

Project No.: 100008 - 4

## Conservation of Imperilled Crayfish: The Fitzroy Falls Crayfish, *Euastacus dharawalus* Morgan 1997.

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### Research Brief

#### Background

The Australian Crayfish Project has been finding and identifying freshwater crayfish species from across Australia. As part of this project sampling of freshwater crayfish was conducted around the Fitzroy Falls region of NSW. Within this aquatic ecosystem a rare and unique species of freshwater crayfish occurs. This species, *Euastacus dharawalus* is only found in this aquatic system above Fitzroy Falls. The Falls are at the northern end of Morton National Park and are formed where Yarrunga Creek pours 80 m over the escarpment. These Falls have acted as a barrier to the more aggressive and dominant crayfish species that live below the falls (e.g. *E. spinifer*) and *E. dharawalus* survives as a remnant population restricted only to the small, highland section of stream above the falls.

Unfortunately, an exotic species of crayfish (*Cherax destructor*) has become established at the site (Coughran et al. 2009). This species is a predatory, aggressive, highly fecund and fast growing species, biological traits that equip it to rapidly spread throughout this aquatic system. This species poses an imminent and growing threat to the survival of *E. dharawalus*, a much slower growing species with a comparatively poor reproductive biology. The problem may be compounded by the introduction of other recreational fishing species (i.e. Trout, Australian Bass and Carp) plus the growing recreational fishing effort for crayfish centered around the reservoir.

Due to these and other factors, a recent assessment identified *E. dharawalus* as satisfying IUCN criteria for listing as Critically Endangered (Coughran and Furse 2010). *Euastacus dharawalus* is considered one of Australia's most threatened crayfish species. Urgent research is required into the life history of the species, population assessment and monitoring of both the imperilled Fitzroy Falls Spiny Crayfish and the introduced competitor, *Cherax destructor*.

This current project aims to gather such biological information, and builds on the information gathered in the three previous surveys conducted by AABio staff.

#### Method

The research project will involve an intensive survey of the whole aquatic system above Fitzroy Falls, to ascertain the current distribution and relative abundances of all species. This will require an intensive capture program across the entire water body and tributaries, over a 2 day period. We know from previous research by the Australian Crayfish Project (ACP) that this species is carnivorous and readily attracted to fish baits. The capture program would be conducted with baited traps that will easily and effectively capture both crayfish species. Crayfish will be captured, weighed, measured, and tallied. Native crayfish will be marked by clipping a uropod (Coughran 2006) and released back into the system, and exotic crayfish will be removed from the system and humanely euthanized. The survey will be conducted at approximately 10 locations around the circumference of the reservoir, as well as several sites in Yarrunga and Wildes Meadow Creeks and other minor drainage gullies.

Transects of 3 traps placed 10 metres apart will be set at 10 locations along the shore of the reservoir, and three transects of 10 traps will be set below the reservoir in Yarrunga Creek. These are baited opera house traps, they will be laid in the morning and checked every 2 hours. Traps will be emptied and reset. They will be checked throughout the day and left out overnight and checked again in the morning. Duration of the project is 2 days and 1 night.

The broad sampling will provide a rudimentary picture of approximately where *Euastacus dharawalus* and *Cherax destructor* occur within the system, and an estimate of overall population densities.

### **Deliverables**

The results of this research project will deliver:

- Preliminary distribution maps of the crayfish species within the aquatic system.
- Maps of the distribution of all species in the greater area.
- Preliminary estimates of population size and relative abundances of *E. dharawalus* and *C. destructor* within the aquatic system.
- Biological and ecological information on aspects such as wounds and disease, ectosymbionts, reproductive biology and life history, habitat requirements, etc. The information ascertained on the biology and ecology of *Euastacus dharawalus* would be used to protect and conserve the species into the future.
- Creation of a database to manage the information gathered.
- Increase in the knowledge base on the species and its habitat and improved understanding of its requirements for survival.
- The information generated may lead to conservation listing and management, etc.

Three surveys have been completed to date and those research results together with the new information gathered in this latest proposed project will be presented in this paper.

Australian Aquatic Biological P/L (AABio) currently has the permits from NSW DPI Fisheries, NSW Department of Environment and Climate Change and the SCA to conduct research and will work closely with all towards the fruition of the project and to ensure that all permits required for this project are current.

### **For Further Information**

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## Update 2011

Survey 1 completed 26<sup>th</sup> September 2006.

Survey 2 completed 5<sup>th</sup> March 2007

Survey 3 completed 26<sup>th</sup> January 2008

Survey 4 completed 28<sup>th</sup> April 2011

Survey 5 completed 25<sup>th</sup> and 26<sup>th</sup> of October 2011.

Survey 6 completed 3rd of November 2011.

All surveys have now been completed and the final paper is being drafted and due for publication 2012.

## Fisheries Scientific Committee

May 2011

Ref. No. PD 51  
File No. FSC 11/01

### PROPOSED DETERMINATION

#### **The Fitzroy Falls spiny crayfish – *Euastacus dharawalus* as a Critically Endangered Species**

The Fisheries Scientific Committee, established under Part 7A of the *Fisheries Management Act 1994* (the Act), is proposing to list the Fitzroy Falls spiny crayfish, *Euastacus dharawalus* as a **CRITICALLY ENDANGERED SPECIES** in Part 1 of Schedule 4A of the Act.

The listing of Endangered Species is provided for by Part 7A, Division 2 of the Act.

#### Update:

The NSW Scientific Committee listed the Fitzroy Falls spiny crays as critically endangered and it was gazetted in March 2012.

They have produced a PRIME FACT SHEET, a copy follows.....

# Fitzroy Falls Spiny Crayfish

## *Euastacus dharawalus*

Fisheries Ecosystems Unit, Port Stephens Fisheries Institute



*Euastacus dharawalus* – The Fitzroy Falls Spiny Crayfish Photo: Rob McCormack

### Introduction

The Fitzroy Falls Spiny Crayfish is endemic to NSW, Australia. The species has a very limited geographic range, and is found only in Wildes Meadow Creek on the NSW Southern highlands. The population is restricted to a small part of the waterway upstream from Fitzroy Falls. The extant distribution of this single crayfish population is restricted to approximately 12 km of waterway, of which less than 1 km is high quality habitat protected within the Morton National Park. The species has only been recorded from five sites,

four above and one below the Fitzroy Falls Reservoir.

Combined with their limited distribution, the species also has an extremely low abundance. Many individuals caught during surveys bear injuries caused by the common Yabby (*Cherax destructor*); a species introduced from the Murray Darling Basin. Interactions with the common Yabby are one of the major reasons for this species' decline. In addition, misidentification by fishers, habitat degradation and alteration to the

hydrological regime of headwater streams have put this species at imminent risk of extinction.

The Fitzroy Falls Spiny Crayfish is listed as a **critically endangered species** in NSW. Heavy penalties are imposed for harming, possessing, buying or selling the species, or for harming their habitat (see 'Legal implications').

## Description

The Fitzroy Falls Spiny Crayfish is a large, non-aggressive spiny crayfish which resembles most members from the genus *Euastacus*. The *Euastacus* genus is the second most widely distributed group of freshwater crayfish in Australia, with many different species occurring from North Queensland to South Australia, including Eastern and Southern NSW and Victoria.

The Fitzroy Falls Spiny Crayfish is morphologically closest to the Sydney Spiny Crayfish (*Euastacus spinifer*), but can be distinguished by its reduced rostral spines, thinner rostral carinae (the ridge-like structure between the eyes) and absence of a dorsal abdominal boss (pronounced humps along the centre of the tail). Any spiny crayfish found in Yarrunga Ck and its tributaries should be assumed to be *Euastacus dharawalus* until positively identified.

The Fitzroy Falls Spiny Crayfish can also be confused with the common Yabby but can be distinguished by its larger size and the presence of short robust spikes on its claws, carapace and abdomen while the Yabby is smooth shelled.



Female Fitzroy Falls Spiny Crayfish carrying eggs. Note the short stout spines covering the claws and abdomen. **Photo: Justin Stanger**

## Habitat and ecology

- The Fitzroy Falls Spiny Crayfish creates burrows in the soft stream bed below the waterline, where it spends extensive periods of time.

- The species is an opportunistic omnivore and has been observed actively foraging upon the stream bed where it feeds upon a range of vegetable and other organic matter.
- The Fitzroy Falls Spiny Crayfish is most active late afternoon and early evening.
- The species is adapted to flowing stream conditions. As a result of the construction of the Fitzroy Falls Reservoir, a large portion of its habitat has been altered, forming a large static body of water. The introduced Yabby thrives in these conditions.
- Egg fertilisation occurs from May to June and the female tends the eggs and larvae under her abdomen until juveniles disperse in December. Not all females breed every year.
- The maximum reported size is 86 mm occipital-carapace length (OCL) and 300 grams.



Wildes Meadow Creek - crayfish country. **Photo: Justin Stanger**

## Why is the Fitzroy Falls Spiny Crayfish threatened?

- Predation from, and competition with, the common Yabby (*Cherax destructor*); an aggressive crayfish that has been introduced to Fitzroy Falls Reservoir from the Murray Darling Basin, have caused a decline in the remnant population of Fitzroy Falls Spiny Crayfish.
- Yabbies are highly fecund, fast growing, and difficult to eradicate.
- Densities of approximately 25:1 of Yabbies to Fitzroy Falls Spiny Crayfish have been recorded in surveys (Coughran et al. 2009).
- Predation by exotic species including foxes, cats, and introduced salmonids may have also contributed to declines.
- Habitat degradation from clearing, construction of Fitzroy Falls Reservoir, and degradation of riparian vegetation.

- Potential illegal harvest or misidentification with the common Yabby. Current fishing regulations prohibit taking spiny crayfish with an OCL < 90mm, however there is potential for misidentification with the common Yabby which do not have minimum length restrictions.
- The limited geographic range and low abundance of this species compounds the effects of all other threatening processes.



*Fitzroy Falls Spiny Crayfish - a prickly character - Note the large overall size and spines on the claws. Photo: Justin Stanger*

### Conservation and recovery actions

- Educate fishers about the identification and protected status of Fitzroy Falls Spiny Crayfish.
- Conduct urgent research into the life history of the species, population assessment and monitoring of both the critically endangered Fitzroy Falls Spiny Crayfish and its introduced competitor, *Cherax destructor*.
- Protect the few remaining sites with the potential to support the species, and address key threats.
- Investigate ex-situ conservation options including relocation into Yabby free areas and breeding programs.
- Report any sightings of the species on the NSW DPI 24-hour automated message-taking service by calling (02) 4916 3877.

### Legal implications

It is illegal to catch and keep, buy, sell, possess or harm Fitzroy Falls Spiny Crayfish (or any other threatened species in NSW) without a specific permit, licence, or other appropriate approval, and significant penalties apply. For critically endangered species, these penalties can include fines of up to \$220,000 and up to 2 years in prison.

There can also be significant penalties for causing damage to the habitat of a threatened species without approval through actions such as dredging, damaging riparian vegetation and constructing barriers that block the free passage of fish.

The impact of developments or activities that require consent or approval (in accordance with the *Environmental Planning and Assessment Act 1979*) must be assessed and considered by consent or determining authorities. Where such actions are likely to result in a significant impact on a threatened species or its habitat, a detailed species impact statement must be prepared.

Strategies to be adopted for promoting the recovery of Fitzroy Falls Spiny Crayfish to a position of viability in nature must be set out in the NSW DPI Priorities Action Statement.

A recovery plan may be prepared in accordance with the provisions of the *Fisheries Management Act 1994* to promote the recovery of the species to a position of viability in nature.



*The Fitzroy Falls Spiny Crayfish (top photo) can be distinguished from the common Yabby (bottom photo) by its larger size and presence of short robust spines on its claws, carapace and abdomen. The Yabby is smooth shelled. Photos: Rob McCormack.*

## Bibliography and further reading

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- Morgan, G. J., 1997. Freshwater crayfish of the genus *Euastacus* Clark (Decapoda: Parastacidae) from New South Wales, with a key to all species of the genus. *Records of the Australian Museum Supplement* 23, 1–110.

## For further information

See the NSW DPI website: [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

Contact the NSW DPI Threatened Species Section:

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ISSN 1832-6668

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Published by the Department of Primary Industries, a part of the Department of Trade and Investment, Regional Infrastructure and Services.

PUB12/41



Fitzroy Falls Spiny Crayfish habitat. **Photo: Justin Stanger**



Females carry eggs, and later larvae, under their abdomen until dispersal. **Photo: Justin Stanger**