

Water Pro

Information for professionals working with water issues.

A past, present and future look at their prevention and treatment

Featuring:

- ◆ Exotics in the Minnehaha Creek Watershed
- ◆ Dr. Lorin Hatch Joins MCWD as Water Quality Specialist
- ◆ Boy Scouts Named Watershed Heroes for Cleaning Up Minnehaha Creek

INVASION OF THE EXOTICS

Exotic species like Eurasian water milfoil, zebra mussels and purple loosestrife have been in the news and in our waters for some time now. But newer – and potentially deadlier – invasive or nuisance species like *Cylindrospermopsis raciborskii* (blue-green algae) are now on the sonar, too. Last year, the lethal blue green algae was responsible for at least one death nearby in Wisconsin. How these species can be treated and/or prevented is currently part of the public natural resources discussion – not only at the state policy level, but also at the Minnehaha Creek Watershed District (MCWD).

A look at the historical record tells us that terrestrial species have been on the move for more than 10,000 years. Though less mobile as a species, aquatics have begun the march to new locales; for example the Danube Carp found its way to Greece and Italy more than 2,000 years ago, so the problem of exotics is nothing new. What *is* new is the fact that their rate of introduction increased between 1500 AD and WWI and has radically increased between WWI and the present.

In the Great Lakes alone, 12 major introductions of exotic species have occurred since 1980. With few governmental policies or strategies in place, the public's reaction thus far has been to briefly express distress, fund research and fuel a short-lived policy debate. Once this cycle of resistance winds down, an increased acceptance of the situation sets in. Though a conscientious few keep sounding the alarm, the issue ends up on the back burner for most people. The truth is, exotics are not going away... but does it really matter?

Impacts to Communities

The elimination of invasive exotics is improbable if not impossible, and their management is difficult and expensive. So what are the alternatives? One is to minimize negative impacts by anticipating colonization. Another is to improve and protect our existing natural resources. Just

as unhealthy people are prone to sickness and disease, disturbed or stressed habitats are prone to invasion by exotic plants and animals. Keepers of the environmental trust must strive to predict effects and encourage informed decisions, while monitoring progress of invasions and their impacts. In short, if it's deemed to be in the public's best interest to control the spread of exotic plants and animals, the most effective way to do so is proactively.



Most natural systems exist in a wonderfully evolved state of balance. Exotic invasive species can change that balance, because the predators, diseases and natural conditions that keep their populations under control in their original habitat often do not exist in their new homes. Successful invaders also typically have high birth rates. They are good dispersers and highly adaptable over wide geographical ranges. And they possess a broad habitat tolerance and diet. Of course, the more invaders that are introduced, the greater their potential for a successful colonization.

The effects of invasion can be devastating, including breaking down food webs and altering natural habitats. Natives are in effect forced to shift their habitat use, which often results in their decreased numbers – and possibly reduced size. New diseases among natives are another harmful result, nutrient cycling is disrupted and the ecosystem loses its “service base.” While native communities spiral downward, natural conditions are only enhanced for future invaders.

Management Options

Research has shown that biodiversity has its own management benefits in preventing invasive takeovers. As the richness of natural species increases, fewer outsider species are able to invade an area, and subsequently the natives become less susceptible to disease, too. Associated species also become more diverse (e.g., more plant species equals more insect species). Resource management options in general, however, are limited to a few strategic issues.

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Meet Annie, Fannie and Mike

Exotics in the Minnehaha Creek Watershed

The Minnehaha Creek Watershed District is already dealing with several exotic species, including the following:

Eurasian water milfoil is present in nearly all MCWD lakes. Currently, the district’s treatment recommendations include manual harvest and chemicals. A major infestation often necessitates a mechanical harvest. Ultimately, the best defense against an infestation of invasive plants is a healthy native plant community.

Curly-leaf pondweed is present in many MCWD lakes. It poses problems because it grows rapidly immediately after ice-out in the spring. When the plants die off in mid-summer, they release a significant amount of phosphorus that can fuel late summer blue-green algal blooms.



Curly-leaf pond weed

Purple loosestrife, evident in many MCWD wetlands and shorelines, does well in areas of poor habitat and food quality. Herbicides such as Rodeo® prove most effective. The DNR is using select insects with some success. For a list of these, visit the DNR website : www.dnr.state.mn.us/invasives/aquaticplants/purpleloosestrife/biocontrol.html

Free reed canary grass, found in many MCWD wetlands, is difficult to remove completely, as its seeds frequently blow in from nearby areas.

While these are the most common exotics, the district faces emerging issues such as:

Flowering rush, which has been identified in Forest Lake in Washington County. While it is not widespread yet, this exotic poses a risk.



Flowering rush

Cylindrospermopsis raciborski (a nuisance blue-green algal species), discovered in two southwestern Minnesota lakes this summer, was found in shallow, well-mixed, eutrophic bodies of water. The algae is small, and because of its different forms, is difficult to detect because

of its different forms. It has a high toxicity (including saxitoxin). Most toxic blooms are due to three blue-greens, informally referred to as **Annie** (*Anabaena flos-aquae*), **Fannie** (*Aphanizomenon flos-aquae*) and **Mike** (*Microcystis aeruginosa*).

Along with the dreaded blue-green algae, **yellow iris** is another offender on the horizon.

Exotic aquatic animals that threaten the watershed include the following:

Common carp, ubiquitous in Minnesota waters, disturb lake/stream bottoms and contribute to nutrient-loading impacts and habitat alteration and are present in the MCWD. Management methods currently being used are rotenone, seining and physical barriers.

Asian carp (also known as “flying carp”) found in Lake Pepin have necessitated the discussion about stringing an electric barrier across the Mississippi River. However, that probably won’t stop other carp species from spreading north, after escaping from southern US aquacultural operations.

Zebra mussels are perhaps the biggest threat of all to MCWD waters. They can alter the physical, chemical, and biological dynamics of lakes and rivers, allowing for greater blue-green algal bloom problems, running the potential treatment costs into the millions of dollars and the ruining of numerous local recreational opportunities. Zebras have already been found in the Mississippi and St. Croix rivers, plus in two lakes - Lake Zumbro in Olmstead County and Lake Ossawinnamakee in Crow Wing County.



Zebra mussels

Invaders to be on the lookout for include the following:

Ruffe, a small fish which was recently discovered in the Duluth harbor and nearby St. Louis River.

Round and tubenose gobies, another small bottom feeding fish also found in the Duluth harbor, are even more abundant in the Illinois River and will likely will spread to the Mississippi.

The spiny waterflea (Duluth harbor) can also be found in a few Duluth area lakes.

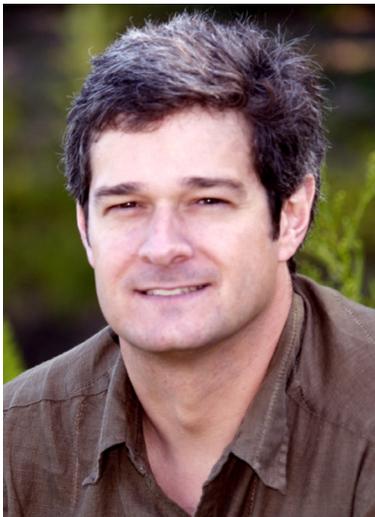
Rusty crayfish, often used for bait (accidentally or illegally), are classic bottom feeders that can destroy macrophytes and have been found in the Zumbro River.

Lorin Hatch Named Water Quality Specialist at MCWD

In a move certain to strengthen the Minnehaha Creek Watershed's expertise on water resources, Lorin Hatch, Ph.D., has been named the district's Water Quality Specialist. The position, a new post at the 181-square-mile watershed, is expected to substantially increase the MCWD's analysis, modeling and management capabilities regarding water-quality issues.

Dr. Hatch is a highly respected limnologist, professor, lecturer and author of many papers on water-resource issues. In the past, he's also been an active participant in both small and large projects with the National Science Foundation, the U.S. Geological Survey (co-principal investigator), the U.S. Department of Agriculture (co-principal investigator), the Minnesota Department of Natural Resources, the Minnesota Department of Agriculture, the White House Committee on Environmental and Natural Resources, the U.S. Environmental Protection Agency and the University of Minnesota.

"The Minnehaha Creek Watershed is an ideal place for a limnologist and an ecologist to do intensive and productive research and water-quality management, because it represents nearly every feature and challenge found throughout watersheds in Minnesota," says Dr. Hatch. "From agricultural runoff in undeveloped areas to inner urban lakes and streams impacted by stormwater runoff, erosion and flooding, this watershed has many timely issues facing it, including habitat, exotic species,



Dr. Lorin Hatch

buffers and water infiltration. I'm looking forward to working with the MCWD's great staff and area citizens to help make long-term improvements for the future."

Prior to joining the MCWD, Dr. Hatch was the visiting assistant professor of aquatic ecology at Macalester College in St. Paul (August 2002 – August 2004), an adjunct water-resources research professor at the University of Minnesota – Twin Cities campus (August 2000 – present) and a visiting assistant professor of water quality at the University of Minnesota (August 2000 – July 2002), where he also was a post-doctoral research associate (January 1998 – July 2000).

Hatch holds a Ph.D. in ecology from the University of California – Davis (1997), an M.S. in animal ecology (limnology) from Iowa State University – Ames (1992) and a B.A. in biology from the University of Iowa – Iowa City (1989). He's done significant coursework in ecology (emphasizing aquatic systems), experimental design and statistical analysis, hydrology, soils/soil conservation, toxicology and watershed management.

Dr. Hatch has written five first-author and seven second-author publications in peer-reviewed journals and agency reports while serving as a peer reviewer for several journals and research grant competitions (as both mail and panel reviewer). Since the late 1980s, he has spoken at professional societies and educational, agency and public events about water resources and watershed management.

Prevention Of Exotic Species Is Least Expensive Method

Exotics continued from page 1

- ◆ Accept that elimination is impossible.
- ◆ Monitor and detect for invaders.
- ◆ Alter habitat to prevent colonization.
- ◆ Use biocontrol, for example, introducing another exotic species that feeds on the original exotic species.
- ◆ Educate the public to prevent the spread of invasives.
- ◆ Deploy chemical control, noting associated impacts.
- ◆ Increase mechanical or recreational harvest.

Ideally, the time to act is before an invader arrives in the area. Prevention is always the least expensive method. Once an invader is spotted, it's imperative to act quickly to eradicate it, which means having an action plan in place prior to its arrival. If an invader becomes established, learn to live with it and use chemical and mechanical control mechanisms in areas where human uses of the water are

significantly affected by the invaders presence.

Ecologist Daniel Simberloff, Ph.D., uses cancer treatment as an invasive species analogy: you monitor, detect, eradicate it. Attack non-native species immediately upon discovery by any means necessary.

The lag time between an invader's arrival and its spread creates its own problems; for one thing too much time wasted after discovery will result in no one claiming responsibility for the expense to rectify the situation. Remember the red tape of bureaucracy will add impediments to your eradication plan. Plus, don't let the need for more information or research keep you from acting; delay tactics create only delays, not positive outcomes. If a non-native becomes established, the window of easiest eradication opportunity is closed, making the necessary remedy more involved and costly.

28 Rounds of Unfired Ammo, a 25-inch TV, a 150-lb Tractor Tire & Other Litter Pulled From Minnehaha Creek Area Boy Scout Troops Named 'Watershed Heroes'

You wouldn't believe the things people throw in Minnehaha Creek - but three Minneapolis-based Boy Scout troops would like to show you. This fall, Troops 6 of the Church of the Good Shepherd, Troop 110 of Mount Olivet Lutheran Church and Troop 196 of Diamond Lake Lutheran Church (Metro Lakes District, Viking Council) removed more than 1,100 pounds of waste and debris from a stretch of the creek during their "Metro Lakes Creek Crawl." And that good deed in environmental stewardship recently earned them a "Watershed Heroes" award from the Minnehaha Creek Watershed District.

So, what did they find – besides too many bags of dog feces to count (a significant number recovered in the section of creek between Lynhurst Park and Lyndale Avenue)? Following is a partial list:



- 28 rounds of ammunition – unfired**
- Parts of road barriers**
- 25" television**
- Beverage containers**
- Plastic contractor sheeting**
- A full-sized (30 gallon) garbage can**
- Piping (metal and PVC)**
- Clothing (caps and shoes)**
- MPRB tree-removal signage**
- A 150 lb. tractor tire**
- Four standard tires**
- Miscellaneous consumer litter**

"There seemed to be an area-specific trend for various types of debris," notes Anthony Garcia, Unit Commissioner for the Metro Lakes District, who helped coordinate the event. "Bags containing dog feces, commonly carried by people walking their dogs, were generally found to be in very close proximity to schools, playgrounds, and centralized parks. At this time, the lower half of Minnehaha Creek is experiencing elevated levels of fecal coliform bacteria, as substantiated by a 2003 hydrological data report commissioned by the Minnehaha Creek Watershed District. I don't believe the removal will in itself alleviate the elevated levels; it will at least contribute to the solution. Unfortunately part of the population feels Minnehaha Creek is just another ditch that happens to run through the city." Next spring, Garcia hopes to expand the clean up, by involving more scout troops, to include the entire 22 miles of the creek

Besides receiving a distinguished "Watershed Heroes" award at the November 4 MCWD Board meeting, many of the scouts will also get conservation merits toward the advancement of Eagle Scout and a new appreciation for service to their neighborhood and its ecology.



Minnehaha Creek Watershed District



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