Mussels on Road to Recovery at Genoa NFH

by Craig Springer

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These tiny mollusks are the first winged mapleleaf mussels ever cultured.

Tony Brady carefully opens an adult Higgins eye pearlymussel to harvest its glochidea.

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His southern brogue isn't what you would expect to hear in Wisconsin. But then again, his work isn't what you would traditionally expect from a National Fish Hatchery. Tony Brady, a native of North Carolina, headed north armed with degrees from Cumberland College and Tennessee Technological University to become the Fish and Wildlife Service's first mussel propagation biologist, a position focusing on the recovery of listed species.

Brady's experiences prove that chance encounters can change lives and the course of conservation. At Cumberland, he met a biologist with the Kentucky Department of Fish and Wildlife Resources who was helping direct a senior thesis research project. Brady immersed himself into examining population characteristics of largemouth bass (*Micropterus salmoides*) and was captured by the prospects of a career in conservation. His interactions with agency biologists aimed him toward a master's degree at Tennessee Tech studying a new mussel propagation program.

While completing his thesis research, Brady met biologists from the Genoa National Fish Hatchery who were on a fact-finding expedition for mussel recovery. The station would soon be looking for a biologist to help in its mussel restoration efforts. His experience in conducting mussel field surveys could be applied towards the cooperative efforts to stave off the extinction of the Higgins eye pearlymussel (*Lampsilis higginsii*) and the winged mapleleaf mussel (*Quadrula fragosa*).

At one time, the winged maple leaf was thought to be restricted to the St. Croix River in Wisconsin and Minnesota. It has since been found in the Saline and Washita rivers of Arkansas and Missouri, but it is still endangered, confined to the fringes of its former ranges due to dams, habitat loss, and pollution.

The Higgins eye pearlymussel has been listed as endangered since 1976. Its plight became even more critical with the invasion of non-native zebra mussels (*Dreissena polymorpha*) into the Mississippi River basin. At one point, the Higgins eye was one among 27 mussel species found in the east channel of the Mississippi River at Prairie du Chien, Wisconsin. Surveys showed that from 1996 to 2000, the mussel bed became much less diverse; only seven species had survived, and the Higgins eye was not among them.

A mussel coordination team consisting of biologists from the Army Corps of Engineers, Fish and Wildlife Service, U.S. Geological Survey, state conservation agencies of Minnesota, Wisconsin, and Iowa, and academic interests focus on saving the Higgins eye. The team approached the Genoa NFH about the possibility of raising the mussel in captivity. Every spring since 2000, gravid Higgins eye females have been collected in the wild, and about 9,000 walleye (*Sander vitreus vitreus*), largemouth bass, and smallmouth bass (*Micropterus dolomieu*) have been infested with mussel larvae or glochidia, which parasitize the fish until they are ready to survive and grow on their own.

Annually, up to 3,500 of the fish infested with Higgins eye glochidia have been released to face the rigors of the wild in the Wisconsin, Iowa, and Wapsipincon rivers, all tributaries of the Mississippi. It's up to nature as to where the young mussels drop from their host fish. The remaining fish are placed in cages, not so much to retain the fish but to protect the mussels as they fall off and mature. As they get bigger, the mussels are marked and stocked in the wild with the intent of establishing five new populations. Since 2003, over 7,000 adult and sub-adult mussels have been stocked annually into the wild. Approximately 22,000 Higgins eye pearlymussels from the 2005 year-class are set to be stocked out in fall of 2007 from 110 cages.

In fall of 2003, biologists from the Service's LaCrosse Fisheries Resource Office and the U.S. Geological Survey made a breakthrough, discovering the host-fish species for the winged mapleleaf mussel. Genoa NFH was once again called upon to propagate the winged mapleleaf. Each year, divers collect gravid female mussels within a narrow window of time in September. The mussels are then taken to Genoa, where they are held until the glochidia are expelled. The species' natural host, channel catfish (*Ictalurus punctatus),* also play host at the hatchery. In temperature-controlled tanks, the water is cooled in the winter and warmed in the spring to mimic what the fish and growing mussels might face in nature. By October of 2006, the effort yielded 25 winged mapleleaf mussels 0.4 to 0.8 inches (10 to 20 millimeters) in length, marking the first captive propagation of this rare species. Currently, more than 600 channel catfish are infested with approximately 120,000 glochidia being held at the hatchery for spring release.

Brady says that the limited assessments of the released Higgins eye pearlymussels in Iowa have turned up 10 specimens. With a high natural mortality rate in the first year of life, and a large potential habitat, locating them is like "finding a needle in an 80-acre hayfield," according to Brady. But advances in mussel propagation may give this and other species a better chance for eventual recovery.

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Biologists count cage-harvested Higgins eye pearlymussels.

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A Higgins eye pearlymussel engraved with a tracking number.