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How aquatic exotic species alter Wisconsin waterways



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Clean boats, clean waters

Working together we may be able to protect our waters from unwelcome aquatic invaders

Ron Martin

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Like bullies on a playground they can be pushy.

They can be nuisances.

And sometimes, they can even be dangerous.

The potential threat of exotic species to native species and the biodiversity of aquatic communities nationwide is, and will continue to be, a significant problem.

Exotic species are often referred to as invasive, non-native or nonindigenous, all of which is just another name for alien species. "Exotics," as they are most commonly called, can be either plants or animals that enter an ecosystem from beyond their native range (from another watershed, state, country or continent).

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While not all exotic species are harmful, some threaten the diversity or abundance of native species, the ecological stability of aquatic or terrestrial habitats, or commercial, agricultural, aquacultural and recreational activities.

Exotic species can take over new waters for two main reasons: their natural predators are not present, and native species don't have the ability to hide from them, compete with them or fight back.

Freed from the predators, parasites, pathogens and competitors that have kept their numbers in check, invasive species can crowd out native ones. Their numbers can explode under favorable environmental conditions and once firmly established, exotic species are difficult to manage and nearly impossible to eliminate.



Eurasian water milfoil covers this diver's head. © Robert Queen.

In fact, invasive species are a major cause of habitat change, degradation and loss of biological diversity and are considered to be "biological pollutants." Their introduction may be intentional or accidental, but either way they present risks to native species.

Here, we limit our focus to aquatic organisms. We introduce you to some of the more troublesome aquatic exotic species in Wisconsin waterways so you can understand how to help control their spread.

"Clean boats, clean waters" remains the cornerstone of the Wisconsin DNR's program to prevent aquatic exotics from spreading.

People can spread invasive species through the ballast water of ships, recreational boating, sport fish stocking and accidental releases associated with the aquaculture industry, aquarium trade, bait business or horticultural practices.

The rate at which exotic species are introduced continues to increase in the Great Lakes region and throughout the United States as humans assist in transporting them.

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The situation has worsened. Once new invasive species are introduced to the Great Lakes they can be transported to inland waters on recreational boats. The Mississippi River acts as another conduit where invasive species are released via barge traffic from the Gulf of Mexico and southern states.

Today, more than ever, prevention and control efforts are needed to address the problem of invasive species. The environmental and economic costs from new infestations continue to escalate. Last year, the U.S. Fish and Wildlife Service launched an educational campaign warning about the spread of exotics and called the watch list: America's Least Wanted.

Although an awareness of problems caused by exotic aquatic species is emerging in Wisconsin, solutions are not always readily apparent.

The Department of Natural Resources is primarily responsible for investigating aquatic invasive species. Because of the rapid emergence of exotics as a problem, new funding has not kept pace with the need to protect our aquatic resources from biological pollutants. Without adequate resources, the state is at a disadvantage when it comes to control and management of invasive species. Wisconsin is one of the few Great Lakes states that does not have a full-time director to manage aquatic invasive species.

Minnesota has had an exemplary program in place over the last decade to prevent and control the spread of exotic species. The Wisconsin Department of Natural Resources would like to establish some of the same programs here.

Efforts in Minnesota over the last decade include slowing the spread of Eurasian water milfoil, an aquatic plant known for its propensity for explosive growth and its ability to regenerate, and out-compete important native plants.

Minnesota's prevention program includes watercraft inspections at boat landings, enforcement efforts and a comprehensive public awareness campaign that includes television and radio to reach a large audience.

It's working.

Research shows that fewer lakes are becoming infested with Eurasian water milfoil in Minnesota because boaters and other water recreationists are taking action at boat access sites to prevent their spread. A survey conducted by the University of Minnesota Sea Grant Program in 1994 found that 91 percent of Minnesota boaters thought it was very important to prevent the spread of water milfoil compared to Wisconsin (54 percent) and Ohio (29 percent). Overall,

Four reasons to care about aquatic exotics

Economics. The costs of controlling exotic species in the United States increase every year. A typical consumer absorbs these costs through higher water and electric bills. A Cornell University study reports that exotic species on land and water already cost the United States \$138 billion annually. The Great Lakes sport and commercial fishing industry, valued at almost \$4.5 billion annually, is at risk due to the growing numbers of exotics such as the zebra mussel, spiny water flea, sea lamprey, ruffe and round goby that prey on clams and mussels, invertebrates of all sizes, as well as fish eggs and small fish. Large water users in the Great Lakes, including municipalities and industries, spent about \$120 million from 1989 to 1994 to combat the spread of zebra mussels.

Health. Some exotic species may cause significant health problems. For example, a South American strain of human cholera bacteria was found in ballast water tanks of ships in the port of Mobile, Ala. in 1991. Cholera strains also were found in oyster and fin/fish samples in Mobile Bay, resulting in a public health advisory to avoid handling or eating raw oysters or seafood. Temporary bans on commercial harvest

survey results indicate that Minnesota boaters are more knowledgeable about exotic species and have changed their behavior to prevent the spread to a greater extent than boaters in the other two states.

"From our experience in Minnesota, Wisconsin would greatly benefit from a similar aquatic nuisance species (ANS) program that focuses on prevention through education, containment, management, monitoring and research," notes Doug Jensen, the Exotic Species Information Center Coordinator for the University of Minnesota Sea Grant Program.

Jensen believes that success in preventing the spread of aquatic nuisance species will come from education, collaborative efforts and long-term stable funding.

We don't expect to make everyone a taxonomist, says Jensen. Instead, he says that we just want people to know what these exotics look like so that if they discover something strange looking, they'll report it to the Department of Natural Resources or Sea Grant.

"We are glad when people contact us about a potential sighting because this means their awareness is heightened," Jensen says. "Often, the public discovers new infestations before they are found by a state or federal agency. That's why an informed public is critical for early detection."

Jensen points to zebra mussels as another example where Minnesota has successfully slowed the spread of an exotic. Despite infestations in the Duluth-Superior harbor and the Mississippi River for about a decade, only one lake in Minnesota is infested.

"We've been able to hold off the zebra mussel infestation at our border because we've made public education a priority and boater surveys show that it's paid off. Our efforts are proactive and highly collaborative, plus we have laws in Minnesota that prevent the spread of exotic species within the state that give us 'the teeth' to combat apathy about them," he notes.

Taking a lesson from what has worked in Minnesota, the Wisconsin Department of Natural Resources is actively seeking funding from federal and state sources. An expanded state program on exotic aquatic species would establish a watercraft inspection program and strengthen ongoing

may be put into effect when health concerns exist.

Ecological. The rapid spread of zebra mussels in the Great Lakes shows how profoundly an exotic can alter the aquatic environment. These tiny mussels rapidly reproduce. Coupled with consumption of microscopic plants and animals, zebra mussels affect the aquatic food web, decimate native mussel/clam populations and place valuable ecological communities resources at risk.

Recreational. Invading species such as the sea lamprey, ruffe and round goby can harm native fish such as lake trout, walleye, yellow perch and catfish, which threaten a national sport and commercial fishing industry valued at almost \$4.5 billion annually that supports 81,000 jobs in the Great Lakes. Aquatic invasive plant species such as purple loosestrife and Eurasian water milfoil quickly established themselves and in some cases replaced native plants. The proliferation of these exotic plants impairs boating, swimming and fishing, navigation and flood control, and degrades water quality as well as fish and wildlife habitat. -- *List compiled from the Aquatic Nuisance Species Task Force and the Great Lakes Panel on Aquatic Nuisance Species.*

Some aquatic exotic species in Wisconsin

- Round goby (*Neogobius melanostomus*)
- Sea lamprey (*Petromyzon marinus*)
- Rusty crayfish (*Orconectes rusticus*)
- White perch (*Morone americana*)
- Flowering rush (*Botumus umbellatus*)

programs, such as public outreach, education and monitoring for exotic species. Policy and enforcement of transportation regulations is another option.

If funding became available, the Department of Natural Resources would establish a watercraft inspection system at key boat launches to increase awareness of problems caused by exotic species and to teach boaters how to properly inspect and clean their watercraft. Waters infested with problem species would be targeted for inspections to reduce the likelihood of spread. Inspections would also be conducted at fishing tournaments, sailing regattas and water ski tournaments that bring many watercraft users together at one location and increase the risk of transporting exotics.

- Curly-leaf pondweed (*Potamogeton crispus*)
- Zebra mussel (*Dreissena polymorpha*)
- Ruffe (*Gymnocephalus cernuus*)
- Spiny water flea (*Bythotrephes cederstoemi*)
- Eurasian water milfoil (*Myriophyllum spicatum*)
- Purple loosestrife (*Lythrum salicaria*)
- Common carp (*Cyprinus carpio*)
- Rainbow smelt (*Osmerus mordax*)
- Alewife (*Alosa pseudoharengus*)

With additional resources, the Department of Natural Resources would expand and improve Wisconsin's education program aimed at recreational boaters and anglers using displays at waysides, state parks and recreational areas. Other educational tools include billboards, species watch identification cards, publications and brochures, paid public service announcements, displays at symposiums, sport shows and conventions, and signs at boat landings.

Funding also would broaden the statewide monitoring program for exotic species and results would be posted on the DNR's website. Additional monitoring studies would allow us to better understand impacts exotic species have on lakes, rivers and wetlands.

As a final component of this comprehensive plan, research would be directed at controlling the spread of certain invasive plant and animal species that are particularly problematic to Wisconsin's waters. This would be done through chemicals, biocontrols, barriers and other potentially viable, economical, and environmentally friendly methods.

The DNR's aim is to find, prevent and control the spread of invasive exotic species and develop strong partnerships to foster enhanced protection of our aquatic resources.

"By working together, we've been able to focus on priorities, avoid duplication of effort and add consistency to programming and communications," Jensen says. "Aquatic nuisance species, after all, know no political boundaries."

Ron Martin works with aquatic exotic species issues for the Department of Natural Resources.

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