

Chapter 1: What are Invasive Species?

A. Background

According to Minnesota Sea Grant: “Aquatic Invasive Species...

- Are non-native plants, animals, and pathogens
- Live primarily in water
- Thrive in a new environment
- Cause economic loss, environmental damage, and harm to human health

These species are introduced or moved by human activities to a location where they do not naturally occur. Minnesota’s natural resources are threatened by aquatic invasive species such as the zebra mussel, Eurasian watermilfoil, faucet snails, spiny waterflea, and purple loosestrife. These species along with new invasive species could be easily spread within the state if citizens, businesses, and visitors don’t take the necessary steps to contain them.

Impact of Infestations

AIS May Change Minnesota’s Waters Forever- Ecologically, Economically, and Recreationally

Aquatic invasive species compress the natural time and space scales for invasions to the point where natural systems are unable to adapt in a timely manner. As a result, aquatic systems are thrown off balance and are less able to provide ecologic, economic, recreation and natural resource services.

The issue of invasive, exotic, non-native, alien species is so pervasive that it is easy to throw up our hands. Burdick (2005), senior science editor for Discover, refers to this new era as the ‘Homogocene’ – where the greatest threat to biological diversity is “not bulldozers or pesticides, but in a sense, nature itself.” Biological diversity is the gold standard for ecological health and ecological invasions are often framed in the terminology of biodiversity in academic circles. As invasive species take over a community they drastically reduce biodiversity. However, ecological invasions have more personal, practical and tangible impacts as well. Invading species replace or damage plants and animals of horticultural, agricultural or aqua-cultural value. Invasive plants and animals cause or mediate disease.

Invasive species damage lake ecology, recreation, property values, commerce and industry. Invasive species can impact an ecosystem in various ways, but the most general impact is competition for food and space with native species. This competition can lead to significant declines, and in some cases complete removal of native species populations for the environment. The declines or elimination



of native species populations in one trophic level can work like a domino effect causing negative effects on native species in other trophic levels. AIS can upset the natural balance within ecosystems through displacement of native species, reduction in species diversity, destruction of habitat, and degradation of water related recreation

According to Chang and Boyle (2010) in a study on Vermont lake property owners, as Eurasian watermilfoil infests a lake, property values can diminish by < 1% to 16% for incremental increases in the infestation level. It is important to lakeshore property owners to keep invasive species out of their lake not only for reasons of aesthetics but also to protect their property investment.

A poll in Iron River, WI regarding the possibility of Eurasian watermilfoil (EWM) invading lakes found:

- A \$1 million reduction in local fishing economy revenue per year
- A reduction of \$250,000 per year in general spending for the area
- The average annual loss for additional infested lakes was calculated to be \$187,000 per year.

Further, results showed an average impact of \$30,000 to lakeshore property values in the area, or about 13% decline if EWM infests that body of water. The average homeowner in the area was willing to pay \$1,400 to prevent EWM infestation.

B. Pathways of Spread

Recreational, Animals, and Businesses

The best thing that you can do to help prevent the spread of AIS is to be aware. There are several vectors or pathways that are the most common way that AIS are transported from water body to water body. Below are vectors that contribute to the distribution of AIS and some simple but vital steps that can be taken to prevent the spread of AIS.

Ballast water

Ocean going vessels from ports in Europe or Asia take on ballast water from their homeport for stability when crossing the Atlantic Ocean for destinations within the Great Lakes. Once in port, the ballast water is not needed anymore and it is pumped out of the ship and into the lake. Whatever organisms are in the ballast water from the ship's homeport have been given a ride half way around the world and are dumped with the ballast water into Lake Superior. Trans-oceanic ships now are required to exchange ballast water in the open sea at least 200 miles from U.S. coasts under regulations implemented in 1993 by the U.S. Coast Guard. The exchange system requires ships to replace pumpable ballast water at sea with open-ocean water. The idea is that this reduces the number of organisms available for discharge and exposes those remaining to salt water, which may kill them or affect their ability to reproduce. However, ballast exchange may not totally eliminate or affect organisms in the sludge and sediment on the bottom of a ship's ballast tanks.

Boaters and fishermen

Boaters and fishermen, because of their movement from multiple lakes and rivers, are a major pathway of AIS spread. Their boats, fishing gear, and bait can be sources of AIS transport. Some simple steps that can be taken include:

- Remove any visible plants, fish or animals from your boat and trailer.
- Remove mud and dirt since it too may contain mussels or small larvae that can establish themselves in the next lake where you launch.
- Remove plant fragments as some AIS can root from even these small fragments.
- Eliminate all water from every conceivable item before you leave the area you are visiting.
- Remove water from motors, jet drives, live wells, boat hulls, scuba tanks and regulators, boots, waders, bait buckets, seaplane floats, swimming floats.
- Don't dispose of your bait by dumping it in the lake. Give it to another angler before leaving your fishing hotspot or put them in the garbage.
- Allow your boat, fishing equipment, and other recreational equipment to dry for 5 days before using them at the next fun spot!

Lake Service Providers

Lake Service Providers represent a wide range of businesses such as boat dealers/installers, boat storages, fishing guides, and harvesters. As part of their businesses they are required to move products from lake to lake. Often lake service providers work in both AIS infested and uninfested waters. Later in the manual we will discuss some steps that can be taken to minimize the chance that AIS will be spread during business operations.

Shore owners and tourists

- Check your docks and remove any plants and mussels that might be attached. If you suspect that the critters are on your docks are zebra mussels contact your local DNR staff and let them know.
- After a full day of water play wash your dogs before you take them on their next water adventure.

Water gardener or aquarium owner

- If you cannot find a home for the critters in you aquarium, bury them. Dump the water into the toilet or yard, far away from storm drains.
- Check your water garden plant order for unwanted plants. Invasive species have been unintentionally introduced in water gardens in our state.