



## Saving the Higgins' Eye Pearlymussel

Propagation at Genoa National Fish Hatchery  
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### Background

The Higgins' eye pearlymussel is native to the Mississippi River and some of its northern tributaries. It is usually found in areas of swift current and buries itself in mud-gravel bottoms in water up to 15 feet deep with only the edge of its shell and its feeding siphons exposed. Higgins' eyes measure 3 to 4 inches and have thick, round, olive-brown shells with dark rings.

The Higgins' eye was listed as endangered under the federal Endangered Species Act in 1976. Under the Act, an endangered species is one likely to become extinct in the foreseeable future. At the time the Higgins' eye was listed, major threats included its diminished range and numbers, and loss and degradation of habitat. In recent years, a more immediate threat is the presence of the non-native zebra mussel.

### The Zebra Mussel Threat

Zebra mussels are small mussels native to Eastern Europe and Asia. They are believed to have arrived in the United States in the ballast of ocean-going vessels which emptied their tanks in Great Lakes ports. Zebra mussels were discovered in Lake St. Clair (between Lake Huron and Lake Erie) in 1988; since then, these prolific mussels have spread to most major river systems in the Midwest, as well as all the Great Lakes. They move from one area to another by attaching to boats and barges. Zebra mussels established themselves in the Upper



*The exotic zebra mussel attaches to any hard surface and is so prolific that it smothers native mussels like the Higgins' eye.*

Mississippi River by 1992 and have continued to spread.

The increase in zebra mussel populations has been matched by a decline among many native mussels. Zebra mussels compete with native species for oxygen and food, and are so prolific that they can virtually smother native mussel beds. One section of the Upper Mississippi River once supported one of the upper river's most diverse and dense mussel beds, with more than 30 species reported in 1996. By 1999, only seven species were reported, no Higgins' eyes were found, and the native mussel bed was covered by a carpet of zebra mussels several inches thick.

One contributing factor to the spread of zebra mussels in the

Upper Mississippi River is the operation of the navigation system of locks and dams on the river to facilitate barge traffic and other river users. In an Endangered Species Act consultation with the Corps of Engineers on the navigation system, the Service determined that operation of the system would jeopardize the existence of the Higgins' eye pearlymussel. As a result of that consultation, the Service and Corps agreed to measures that would lessen the impacts on the Higgins' eye. Measures included relocation and propagation of mussels threatened by the presence of zebra mussels.

### The Propagation Project

Higgins' eye populations are in immediate danger of being

eliminated in the Upper Mississippi River. If that occurs, the only remaining Higgins' eyes will be found in small populations in the St. Croix and Wisconsin Rivers. One of the strategies to save the species is the propagation of the Higgins' eye at Genoa National Fish Hatchery. The project is a partnership effort among the Service and the states of Minnesota and Wisconsin.

As with other freshwater mussels, Higgins' eye pearlymussels need host fish in order to complete their life cycles. Tiny larval mussels, released by the female, must attach to the gills of a host fish, where the microscopic larvae – called glochidia – spend several weeks before dropping to the streambed. Mussels use different species of host fish; Higgins' eyes are thought to use sauger, freshwater drum, largemouth bass, smallmouth bass and walleye.

The propagation process for Higgins' eye begins in the spring with the collection of adult females from the St. Croix River. Divers trained to identify female Higgins' eye pearlymussels collect about 15 gravid females, or those that contain glochidia within them. The adult mussels are taken to Genoa National Fish Hatchery, where hatchery workers carefully remove the glochidia using a syringe. The microscopic glochidia are then placed with host fish in a bucket where the glochidia attach to the host's gills. The infected fish are then placed in aquariums or raceways.

After 2 or 3 weeks, some of the infected fish are taken to sites in suitable habitat where they are either released directly into the river, or held in underwater cages over suitable mussel habitat. Fish

remaining in the hatchery are checked periodically, and hatchery staff collect glochidia once they have matured enough to leave the host fish. These juvenile mussels remain at the hatchery until mid-summer when many are released into areas where zebra mussels are not a threat.

The propagation project began in 2000, using funding from a grant from the National Fish and Wildlife Foundation. Work is done at Genoa National Fish Hatchery in Genoa, Wisconsin, in a specially constructed facility known as the "Clam Palace." In 2000, workers released 3,750 juvenile Higgins' eye pearlymussels in the Wisconsin River, and placed another 1,100 juveniles in special screened trays in the river to be monitored periodically.

### **National Fish Hatcheries and Endangered Species**

Genoa is one of 69 fish hatcheries in the National Fish Hatchery System, administered by the U.S. Fish and Wildlife Service. The system also includes seven fish technology centers, and nine fish health centers. Hatcheries and technical centers are working with 44 aquatic species federally listed as endangered or threatened. Among them are fish, five species of freshwater mussels, as well as toads, salamanders, and horseshoe crabs. These facilities play an important role in conservation and recovery through the development of state-of-the-art captive propagation techniques and by providing genetic refugia for listed species.

*U.S. Fish & Wildlife Service  
1 Federal Drive  
Fort Snelling, Minnesota 55111  
612/713-5350  
<http://midwest.fws.gov/endangered>*