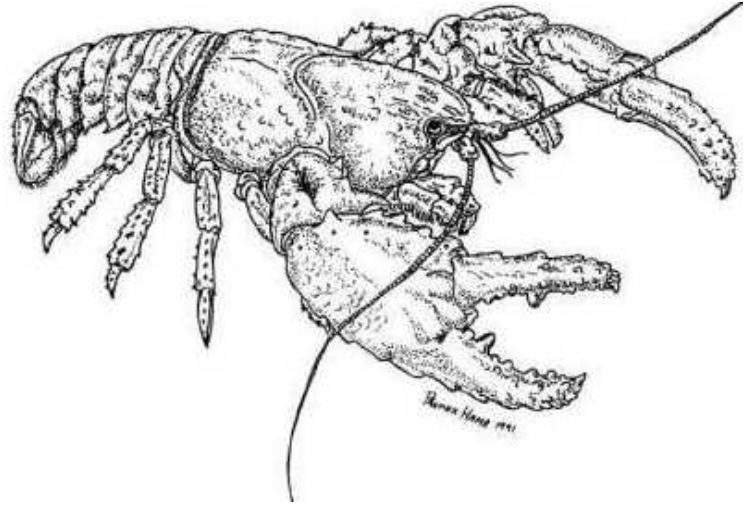


Disjunct Naturalists

WEBSITE OF THE CENTRAL NORTH FIELD NATURALISTS



Why Crayfish

by **Jim Nelson**

I have always considered my interests in natural history to be fairly wide ranging. My early interests as a boy consisted mainly of trees, fish (and fishing), birds, turtles, snakes, mammals and insects. I was lucky enough to live along a section of the Fox River in Illinois, which is part of the Mississippi catchment. The centre of my existence as far as I was concerned was the river, and I spent much of my free time exploring its wooded islands, watching the birds (especially the water birds), learning where various animals such as musk rat and the odd beaver lived, catching snakes, and learning where the different species of fish hung out in order to have a better chance of catching them.

My interest in fishing led me to an appreciation of freshwater crayfish, initially because they were favoured by most fish as a food. One of my first important observations about crayfish occurred when I decided at the age of 12 to go into the bait business selling large earthworms called 'nightcrawlers' as well as 'crawdads' (crayfish). The crayfish part of the enterprise failed when I discovered that they are very cannibalistic, and cannot be kept together. However this failure raised my curiosity, and I began to look more closely at crayfish habitat in order to discover the niches they retreated into, especially when they needed to moult safely. In the process, I found it fascinating to learn the fact that many invertebrates have to moult (by shedding their old, hardened carapaces) in order to grow. Underneath is a new, soft carapace which can be 'pumped up' before it hardens, thus allowing the animal to expand in size.

I remember trying to enthuse about this knowledge to my friends, and receiving little more than puzzled looks, or a 'who cares?', or 'do you wanna play football?' responses. There was, however, a neighbour who was a fellow fisherman friend of my father's who appreciated my interests. He had interesting bits of local knowledge and began to tell me fascinating things about many creatures living in or near the river. He also introduced me to a concept he called 'conservation'. He and my father were members of the Sportsmans Club, which was composed of hunters and fishers with an interest in preserving the environment for their enjoyment of these 'sports'. My father was encouraged to bring me along to the club, and over the years I was taught many lessons about their version of looking after the environment, and I was even sent off to a conservation camp one summer where I learned lessons about clean water and clean air, and how a person could and should look after the environment - perhaps even if he didn't do so in order to hunt or fish.

When I was about 15, the area we were living in managed to attract a huge

manufacturing company to establish locally. Suddenly, new housing started springing up everywhere as the town went into considerable expansion. The old sewage system couldn't cope with this expansion, so the city fathers in their wisdom agreed to divert the excess sewage into the storm drain system that emptied into the Fox River. My father objected vigorously to the city council and the mayor, but he was told this was 'the price of progress'. It seemed to us more like the terrible price of stupidity. I remember reading in the local paper (*The Beacon News*, but known as the 'Be Confused') that there was really no problem because a river could 'purify itself every hundred yards'. As I walked along the river looking at the revolting flotsam, I failed to find any evidence of this 'purification', and the dying fish helped confirm my suspicions of the lies told in the name of 'progress'.

Finally, as the river became little more than an open sewer, we moved away. Later, when I was at university, an environmental activist had started up in the area and called himself The Fox. He began to block up the various effluent pipes dumping filth into the rivers, and gained nationwide attention by doing so. I remember how we cheered for the Fox from the sidelines, and waited for the evening's TV news to hear and see his latest 'action'. He was one of the earliest and one of the most successful environmental activists, and the local County sheriff was so frustrated he ordered his deputies to 'shoot to kill'. But his deputies knew the sheriff was being paid as a 'security advisor' by one of the factories involved in massive pollution of the river. The deputies were so outraged by their sheriff's order that they found out who the Fox actually was, and started giving him messages in a bottle hidden behind a certain tree whenever there was going to be either extra security or no security on that factory's effluent pipeline so he could plan his actions.

There were numerous rumours about the identity of the Fox, but many years later on a trip back to the U.S. I finally found out who he was. He was a school teacher, and he ended up writing a very thoughtful book about why he did his actions. He explained to me that his actions suited the times, but he encouraged people who were interested in conservation outcomes to find better methods than he had used. His methods were perhaps right for the times, but they were also polarising. He felt that wider education about the environment was the main answer. Nevertheless, his activities contributed significantly to a public awareness of the problems, and contributed to the momentum to have a Clean Streams Act that was passed by Congress. He died not long after I interviewed him.

These days, Aurora, Illinois is trying to clean up the Fox River after many decades of abuse. In recent times they have found it necessary to get their drinking water from the river because they have largely used up the local aquifer. Now there are even articles in the same old ultra conservative newspaper about the need to look after the river and stop pollution.

Upon my arrival in Tasmania in the early 70's, my interest in freshwater crayfish was revived when I discovered the streams in my local environment in the Mersey River valley contained the largest freshwater crayfish, indeed, the largest freshwater invertebrate, in the world: *Astacopsis gouldi*, known locally as the Giant Freshwater Lobster. I also discovered the extra element of caution that is involved handling a crayfish capable of doing considerable damage if it manages to catch hold of you with a giant claw.

In the late 1980s, *A. gouldi* was declared by noted Astacologists, Dr Pierre Horwitz, and Dr Premek Hamr, to be in trouble from over fishing and habitat destruction. Our fledgling field naturalists group, then called the Deloraine Field Naturalists Inc., decided to apply for and carry out a Commonwealth funded study to determine any impacts of habitat destruction on the giant crayfish. This was an enormous commitment from the group, and involved around a dozen field nats doing weekend surveys over the summer season of

5 different streams in the Gog Range. These streams were graded from 'Pristine' to 'Severely Impacted' due to forestry operations. The published result was the Gowns Report written by our supervisor in the field, Dr Ivor Gowns, and it correlated the size of a stream's crayfish populations to the impacts on the streams from forestry operations. This report was of course denigrated and ignored by the Tasmanian State agencies, but led to Dr Horwitz successfully nominating *A. gouldi* on behalf of the Field Naturalists as a species Vulnerable to Extinction under the Commonwealth's Threatened Species Act.

(Thus does the CNFN have *A. gouldi* as its logo, which has been retained after the DFNG metamorphosed into the present organisation.)

Around 20 years ago while Pierre Horwitz was staying here to give a public lecture we had organised, he informed me that since I was so keen on crayfish he wanted to show me something REALLY interesting. He introduced me to a group of crayfish called *Engaeus*, which are a genus of burrowing crayfish. This was like a re-visit from my boyhood once again to encounter a burrowing crayfish, only this time it was in the enthusiastic company of the reigning expert, Pierre, who had carried out his PhD work on the genus *Engaeus*, and had named most of the species. He impressed upon me how there was a lifetime of work to be done just gathering and refining distribution information on this group, not to mention the possibilities of finding new species. He suggested that amateur enthusiasts like me were needed to carry out some of the work. I was hooked.

How could I resist? It was like going back to something that had been waiting for me for many years. Mind you, the learning curve was pretty steep because in order to identify species I had to learn quite a bit of crayfish anatomy to use Pierre's key for the various species. Meanwhile, Pierre had taken a position at Edith Cowan University in WA, so I seemed to spend a lot of time writing, phoning, sending emails and mailing specimens to him. To his credit, he always was willing to give me the time and advice I needed, and especially to assist me with the taxonomy which I at first found impenetrable until I became more familiar with crayfish anatomy. Some key anatomical features such as the 'exopodite of the third maxilliped', which (once found!) took considerable patience with my cheap, dissecting microscope to determine whether it might be multi-articulate or not, otherwise, I couldn't move any further along in the key.

When we managed to get the Giant Freshwater Crayfish listed as a threatened species, it was one of the first invertebrates to be put on the list. Given that invertebrates make up most of the life on earth, it did open up a can of worms (sorry), and it almost goes without saying that invertebrates don't exactly get equal billing with vertebrates or plants.

Working with endangered crayfish over the years has certainly had its challenges. For instance, our field nats contributed over eight years of voluntary work on the *Astacopsis* Recovery Plan once the species was listed, and in the end a bureaucrat in the lead agency simply watered down the plan according to what that department needed to do in order to not upset forestry interests.

This past year, I saw a news piece on the TV about how *Astacopsis gouldi* had now been 'saved'. It is true that since the halt of fishing due to its threatened listing, the species has recovered somewhat in places in the NW of Tasmania where there is still reasonable habitat. However, in the NE of Tassie (where hardly any work has been done), I believe the species teeters increasingly towards eventual extinction. The real threat is the trashing of habitat, especially in the headwater streams which are important nursery areas for the species. A REAL Recovery Plan remains something needed to address the needs of the species to survive wherever it currently occurs.

With the some of the threatened *Engaeus* burrowing crayfish, things are also bleak. I was commissioned a few years ago by the *Engaeus* Recovery Team to do the distribution work for a Central North species, *Engaeus granulatus*, which led to the species being listed as Endangered. Since that listing, a number of colonies have been severely impacted or extinguished by developments, and there appears to be no effective planning mechanism in place that works on behalf of the crayfish rather than the developer. I have wasted many countless hours doing report writing for the Commonwealth concerning protection measures for various colonies of *E. granulatus*, only to then see my work simply ignored. If I could write a pop song, it would be about betrayal of my midnight toil.

In the NE there is a listed Endangered *Engaeus* species, *E. spinicaudatus*, which mainly occurs in a few buttongrass areas near the Forester River. There is a current proposal to dam the river, which would destroy much of this species' habitat. Given the current regime and policies in Canberra, I wouldn't bet on the crayfish winning that battle.

Our rock star credentialed Federal Minister for the Environment has also decided that Recovery Teams are no longer needed, and that we perhaps need to stop worrying about individual species. His record thus far should qualify him as an 'endangering process' for species of concern.

Tasmania has one of the richest if not THE richest freshwater crayfish faunas in the world that includes five unique genera of mostly endemics. This includes the world's largest (*Astacopsis*), and arguably the world's most highly evolved (*Engaeus*). Observing and learning about many of these species has provided me with a great deal of pleasure over the years, while my growing awareness and admiration of their long history of evolution and adaptation has spurred a sense of purpose to work on their behalf. Trying to make a difference for them has proved to be an ever increasing challenge. In trying to meet that challenge, I was once confronted with the question: 'But what GOOD are they?' Increasingly, that becomes a question difficult for me to answer for our own species.

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