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Water Issues And Concerns Fact Sheet Series

Exotic Species

by Leslie Dorworth

Since the 1800s, at least 139 nonindigenous aquatic organisms have become established in the Great Lakes including species of plants, fish, algae, mollusks, and oligochaetes. The impacts caused by species, such as the sea lamprey (*Petromyzon mariunus*), zebra mussel (*Dreissena polymorpha*), purple loosestrife (*Lythrium salicaria*), Eurasian watermilfoil (*Myriophyllum spicatum*), and spiny water flea (*Bythotrephes cederstroemi*) have not only taken their toll in the Great Lakes but are also spreading to inland waters. Section 1203 of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (Public Law 101-646) provides guidance for the development of state plans and authorizes federal cost share support by the national Aquatic Nuisance Species (ANS) Task Force. The Task Force has worked since 1991 to prevent, control, and manage the occurrence of aquatic nuisance species in the Great Lakes.

How do they get to our waters?

A number of these organisms are getting a free ride in ballast water of large ships. The ballast of a large ship is filled and emptied when necessary to provide stability and has become a pipeline for the transport of nonindigenous species around the world. A series of invasions of exotics into U.S. waters has occurred. The animal to catch the attention and imagination of the American public within the past ten years is the zebra mussel. Instead of costing a few thousand dollars to control, it has cost millions and still is not under control. The barnacle sized mussel attaches to most hard substrates. Power companies, water treatment facilities and other water dependent industries have had a continuous battle in clearing intake pipes and keeping screens clean of the thick mats of the mussels.

As authorities struggle to keep exotics species such as the zebra mussel under control, other species are being intentionally released into waters to control other "nuisance" species.

Organisms being managed through control range from plants to animals, whereas others are just being released to create a sports fishing industry. One example of the release of an exotic to control an exotic is the Asian grass carp. The carp is used in many states to control aquatic weed growth (Table 1).

Table 1. Some of the common aquatic plants eaten by grass carp

Common Names	Scientific Names
Duckweed	Lemna, Wolffia
Pondweed	Potamogeton, Najas
Milfoil	Myriophyllum
Coontail	Ceratophyllum
Waterweed	Elodea
Muskgrass	Chara

In Lake Michigan, the zebra mussel is thought to have changed the ecosystem and the change is still in flux. Due to their ability to filter water, the depth to which light penetrates is deeper, thereby allowing more benthic algae to grow. The increase in certain aquatic plant communities, such as the filamentous green algae and the loss of other communities, the benthic algal community, results in a decline of certain desirable fish species and other benthic organisms and an increase in other organisms that may or may not be desirable. However, too many aquatic plants or excessive plant growth can be considered a nuisance and may eventually lead to a eutrophic water system. It is hypothesized that the zebra mussel activities have indirectly enhanced the benthic invertebrate communities in the lake.

What can be done to stop a possible infestation?

Monitoring for zebra mussel populations is the best way to determine if they are in your lake. Just because your lake does not have a direct connection to another lake does not mean that zebra mussels or any exotic organism can not be transported into your lake.

Movement of exotics between water bodies is usually done unknowingly by a boat operator. For example, adult mussels and the veligers (larval stage which is microscopic) can be transported on the hull of the boat, on the boat's engine, in the ballast water and even on the aquatic weeds that are caught on the trailer.

Once a boat is removed from the lake, the boat operator should inspect the hull as well as the trailer and remove any attached animals or plants before leaving that particular body of water. The boat operator would definitely want to flush the boat's engine since zebra mussels, more specifically the veliger form can get into the cooling engine and eventually clog the intake pipes. Therefore, drain the water from the motor, livewell, bilge, and transom wells while on land before leaving the water body area. Empty the bail bucket on land, do not release aquatic organisms into a water body. Also, has a final check to make sure the water craft is clean of exotics, wash and dry the boat, tackle, downriggers, trailer and other boating equipment. The recommended water temperature for rinsing equipment is 104°F or 40°C tap water. The main reason for such a high temperature is that certain exotics are capable of surviving outside an aquatic environment for more than two weeks. If water at this temperature is not available then spray the boat and trailer with high pressure water or make sure the boat has been dry for at least five days before transporting to another body of water.

If you find them on your water craft report them to the Department of Natural Resources as well as remove them so that you don't transport them to the next body of water. Besides checking for zebra mussels, the boat operator should also check for plant fragments. Hydrilla, an aquatic nuisance species can be transported from water body to water body by unknowing boat operators as well.

More detailed information

Exotic species in the Great Lakes has been reported extensively in various publications from many organizations around the Great Lakes. Extensive information on zebra mussels and other aquatic nuisance species is found on the Sea Grant Nonindigenous Species Web Site (www.ansc.purdue.edu/sgnis/). The information on this web site was pulled together by the Great Lakes Sea Grant Network and it was a project of the National Sea Grant College Program.

Information contained on the site is current information relevant to zebra mussels and other nonindigenous species from Sea Grant publications and other research publications. Also see the list of attached references for more information pertaining to this subject.

Recommended Resources

Great Lakes Exotic Species, Great Lakes Sport Fishing Council

<http://www.execpc.com/~glsfc>

This site provides photographs of the many exotics that have entered the Great Lakes as well as other links to pertinent sites on the web dealing with exotic species.

Sea Grant Zebra Mussel and Nonindigenous Species, Great Lakes Sea Grant Network

<http://h2o.seagrant.wisc.edu/greatlakes/glnetwork/glnetwork.html>

This site offers a comprehensive collection of research publications and education materials.

Water Quality Issues and Concerns is an ongoing series addressing relevant water quality issues. For water quality information, contact Leslie Dorworth, Sea Grant aquatic ecology specialist, at 219 989-2726; dorworth@calumat.purdue.edu

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