

## INVASIVE SPECIES

You only have to take a brief walk along the Grand Traverse Bay shoreline to see the impact of aquatic nuisance species in our watershed. Along some portions of the bay's shoreline, the piles of dead zebra mussel shells are often two feet deep – remains of the untold millions of these small mollusks that are living beneath the surface.

### **What Are Invasive Species?**

Invasive species (also called exotic or non-native species) have threatened the Great Lakes ever since Europeans settled in the region. Invasive species are organisms that are introduced into areas where they are not native. Invasive species are considered a nuisance when they disrupt native species populations and threaten the balance of an ecosystem, as well as cause damage to local industry and commerce. Without pressure from competing species, parasites, and pathogens that would normally keep their numbers in check, invasive species may grow and spread rapidly.

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 invasive species has increased as well. More than one-third of the current invasive species have been introduced in the past 30 years, a surge coinciding with the opening of the St. Lawrence Seaway. Once introduced, invasive species must be managed and controlled as they are virtually impossible to eradicate.

### **How Do Invasive Species Get Into the Great Lakes?**

Many invasive species currently in the region came from the ballast water of foreign ships. When ships are not loaded with cargo, they take on ballast to balance and stabilize them as they travel from port to port. Ballast water may be picked up at a port in Europe and discharged at a port in the Great Lakes. It is estimated that in the history of Great Lakes shipping, 34% of the invasive species entered in solid ballast and 56% entered through ballast water. As stated above, the incoming surge of invasive species over the last 30 years coincided with the opening of the St. Lawrence Seaway. The United States and Canada have requested that all ships entering the Great Lakes discharge their water ballast while still in the ocean – about 90% currently do this.

Additionally, while many exotic species are introduced accidentally, others are intentionally released, often to enhance recreational opportunities such as sport fishing. The Pacific salmon, which was purposely stocked in the Great Lakes, is an exotic species, but not considered a "nuisance" species.

## How Do Invasive species affect the Great Lakes Ecosystem?

While many non-native species have no serious ecological impact, the introduction of a single key species, such as the sea lamprey, can cause a sudden and dramatic shift in the entire ecosystem's structure. Introducing plants and animals to new habitats is risky. New species can significantly change the interactions between existing species, creating ecosystems that are unstable and unpredictable.

Free from natural predators and competitors, some exotic species reproduce rapidly in their new homes, overtake native species (leading to their decline or extinction) and become a costly nuisance. In general, invasive species are considered "biological pollutants" that have led to a severe loss of biodiversity and habitat alteration throughout the world.

In the Great Lakes, sea lamprey and zebra mussels are among the most harmful of invasive species. Both have permanently altered the Great Lakes ecosystem, contributed to declines in some native fish, and cost millions of dollars to control each year.

### *Sea Lamprey*

The invasive sea lamprey parasitizes other fish by attaching its sucker-like mouth to suck out blood and body tissues. Lampreys can decimate populations of lake trout and other predator fish which allows for an explosion of smaller fish such as alewives. Chemical controls toxic to lamprey larvae have been applied to spawning streams and electric weirs have been constructed in major tributaries throughout the Great Lakes in an attempt to control the sea lamprey. Locally, lampricides have been used in Mitchell Creek and the Boardman River.

### *Zebra Mussels*

Zebra mussels are small, fingernail-sized mussels native to the Caspian Sea region of Asia and a stark example of the explosive growth potential of the introduction of a non-native species. Zebra mussels, and their cousin the quagga mussel, filter out much of the plankton and suspended organic matter from the water and bind what they don't use into waste pellets that can not be used by other plankton-feeding organisms such as other fresh-water mussels and shrimp. This filtering process is responsible for the increased clarity in area waters. However, by removing too much of the microscopic plants and animals that other organisms rely upon for food, these other organisms begin to starve and their populations may decline significantly.

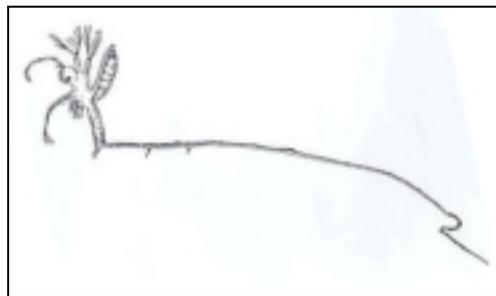


*Zebra Mussels*

Zebra mussels accumulate on objects such as boat hulls. When people trailer their boats from lake to lake (and river to river), they unknowingly transport zebra mussels on their boats and boat trailers. Zebra mussels also clog water-intake systems of power plants and other factories. Large water users on the Great lakes spend an annual average of \$350,000 to \$400,000 per user just to clear zebra mussels from their intake pipes. The U.S. Fish and Wildlife Service estimate the potential economic impact of zebra mussels over the next ten years at \$5 billion to U.S. and Canadian water users within the Great Lakes region alone (USGS-Great Lakes Science Center website, [www.glsc.usgs.gov/](http://www.glsc.usgs.gov/)).

### *Other Exotics*

Other common nuisance animal species in our watershed include the round goby, rusty crayfish, spiny water flea, fishhook water flea, and the Eurasian ruffe. Plant exotics include purple loosestrife (a beautiful, wetland-loving plant that can choke out other native vegetation in a matter of a few years), and Eurasian watermilfoil, and curly leaf pondweed.



*Fishhook Water Flea*



*Eurasian Watermilfoil*



*Purple Loosestrife*



*Rusty Crayfish*



*Spiny Water Flea*

**Websites for More Information:**

- Michigan Sea Grant: [www.miseagrant.org](http://www.miseagrant.org)
- Aquatic Nuisance Species Task Force (cosponsored by U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration): [www.anstaskforce.org](http://www.anstaskforce.org)
- Great Lakes Information Network: [www.great-lakes.net](http://www.great-lakes.net)
- Great Lakes Panel on Aquatic Nuisance Species: [www.glc.org/ans](http://www.glc.org/ans)