

***Maccullochella ikei*, an Endangered Species of
Freshwater Cod (Pisces: Percichthyidae) from the
Clarence River System, NSW and *M. peelii mariensis*, a
New Subspecies from the Mary River System, Qld**

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ABSTRACT. The eastern freshwater cod, *Maccullochella ikei*, from the Clarence River system, NSW, is described and *M. peelii mariensis* is described as a new subspecies from the Mary River system, Qld. The Murray cod, *M. p. peelii* and the trout cod, *M. macquariensis*, are indigenous to the Murray-Darling River system. Using electrophoretic data for 19 presumed loci, the coefficient of genetic identity between *M. p. peelii* and *M. ikei* was 0.72 and the banding-patterns of the muscle general protein, liver esterases and five other enzymes, were species-specific. A high proportion of abnormal and inviable hybrid larvae in a cross-breeding experiment indicate that post-zygotic isolating mechanisms have evolved between *M. p. peelii* and *M. ikei*. The coefficient of genetic identity between *M. p. peelii* and *M. p. mariensis* was 0.85 and banding patterns of muscle general protein were diagnostic. Canonical variates analysis using 18 morphological and nine meristic characters, clearly separated both species and the subspecies. *Maccullochella ikei* is distinguished from *M. p. peelii* by having longer pelvic fins, larger orbit length, and larger and morphologically distinct sagittal otoliths. *Maccullochella p. mariensis* differs from *M. p. peelii* by the combination of a deeper and shorter caudal peduncle, longer pelvic fins, larger sagittal otoliths and lesser extension of the first anal pterygiophore towards the first caudal vertebra, and from *M. ikei* by the combination of a deeper caudal peduncle, greater postorbital head length, smaller orbit, larger interorbital width, fewer scale rows below the lateral line, shorter fifth-sixth dorsal spine and lesser extension of the first anal pterygiophore. Although each species has distinctive colouration and mottling, there is some intra-specific variation. *Maccullochella macquariensis* is distinct from the other species by having a straight head profile, jaws of similar length, 14 precaudal vertebrae and distinctive colouration. There was a dramatic reduction in the distribution and abundance of cod in the eastern drainage during the early 1900s and cod were probably extinct in the Richmond and Brisbane River systems by the end of the 1930s. *Maccullochella ikei* and *M. p. mariensis* are each represented by one, small population. Possible causes of the decline, and the management strategies taken to conserve the endangered *M. ikei* are discussed.

ROWLAND, S.J., 1993. *Maccullochella ikei*, an endangered species of freshwater cod (Pisces: Percichthyidae) from the Clarence River system, NSW and *M. peelii mariensis*, a new subspecies from the Mary River system, Qld. Records of the Australian Museum 45(2): 121–145.

The Murray cod *Maccullochella peelii peelii* (Mitchell, 1838) is an Australian native warmwater fish which grows to over 50 kg and is highly regarded because of its size and excellent angling and edible qualities. Murray cod, although no longer common (Rowland, 1989), are found naturally throughout much of the Murray-Darling River system (Fig.1). The trout cod, *M. macquariensis* (Cuvier, 1829) which was once sympatric with *M. p. peelii* in the southern tributaries of the Murray-Darling River system (Berra & Weatherley, 1972), is now found only in the Murray River between Yarrowonga Weir and Tocumwal, and in the upper reaches of Seven Creeks (Ingram *et al.*, 1990) and has been classified as endangered

(Harris, 1987).

Murray cod have been introduced into numerous waters outside their natural range including the Cox's, Mulwaree, Nepean and Wollondilly Rivers, Cataract Dam, and several other Sydney water supply dams in the eastern drainage of central NSW (Rowland, 1989). Freshwater cod have also been recorded from the Clarence, Richmond, Brisbane and Mary River systems in the eastern drainage of northern NSW and southern Queensland, but there has always been doubt as to the taxonomic status and origin of the cod in these coastal rivers (Ogilby, 1893, 1895; Anderson, 1916; Lake, 1971). Wilcox (1863) stated that Mr J. Macleay identified a 'Murray River cod' from the Urara

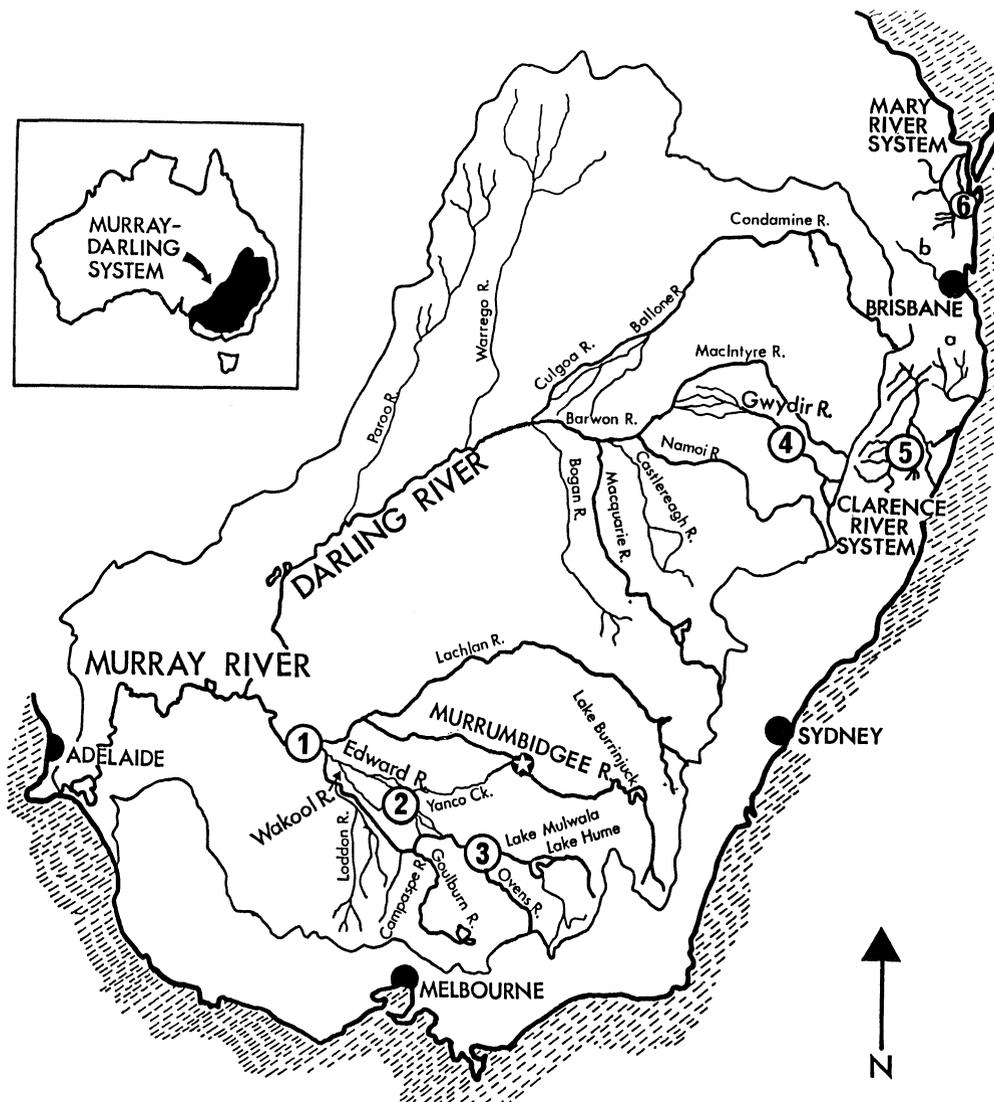


Fig.1. The Murray-Darling, Clarence and Mary River systems: (a) Richmond River system, (b) Brisbane River system. Sampling sites: 1. Murray River; 2. Edward and Wakool Rivers; 3. Lake Mulwala; 4. Gwydir and Macintyre Rivers; 5. Mann and Nymboida Rivers; 6. Six-mile, Cooodoo and Tinana Creeks. Star in circle – Inland Fisheries Research Station.