



INVADERS OF THE POTOMAC

By Eric Dinerstein

The title of this column may seem like a cheap way to grab your attention, but the ecological health of our beloved river requires some sirens to sound the alarm. Beneath the roiling waters of the Potomac, an invasion that could determine the future of life in the river is in full swing. And the problem is us—specifically, fishermen who love the river and their pastime but whose practices threaten the extinction of what makes the Potomac and the rivers and streams of the Southeast so globally important for nature conservation.

So who is the invader? Crayfish, crawdaddies, mudbugs—whatever you want to call them. Widely used as bait by local fisherman to catch smallmouth bass, largemouth bass, perch, catfish, or other fish—actually, just about any fish in the Potomac would eat a crayfish. But when the fishermen are done for the day, rather than carry the buckets of bait back to their car—or leave the crayfish in the forest for the birds, foxes, and raccoons—they dump the crayfish in the river. The three most commonly used crayfish for bait in our region are the virile crawfish, the rusty crayfish, and the red swamp crayfish. While the first two species are native to the waters of the upper Midwest and the red swamp crayfish is found in Louisiana, all are alien invaders in our area. If they were simply gobbled up by native fish, turtles, and aquatic birds soon after the fishermen dumped their bait, that would at least give our local crayfish a chance. But these three species escape, flourish, and outcompete the nine species of native crayfish we have in Maryland. Some natives, like the acuminate crayfish, are on the watchlist as species of concern for extinction.

As a group, crayfish are stunningly diverse in the United States. When the amateur naturalist is asked to name the likely center of diversity for most any group of organisms a common response is, “Oh, it must be the Amazon.” But in fact, the center of the universe, as far as crayfish (and freshwater mussels) are concerned, is the streams and rivers of the southeastern U.S. (and to a lesser extent the streams of eastern and southern Australia and Tasmania). Crayfish are considered by some ecologists as keystone species in freshwater streams. By keystone, we mean that their removal would have a destabilizing effect on many species in the ecosystem. Conversely, their recolonization can have the opposite effect. For example, think of the recovery of the North American beaver whose triumphant return from near-extinction created new habitats for many freshwater species.

Many species feed on crayfish who in turn feed on leaf material fallen into streams and recycle these nutrients. Removing crayfish from the ecosystem upsets the balance.

CRAYFISH

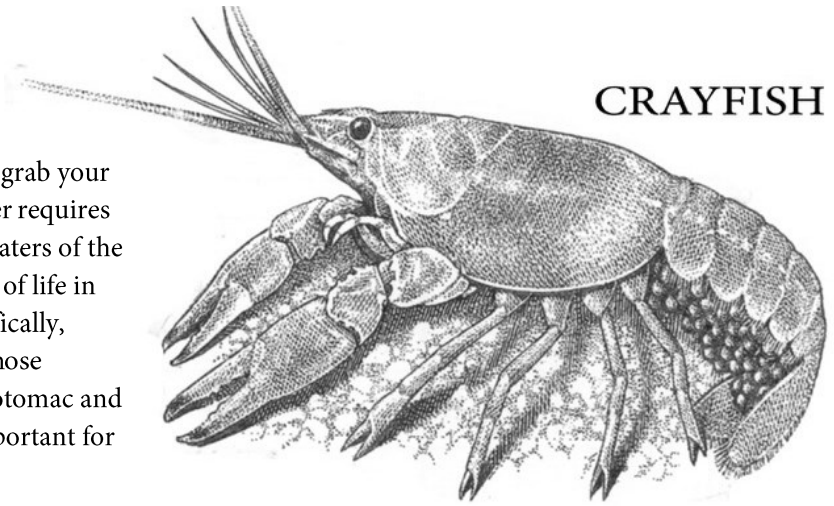


Illustration: Trudy Nicholson

So, what is the problem here? If the acuminate crayfish are replaced by the rusty or virile crayfish, won't the newcomers play the same ecological role? In a word, no; they are not ecological equivalents. First, some of the non-natives are aggressive to the native species and eat them. Second, these non-natives can reach densities 7-10 times higher than the native species of crayfish. Such high density of invasives has knock-on effects by reducing the leaf matter and detritus that freshwater mussels, snails, freshwater invertebrates, and other species feed on; they reduce the numbers of amphibians by eating their eggs and ultimately, by depleting the supply of all of the above, they diminish the feed of the very fish that anglers want to catch. Simply put, non-native crayfish screw up the system.

How can we stop the spread? About 20% of Maryland anglers use crayfish as bait. About 70% of these anglers release the bait alive in the water when they are done for the day. Proper education of fishermen not to dump their bait in the water would be a good start. Prevention is the ticket as it is very hard to control these invasive crayfish once they have entered a stream in large numbers. Another approach would be to allow fishermen to use only dead, not live crayfish as bait. That would help solve part of the problem. But the best solution of all is to keep non-native crayfish far away from the Potomac and its feeder streams. Once they have become established, there is little chance of removal. One hope for the far-off future: gene editing could allow scientists to create versions of the three invasives where the females don't reproduce and the males are infertile. Then their populations would crash naturally. Until then, if you see someone fishing with crawdaddies, you might gently suggest they dump the leftover live ones where the raccoons and other animals can have their own crawdaddy feast—far from the shore.