

Sending Surrogates to the Rescue

by Ken Burton



Artificially-propagated juvenile wavy-rayed lampmussels

Photo by Richard Neves/U.S. Geological Survey

It is reclusive, silent, and sedentary, but it's also Mother Nature's natural water filter and an indicator species to boot, and now a small group of scientists in the Southeast is putting in long hours in an attempt to rescue a single imperiled species of mussel.

The road back, says Dr. Jim Layzer, of the Tennessee Cooperative Fishery Research Unit, means putting a mussel back in part of its historic range and seeing it thrive, to the point where the species won't have to remain on the endangered species list.

"Recolonization is an extremely delicate process," says Layzer, who spends a lot of his time working with other researchers to find the key that will get a mussel through its first growing season. Layzer says, with delight, "We are having great success."

Layzer's efforts are aimed at reviving the population of endangered Cumberland bean (*Villosa trabalis*) mussels, originally found in the Tennessee and Cumberland River drainages.

Like most other mussels in trouble, these can trace some of their problems back to the early twentieth century. Pollution played a role, and so did the effects of agriculture, logging, and dams.

The plight of the freshwater mussel is neither a regional nor a small problem. Seventy-two species of mussels throughout the United States are already classified as threatened or endangered, and dozens more species may be headed in the same direction.

A central piece of the puzzle, says Layzer—who is part of an effort supported by the state of Tennessee, Tennessee Tech University, the Biological Research Division of the U.S. Geologic

Survey and two U.S. Fish and Wildlife Service fish hatcheries, Dale Hollow in Tennessee and Wolf Creek in Kentucky—is how to nurture juvenile mussels beyond the critical first 2 to 4 months.

"We need to grow them to maturity," Layzer says, "and when we can get them to that point, we can reintroduce them in quantity." Both hatcheries have encountered problems keeping young mussels alive for prolonged periods, but survival after 60 days usually indicates that the mussels are meeting their nutritional requirements.

Layzer and his researchers have collected and reproduced the wavy-rayed lampmussel (*Lampsilis fasciola*), which is also found in the same river drainages as the Cumberland bean, and used it as a substitute for testing reintroduction techniques since it isn't endangered. If the lampmussels survive reintroduction, then there is good hope for the Cumberland bean. If the lampmussels don't survive, none of the endangered mussels have been lost.

"If the mussel population is in trouble, that can be a signal that other things are wrong," says Andrew Currie, who manages the Wolf Creek and Dale Hollow hatcheries. Currie and Layzer both agree: a decline in the mussel population could not only affect water quality—they are Mother Nature's natural water filters—but their absence can also indicate that something more is amiss.

Mussels are capable of ingesting pesticides or heavy metals, but only to a point. Accumulated in heavy doses, those toxins can then become threats to other animals that depend on mussels as part of their diet. That can warn of danger to people who depend the rivers for drinking water.

Mussels can signal environmental changes in other ways. Many mussel species depend on specific species of fish to serve as hosts for mussel larvae, or glochidia. If dams reduce a fish's habitat, a declining mussel population could be the result.

Layzer believes that mussels are valuable but, because they are not fully understood, no one is able to fully appreciate their ecological contributions to our world.

"We're destroying or wiping out species before we know what their value might be," Layzer says. "That in itself should justify the time and expense that it takes to help them avert extinction. Beyond that, we have an ethical obligation to all the species that share this planet."

When we lose anything we don't fully understand, we're really losing a figurative encyclopedia. And we might be losing a page with enormous beneficial effects for mankind."

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Cumberland bean mussel

Photo by Richard Biggins/USFWS

