AN ASSESSMENT OF THE DISTRIBUTION, BIOLOGY, THREATENING PROCESSES AND CONSERVATION STATUS OF THE FRESHWATER CRAYFISH, GENUS EUASTACUS (DECAPODA, PARASTACIDAE), IN CONTINENTAL AUSTRALIA. I. BIOLOGICAL BACKGROUND AND CURRENT STATUS

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ABSTRACT

Of the 10 Australian crayfish genera, Euastacus is the largest with 49 species described, including some of the largest, and some of the rarest, species in the World. Many species are slow growing, late maturing, and the lifespan of some exceeds 30 years. The distribution of the genus encompasses most of the east coast of Continental Australia, a latitudinal range of approximately 23° (a distance of over 2500 km). Euastacus also has the widest altitudinal range of all Australian genera, occurring from sea level to over 1500 m above sea level. Due to these broad geographical and altitudinal ranges, Euastacus inhabit most of the climatic zones in Australia, and are found in a wide range of habitats including large temperate lowland rivers, high altitude rainforest gullies and Alpine streams. We review the distribution, habitat, population data, and biology for these crayfish, and their current conservation status where available. Sixteen species were listed on the IUCN Red List in 1996, and there have been increasing concerns regarding the conservation status of the genus since then. The current review was undertaken in order to allow, 1) assessment of the conservation status of all species against current IUCN Red List Criteria, and, 2) a discussion of research, conservation and management imperatives for the genus, presented in two accompanying papers.

INTRODUCTION

The freshwater crayfish of Australia

Australia features the World’s second most diverse freshwater crayfish fauna with more than 130 species known from 10 genera, and in terms of

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species richness, Australia is second only to North America (more than 380 species from 12 genera) (Crandall & Buhay, 2008). The Australian freshwater crayfish fauna features many of the Worlds’ largest species (from the genera Astacopsis, Euastacus and Cherax), the largest of which, Astacopsis gouldi Clark, 1936, can reach \( \sim 1 \) m in overall length and \( \sim 4.5 \) kg in weight (Holdich, 2002). In contrast, at 25 mm overall length Tenuibranchiurus glypticus Riek, 1951 is one of the Worlds’ smallest species (Riek, 1951).

Genus Euastacus

Euastacus is the largest of the 10 Australian genera with 49 species described (Coughran, 2008; McCormack & Coughran, 2008) and comprises 37% of the total Australian freshwater crayfish species. Sixteen of these species (one third of the genus) have only been described in the last 12 years (Morgan, 1997; Coughran, 2002, 2005; Coughran & Leckie, 2007; McCormack & Coughran, 2008), with further probable new species collected and awaiting description (Coughran, unpubl.). The very large and remote geographical areas of the Australian Continent that have not yet been surveyed, but feature suitable Euastacus habitat, may yield a number of additional new species in the future. Some Euastacus species are very large, with 21 species exceeding 50 mm Occipital-Carapace Length (OCL, Morgan, 1986), including the Worlds’ second largest species Euastacus armatus (von Martens, 1866) which can reportedly reach half a metre overall length and weigh more than 3 kg (Horwitz, 1990; Geddes et al., 1993). However, while the genus is recognised as containing several of the largest crayfish in the World, many Euastacus species are quite small, such as Euastacus jagabar Coughran, 2005, reaching a maximum OCL of 30 mm. A number of the larger species are highly aggressive (e.g., Euastacus sulcatus Riek, 1951) and/or very powerful (e.g., Euastacus valentulus Riek, 1951) and a great deal of care is required when handling these species as the chelae can inflict serious injuries. Euastacus are often referred to as the “Spiny Crayfish” of Australia as some species feature impressive arrays of spines on the thorax, abdomen and chelae (some of which are needle sharp). However some species lack any appreciable spination (Morgan, 1986, 1988, 1997; Coughran, 2002, 2005, 2008; McCormack et al., 2010) and can easily be confused with the “Smooth Crayfish” from genus Cherax. Many species are brightly coloured in vivid blues or various shades of red. Other species are less colourful overall (i.e., brown, green or dark black) but feature spines that are tipped in bright fluorescent colours, or have striking red, yellow, orange, green, blue or lilac undersides (see Merrick, 1993;