Those Fabulous Freshwater Mussels

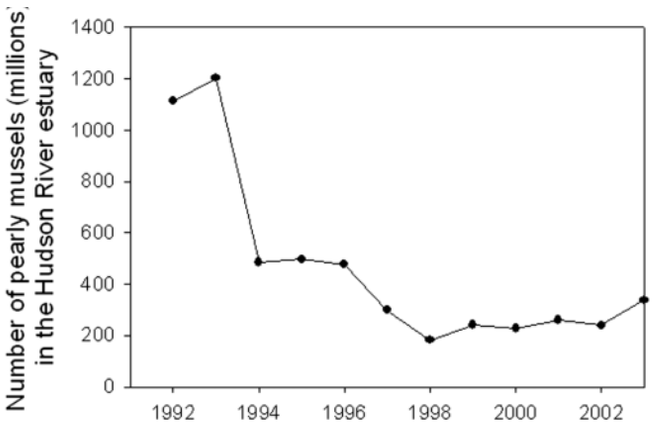
By Dave Strayer

Most people who have run into freshwater pearly mussels don't think they are very interesting. You may have seen these animals along a river or lake shore, where they seem to be nothing more than living rocks. Or worse yet, you may have encountered pearly mussels in a biology classroom through a diagram of their complicated plumbing, or dissected a watery, gray animal whose actual plumbing didn't look at all like the picture in the book. If so, you just didn't get off on the right foot with these animals, which are actually pretty interesting.

Three reasons pearly mussels are "actually pretty interesting:"

Pearly mussels are pretty

Pearly mussel shells are beautiful, and are made out of the same material as real pearls (that's why we call them "pearly mussels," right?). People have collected mussel shells for centuries for ornaments like knife handles and pearl buttons. In fact, about a hundred years ago, pearl buttons were big business in the Midwest, with button factories along all of the major rivers. People caught whole bargeloads of mussels from these rivers - mussellers took 25,000 tons of shells from just a single mussel bed in the Mississippi River, and more than 14,000 tons of mussel shells from Illinois in just one year. Of course, harvests like this couldn't go on forever, and the pearl button industry faded away about 1925 from a combination of falling catches and competition from plastic buttons.



This shows the estimated number of pearly mussels (all three species combined) in the Hudson River between Troy and Newburgh (there are essentially none south of Newburgh). The zebra mussel population exploded in late 1992. Source is Strayer and colleagues at Institute of Ecosystem Studies.

The brook floater, an imperiled mussel that still has a few populations in streams of southeastern New York. Photo by Dave Strayer.

Pearly mussels also make beautiful lustrous pearls that people have treasured for more than a thousand years. One of the reasons Julius Caesar invaded Britain was to get its pearls, and pearls from freshwater mussels decorate many Russian religious icons. Here in the United States, pearl fisheries were a key source of cash in the rural subsistence economies of the 19th century. (If you're thinking about going out right now and collecting a bunch of pearly mussels to make your fortune from their pearls, don't bother. You'd have to kill and sort through a lot of smelly mussels to find a few crummy pearls, and besides, it's illegal to collect pearly mussels in New York).

These living rocks have strange, secret lives

Really they do. To begin with, instead of making respectable baby mussels, or even swimming larvae that turn into baby mussels (like clams and mussels in the ocean do), pearly mussels make tiny larvae that are parasites of fish. This seems like a bad idea, because these larvae need to contact and attach to just the right kind of fish, but the larvae can't swim and they only live for a few days. But mussels aren't as dumb as they seem. Instead of just releasing their hapless larvae into the water to die at the bottom of some God-forsaken creek, pearly mussels trick fish to come to the larvae. Some mussels release their larvae in packets that look just like delicious morsels of fish food, while others display lures that entice fish to attack the mother mussel, who then infects the attacker with larvae. Some mussels even angle for fish by dangling their larvae on the end of a 3-foot-long clear fishing line.

Pearly mussels are disappearing

Many American rivers used to be full of pearly mussels - one bed in the Mississippi River probably held more than 100 million animals. The Hudson River estuary held 1.1 billion pearly mussels before zebra mussels arrived in the early 1990s, of which about 30% remain. In fact, North America had 300 kinds of pearly mussels—more than anywhere else in the world. One rapids at Mussel Shoals, Alabama, held 63 species of pearly mussels. Many of our pearly mussels are going the way of the passenger pigeon - scientists estimate that 37 American species are extinct, and 2/3 of the remaining species are in danger of going extinct in the coming decades. The disappearance rates can be breathtaking - over half of pearly mussel populations in Iowa streams vanished between 1984 and 1998. Pearly mussels are disappearing because people have been really rough on the rivers that mussels prefer - we've blocked rivers with thousands of dams (the "shoals" at Mussel Shoals are now drowned deep behind a hydroelectric dam); polluted the water with poisons, sewage, and agricultural runoff; brought in exotic species from around the world; and of course, harvested tons of mussels for pearls and buttons—and mussels can't swim away to a clean river. No other group of animal in North America is worse shape than the pearly mussels, and prospects for the future don't look that bright.

Despite these sharp declines, many lakes, streams, and rivers in our area still contain pearly mussels - about 15 species can be found locally, including three species that are protected by the federal government or New York State as threatened or endangered.

So the next time you see a pearly mussel shell washed up on the beach, don't forget that these are fascinating, beautiful, and endangered animals, with an illustrious history that reaches back to the great Caesar. And for those of you dissecting a mussel in a stuffy classroom, try to remember—these animals are more interesting than they seem to you right now.

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