

Chapter 6 - Aquatic Invasive Species (AIS)

What are aquatic invasive (or nuisance) species?

An “invasive species” is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm, or harm to human health (www.invasivespecies.gov/). Invasive species can be plants, animals, and other organisms, such as bacteria and viruses. This chapter addresses invasive species that can live in the aquatic habitats of Indiana, such as lakes, rivers and wetlands.

Why should we be concerned?

Invasive species problems are both a consequence of and an impact on the economic welfare of our nation. Most introductions of invasive species can be linked to the intended or unintended consequences of economic activities, such as trade and shipping. The Food and Agricultural Organization identified six types of economic impacts: (a) production; (b) price and market effects; (c) trade; (d) food security and nutrition; (e) human health and the environment; and (f) financial costs impacts. During the past 200 years or so, more than 50,000 foreign plant and animal species have become established in the United States. About one in seven has become invasive, with damage and control costs estimated at more than \$137 billion each year.

New invasions of nuisance aquatic species could decimate fisheries and other aquatic resources, requiring funds for prevention, control and mitigation that could have been used for other purposes. Nuisance aquatic plant and animal invaders (such as zebra mussels, bighead carp, purple loosestrife, gizzard shad and sea lamprey) cost Hoosiers millions of dollars each year in control measures and lost natural resource value. For instance, University of Notre Dame researchers determined that it would be cost effective to spend \$324,000 per year to prevent zebra mussel infestation of each lake associated with a power plant due to the high costs of managing their negative impacts on water withdrawals. A survey conducted by the Invasive Plant Advisory Committee of the Indiana invasive species council found that land owners and managers in Indiana spent \$5.85 million in 2012 to manage invasive plants on their land.

Species of Interest

The following pages list just a few of the species of concern in Indiana. This is by no means a complete list, but these are species that you may have heard of. As Riverwatch volunteers, we ask that you keep your eyes open for anything that looks out of place. In an attempt to aid the public and water resource managers, DNR has posted 40+ aquatic invasive species fact sheets that aid in identification of plants, vertebrates, and fish at: www.IN.gov/dnr/3123.htm. If you think you have seen an exotic or invasive species, please report it. Visit the above website for more information and pictures of invasive species in Indiana, as well as instructions on how to report a sighting.

Exotic Invasive Mussels

The introduction of exotic invasive species such as the Asian clam (*Corbicula fluminea*), quagga mussel and the very prolific zebra mussel (*Dreissena polymorpha*) has had detrimental effects on many mussel species. Zebra mussels colonize on native mussels which can hamper their movements, including opening and closing their shells. Zebra mussels filter a large amount of water for such a small mussel (1 liter per day) and due to their large numbers they can take away a large portion of the food that the native species need. If zebra mussels are found, check the box on the Biological Monitoring Data Sheet.

What you can do to prevent the spread of Zebra Mussels:

Figure 32

- Learn to recognize zebra mussels.
- Inspect and remove aquatic plants, animals, and mud from boat, motor, and trailer.
- Drain water from boat, motor, livewell, bilge, and bait containers.
- Rinse boat and equipment with high-pressure and/or hot water (104°F) especially if moored for over a day. OR
- Dry everything for at least five (5) days.
- Never introduce fish, plants, crayfish, snails, or mussels from one body of water to another.

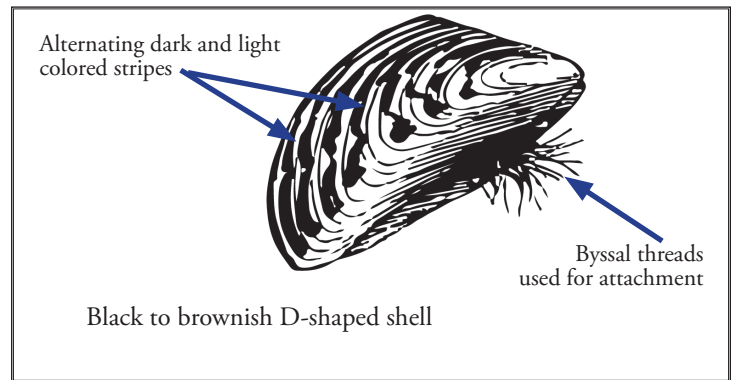


Figure 33

Description: Zebra mussels (Figure 32) have a triangular shaped shell that rarely exceeds 1.5 inches in length. Their shell is bivalve meaning it has two halves. Usually the shell will have alternating dark and light bands resembling the stripes of a zebra, hence their name. However, not all zebra mussels will have this characteristic coloring pattern, some may be entirely dark or light. The most distinguishing characteristic to look for would be the tuft of fibers called the byssal threads that grow from the foot and through the hinge of the mussel. These threads allow the mussel to attach to any hard surface. A similar species that may be confused with the zebra mussel is the quagga mussel, another exotic species.

Asian Carp

Asian carp (Figure 33) is a catchall name for species of silver, bighead, grass, and black carp from Southeast Asia. They were imported into the U.S. in the 1970s by Arkansas fish farms. Flooding in the area allowed them to escape and establish populations in the wild. At present, bighead carp have been found in the open waters of 23 states and silver carp in 17 states. Asian carp represent over 97% of the biomass in portions of the Illinois and Mississippi Rivers and are swiftly spreading northward up the Illinois River towards the Great Lakes. Voracious filter feeders, Asian carp consume up to 20% of their bodyweight per day in plankton and can grow to over 100 pounds. Plankton are small floating organisms that form the foundation of the aquatic food chain and are vital to native fish. The huge, hard-headed silver carp also pose a threat to boaters. The fish can leap out of the water when startled by boat engines, often colliding with people and causing injuries.

Invasive Aquatic Plants

Aquatic plants are indicators of clear water and stable substrate. They provide habitat and stabilize the stream bed during high flow conditions. They also produce oxygen and take contaminants out of the sediment via root absorption. (From IOWATER Program Handbook) However, exotic invasive plants can cause serious damage to an ecosystem. We need your help to identify and check for new invaders to Indiana's water, hydrilla and Brazilian elodea. If hydrilla or Brazilian elodea is discovered, please report immediately to the DNR Aquatic Invasive Species Coordinator at (317) 234-3883.

Hydrilla (*Hydrilla verticillata*): is an exotic and extremely invasive aquatic plant. Hydrilla typically has 5 leaves whorled around the stem although that number can range from 2 to 8. Leaves have distinctly serrated edges. Individual leaves can range from 1 to 2 cm. If nut-like tubers are found on the roots, the plant is definitely hydrilla. The other two plants described here do not form tubers. (Figure 34)

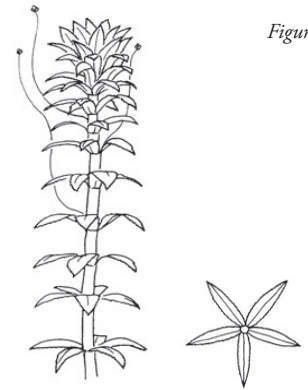


Figure 34

Brazilian elodea (*Egeria densa*): Brazilian elodea is an exotic invasive aquatic plant. This plant has 3 to 5 leaves per whorl although 4 are most common. Serrated leaf edges are not visible. This plant can have leaves up to 4 cm, making it much larger than the other plants described here. Tubers do not form on the roots. (Figure 35)

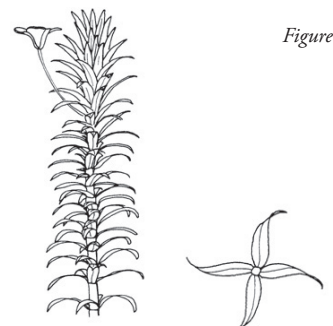


Figure 35

Elodea (*Elodea canadensis*): is a **native** submersed aquatic plant. Elodea usually has 2 or 3 leaves per whorl. Serrated edges of the leaves are not obvious. Leaves can be up to 1.5 cm although they are usually much smaller. Tubers are not produced on the roots. **Elodea is a beneficial native plant.** Reports are not necessary if you discover this plant. (Figure 36)



Figure 36