lake or river water on land
- **Dispose** of unwanted live bait properly
- **Rinse** boat and equipment with high pressure or hot water  
OR
- **Dry** everything for at least 5 days

## Protect Our Water Resources

Check out [www.co.dane.wi.us/commissions/lakes/invasives.shtml](http://www.co.dane.wi.us/commissions/lakes/invasives.shtml) for more information and links

### DANE COUNTY LAKES & WATERSHED COMMISSION Information and Education Subcommittee



**Dane County Lakes & Watershed Commission**  
Room 421, City-County Building, 210 Martin Luther King, Jr. Blvd., Madison, WI 53703-3345  
[www.co.dane.wi.us/commissions/lakes](http://www.co.dane.wi.us/commissions/lakes)  
Susan Jones, Watershed Management Coordinator, 608-267-0118, [lakes@co.dane.wi.us](mailto:lakes@co.dane.wi.us)