Long Lake & Zebra Mussels

Now that zebra mussels (ZM's) appear to be establishing a presence in Long Lake we need to be ever more vigilant. The best practices you apply to curb ZM propagation here may also help to prevent/slow the introduction of other invasive species into our waters. The purpose of this brochure is to educate you on ZMs and the best ways to manage them. Please OBEY Wisconsin laws, and Wisconsin Department of Natural Resources (WDNR) regulations; and also CONSIDER the additional guidelines provided to effectively prevent invasive species propagation as much as possible.

About ZMs

ZMs are small, clam-like, mollusks no larger than the size of the end of your finger (typically only about 1 to 1.5 inches long at full growth). They are neither native to Wisconsin nor to North America. ZMs first spread from the Caspian Sea between Europe and Asia into the Great Lakes through ballast water in cargo ships. They were first noticed in the Great Lakes in the 1980's and have been spreading inland to lakes and rivers ever since.

Their life span is four to five years, and they have three life stages – larval, juvenile, and adult. In their larval stage they are microscopic in size and live freely throughout a lake's water column. In this stage they are easily transported through water left in boat ballast tanks, bait wells and live wells.

As indicated by their name, adult ZMs have stripes. The color pattern is usually dark brown stripes on a lighter brown, beige, or yellowy base. Sometimes their base color can be very dark so the

LONG LAKE'S ZM MYTHS:

<u>Only boaters with boat trailers need to be concerned about the spread of ZMs</u> – All of Long Lake's users and residents play an important role in controlling the spread of aquatic invasive species, including ZMs. How you handle and dispose of them will make a difference.

<u>ZMs cannot survive in Long Lake</u> – Our limited history of infestations led to a theory that ZMs could not sustain a healthy population in our water. Unfortunately, this is not backed by any science, and nobody ever knew that for certain. The ZM population growth over the past few years appears to debunk that theory.

<u>ZMs will significantly disrupt use of Long Lake</u> – ZMs are a definite problem. They can overtake native mussels, cover anything that stays in the water for extended periods, including boats, motors, docks, rafts, anchors, ropes and swim mats. They can cling to rip rap, rocks and cut your hands when removing docks or cut the feet of swimmers, but there are helpful things in this brochure that you can do to lessen their impacts on your enjoyment of the water.

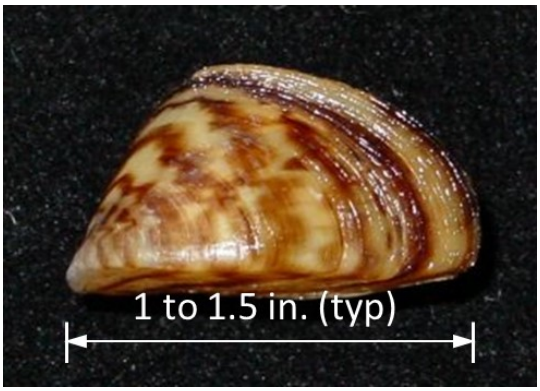
Typical ZM cluster found on a swim mat in Long Lake (Sep 2021)

It's up to each of us to help prevent the spread of invasive species into and from Long Lake. Thank you for doing your part!

LONG LAKE'S ZEBRA MUSSEL (ZM) HISTORY:

- Two shells were first found along the northern shoreline and reported to the WDNR in August 2002. The WDNR confirmed their presence and placed Long Lake on their list of Zebra Mussel Infested Water Bodies that same year.
- Eight artificial substrate samplers were handed out by LLA at their 2003 spring meeting and two additional samplers were added later. Each sampler was a 2-foot section of 4 -inch diameter PVC pipe that volunteers around the lake suspended by rope in shady places under their docks or rafts.
- No ZMs were found in 2003, 2004 or 2005, with the DNR visiting the lake 3 times each year without finding any further evidence.
- At LLA's request, and with back up data from the substrate samplers, WDNR officially delisted Long Lake as containing ZM's in February 2006.
- No ZM sightings were reported in the ensuing years after the Long Lake was delisted. Our Clean Boats Clean Waters program was a major contributor to this success.
- In fall 2018, four ZMs of 5/8 to 3/4 inches were found in the narrows on the north shore.
- In fall 2019, several more owners reported finding ZMs on their boat lifts and docks along the northern shore from the narrows toward the west bay. In 2020 and 2021 these reports grew in numbers and locations.
- WDNR and Golden Sands Resource Conservation & Development Council experts have again officially verified the presence of ZM's in Long Lake.
- At this time, Long Lake is again on the WDNR list of Zebra Mussel Infested Water Bodies with a "date first found" of 2002.

Follow this QR code to see the WDNR list of ZM infected waters



Typical Zebra Mussel
(Source: US Geological Survey)

stripes are hard to see. Adult ZMs can stay alive for several days outside of water and can be common hitchhikers on boats, fishing equipment – and aquatic plants. In fact, ZMs can attach themselves to any solid surface, although the evidence from Long Lake seems to indicate they prefer rocks and plastic items over anything metal so far.

ZM Population Growth

Science indicates that, like all living organisms, the ZM population in any lake will follow the abundance of their food supply. With the increase of erosion the past several years from high water levels, and the noticeable influx of boaters from outside the area when other lakes were under wake restrictions, it is possible that a perfect storm of increased nutrients and introduction of ZMs from other waters have helped them gain a foothold in Long Lake during recent years.

However, no one knows for sure how quickly or whether ZMs will further spread in Long Lake. If history repeats itself, ZMs may diminish and go away (although the numbers we are seeing in recent years suggests that is unlikely). If they continue to propagate then it could take several years before we'll understand the ZMs full impact in the lake.

Fortunately, Long Lake's water generally has lower nutrient levels and less algae to nourish ZMs than other more eutrophic lakes in the state of Wisconsin. While this may sound encouraging, other lakes with similar oligotrophic qualities like Long Lake, have still developed ZM populations. Time will tell.

Despite the negatives, it is important to also ask if any positives may occur from the presence of ZMs. The filter feeding mechanism ZMs use can clean up lake water by removing algae. For some lakes this is a positive, but whether this may be a positive for Long Lake remains an unanswered question. Because Long Lake's water is already very clear, the impact may not be all that significant or noticeable over time. Any noticeable impact will likely depend upon the degree to which clearer water also affects aquatic vegetation growth/location, and whether it could thereby impact fish populations by reducing food available for newly hatched fish.

Reports from other lakes indicate there may be a benefit to smallmouth bass growth when ZMs became established in a lake. Biological information supports this hypothesis. Crayfish are known to eat ZMs, enhancing a significant food source that benefits smallmouth bass growth and abundance This could explain why smallmouth bass fishing in Long Lake has improved dramatically in the past several years.

Smallmouth Preying on Crayfish (Source: https://reelfishn.net/best-times-to-fish-with-crayfish/)

Doing Our Part to Prevent the Spread of ZMs from Long Lake

Tips for boaters and anglers – Remove all plants, animals or mud that may be on or in your boat or trailer after pulling your boat out of the lake. Drain water from your boat and trailer. After pulling your boat open the drain plug and keep it open until you are ready to launch the boat again. Drain your bait buckets, live wells, bilges and containers that have held lake water before leaving the boat ramp area. Throw any live bait that has been in contact with the water into the trash or place the bait into clean water from outside the lake. A best practice is to clean your boat, trailer and containers with a pressure hose to proactively remove ZMs.

Tips for lakeshore residents – Drain and dry your stationary equipment (docks, lifts, rafts, etc.) for 21 days after you take them out of the lake if you intend to move them to another body of water or sell them. If there are ZMs clinging to the equipment, you will need to remove them by scraping them free before moving or selling the equipment. Follow the disposal recommendation in this brochure for any shells or pieces of ZM you remove from your equipment.

How to Deal with ZMs

Remove Them From Your Shoreline – If you encounter a random ZM along your shoreline, carefully remove it from the water and dispose of it following the simple guidelines in this brochure. ZMs are prolific; Each adult female can produce from 30 thousand to 1.6 million eggs per year. Removing even one ZM is a good idea. Similarly, when you remove your equipment at the end of the season, scrape off any mussels, contain them and dispose of them following the guidelines.

Protect Your Boat with a Lift – Using a boat lift to keep your boat motor and lower unit out of the water between uses is probably the most effective and simplest solution. A boat/motor that stays in the water is at a higher risk from ZMs.

Regularly Inspect Your Boat Motor – Depending on age, ZMs can be very small and can easily cover intakes or enter a boat's cooling system and clog it, causing it to run hot. If you notice this, take steps to remove ZMs and regularly inspect your boat/motor. A good preventative measure is to run your boat motor regularly at slow speeds for 10-15 minutes. This will help clear the cooling water tubes and hoses. For outboards and I/O's hooking a hose to a motor flusher or muff can help flush out mussels from interior channels, tubes and hoses.

HOW TO PROPERLY DISPOSE OF ZEBRA MUSSELS

The WDNR generally does not issue permits to kill ZMs with pesticides, especially if they are considered widespread. Follow these recommendations to properly dispose of ZMs you encounter:

Remove them when you see them!

Wear gloves and use a tool.
A paint scrapper or other tool will help you avoid cutting yourself.

Put the ZM shells in a sealed bag and throw the bag in the trash.
The mussels will suffocate and die in the bag.

For a more humane option, put the sealed bag in the freezer.
The mussels will effectively go to sleep and then freeze. You can dispose of them later.

NEVER put ZMs in a compost bin - they will rot and smell terrible.

NEVER put ZMs, bait or lake water down toilets or other plumbing drains!

Employ Anti-ZM Disks Under Your Dock – Among the newest measures available involves the placement of non-toxic disks that can repel ZMs from the area of your dock and boats. Each disk repels ZMs over a 6 foot to 8 foot diameter area when suspended in the water column. The disks are easily suspended underneath a dock and their effectiveness at repelling mussels generally lasts a season (6 months). (Note: LLA does not endorse this patented product, but simply brings it to your attention as a potential solution. Follow this QR code to learn more.)

The Future

While a ZM infestation is considered new to many of us, it is not considered new to the WDNR (see "History"). We will not need to report discovery of any new ZM populations officially. However Long Lake Association (LLA) will keep data to track the spread of the ZMs. To report on a discovery of ZMs on your shoreline, please send an email to longlakewi@gmail.com and include your name, description of the ZM discovery/sighting and contact information for follow up questions.

The LLA, with support from the Friends of Long Lake, administers an annual survey for detection of aquatic invasive species in Long Lake. We educate our members and lake residents on the best practices needed to limit the spread of these costly plants and animals. PLEASE consider joining LLA and contributing to Friends of Long Lake so we may continue our efforts to keep Long Lake healthy and to educate everyone on this wonderful lake we are privileged to enjoy.

PLEASE HELP!
Volunteer for LLA's Clean Boats Clean Waters program!

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