Water Column

Fall 2008
Vol. 20, No. 3

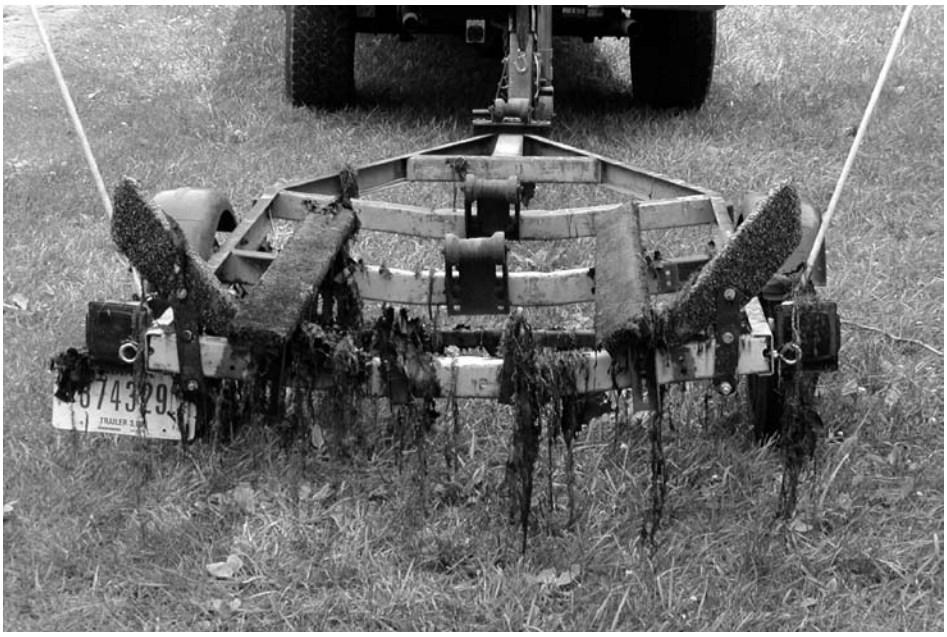
Aquatic Invasive Species are in the News

Have you ever seen a catfish walk? Did you know that "frog-bit" does not refer to a vicious frog attack, but rather is the name of a plant? Why is the Chinese snail "mysterious"? Can the fishhook water flea be used to catch fish?

These questions and more can be answered on the Indiana Department of Natural Resources Invasive Species Webpage at: **http://www.in.gov/dnr/2343.htm**. The Webpage features information and identification aids for 35 aquatic plants and animals, as well as several diseases that can afflict aquatic species. Everyone who lives on or recreates on Indiana's lakes and reservoirs owes it to themselves to learn more about aquatic invasive species (AIS) and this IDNR Webpage is a great place to begin.

AIS are particularly well-adapted at invading new habitats – that is why they are invasive. Native predators in our aquatic habitats are often wary of these new species because they haven't seen them before and they may even be ill-equipped to prey on AIS. AIS also compete for habitat, food, and nutrients needed by native species that have similar functions and habits. With little predation to curb them and superior competitive skills, it isn't any wonder that AIS can quickly overtake natives and dominate our Indiana waters.

Controlling AIS once established is extremely expensive. The Indiana DNR spent $135,000 and three years to eradicate Brazilian elodea from Griffy Lake in Monroe County – or about $1,400 per acre. At Lake Manitou, eradication of Hydrilla is expected to cost no less than $1.5 million and at least four years of treatment.



Caldwell Lake, Indiana, boat trailer loaded with weeds.

Informational poster, Bloomington, IN.

Keeping AIS out of our Indiana waters in the first place is the best control. The following tips will help:

1. Remove any aquatic plants attached to boats and trailers immediately on exiting a lake.
2. Don't dispose of aquarium contents in local waters.
3. Don't allow backyard garden ponds to drain to natural waters.
4. Before you purchase aquatic species for your aquarium or garden pond – either from a local store or on the Internet – do your own research to insure that you don't purchase a species that is invasive in Indiana.
5. Talk to your local garden center or aquarium shop about not offering aquatic invasive species for sale.
6. Visit the Habitattitude Website for more information at: **http://www.habitattitude.net/**.

We devote this entire issue of *WaterColumn* to aquatic invasive species because they have been in the news so much recently.

DNR Takes Aim at Invasive Plant in Meserve Lake

Parrotfeather, an invasive plant used in water gardens and aquariums, was found in Meserve Lake this summer by lakeshore residents, reported to DNR, and is now being chemically treated.

While the residents didn't know the identity of the plant at first, they saw it spreading rapidly and creating a nuisance. Meserve Lake is a 16-acre natural lake in Steuben County.

The plant (*Myriophyllum aquaticum*) comes from notorious kin, and is capable of carrying on the family tradition. "This is a close relative of the worst invasive aquatic plant currently found in Indiana, Eurasian watermilfoil (*Myriophyllum spicatum*)," said Doug Keller, aquatic invasive species coordinator at the DNR. "Both plants are very aggressive and can quickly grow to the surface of a body of water, causing difficulties with fishing, boating, and swimming. Parrotfeather can actually extend a portion of the plant above the water's surface nearly a foot."

Meserve's shoreline residents attest to the plant's proliferation. They reported that the plant has been present in the lake for only a few years but now covers approximately five acres. Parrotfeather is found in Meserve waters as deep as 15 feet and can even grow on moist mud flats.

To prevent this pest plant from developing into the nuisance that its cousin has already become, DNR is acting to eradicate the plant from the lake before it spreads into other waters. The lake lies near the head of the Pigeon River drainage, which has a number of lakes and wetlands that would likely be susceptible to invasion. Surveys in lakes adjacent in the chain to Meserve have not detected parrotfeather so far.

Parrotfeather reproduces exclusively by fragmentation.

Parrotfeather

Seed production has never been documented from parrotfeather in the United States and is only occasionally observed in its native range of South America.

The DNR started chemically treating Meserve Lake in July, using funds from the DNR Lake and River Enhancement (LARE) program. Frequent treatments will likely be necessary through the 2009 growing season to eliminate the plant. The most recent treatment at Meserve Lake was performed September 17 and 18.

"The cost to eliminate this plant is unknown at this time," Keller said. "Since we have not dealt with this plant in Indiana it is difficult to tell how many treatments will be necessary."

While herbicides can be effective, preventing problems with invasive plants from starting in the first place is the preferred, easiest, and most economical approach. Responsible actions by citizens hold the key.

"Water garden and aquarium hobbyists should be cautious about what plants they purchase and avoid those with invasive tendencies," Keller said. "Exotic plants should always be kept in contained habitats so they cannot enter any of our bodies of water. Excessive plant growth in aquariums and water gardens should be disposed of in household trash or completely composted; it

should never be discarded in lakes, ponds, wetlands or streams."

Once invasive plants become established, they can easily be moved on recreational equipment. To prevent the spread of invasive aquatic plants, boaters should always inspect and remove plants from their boat and trailer immediately after removing equipment from waterways.

Those with questions about how to identify, avoid, or destroy such plants should contact Doug Keller, (317) 234-3883.

St. Lawrence Seaway Major Route for Midwest AIS

Exotic species have threatened the Great Lakes ever since Europeans settled in the region. Since the 1800s, more than 140 exotic aquatic organisms of all types – including plants, fish, algae, and mollusks – have become established in the Great Lakes. As human activity has increased in the Great Lakes watershed, the rate of introduction of exotic species has increased. More than one-third of the organisms have been introduced in the past 30 years, a surge coinciding with the opening of the St. Lawrence Seaway. Foreign ships have imported more than 60 invasive species into the lakes since the St. Lawrence Seaway opened in 1959. Those species cause an estimated $200 million damage annually in the lakes. New invasive species are currently being discovered in the lakes at the rate of one every seven months.

From the Great Lakes, recreational boats can rather easily transport AIS to inland Indiana lakes and rivers.

Federal legislation that would require ocean freighters to disinfect ballast water before entering the Great Lakes will die at the end of this year, forcing lawmakers back to square one next year on the politically divisive issue.

In April, the U.S. House of Representatives passed legislation requiring all transoceanic freighters to sanitize ballast tanks before entering U.S. waters. It would have required all freighters by 2015 to install treatment systems capable of killing all living organisms in ballast tanks, including pathogens.

But the legislation ran into a brick wall in the U.S. Senate. Critics blocked a vote on the legislation because it contained a pre-emption clause that would have prevented individual states and the U.S. Environmental Protection Agency from adopting tougher ballast treatment standards.

The U.S. and Canada recently adopted rules requiring every transoceanic freighter destined for the Great Lakes to flush ballast tanks with seawater before entering the St. Lawrence River. Studies have shown that procedure reduces the number of viable organisms in the tanks by 95 percent.

Source: Great Lakes Information Network

Separate Great Lakes, Mississippi Basins

By Sophia Tareen
Associated Press Writer

CHICAGO – Connections engineered more than a century ago between the Great Lakes and the Mississippi River watershed should be changed to block the advance of invasive species that can cause irreversible damage, an environmental advocacy group says.

There are no natural connections between the Great Lakes and Mississippi River watersheds. More than a century ago, engineers linked them with a complex network of manmade canals and existing rivers to reverse the flow of the Chicago River and keep waste from flowing down it to Lake Michigan, which Chicago uses for drinking water.

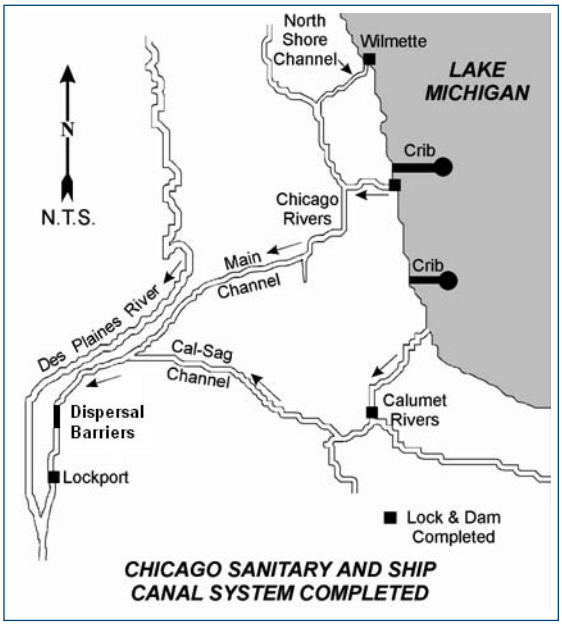
Separating the two basins is the only way to stop the transfer of some species, including the voracious Asian carp that is within 50 miles of Lake Michigan, says a feasibility study issued recently by the Alliance for the Great Lakes.

"If you want to protect the Great Lakes, this is what you have to do. Invaders like Asian carp are unpredictable, but their effects are catastrophic and irreversible," said Joel Brammeier, Alliance vice president and lead author of the study. "You've got to remove their pathway."

Researchers fear the carp, which can grow up to 100 pounds and more than four feet long, could eat all the food that's available for other species in the Great Lakes ecosystem, possibly leading to the collapse of the lakes' multibillion-dollar fishing industry, Brammeier said.

The Minnesota DNR reported recently that an Asian carp was caught in the Mississippi River at La Crosse, WI. This is much farther north than had been recorded previously.

See a CBS news story video about the Asian carp and their amazing habits at: **www.youtube.com/watch?v=SGWiaqGjQaU**.



CHICAGO SANITARY AND SHIP CANAL SYSTEM COMPLETED

Scientists say more than 150 invasive species have entered the Great Lakes, multiplying rapidly and feeding on native species or outcompeting with them for food. Millions of dollars have been spent trying to control the zebra mussel and round goby, which already have moved between the Great Lakes and Mississippi River basins.

Millions also have been spent on electrical barriers across the Chicago Sanitary and Ship Canal south of the city to keep Asian carp out of Lake Michigan. The Alliance says the barriers, which deliver a non-lethal jolt to fish, have been effective, but are not a long-term solution.

Possible changes include erecting concrete walls and constructing more shipping locks, according to the study. It does not make explicit recommendations, but calls on the U.S. Army Corps of Engineers and Environmental Protection Agency to conduct further study.

The alliance's study – funded by the Great Lakes Fishery Commission and Great Lakes Fishery Trust – gives general cost ranges for some projects. The cost of the most complicated, such as installing a sterile lift to transfer barges between the two watersheds, is listed only as "expensive."

Low-Volt Jolt: Carp Barrier Ready, But Can't be Operated at Peak Strength

By Dan Egan
Journal Sentinel

The man in charge of the Army Corps of Engineers' electric Asian carp barrier says it looks like the $9 million contraption is ready to be turned on, but not at a power level biologists say is necessary to actually stop all sizes of fish.

That means the door to the world's largest freshwater system will remain cracked open to the giant filter-feeding fish that could ruin the Great Lakes' multibillion dollar fishing industry, ravage their ecology, and threaten recreational opportunities such as water skiing because of their dangerous penchant for hurtling out of the water when agitated by the whir of a boat motor.

The fish have already overwhelmed stretches of the Mississippi and Illinois rivers and have migrated to within about 15 miles of the barrier on the Chicago Sanitary and Ship Canal.

The electric gate was finished in early 2006, but aside from testing, the Corps has refused to turn it on because of worries about the dangers the electrified water could pose to barge operators and pleasure boaters plying the manmade waterway that links Lake Michigan to the Mississippi River.

On October 31, the eight Great Lakes governors wrote the Army Corps and U.S. Coast Guard seeking answers. About $1 million of the $9 million so far spent on the project has gone toward more than two years of safety tests and other work to make the barrier safer. Yet despite all that effort, the federal government still wouldn't say when – or even if – the barrier would ever be activated. Now the Army Corps says it looks like it's ready to finally flip the switch.

"I think it's probably ready to go," Chuck Shea, barrier project manager for the Army Corps, said recently. "We've done a lot of tests, and recent results appear fairly promising."

But there is a catch: At this point, the Corps would allow the barrier to operate at only about one-quarter of its maximum power, or one volt per inch. That is the strength of a smaller "temporary" barrier currently operating in the canal at a level that biologists agree is not strong enough to permanently keep the carp out of the lakes. That is also the level the Corps promised the barge industry it would not exceed in a 2006 agreement allowing the new barrier to be turned on in an emergency if the temporary barrier fails, according to documents the *Journal Sentinel* obtained through the Freedom of Information Act. Barge industry leaders fear that operating the barrier any higher than one volt per inch poses too much of a risk for sparking between barges, or for anyone who might fall overboard.

The Corps and Coast Guard say they still need more studies to determine if the barrier is safe to operate at its maximum power level of four volts per inch, but the one volt per inch level should be enough to protect the lakes from the supersized carp dubbed the "100-pound zebra mussel" because of its ability to vacuum nutrients from the water.

The science says otherwise. A throttled-down new barrier should repel larger adult fish, but little juvenile fish are less affected by electric currents and therefore need a bigger shock, according to laboratory research. Great Lakes Fishery Commission biologist John Dettmers said he has personally witnessed other species of small fish swimming just fine through the temporary barrier

"Until we got close to four volts per inch, we were not overly effective at stopping small fish," said University of Nebraska biologist Mark Pegg, who conducted shock studies on the fish between 2002 and 2004.

"The fish barrier must both prevent invasive species from migrating into Lake Michigan and also minimize the very real risk it poses to the lives and health of those many recreational and commercial waterways users who regularly pass near and over it," said Capt. Bruce Jones, the Milwaukee-based commander of the Coast Guard's Lake Michigan sector.

But advisory panel co-chairman Philip Moy said he worries that biology is taking a backseat when the barge industry talks to the Army Corps and Coast Guard about how to best operate the new barrier.

Zebra Mussels: Could Solution Have Been Right Under Our Feet All Along?

Posted by Dave McKinley
on **wgrz.com**

Since being introduced into the Great Lakes 20 years ago through ballast water from foreign ships, zebra mussels have gained the reputation of being the granddaddy of invasive species. Since then, millions of dollars have been spent to try to eradicate or control them. Now, an Albany scientist has come up with a potential way to keep them in check, without the use of chemicals.

Dr. Daniel Molloy, Director of the New York State Museum Field Research Laboratory, has for much of the last 17 years hunched over microscopes dissecting zebra mussels, trying to find a non-chemical means to keep these critters – known for clogging intake pipes, damaging boat motors, and spreading botulism that kill fish and birds – at bay.

Having had success using bacteria to eradicate black flies in the 1980s, Dr. Molloy and his team set about finding a similar solution aimed at the pesky mollusk instead.

"We looked at over 700 different strains of bacteria before we stumbled upon *Pseudomonas Fluorescens*, which – if consumed in high enough quantities by a zebra mussel – is lethal," Dr. Molloy explained via telephone from Cambridge, NY, where the state-run research lab is located.

It turns out this particular bacteria is most commonly found in dirt. "It's on your shoes right now, it's everywhere," Dr. Molloy said.

$3 million in grants have come from both the federal and state governments, as well as a host of power plants and other private industries eager to keep in-take pipes clean by means other than chemicals, the use of which had become threatened when some were found to be carcinogenic. Those funds allowed for research to make sure the bacteria killed zebra mussels, and nothing else.

"We've tested it against other types of organisms in Lake Erie, in Lake Ontario, and there's no mortality, so it appears it has great specificity," said Molloy, who stressed the bacteria cannot be used to entirely eradicate zebra mussels throughout the Great Lakes because it would be impractical to place solutions of the bacteria high enough in all places where the mussels exist.

Rather, the idea is to disperse the bacteria in high concentrations at the outlet of intake pipes for various power plants and industrial facilities that draw water from the Great Lakes and its tributaries.

Dr. Molloy expects the first full-scale applications of the bacteria to occur sometime in the spring of 2009.

Trouble Starts When Exotic "Pets" are Set Free

Posted by Gene Mueller
December 07, 2008 4:00 p.m.,
Washington Times (online)

The astonishing amount of damage that can be caused when exotic pets are set free is amply illustrated by the Washington area's very own ecological misadventure that continues to baffle Virginia and Maryland fisheries biologists. Someone, we know not who, set free a number of exotic, imported aquarium fish in a suburban farm pond and also in the Potomac River not far from President George Washington's home, Mount Vernon.

The unwanted intruder has been identified as the Northern snakehead, a Chinese import that multiplies like fleas, is able to live on land for a short period of time, even do a little land traveling, and worst of all – once it takes hold in any water – establishes a firm population that competes with native species for food and critically important habitat.

We call the initial introduction of the snakehead fish into the historic Potomac a release of "pets" because they were owned by someone who probably enjoyed looking at them cavorting in an aquarium, but eventually didn't feel like caring for them any longer as they grew larger and hungrier, hence let them go.

Now the Florida Fish and Wildlife Conservation Commission (FWC) is pleading with the citizens of the Sunshine State: "If you have an exotic pet you can't care for

WATER COLUMN
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PAID
Bloomington, IN
Permit No. 2

WATER COLUMN

Published quarterly by the Indiana Clean Lakes Program as a medium for open exchange of information regarding lake and watershed management in Indiana

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anymore, please don't just open the front door and set it free."

The commission recently held its fourth Non-Native Pet Amnesty Day at the Jacksonville Zoo and Gardens, where it asked no questions or levied fines and legal charges against anyone who brought in exotic reptiles, amphibians, birds, fish, and mammals. It would accept anything that didn't belong in Florida, but would not accept homeowners' dogs, cats, rabbits, and ferrets.

"Our main purpose is to give pet owners an alternative to releasing non-native animals into the wild," said Jenny Tinnell, a biologist for the FWC. "It's illegal to release a non-native animal into the wild in Florida, and it could be detrimental for the animal and the environment."

Likewise, it is illegal to release a non-native animal into the wild in Indiana or any other state. This is the likely reason that we've found piranha, pacu, bala sharks, aruana, and other exotic fish "pets" in Indiana lakes and ponds. Please return unwanted aquatic pets to your local aquarium or pet store where they can be re-sold to other hobbyists.

Happy Birthday, Wild and Scenic Rivers Act!

Forty years ago, Congress recognized the importance of protecting America's last remaining free-flowing rivers by passing the National Wild and Scenic Rivers Act. Over the past four decades, more than 165 rivers in 39 states and Puerto Rico have been permanently protected under the Act.

Perspectives

"Almost half of the plant and animal species in the United States that are protected by the Endangered Species Act are at risk primarily because of competition or predation by invasive species"

~ Comments a House Science Environment, Technology and Standards Subcommittee heard on "Combating the Invaders: Research on Non-Native Species," July 26, 2001