

15,000 reasons to worry about invasive species

November 9 2009, By Dan Egan

A day at the beach in Wisconsin's North Woods didn't used to go like this. Candy Dailey spent a Fourth of July holiday splashing with grandkids on the sandy shore of Lake Metonga when she felt a nasty sting on her foot.

She didn't need to look down to know the culprit was a zebra mussel -- cuts from the razor-sharp shells have become as unremarkable as bee stings since the mussels invaded Dailey's lake eight years ago.

The natives of the Caspian Sea region first turned up in North America in the summer of 1988, thanks to overseas freighters' long-standing -- and ongoing -- practice of dumping their contaminated ballast water in the Great Lakes, which are now home to more than 185 non-native species.

None has wreaked more damage than the mussels, which feast on Great Lakes plankton and have cost the region billions of dollars in starved [fish populations](#), beach-trashing [algae blooms](#) and plugged industrial and municipal water intake pipes.

Now, this ecological mess is spreading inland.

"The Great Lakes are just a beachhead for invasions that are going to play out in lakes across the country in the next century," says University of Wisconsin ecologist Jake Vander Zanden. "It's just the start."

Dailey is painfully aware of this.

"I'm a nurse, so I knew to make it bleed and wash it out," she says of the cut suffered from the molar-sized mussels. "I dried it off and taped it."

Trouble came in the middle of the night when she woke with a throbbing, swollen foot. By morning a tell-tale red streak was creeping up her leg. By sunset she was taking a broad-spectrum antibiotic.

Dailey recovered from the bacterial infection, but her holiday was over.

It's not the kind of story that makes a headline. It's just one infection from one cut. It's just one person swimming in one inland lake.

The problem is Wisconsin has more than 15,000 inland lakes.

Politicians have tried for years to force overseas freighters to treat their ballast water -- used to steady the ships -- before discharging it at a Great Lakes port in exchange for cargo.

The shipping industry acknowledges the trouble it has pumped into the world's largest freshwater system, and its leaders profess a desire to do something about it.

Yet at the same time they have consistently fought regulations proposed by Great Lakes states to require freighters to install onboard ballast treatment systems, claiming they are impossibly stringent, expensive or inconsistent from state to state.

Members of Congress, meanwhile, have repeatedly vowed -- and repeatedly failed -- to craft an overarching national ballast law that is palatable to both the shipping industry and environmentalists.

The result is the door remains open to invasions, the most recent being the "bloody red shrimp" discovered in Lake Michigan in late 2006. There could well be others that have arrived since then; it can take years for populations to grow big enough to be noticed.

Biologists say the damage being done to the world's largest freshwater system cannot be overstated, but the problem has become bigger than the Great Lakes themselves. It's now clear the failure to slam the door on new Great Lakes invasions has consequences for everyday folks with cottages on inland lakes, places working-class people across the state like to claim as their favorite on Earth.

"Where is the fun in playing on the shoreline anymore if our lakes are wall-to-wall [zebra mussels](#)?" asks Dailey. "Look at the money that we all pay in property taxes to live on a lake that is now not the lake that it used to be."

The potential economic impacts of this second-wave invasion could prove staggering.

Property on Forest County's Lake Metonga sells for an average of about \$1,200 a shoreline foot, and the lake has roughly seven miles worth of it. That means a crude estimate of just this lake's shoreline value -- not including any of the homes built on it -- lands somewhere above \$44 million.

At the same time, one estimate of the annual savings associated with using overseas ships to haul cargo into the Great Lakes instead of transporting it via truck, train or barge is only \$55 million.

That's basically the real estate value of just one inland lake.

People flock to places like the forested shores of Lake Metonga to get

away from the rest of world.

It is an illusion.

Standing in front of about 400 shorefront property owners at the annual Wisconsin Lakes Convention in downtown Green Bay, University of Notre Dame professor David Lodge dimmed the lights and gave a pointed presentation last spring about the biological perils for a globe that has been stitched so tightly together by increasingly efficient transportation networks.

Lodge pulled up a slide showing the Great Lakes are directly connected to 12 percent of the world's ports. That means a mussel, fish or even virus picked up at a bustling global port in a place like Antwerp, Belgium, can arrive in a matter of days at the Green Bay docks just outside the doors of the conference center at which Lodge spoke.

Then Lodge showed a slide that revealed 99 percent of the world's ports are just two stops or fewer away from the Port of Green Bay, or any other commercial dock in the Great Lakes. This is not a theoretical problem; freighters are blamed for the arrival of nearly 60 new species since the St. Lawrence Seaway opened the Great Lakes to oceangoing vessels 50 years ago.

And spreading that misery inland like so many viruses are the fishing boats, Jet Skis and other pleasure craft rolling on trailers down the state highways that provide a 65 mph link between the Great Lakes and inland waters.

Wisconsin now has 120 inland waterways confirmed as infested with zebra mussels, though there is not a comprehensive annual survey of each lake so the actual number could be much higher.

Beyond slicing swimmers' feet, zebra mussels have been linked to inland lake outbreaks of blue-green algae that produce toxins that can kill an animal and can cause liver damage in humans.

This algae was a problem in state waters during the 1960s and '70s, but it faded with a ban on laundry detergents that contained the phosphorous that fed its blooms.

Now blue-green algae outbreaks are making a comeback, and scientists are pointing to zebra mussel infestations as a big reason.

The mussels encourage the blooms because they eat virtually every type of algae except for the blue-green algae. That gives the toxic algae a competitive advantage over its nutrient-rich cousins that have historically nourished the base of a lake's food chain.

Zebra mussels may also further promote these toxic blooms because their excrement fertilizes them.

Still, not every lake in Wisconsin is destined to become home to zebra mussels. Many, for example, don't contain enough mussel shell-building calcium. Biologist Vander Zanden's lab analyzed 923 lakes in northern Wisconsin's Vilas County and found 91 of them to be suitable habitat for zebra mussels. It's a completely different story in southeastern Wisconsin, where all but one of 334 analyzed can likely sustain zebra mussels.

But property owners on inland lakes have to worry about a lot more than just zebra mussels.

"If you want to know what's coming next, look at the species that are already in the Great Lakes," Lodge says.

And the problem doesn't stop at the state line; boat ramps around the country are launching more than just boats. Zebra mussels are widespread in the Mississippi River basin, and quagga mussels are now plugging pipes all the way out in California.

The list of Great Lakes invaders that threaten inland waterways includes VHS, a viral disease spreading through the Great Lakes that can be lethal to dozens of fish species.

It also includes the quagga mussel, a slightly larger and hardier cousin to the zebra mussel that has exploded across the bottom of Lake Michigan in the past few years. Scientists say they are swallowing the base of the food chain and that jeopardizes everything above it, including the prized salmon that drive much of the Great Lakes' billion-dollar recreational fishery.

Overseas freighters also brought to the Great Lakes the round goby, a bug-eyed fish that thrives on native species' fish eggs. Lake Michigan has lost more than 90 percent of its prey fish population since the arrival of invasive mussels, but the round goby is thriving, now accounting for about a fifth of the lake's prey fish.

Gobies were first found in the Great Lakes in 1990 and in recent years began gobbling their way up Great Lakes tributaries, in some cases as far as 30 miles inland. The fish have been found in more than one-third of the Lake Michigan tributaries sampled.

"They are marching inland, and there is a lot of habitat for them," says Vander Zanden.

Ballast water has also brought to the Great Lakes the spiny and fish hook water fleas, which are both hard for native fish to eat because of their namesake tails, and a rival when it comes to feasting on the microscopic

critters at the bottom of the food chain.

Wisconsin's Department of Natural Resources has distributed more than \$10 million to communities to fight aquatic invasive species since 2003. Regardless, the list of new invaders is likely to grow.

The only protection the Great Lakes has at the moment from contaminated ballast water is a requirement that overseas ships bound for the Great Lakes flush their ballast tanks with mid-ocean saltwater to expel or kill any unwanted hitchhikers. It is a practice scientists say goes a long way -- but not all the way -- to reducing the risk of future invasions.

In January, the Environmental Protection Agency released a report that spotlighted 30 organisms that have yet to invade the Great Lakes but are medium to high-risk candidates to do so.

Twenty-five years ago, few in the Great Lakes region had even heard of a zebra mussel. The question now: What next is headed up the St. Lawrence Seaway?

"Until we control the ships, there will be lots of species nobody has ever heard of arriving on their doorsteps," says Anthony Ricciardi, an invasive species expert at Montreal's McGill University.

In 2008, organizers of the Pewaukee Triathlon had to cancel the swim portion of the event, which drew some 2,000 racers, because of plumes of blue-green algae. Nutrients flushed into the lake by heavy rains were a likely factor, but it didn't help that Pewaukee has also been infested with zebra mussels.

On a busy Sunday over Labor Day weekend, Pewaukee Lake bait shop owner John Laimon estimated there were about 200 trailered boats on

the lake "coming from who knows where."

It's not lost on him that Lake Michigan boat ramps are just a half-hour away. He is flabbergasted that two decades after zebra mussels were discovered in Lake Michigan, the government has failed to turn off the invasive species spigot.

"We're the ones paying for the mistakes at the federal level, and there is nothing in the wind that is going to stop that," he says.

With little progress in Congress, the state of Wisconsin earlier this year tried to take matters into its own hands. It followed the leads of other [Great Lakes](#) states such as Michigan, Minnesota and New York and proposed its own ballast regulations that would require ships to install onboard treatment systems.

Shipping industry advocates were not happy, particularly because Wisconsin's proposed standards, which mirror New York's, are much stricter than those of neighboring Minnesota.

They urged the Wisconsin Department of Natural Resources to back off or adopt weaker regulations more in harmony with those of Minnesota, with which Wisconsin shares Duluth-Superior harbor. What's the point in stringently protecting just one side of a harbor, they asked.

Conservationists agreed. But they urged Minnesota to get as tough as Wisconsin was considering.

The shipping industry turned out in force at a public hearing on Wisconsin's proposal last spring, easily outnumbering those in favor of greater protections.

"In a time of national recession and a record state budget deficit, the last

thing Wisconsin should do is impose a (ballast) permit that will: A) destroy jobs, B) reduce tax revenues and C) not result in any environmental benefits," said Andy Lisak, executive director of the Development Association that promotes business interests in Douglas County and the port city of Superior.

The DNR has been sitting on its proposal ever since.

And this has left bar-and-boat-launch owner Andy Cuppan "terrified" about what might be headed next down the interstate off-ramp and into his mussel-infested lake.

He and his business partner recently bought the Boathouse Bar and Grill on the shore of Upper Nemahbin Lake, which is literally just feet from the rumbling westbound lanes of I-94.

Cuppan mentions that this summer he dared to take a shoeless swim and suffered several stinging mussel cuts.

More painful for him is the idea that not enough is being done to protect him from the big lake 30 miles to the east and from what's stewing in the water at ports across the globe.

"We can't do anything about what's here, but let's not let anything else in," he said. "Our livelihoods are at stake."

Of course this is just one guy, on one lake.

The problem is Wisconsin has more than 15,000 of them.

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Citation: 15,000 reasons to worry about invasive species (2009, November 9) retrieved 26 July 2024 from <https://phys.org/news/2009-11-invasive-species.html>

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