

FIGURE 4. The sites in the Pilbara Drainage Division where the lesser salmon catfish (*Arius graeffei*) was captured. Also included are the Western Australian Museum records for the species.

Lesser salmon catfish (Ariidae)

Arius graeffei Kner and Steindachner 1867

Seventy six lesser salmon catfish were captured from 10 sites in the Ashburton, Fortescue, Harding, Sherlock and DeGrey rivers (Plate 1, Table 1, Fig. 4). Western Australian Museum records report this species from the Fortescue and DeGrey rivers. This species

was rarely abundant in the upper reaches of rivers, and although recorded at a density of 0.2 m^{-2} at one site it was found at densities of less than 0.05 m^{-2} at all other sites. This species was captured in salinities between 0.5 and 1.4 ppt. In Australia, *A. graeffei* has a coastal distribution from the Pilbara (Ashburton River) to New South Wales (Hunter River) where it is common in the estuarine reaches of rivers, however it can also survive and reproduce far upstream in riverine pools (Allen *et al.* 2002). Maximum size ~60 cm TL, based on our observations in the Kimberley spawning is likely to be during the wet season (summer).

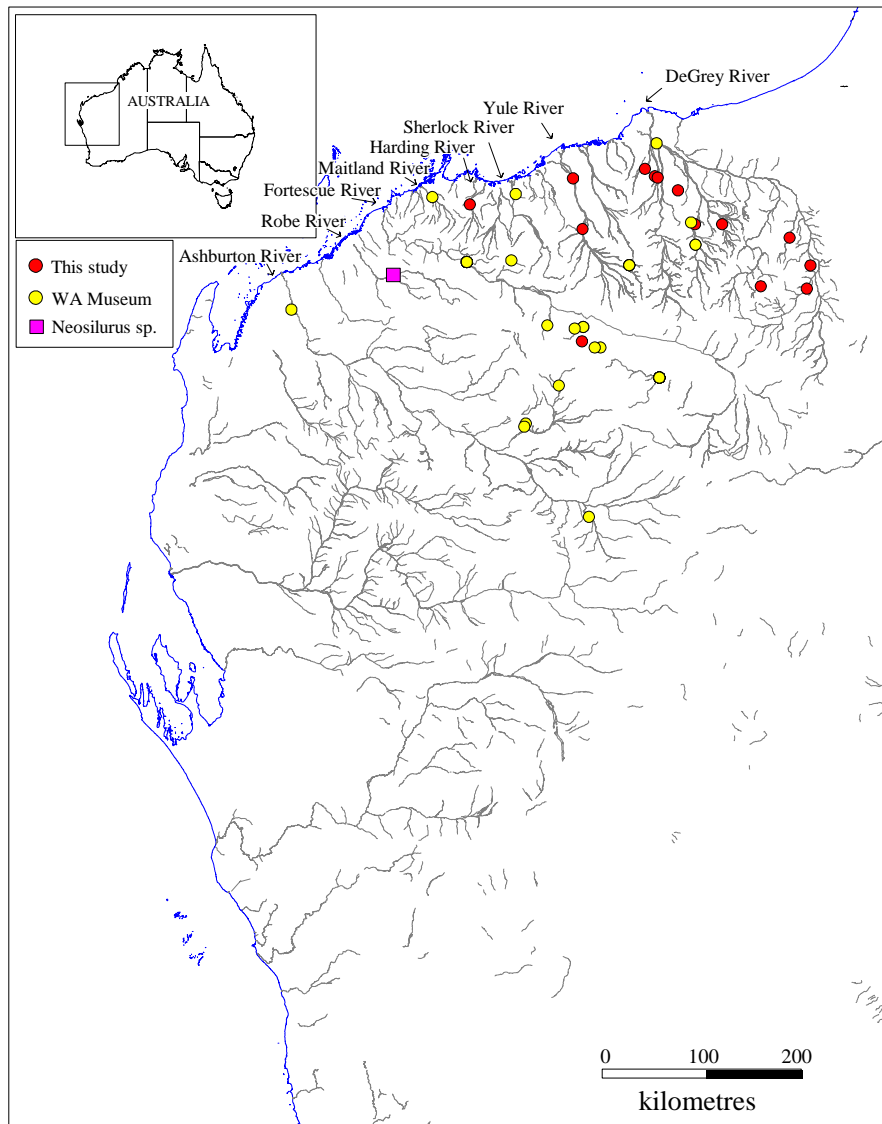


FIGURE 5. The sites in the Pilbara Drainage Division where Hyrtl's tandan (*Neosilurus hyrtlui*) and *Neosilurus* sp. were captured. Also included are the Western Australian Museum records for *N. hyrtlui*.

Hyrtrl's tandan (Plotosidae)
*Neosilurus hyrtl*i Steindachner 1867

Two hundred and thirty one Hyrtrl's tandan were captured from 14 sites in the Fortescue (0.4 ppt), Harding (0.5 ppt), Yule (0.3–0.4 ppt) and DeGrey (0.3–10.3 ppt) rivers (Plate 1, Table 1, Fig. 5). In the first three of these rivers densities never exceeded 0.05 m⁻². However, in those sites where it was captured in the DeGrey River it was often the third or fourth most abundant species with densities of up to 2.5 m⁻². Western Australian Museum records report this species from the Ashburton, Fortescue, Maitland, Sherlock, Yule and DeGrey rivers. *Neosilurus hyrtl*i is widespread across northern Australia from the Pilbara to the Brisbane River as well as Lake Eyre and the northern Murray-Darling basin (Allen *et al.* 2002). The species often forms very dense congregations in open water, which is presumably a defense mechanism to avoid predation. One specimen of what appears to be an undescribed species of *Neosilurus* was recorded at a single site in the Robe River (0.6 ppt). This latter 'species' is distinguishable from *N. hyrtl*i based on the fact that the head is proportionally larger and the snout length is longer (Plate 1). This species will be described in due course. The maximum size of *N. hyrtl*i is ~20 cm TL and it probably breeds during the wet (Allen *et al.* 2002).

Murchison River hardyhead (Atherinidae)
Craterocephalus cuneiceps Whitley 1944

The Murchison River hardyhead, with 8 128 individuals captured at 37 sites, was the third most numerous species encountered during the course of this study (Plate 1, Table 1, Fig. 6). However, while this species was found in the Greenough (0.2–32.1 ppt), Hutt (1.8–4.2 ppt), Murchison (0.1–13.9 ppt) and Gascoyne (0.9–2.7 ppt) rivers in the south and the DeGrey River (0.1–1.4 ppt) in the north, it has a disjunct distribution and was not found in any river between the Gascoyne and DeGrey rivers. This species was found at densities varying from 0.03 m⁻² at a site in the DeGrey River to 25 m⁻² at a site in the Murchison River. The Western Australian Museum has further records of this species from the Woolamel River. In the Murchison River population, breeding was extremely protracted with recruitment occurring throughout the year; the largest female and male specimens were 96 and 86 mm TL, respectively; sex ratio was 1.09 females :1 male; batch fecundity ranged from 46–454, and lengths at which 50 and 95% of females began maturation were 23.3 and 26.2 mm TL, respectively (Allen 2002).

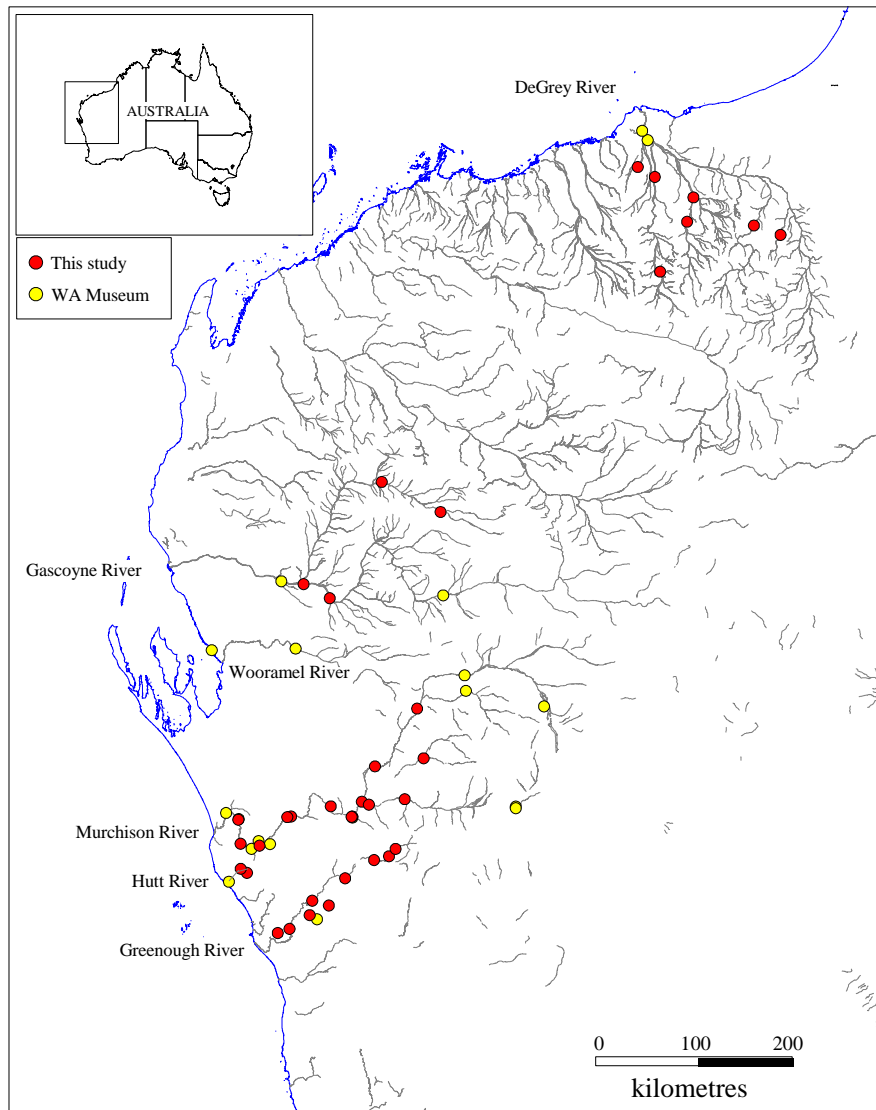


FIGURE 6. The sites in the Pilbara Drainage Division where the Murchison River hardyhead (*Craterocephalus cuneiceps*) was captured. Also included are the Western Australian Museum records for the species.

Western rainbowfish (Melanotaeniidae)

Melanotaenia australis (Castelnau 1875)

The western rainbowfish was the second most abundant species recorded during this study with 11 653 individuals captured from 72 sites in the Ashburton (0.1–9.9 ppt), Robe (0.5–0.6 ppt), Fortescue (0.4–1.4 ppt), Harding (0.5–0.6 ppt), Sherlock (0.2–1.4 ppt), Yule (0.3–1.1 ppt), Turner (1.0–2.3 ppt) and DeGrey (0.1–10.3 ppt) rivers at densities ranging

between 0.01 m^{-2} at a site in the Ashburton River in the south and 31.25 m^{-2} at a site in the DeGrey River in the north (Plate 1, Table 1, Fig. 7). Within the region densities of this species were generally higher towards the northern extent of its range. Western Australian Museum records note this species as present in the Ashburton, Fortescue, Maitland, Sherlock and DeGrey rivers. The range of this species extends from the Ashburton River in WA to the Victoria River in the Northern Territory (McGuigan *et al.* 2000; Allen *et al.* 2002). While only attaining a maximum size of $\sim 10 \text{ cm TL}$, due to their extremely variable and vivid colour patterns they are highly regarded in the aquarium industry. The spawning period appears to be extremely protracted with temperatures above 20°C providing favourable conditions.

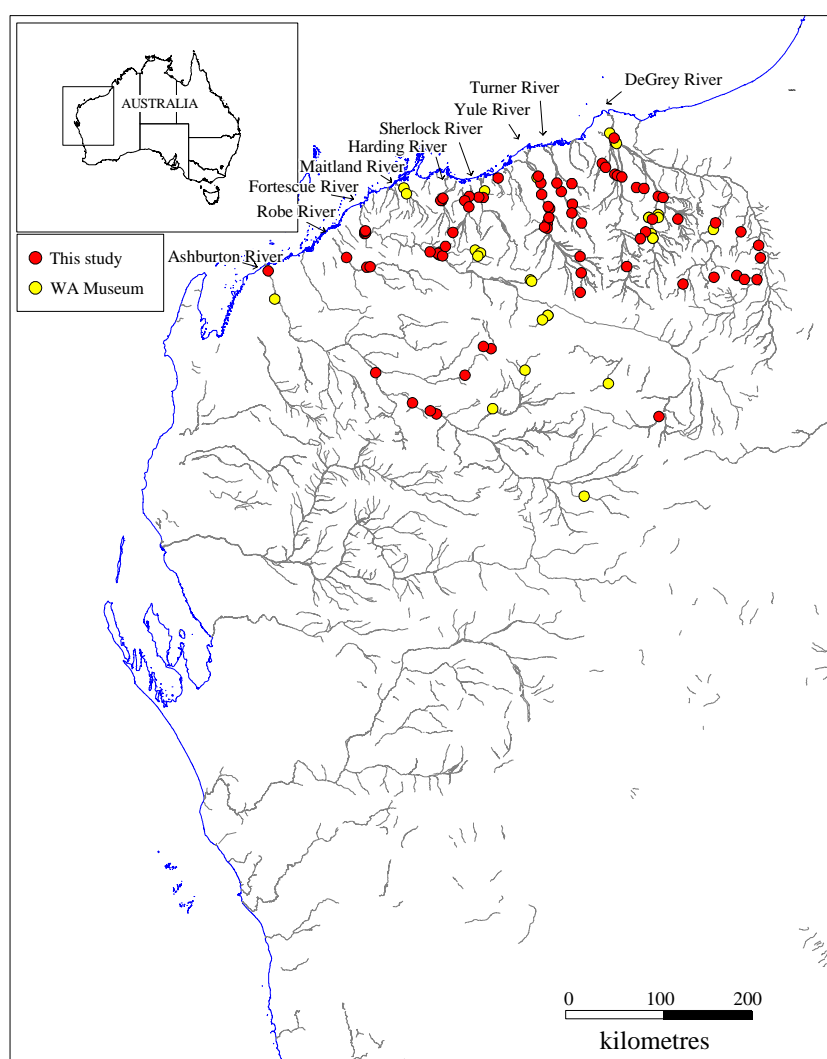


FIGURE 7. The sites in the Pilbara Drainage Division where the western rainbowfish (*Melanotaenia australis*) was captured. Also included are the Western Australian Museum records for the species.

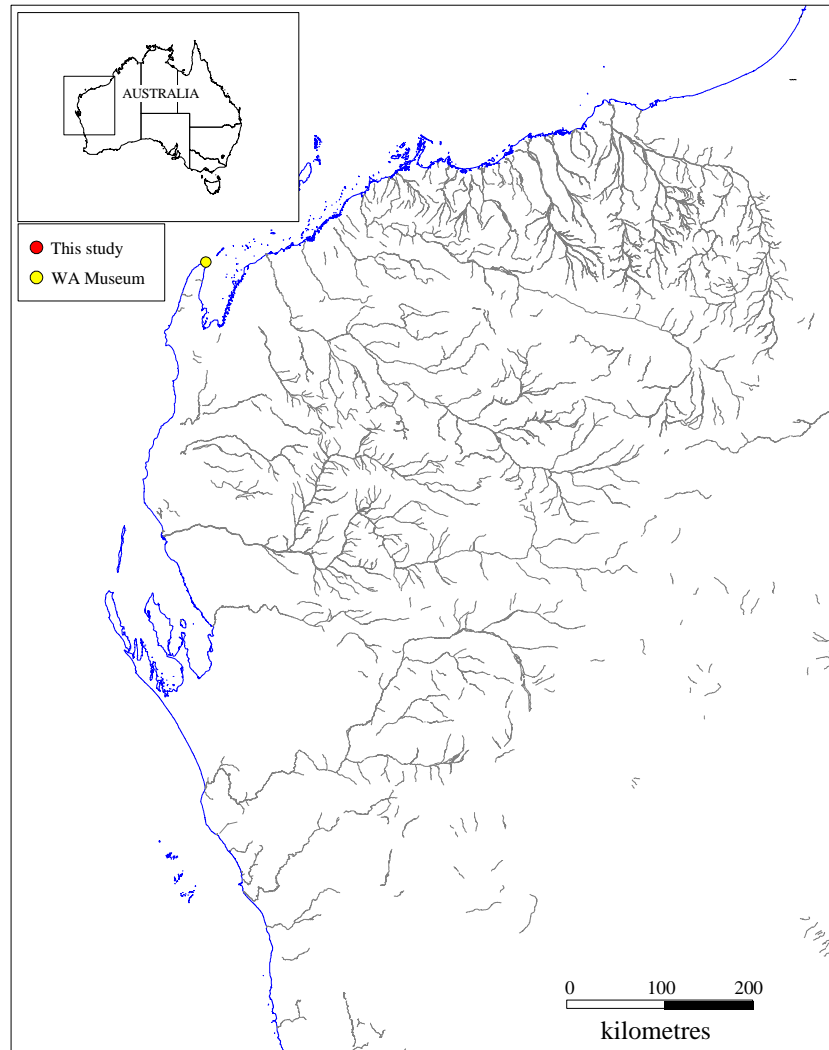


FIGURE 8. The site in the Pilbara Drainage Division where the Western Australian Museum has a record for the blind cave eel (*Ophisternon candidum*).

Blind cave eel (Synbranchidae)

Ophisternon candidum (Mees 1962)

Whilst not captured during this study, this species is endemic to the Pilbara and is restricted to the North West Cape (Fig. 8) (Humphreys & Adams 1991; Allen *et al.* 2002). This is undoubtedly one of Australia's most restricted and vulnerable fish species, a fact that has seen it listed as *VULNERABLE* in the Environment Protection and Biodiversity Conservation Act 1999. Only one other Western Australian freshwater fish species has been afforded the same listing, this being the blind gudgeon *Milyeringa veritas* Whitley

1945 (see below), a species also restricted to the North West Cape (and the adjacent Barrow Island).

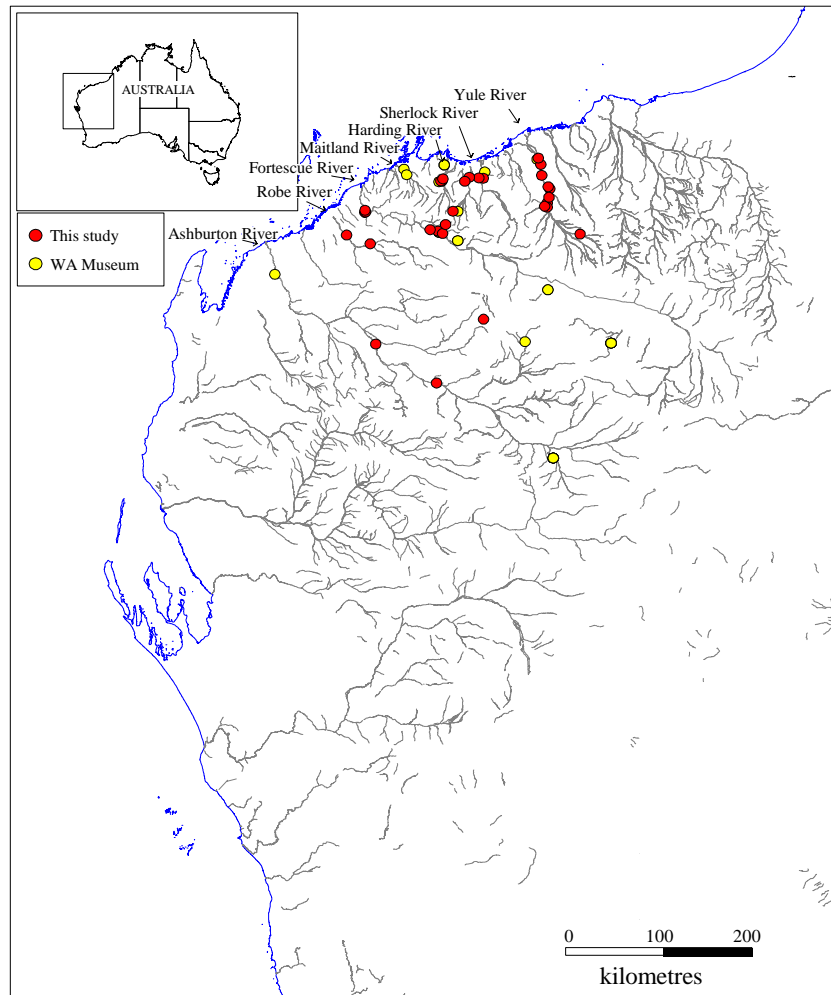


FIGURE 9. The sites in the Pilbara Drainage Division where the barred grunter (*Amniataba percooides*) was captured. Also included are the Western Australian Museum records for the species.

Barred grunter (Terapontidae)
Amniataba percooides (Günther 1864)

The barred grunter was the eighth most abundant species captured during this study, with 939 specimens caught in 26 sites at densities ranging from 0.01 m⁻² in the Robe and Yule rivers to 0.97 m⁻² in the Harding River (Plate 1, Table 1, Fig. 9). This species was caught in the Ashburton (1.0–9.9 ppt), Robe (0.5–0.6 ppt), Fortescue (0.4–3.4 ppt), Harding (0.5–

0.6 ppt), Sherlock (0.2–1.4 ppt) and Yule (0.3–1.1 ppt) rivers during this study, and is also documented in the Western Australian Museum records as being present in the Maitland River. While previously thought to be found in all of the major river systems of northern Australia north of the Ashburton (Allen *et al.* 2002) this species was not captured in the DeGrey River and no Western Australian Museum records exist for the species in this river. This species, which attains ~10 cm TL, forms loose schools in the shallows.

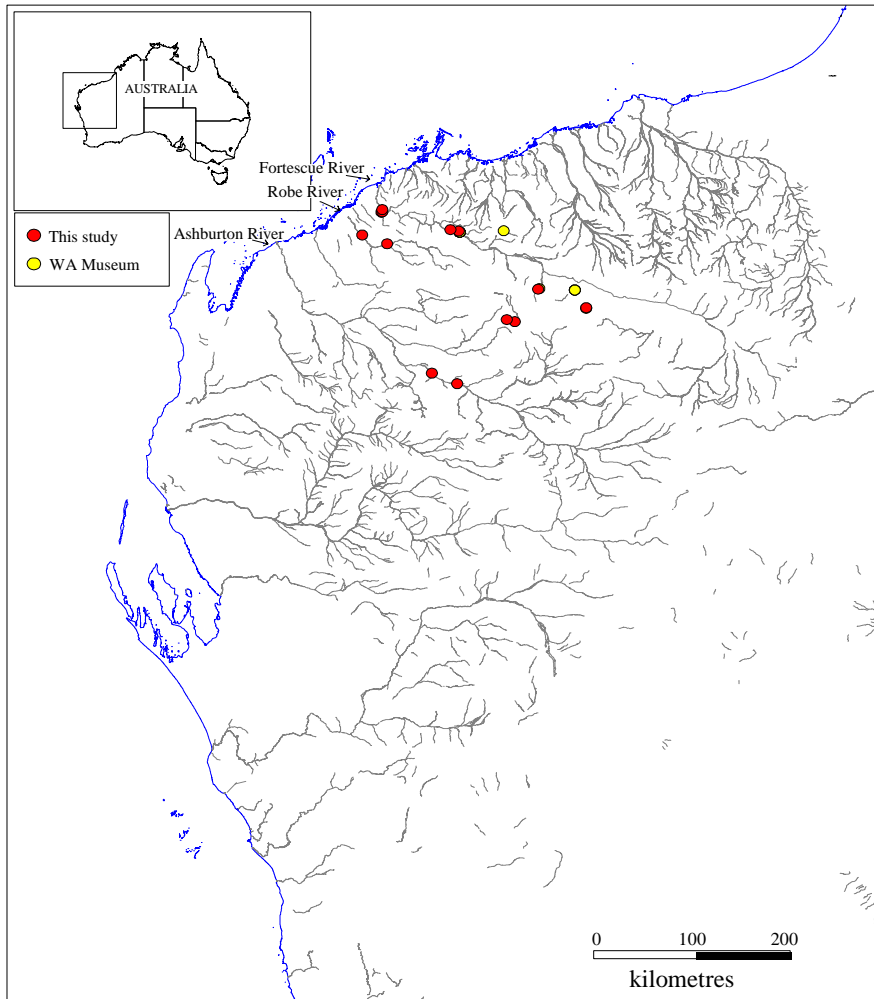


FIGURE 10. The sites in the Pilbara Drainage Division where the Fortescue grunter (*Leiopotherapon aheneus*) was captured. Also included are the Western Australian Museum records for the species.

Fortescue grunter (Terapontidae)

Leiopotherapon aheneus (Mees 1963)

First described in the 1960s and endemic to the Pilbara a total of 792 Fortescue grunters

were caught from seven sites in the Fortescue River (0.3–1.4 ppt) at densities varying from 0.03 to 0.19 m⁻², four sites in the Ashburton River (0.4–9.9 ppt) at densities ranging from < 0.01 to 0.13 m⁻², and two sites in the Robe River (0.5–0.6 ppt) at densities between 0.07 and 0.27 m⁻² (Plate 1, Table 1, Fig. 10). This schooling species attains a maximum length of ~20 cm TL.

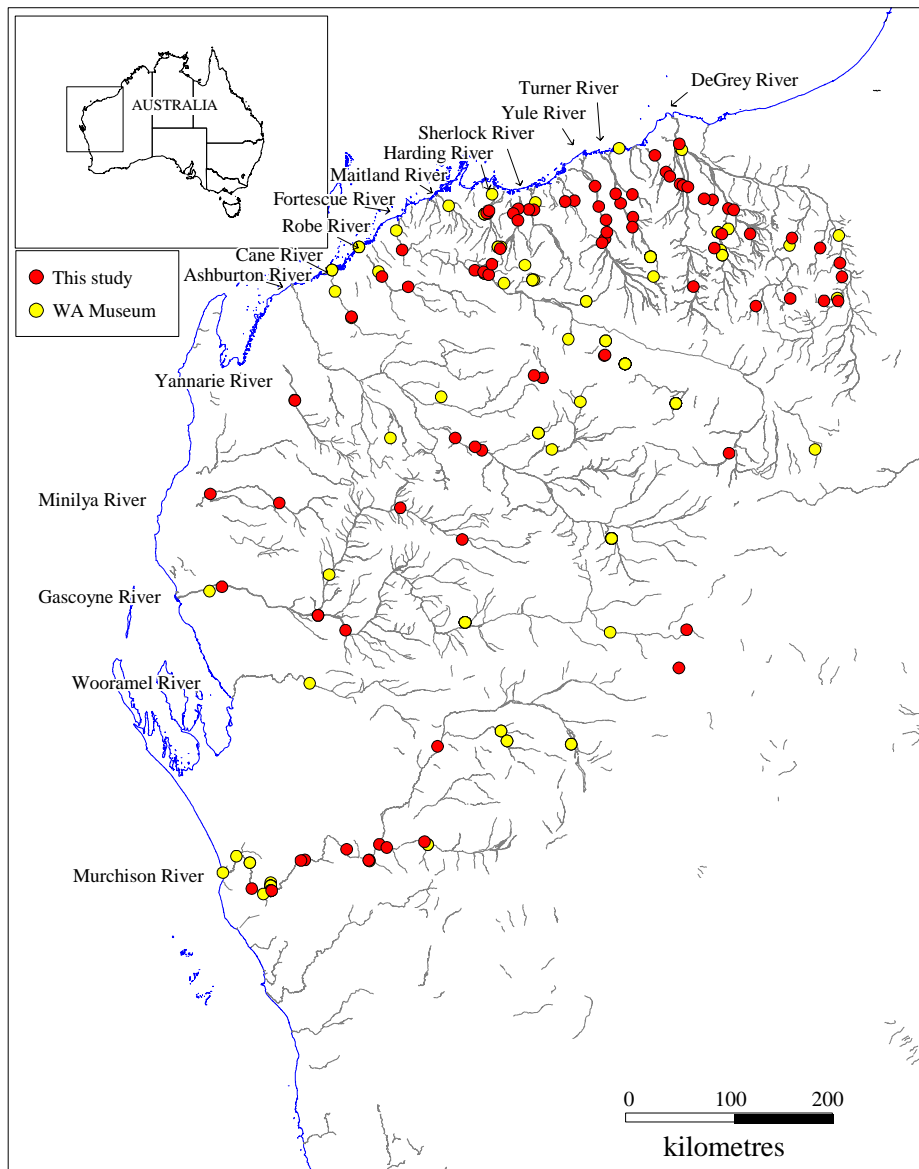


FIGURE 11. The sites in the Pilbara Drainage Division where the spangled perch (*Leiopotherapon unicolor*) was captured. Also included are the Western Australian Museum records for the species.

Spangled perch (Terapontidae)

Leiopotherapon unicolor (Günther 1859)

This species had the most extensive range of any species encountered during this study, being found in every river system between the Murchison River in the south and the DeGrey River in the north (0.1–13.9 ppt) (Plate 1, Table 1, Fig. 11). Spangled perch was the fifth most abundant species found in the region, with a total of 2 066 specimens captured from 82 sites with a mean density of 0.08 m⁻² across all sites sampled. Western Australian Museum records report the existence of this species in the Murchison, Wooramel, Gascoyne, Ashburton, Cane, Robe, Fortescue, Maitland, Harding, Sherlock, Yule, Turner and DeGrey rivers. Thus, this study reports the presence of *L. unicolor* in the Minilya and Yannarie rivers for the first time. Watson (1958) reports *L. unicolor* from the Greenough River, however those specimens, which are housed in the Western Australian Museum, are in fact yellow-tailed trumpeter *Amniataba caudavittata* (Richardson 1845) (see Mees 1963). Spangled perch is Australia's most widespread freshwater species, and ranges from the Murchison River in Western Australia north and east to the Murray-Darling and Lake Eyre drainage systems. The maximum size is ~30 cm TL and in the Murchison River mature males and females were captured in summer and larvae and small juveniles were captured in March. This very hardy and aggressive species had a diet in the Murchison River that was dominated by *C. cuneiceps* and aquatic macrophytes and it can thus be described as omnivorous.

Golden gudgeon (Eleotridae)

Hypseleotris aurea (Shipway 1950)

One hundred and eighty two golden gudgeon were caught from three sites in the Murchison River (0.7–0.9 ppt) and two sites in the upper reaches of the Gascoyne River (0.9–1.3 ppt), at densities ranging between 0.02 m⁻² at a site in the former river and 3.75 m⁻² at a site in the latter river (Plate 1, Table 1, Fig. 12). Western Australian Museum records document this species from an additional three sites in each of these rivers, whilst the Australian Museum has a record of this species from a single site in tributary of the Fortescue River (verified by ourselves and Dr D. Hoese of the Australian Museum). The restriction of this small species to just three river systems makes it vulnerable to ecological and hydrological changes within its environment. This is particularly relevant as one of the rivers in which this species is found, i.e. Gascoyne, is infested with the introduced, much larger and aggressive tilapia *Oreochromis mossambicus* (Peters 1852) (see below). Also pertinent is the salinisation of parts of the lower Murchison River. The salinity tolerance of the species is not known but in the Murchison River, where salinities ranged from 0.7 to 6.4 ppt, they were never captured in water >1.1 ppt.