

Harmful Invasive Species in the 3-Rivers Area

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Purple Loosestrife: Beautiful and Aggressive

First introduced to North America in the 1800's from Eurasia, Purple Loosestrife was originally sold as an ornamental to be used in landscaping. People liked it because it was hardy, long blooming, and easy to grow. The reasons for its popularity also make it good at establishing itself in new environments. Like many other invasive species Purple Loosestrife's good qualities were soon overshadowed by its consequences. The flower grows well in boggy areas and therefore spread rapidly along roadside ditches and into wetlands. There it crowds out native species, taking away the preferred forage and habitat of the birds and aquatic animals in the area. Methods of control currently include predatory beetles and chemical treatment, as well as removal by hand when it is present in low concentrations



Invasive species – Not all introduced species are considered invasive or harmful, and some can have positive effects on an ecosystem. Only those which negatively affect an ecosystem, particularly by decreasing biodiversity or directly impacting humans, are considered harmful invasive species, alien species, or nuisance species.

Asian Carp

Asian carp were imported by catfish farmers in the 1970's to clean algae and suspended matter out of catfish ponds. Large floods in the early 1990s caused many of these catfish farm ponds to overflow releasing the Asian carp through local waterways into the Mississippi river basin from which they entered into the Great Lakes. Due to their large size, ravenous appetites and rapid rate of reproduction, Asian carp are able to out-compete native species for resources. Researchers predict Asian carp will become a dominant species in the Great Lakes ecosystem if they are not controlled. Federal and state agencies have built an electric fence barrier between the river and the lake to stop species migration between the two water systems.

Zebra Mussels

Zebra mussels are small (roughly the size of a fingernail) bivalve mussels originally from freshwater lakes and rivers in Eastern Europe and European Russia, as well as the Caspian Sea. They are filter feeders and one of the only freshwater mussel species able to attach itself to hard surfaces. They were introduced to the United States in the ballast water of ocean-going ships entering the Great Lakes. They have spread further by latching on to recreational boats that are later used in new, uninfested bodies of water. Zebra mussels are extremely detrimental to native mussel species, frequently out-competing them for the same resources. In some cases Zebra mussels attach themselves to native mussels, eventually killing them. They also represent an important problem for humans since they routinely attach themselves to man-made structures, causing important damage.



Ecosystem Service Value Impacts

Environmental Service Value (ESV) is the value which humans place on a certain area or ecosystem based on what uses or services that area can provide to them. ESV thus relates specifically and exclusively to humans, and can take a number of forms, from aesthetic value, to cultural value, to economic value.

-The carp's main impact on ecosystem service value comes with its impact on the fishing industry; the carp tends to compete with other species in its trophic level to the point that fishing for fish like trout becomes almost futile. Both the recreation and fishing industries suffer economically under the common carp. The carp is also considered pretty ugly, and so it affects aesthetic ecosystem values.

-Purple loosestrife is tricky; it was introduced as a decorative plant, and it can still be considered aesthetically pleasing. But its ability to decrease biodiversity and displace bird species has a negative impact on aesthetic values of an environment.

-The zebra mussel has a variety of impacts on the ecosystem and on human institutions. It does tend to make water clearer, increasing aesthetic value of a river. But it also tends to clog any industrial intake and outflow pipes, and is incredibly expensive to remove. It also decreases biodiversity through competition, decreasing economic service value by hurting industrial and recreational fishing. The mussel also poses human health concerns by cutting the feet of those who step on it; this impacts humans very directly, and also decreases recreational value.

Prevention Policy

Both the national government and the state of Minnesota have taken action to legally regulate the introduction and the spread of invasive species.

- Nonindigenous Aquatic Nuisance Prevention and Control Act- 1990 which addressed ballast water. Ships headed for the Great Lakes change their ballast water at sea
- The National Invasive Species Act- 1996 which encouraged the changing of ballast water for ships coming from +200 miles away from U.S. waters, but it required that the ship report whether it had or had not changed at docking. This act established the ANS Task Force.
- National Aquatic Invasive Species Act 2007. All ships must have an Aquatic Invasive Species Management Plan. Stricter regulations enforced by 2012.
- State of Minnesota – Minnesota Invasive Species laws. The state has created a four-tier classification system for invasive species. These include prohibited, regulated, unregulated, and unlisted.

There are also technical and strategic ways of controlling invasive plant and animal life, which are often more effective than the legislative measures because they do not rely on human compliance.

-Purple Loosestrife

Leaf eating beetles consumed the purple loosestrife, root-boring weevils lay their eggs in the base of the root and then the larvae eat their way out destroying the plant. Another type of weevil which feeds on the flower severely limits the seed production.

-Electrical Barriers

Uses a slight electrical current created by two electrodes on either side of the drainage. Gives a slight shock, enough to paralyze the fish temporarily and leave it unharmed.