

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

1. Scientific name (common name)

Litoria lorica (Armoured Mistfrog)

2. Description

The Armoured Mistfrog is a medium sized frog, 35mm in length, with a grey or grey-brown back, and a white belly with peppered dark brown areas on the throat. The skin of this species has fine bumps along the back, the upper eyelids and sides of the head. The skin on the lower surfaces is grainy along the throat, belly and backs of the thighs, but smooth elsewhere. The well developed fingers have some webbing (basal) and the toes have full webbing. Adults are known to occur on boulders in splash areas, near fast-flowing water in upland rainforests (Davies and McDonald, 1979), between 640 m and 1000 m altitude (McDonald 1992).

3. National Context

The Armoured Mistfrog is known from five localities in the rainforest areas of the Wet Tropics Bioregion of north east Queensland. These five sites are located on the Thornton uplands at Roaring Meg Creek, Alexandra Creek, Hilda Creek and on the Carbine Tablelands at two sites in Mossman Gorge (Hero and Fickling 1994; Cunningham 2002). The species was first recorded and described in the 1970s and was considered rare due to its restricted distribution (Davies and McDonald, 1979).

This species is listed as endangered under the Queensland *Nature Conservation Act 1992*.

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

The Committee judges the species to be **eligible** for listing as **critically endangered** 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 Armoured Mistfrog has been recorded at five locations within the Thornton uplands and the Carbine Tablelands from the early 1970s through to the early 1990s. During this time the species was only intermittently recorded and was considered rare due to its restricted distribution (Davies and McDonald, 1979; Cunningham 2002).

The last recorded observation of the species was in December 1991 at Roaring Meg Creek below Mt Pieter Botte. At this site more than 12 individual Armoured Mistfrogs were observed at night clustered in the splash-zone of a major cascade and also in deep cracks beside the cascade during the day (Cunningham 2002). Further surveys conducted at Roaring Meg Creek in November 1994 and June 1995 did not find any Armoured Mistfrogs or any other species of frog previously known to frequent this site (Cunningham 2002).

Ongoing monitoring and searches of the Thornton uplands and the Carbine Tablelands have been undertaken by a number of researchers in the 1990s, with no further sightings of this species

(Richards et al. 1993; Ingram & McDonald 1993, Trenerry et al. 1994, Hero 1996b; Williams and Hero 1998; Hero et al. 1998; McDonald and Alford 1999).

The decline in the Armoured Mistfrog is concurrent with declines in other upland stream dwelling frog species from the same sites. These disappearances have been attributed to the infectious disease *Chytridiomycosis*, which is caused by the frog chytrid fungus (*Batrachochytrium dendrobatidis*) (Berger et al. 1998). A decline in several populations of upland stream dwelling frogs in tropical rainforests of northern Queensland during 1989 and 1991 have been observed and many of these species are no longer found in their former localities (Berger et.al. 1998; Richards et. al. 1993; Cunningham 2002).

Additional threats to the species may include disturbance of habitat from human activities, the introduction of feral animals competing for limited resources and preying on native species, such as Cane Toads, changes in water quality in known habitats and impacts of global warming on stream-dwelling rainforest frogs (Hero 1996).

Further research by Williams and Hero (1998) found that in the wet tropics of northern Australia, frog species that laid small groups of eggs and were restricted to particular habitats, were more susceptible to changes in the environment and experienced more dramatic declines in population numbers. This data contrasted with frog species that laid large groups of eggs and had a wider habitat distribution. There is some evidence to suggest that these more widespread species are recovering to some degree from the chytrid fungus, whereas frog species with more restricted habitats, such as the Armoured Mistfrog, are not (Hero and Morrison 2004).

Armoured Mistfrog habitat occurs wholly within areas reserved for conservation within the Wet Tropics Bioregion, and does not appear to have undergone any changes in habitat quality (Richards et al. 1993; McDonald and Alford 1999). It is likely that this frog species has been adversely affected by the frog chytrid fungus as there have been no sightings of it since 1991, despite survey effort at known sites. Due to the absence of any known extant populations since 1991 and no other quantitative data available on its population size, it can be inferred that this species has undergone a very severe decline in numbers. As exhaustive surveys have not been undertaken at the five known locations, there is insufficient data to conclude that the Armoured Mistfrog is extinct in the wild.

Therefore, the species is **eligible** for listing as **critically endangered** under this criterion.

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

The Armoured Mistfrog is known from five locations within the Thornton uplands and the Carbine Tablelands located within the Wet Tropics Bioregion of north-west Queensland. The total extent of occurrence of this species is estimated to be 120 km² (Cunningham 2002).

It is likely that the frog chytrid fungus is prevalent in this species' habitat, due to this disease having been observed and attributed to the decline in numbers of several other upland stream dwelling frog species in rainforests of the north-west Queensland area during 1989 and 1991.

The Armoured Mistfrog has not been seen in its known habitat since 1991 (Berger et.al. 1998; Richards et. al. 1993; Cunningham 2002). Given that the Armoured Mistfrog has a restricted distribution and is already impacted by the frog chytrid fungus, it can be concluded that its known geographic distribution is precarious for its survival and is restricted.

Therefore, this species is **eligible** for listing as **endangered** 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

There is no quantitative data on the population size of the Armoured Mistfrog. However, Cunningham (pers. comm. 2003) noted that there is anecdotal data which indicates that the total number of individuals ever encountered, across all sites, is less than 60. While it is likely that the species has a limited number of mature individuals, there is 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

As discussed under criterion 3, there is no quantitative data on the population size of the Armoured Mistfrog. While it is likely that the total number of mature individuals is very low there is insufficient data available to assess the species against this criterion.

Criterion 5 – Probability of extinction in the wild

The last recorded observation of the species was in December 1991. Ongoing monitoring and searches of the Thornton uplands and the Carbine Tablelands have been undertaken by a number of researchers in the 1990s, with no further sightings of this species. However, as exhaustive surveys have not been undertaken at the five known locations, there is insufficient data to conclude that the Armoured Mistfrog is extinct in the wild. There is insufficient quantitative data available to assess the species against this criterion.

5. CONCLUSION

The Armoured Mistfrog has been recorded at five locations in the rainforest areas of the Wet Tropics Bioregion of north east Queensland. The total recorded extent of occurrence for this species is 120km². It is likely that this frog species has been affected by the chytrid fungus, and there have been no sightings of it since 1991, despite survey effort at known sites. Given these factors, it can be inferred the Armoured Mistfrog has undergone a very severe decline in population numbers and has a geographic distribution which is precarious to its survival and is very restricted. Therefore, the species is **eligible** for listing as **critically endangered** under criterion 1 and **endangered** under criterion 2.

6. Recommendation

The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **transferring** from the **endangered** category to the **critically endangered** category:

Litoria lorica (Armoured Mistfrog)

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