

# Australian Aquatic Biological Pty Limited

A.C.N. 127 431 118

**Project: 100007**

## **A New Species in Western Drainage, potentially threatening, Murray Cod, Murray Crays, Catfish, Yabbies and other Murray Darling Recreational Fishing Species.**

### **Research Brief**

#### **Introduction**

Biological surveys of the upper catchments of the Cudgegong River, around a popular recreational fishing and camping area (Dunns Swamp) and further upstream in Wollemi National Park and Coricudgy State Forest, have revealed an unidentified species of freshwater crayfish never previously recorded in the western drainage of NSW. Initial indications are that it appears to be *Euastacus spinifer* – a dominant and aggressive crayfish naturally found in the eastern drainage of NSW. If this population in the western drainage is a translocated population of *Euastacus spinifer*, it may pose serious threats to important recreational fishing species in the Murray Darling, including the iconic Murray Cod, Eel-tailed Catfish, Murray Crayfish and Yabbies.

*Euastacus spinifer* is the dominant predator in all the eastern flowing river drainage basins that it inhabits. It has the largest distribution of all crayfish species on the eastern drainage in NSW. It can be found from sea level to an elevation of over 1200 mtrs. It is well armoured with a thick spiky shell and is very large and powerful – its awesome build enables it to be an aggressive predator - immune from attack both in the water and on the banks.

This species is highly fecund and long lived (100 years), and has the potential to dramatically alter the ecology of the Murray Darling Basin. On eastern drainages the instinct of juveniles is to migrate upstream, while large adults over 350 gram instinctively migrate downstream. The Cudgegong flows into the Macquarie River, that in turn flows into the Darling - so basically the whole Murray Darling drainage basin is potentially at risk of infestation with translocated *Euastacus spinifer*. So far, preliminary surveys have only found this species in the upper catchments. An alarming finding of the preliminary surveys was that in those streams where this species was established, no *Cherax destructor* (The yabby, a common recreational fishing species that should have been in abundance) were present.

However, at this stage, it is uncertain if this population is in fact a translocated population of *E. spinifer*, or perhaps a new species or a distinct natural (and previously undocumented) population of *E. spinifer*. Detailed morphological and genetic analysis is required to clarify this. If the population is a translocated population of *E. spinifer*, then it is unknown what effect they will have on key recreational fishing species, such as eel tailed catfish and Murray cod. These species rely on built nests for breeding and such nests may be targeted by *E. spinifer*. They may also devour/displace the smaller *Cherax destructor* species eliminating them from the main streams, the loss of this major food source would have a detrimental impact to the ecology of the whole river system. This species has the potential to dramatically impact the recreational fishing industry wherever they become established. Conversely, if the population constitutes a new species, they may be a new recreational fishing species for the western drainages.

We propose to undertake a detailed population distribution study to determine the extent of both the population and distribution of this species. We also intend to do a detailed morphological and genetic analysis to determine if this is a translocated population, a natural population of *E. spinifer* or an entirely new species that is broadly similar to *E. spinifer*. Depending on the results of the genetic study and the genetic distinctiveness of the populations, specific conservation strategies may need to be implemented.

## Aims

The aim of this project is to ascertain and map the distribution of this crayfish species. A trapping survey over the whole region would be conducted with the aid of NSW Fisheries, NP&WS, local recreational fishing clubs and community volunteers. It is our intention to capture large numbers of these crayfish, certainly hundreds and perhaps thousands that we will weigh, measure, tag and record. A tagging program would provide long term benefits for management strategies and the recreational fishers who will ultimately recapture these crayfish. We also aim to provide an estimate as to the size of the population.

Perform detailed morphological analysis of the species and clarify the taxonomic status of the species.

Perform detailed genetic analysis of this species and if *E. spinifer* identify the strain/population it originally came from via DNA comparative analysis.

Perform a detailed survey for anecdotal evidence on the species and its past history, by interviewing current property owners, recreational fishermen, forestry and parks workers and other interested stakeholders.

Propose management strategies based on the outcome of surveys, genetic and taxonomic analyses.

## Research Outline

The project team has been working on the *Australian Crayfish Project*, finding and identifying freshwater crayfish species across Australia. The team consists of three experts on freshwater crayfish.

- Robert B McCormack – Managing Director/Researcher Australian Aquatic Biological P/L. 25 years as aquaculturalist and teacher. Author of numerous books on freshwater crayfish including his 7<sup>th</sup> book “The Freshwater Crayfish of NSW Australia”. ISBN 978-0-9805144-1-4. President of the NSW Aquaculture Association. Serves on various statutory advisory committees. Research Associate with the Carnegie Museum. Experienced in crayfish taxonomy, including the preparation of formal taxonomic descriptions for publication.

- Dr Jason Coughran - Associate Lecturer, Southern Cross University, PhD in freshwater crayfish biology, ecology and taxonomy. >10 years research experience in freshwater biology.

- Dr. James W. Fetzner Jr. Assistant Curator of Crustacea, Section of Invertebrate Zoology, Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA. Areas of research include 20 years of experience working on the biology, conservation, population genetics, systematics and taxonomy of freshwater crayfishes at a global level. An additional 12 years of experience in bioinformatics and the dissemination of crayfish related taxonomic information via the internet. Professional crayfish-related activities include: Secretary for the International Association of Astacology, Editor of the *Crayfish News* newsletter, co-editor of the journal *Freshwater Crayfish*.

This team will be the core researchers for this project. The survey will require the participation of a large number of stakeholders. It is our intention to co-ordinate the survey with NSW DPI, National Parks and Wildlife Service, recreational fishers and community volunteers. A huge area will need to be surveyed and large numbers of crayfish will need to be captured to give accurate information. It is our intention to conduct fishing days where large numbers of people are co-ordinated to capture and tag crayfish. Tags similar to those used for tagging saltwater rock lobsters would be used. These tags are attached under the tails of the crayfish and are easily visible to recreational fishermen that may recapture these crayfish over the next 100 years. This would give us ongoing

information on the size and movement of this crayfish species over the next 100 years as they are a very long lived species.

DNA samples can be taken from specimens just a piece of tail or leg that will not permanently injury or hinder the crayfish as they will regrow the sample taken. These samples can be sent to the Carnegie Museum for DNA analysis and identification of the species and information if it is *E. spinifer* as to the population/area it has originated from.

### **Comments**

The project would last a full 12 months to gather life cycle information and several major survey/capture days would be required. If we capture and tag crayfish and then several months later recapture the same crayfish and new crayfish we can gather information on their migratory habits and their population densities. This is a major project which will produce ongoing benefits for all parties for the next 100 years plus.

For Further Information

Refer Project No.:100007

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