



*The Higgins eye pearlymussel is found in the upper Mississippi River and several of its tributaries.*



## Higgins Eye Pearlymussel

Higgins eye pearlymussel is an *endangered species*. Endangered species are animals and plants that are in danger of becoming extinct. *Threatened species* are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting, and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's endangered species program.

**Scientific Name** - *Lampsilis higginsii*

**Appearance** - Higgins eye pearlymussel is a freshwater mussel with a rounded to slightly elongate smooth-textured shell that is usually yellowish brown with green rays. The shell, made up of 2 hinged, inflated halves, is up to 4 inches in length and has a rounded side and a pointed (males) or squared (females) side. The inside of the shell is white with portions that are iridescent and areas that may be tinged with cream or salmon. The soft body enclosed by the shell consists of gills for breathing, a digestive tract for processing food, and a large muscled foot for locomotion and anchoring in the stream bottom.

**Range** - Since 1980, live Higgins eye pearlymussels have been found in parts of the following rivers: the upper Mississippi River north of Lock and Dam 19 at Keokuk, Iowa, and in three tributaries of the Mississippi River - the St. Croix River between Minnesota and Wisconsin, the Wisconsin River in Wisconsin, and the lower Rock River between Illinois and Iowa. The species' current range is about 50% of its historic distribution which extended as far south as St. Louis, Missouri, and in several additional tributaries of the Mississippi River.

**Habitat** - The Higgins eye is a freshwater mussel of larger rivers where it is usually found in areas with deep water and moderate currents. The animals bury themselves in the sand and gravel river bottoms with just the edge of their partially-opened shells exposed. The river's currents flow over the mussels as they siphon water for microorganisms such as algae and bacteria, which they use as food. The role of Higgins eye pearlymussels in the natural river ecosystems is as a food source for wildlife like muskrats, otters, and raccoons and as a filter which improves water quality.

### What is the Higgins Eye Pearlymussel?

## What is the Higgins eye pearlymussel? (cont'd.)

**Reproduction** - The male Higgins eye releases sperm into the river current and downstream females siphon in the sperm to fertilize their eggs. After fertilization, the females store the developing larvae (glochidia) in their gills until they're expelled into the river current. Some of the glochidia are able to attach themselves to the gills of host fish, where they develop further. After a few weeks, the juvenile mussels detach from the gills of the fish and settle on the river bottom, where they can mature into adult mussels and possibly live up to 50 years. The sauger, walleye, yellow perch, largemouth and smallmouth bass, and freshwater drum are considered suitable hosts for Higgins eye glochidia.

## Why is the Higgins eye pearlymussel endangered?

**Habitat Loss or Degradation** - Higgins eye pearlymussels depend on deep, free-flowing rivers with clean water. Much of their historic habitat was changed from free-flowing river systems to impounded river systems. This resulted in different water flow patterns, substrate characteristics, and host fish habitat and movement which affect how the Higgins eye feed, live, and reproduce. Municipal, industrial, and farm run-off degrade water quality. As a filter-feeder, this species concentrates chemicals and toxic metals in body tissues and can be poisoned by such chemicals in the water. Dredging and waterway traffic produce siltation which cover the substrate and mussel beds.

**Exotic Species** - The invasive zebra mussel is the greatest known threat to Higgins eye. The zebra mussel is a freshwater mussel native to the Black and Caspian Seas that was introduced into Lake Erie in the late 1980's from ship ballast water discharge. This small mussel is less than 2 inches in length, but tens of thousands can colonize a square meter area. They attach to any hard surface, including shells of other mussels. They compete for food with native species and, when attached to the shells, prevent normal travel, burrowing, and opening and closing of the shells. Several Higgins eye populations in the Mississippi River have been hit hard by zebra mussel colonization, reducing the population at Prairie du Chien, WI, from one of the most numerous Higgins eye populations to one of the least. Technology to control zebra mussel populations is under development, but no successful measures have been developed that could reliably limit zebra mussel colonization and not harm the native mussel species, such as Higgins eye.

## What is being done to prevent extinction of the Higgins eye pearlymussel?

**Listing** - Higgins eye pearlymussel was added to the U.S. List of Endangered and Threatened Wildlife and Plants in 1976. As a result of the listing, the U.S. Fish and Wildlife Service developed a recovery plan that describes actions needed to help this species survive. This plan was revised in 2004 to incorporate new information and address the more recent threat of zebra mussels.

**Research** - Researchers are continuing studies of zebra mussels and their impacts on Higgins eye, of commercial navigation impacts on mussels, and of water quality and contaminant relationships to the species.

**Habitat Protection** - A variety of government and private conservation agencies are working to preserve Higgins eye pearlymussel and its habitat.

## What can I do to help prevent the extinction of species?

**Protect** - Protect water quality by minimizing use of lawn chemicals (i.e., fertilizers, herbicides, and insecticides), recycling used car oil, and properly disposing of paint and other toxic household products.

**Follow** - When boating, please follow any rules established to prevent the spread of exotic pests like the zebra mussel.