Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee (TSSC) on Amendments to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Scientific name (common name)

Galaxiella munda (Mud Minnow)

2. Description

The Mud Minnow is a small freshwater fish which grows to a maximum length of 58 mm and has a scaleless, elongated body and long straight gut (Morgan et al. 1996). Adults are brown-grey on their back with a white belly and possess several whitish blotches near their top midline. They also possess a broad brown stripe just below their midline from behind the eye to the base of their tail fin. The species occurs in swift flowing streams within karri forests and is typically found near submerged vegetation, occasionally in the still water of ponds, swamps and roadside drains, and often inhabiting darkly tannin-stained and acidic water (Morgan et al. 1998, Allen et al. 2002). The water where the Mud Minnow is found exhibits marked seasonal temperature fluctuations. The Mud Minnow is a carnivorous species (Pen et al. 1993) feeding on insects and their larvae in water, and also on micro-crustaceans (Allen 1989, Morgan et al. 1998).

The Mud Minnow feeds near the fringe of streams and pools. The Mud Minnow has a one year life cycle (Morgan et al. 1998) and is known to breed during the winter-spring period between June and October, with females depositing several clutches of eggs over a period of a few weeks in flooded vegetation. Adults develop two olive-brown longitudinal bands at maturity that are separated by an orange stripe (mid-lateral stripe) and a silver belly (Morgan et al. 1996, Allen et al. 2002). The lateral stripe gradually disappears to become a thin silver-white line by October and by January most fish are light olive-brown in colour (Morgan et al. 1996). The Mud Minnow is a multiple spawner that dies soon after final spawning (Pen et al. 1993, Allen et al. 2002).

3. National Context

The Mud Minnow is known to occur in the south western corner of Australia extending from Margaret River in the west to Two Peoples Bay (near Albany) in the east, with an isolated population occurring approximately 100 km north of Perth near Gingin (Morgan et al. 1996, 1998, Allen et al. 2002). The Mud Minnow has also recently been found at one location on the Vasse River, near Busselton, within 50 km and north of the Margaret River (Morgan and Beatty 2004).

Populations of the Mud Minnow have been reported within five National Parks and three Nature Reserves: Shannon River, D'Entrecasteaux, Mount Frankland, Walpole-Nornalup and Mt Roe-Mt Lindsay National Parks and Lake Muir, Gum Link Road, and Blue Gum Road Nature Reserves, which are all currently managed by the Western Australian Department of Conservation and Land Management. The Mud Minnow is also known from a number of State Forest Blocks; Rapids, Quillben, Jane, Wye, Keystone, Trent, Thames, Powey, Hay and Denbarker which are also managed by the same Department. Other populations occur within other Crown Reserves, private property and leasehold land (CALM 2005).

This species is not currently listed in Western Australia under the *Wildlife Conservation Act 1950*. However, Western Australia continues to monitor the species for any change in conservation status.

4. How judged by TSSC in relation to the EPBC Act criteria.

TSSC judges the species to be **not eligible** for listing under the EPBC Act. The justification against the criteria is as follows:

Criterion 1 – It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers.

The Mud Minnow is thought to have once occurred from the Moore River in the north to Two Peoples Bay east of Albany in the south east (Morgan et al. 1998, Allen et al. 2002). While the species may have previously occurred across much of the Swan Coastal Plain, this historical occurrence has not been confirmed by museum specimens.

The species is currently known from two widely separated regions and has recently (i.e. within the last 10 years) been recorded from nineteen river systems. Eighteen river systems occur within the lower south west of Western Australia (between Margaret River and Two Peoples Bay), and one river system occurs near Gingin in the Moore River area north-east of Perth (Morgan et al. 2000, Morgan et al. 1996, 1998, Allen et al. 2002).

Therefore, there appears to have been little change in the overall range of this species, with the current extent of occurrence for the nineteen river systems, estimated at approximately 46 000 km^2.

A number of threats to the survival of the Mud Minnow have been proposed including: competition and predation from introduced fish (e.g. Redfin Perch, Mosquitofish and Trout); the species' low tolerance to salinity and increasing salinisation of freshwater streams (e.g. parts of the Blackwood River have salinity levels greater than seawater and within this river, the species has not recently been recorded from the main channel and is only now found in a few freshwater tributaries); and increased water extraction.

The Mud Minnow may also be affected by river regulation (e.g. weir and dam construction) and the subsequent infestation (or stocking) of these areas with predatory fish species.

It is unclear however to what degree these threats have resulted in at least a substantial reduction in species' numbers. The total population size of the Mud Minnow is unknown and there are insufficient data to adequately determine any trends in the species' population size.

Therefore, it is difficult to quantify to what degree the species has undergone, is suspected to have undergone, or is likely to undergo in the immediate future, a reduction in numbers.

There are insufficient quantitative data available to assess the species against this criterion.

Criterion 2 –Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited.

Based on the catchment areas the Mud Minnow is currently known to occupy, the current extent of occurrence of the Mud Minnow has been estimated to be approximately 46 000 km^2 and the species has an estimated area of occupancy of 10 000 km^2 (CALM 2005).

A recent survey (Morgan et al. 2000) has shown that the Mud Minnow is restricted to the south western corner of Australia, extending from Margaret River in the west to Two People's Bay in the east. There is also one small isolated population known from north of Perth near Gingin (Morgan et al. 1996, 1998, 2000, Allen et al. 2002). Within these two regions there are nineteen river systems which contain the species. Morgan et al. (1996, 1998) collected Mud Minnows from the catchments of the Margaret River, Warren River, Lake Muir, Doggerup Creek, Gardner River, Shannon River, Broke Inlet, Deep River, Frankland River, Bow River, Kent River, Denmark River, Hay River, Torbay Inlet, King River and Two Peoples Bay. Other studies have also recorded this species in the Blackwood and Donnelly River catchments. Morgan *et al.* (2000) confirmed that this species still occurs in low numbers in Gingin Brook (Moore River area). Within the Blackwood River, the south-west's second largest river, the Mud Minnow is restricted to one small tributary (i.e. Rosa Brook).

The species is not likely to be found throughout the length of all these streams and river systems and is more likely to be restricted to just a few kilometres of the small freshwater tributaries. For example, the Mud Minnow has not been captured in the salt affected areas of the rivers and is restricted to the fresher, forested, feeder tributaries of the larger saline rivers (e.g. Blackwood River) (Morgan et al. 2003).

The geographic distribution of the Mud Minnow is not very restricted, restricted or limited.

Therefore, the species is **not eligible** for listing under this criterion.

Criterion 3 – The estimated total number of mature individuals is limited to a particular degree and: (a) evidence suggests that the number will continue to decline at a particular rate; or (b) the number is likely to continue to decline and its geographic distribution is precarious for its survival.

The total population size of the Mud Minnow is unknown. The species occurs in coastal drainages of south western Western Australia between Margaret River in the west to Two Peoples Bay (near Albany) in the east, with an isolated population occurring approximately 100 km north of Perth near Gingin.

Morgan et al. (1996, 1998) collected Mud Minnow from a number of river systems in the lower south-west of Western Australia and have indicated that, while this species was rare throughout most of its distribution, it was occasionally abundant in the headwaters and tributaries of rivers and in a number of shallow pools connected to streams, the species being most common in the creeks and streams of the Gardner and Shannon River catchments (Morgan et al. 1998).

Based on data currently available, it can not be determined whether the total number of mature individuals is limited to a particular degree.

There are insufficient quantitative data available to assess the species against this criterion.

Criterion 4 – The estimated total number of mature individuals is extremely low, very low or low.

The total population size of the Mud Minnow is unknown.

There are no quantitative data available to assess the species against this criterion.

Criterion 5 - Probability of extinction in the wild

There are no quantitative data available to assess the species against this criterion.

5. CONCLUSION

The Mud Minnow is currently known from nineteen river systems. The Mud Minnow occurs in catchments that cover approximately 46 000 km^2 and the species has an estimated area of occupancy of 10 000 km^2. The species' total population size is unknown and while it may have once occurred across much of the Swan Coastal Plain, the species' historical occurrence is uncertain. In addition, while loss and degradation of the species' habitat is likely, along with the presence of a number of potentially threatening processes, it is difficult to verify the impact that these processes are having on the species' survival in the wild.

The species does not meet any of the criteria for listing under the EPBC Act.

6. Recommendation

TSSC recommends that the species ***Galaxiella munda*** **(Mud Minnow)** is **not eligible** for inclusion in the list referred to in section 178 of the EPBC Act.

Publications used to assess the nomination

Allen, G.R., Midgley, S.H. and Allen, M. (2002). Field guide to the Freshwater Fishes of Australia. Western Australian Museum, Perth, Western Australia.

CALM (2005). Records held in CALMs Fauna Database and rare/priority fauna files. Western Australian Department of Conservation and Land Management, Perth, Western Australia.

Morgan, D. and Beatty, S. (2004). *Fish Fauna of the Vasse River and the Colonisation by Feral Goldfish (Carrassius auratus).* Report to Fishcare Western Australia and Geocatch.

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Morgan, D., Gill, H. and Potter, I. (1996). The Distribution of Freshwater Fish in the South-western corner of Australia. Report to Water and Rivers Commission. Waters and Rivers Commission, Perth, Western Australia.

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Pen, L.J., Gill, H.S, Humphries, P. and Potter, I.C. (1993). Biology of the black-striped minnow *Galaxiella nigrostriata*, including comparison with the other two *Galaxiella* species. Journal of Fish Biology. **43**: 847-863.

Pen, L.J., Potter, I.C. and Hilliard, R.W. (1991). Biology of *Galaxiella munda* McDowall (Teleostei: Galaxiidae), including a comparison of the reproductive strategies of this and three other local species. *Journal of Fish Biology* **39**: 717-731.