



## the CRAYFISH TALE

### **Crayfish, Invasive in China and the US**

Although farmers in China recognized that aquatic plant destruction and drained ponds due to the burrowing activity of crayfish has considerable negative impacts, crayfish-stocked ponds were abundant. Farmers did not hesitate to stock crayfish in some ponds and use aggressive chemical treatments to eradicate them from others.

We witnessed crayfish-induced destruction on our first trip to a rice paddy. As we hiked through an invaded field in which much of the vegetation had been destroyed, we noted that the water levels were obviously low, and the water present was murky.

As we were leaving, a neighbor who had heard that we were studying crayfish came up to us and was excited to take us to his pond where he had begun to stock them — and asked us for advice on how to improve his yields! When we asked why he would introduce the crayfish with the knowledge that they could devastate nearby agriculture, he admitted that the business of selling crayfish was too lucrative to pass up. Another rice farmer explained that if he had the necessary resources, he said he would sell only crayfish and eliminate rice farming all together

This novel perspective on invasive species was perhaps most elegantly stated as we made small-talk with a taxi driver in Wuhan. As we explained our research through an interpreter, the taxi driver smiled and asked "Can they really be considered a problem if people eat them?"

Perhaps this beneficial perception of crayfish explains why there have been fewer ecological impact studies conducted in China than in other countries.

Our study was the most comprehensive research ever conducted on stream crayfish habitat use. We invested so much time and effort in this research because crayfish are such an important link in the food chains of so many fish and wildlife species in and around Missouri streams. Destruction or loss of crayfish habitat could potentially lead to a "domino effect" whereby many animals are negatively affected. We noted that cray-

fish, like many animals, use a variety of habitats, but some of those habitats were especially important as nursery areas and are also susceptible to habitat degradation.

They serve as important links in the food chain, feeding on living and dead plants, other invertebrates, and fish. Crayfish are a primary food for fish (bass), water birds (herons), mammals (raccoons), and others. In fact, over 240 species of wild animals in North America have been found to eat crayfish

Crayfish are threatened by habitat destruction caused by dams, water pollution, erosion, siltation, in-stream gravel dredging and, particularly, the introduction of nonnative crayfishes and other exotics. About 65 species of crayfish are endangered, threatened, or listed as species of special concern by the states in which they live, and 48 percent of our native crayfish species are in need of protection. These numbers are best estimates only. The exact status of crayfish endangerment or extinction rates in the United States is largely unknown because very few distribution and population surveys have been completed.

### **What Good Are They?**

Crayfish are ecologically and economically valuable animals. In many streams and lakes, they are the most important link in the aquatic food chain. They eat algae, waterweeds, and aquatic animals, and are, in turn, eaten by over 240 species of wild animals. Raccoons, black bears, otters, mink, herons, and other wildlife feed heavily on crayfish. Smallmouth bass and bullfrog diets, for example, are nearly 75 percent crayfish.

Crayfish play an important role in breaking down dead plant material, and promoting decomposition and recycling. By crushing and chewing, crayfish make organic materials more available and usable as feed for smaller aquatic animals, thereby helping to link the food chain. What would happen if all of the crayfish in a lake or stream were suddenly removed or killed?

Crayfish are important indicators of water quality. Many crayfish species are sensitive to water pollution, and can be used as biological monitors to forecast present and historical water quality conditions. A sudden kill of freshwater crayfish is an indicator of toxic chemicals or other forms of water pollution.

### **Trapper Arne**