

# NSW SCIENTIFIC COMMITTEE

## Peppered Tree Frog *Litoria piperata*

Review of Current Information in NSW

July 2008

### Current status:

The Peppered Tree Frog *Litoria piperata* is currently listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The NSW Scientific Committee recently determined that the Peppered Tree Frog meets criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act 1995* (TSC Act), based on information contained in this report and other information available for the species.

### Species description:

The following description was taken directly from Cogger 2000:

“Dull olive or grey-green above, with irregular darker brown marbling and flecking, and often peppered with white or cream on limbs and flanks. An obscure dark brown canthal stripe. White or cream below. Skin generally smooth above, but with numerous scattered low tubercles, especially on the head; skin granular below. Vomerine teeth in two small clusters well behind the choanae. Pectoral fold absent. Finger and toe pads well-developed, markedly wider than the digits. Fingers with slight basal webbing; toes about three quarters webbed. A small inner and minute outer metatarsal tubercle. Tympanum distinct. Second finger longer than the first. 30mm.”

### Taxonomy:

The Peppered Tree Frog was described in 1985 by Tyler & Davies (1985).

Considerable uncertainty exists over the systematics of the complex containing *Litoria barringtonensis*, *L. pearsoniana*, *L. phyllochroa*, and *L. piperata* (Gillespie & Hines 1999). Studies of the genetic variation in populations of this complex have revealed that the currently recognised species boundaries are in need of major review (Donnellan *et al.* 1999). It is possible that *L. piperata* represents morphologically distinct outlying populations of *L. pearsoniana* (Gillespie & Hines 1999). In 1992 surveys outside the known range on the Northern Tablelands located populations of frogs which closely resemble this species (NSW NPWS 1994). While the external morphology of the population closely resembles *L. piperata*, the mating call is very similar to *L. pearsoniana* (Tyler 1997).

A preliminary genetic study to clarify the systematic status of the Peppered Tree Frog was unable to determine whether the species is genetically distinct from other species in this complex (Donnellan *et al.* 1999). Further genetic and morphometric studies are required to resolve the systematics of these northern populations.

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## **Distribution and number of populations:**

The Peppered Tree Frog was formerly known from five streams on the Northern Tablelands, varying from 800 to 1 120 m elevation, and distributed from the Gibraltar Ranges to south of Armidale (Figure 1, Tyler & Davies 1985; NSW NPWS 2001). Despite searches of the historic localities and other streams with similar habitat within the known distribution of the Peppered Tree Frog, the species has not been seen since 1973 (Mahony 1996; NSW NPWS 2001).

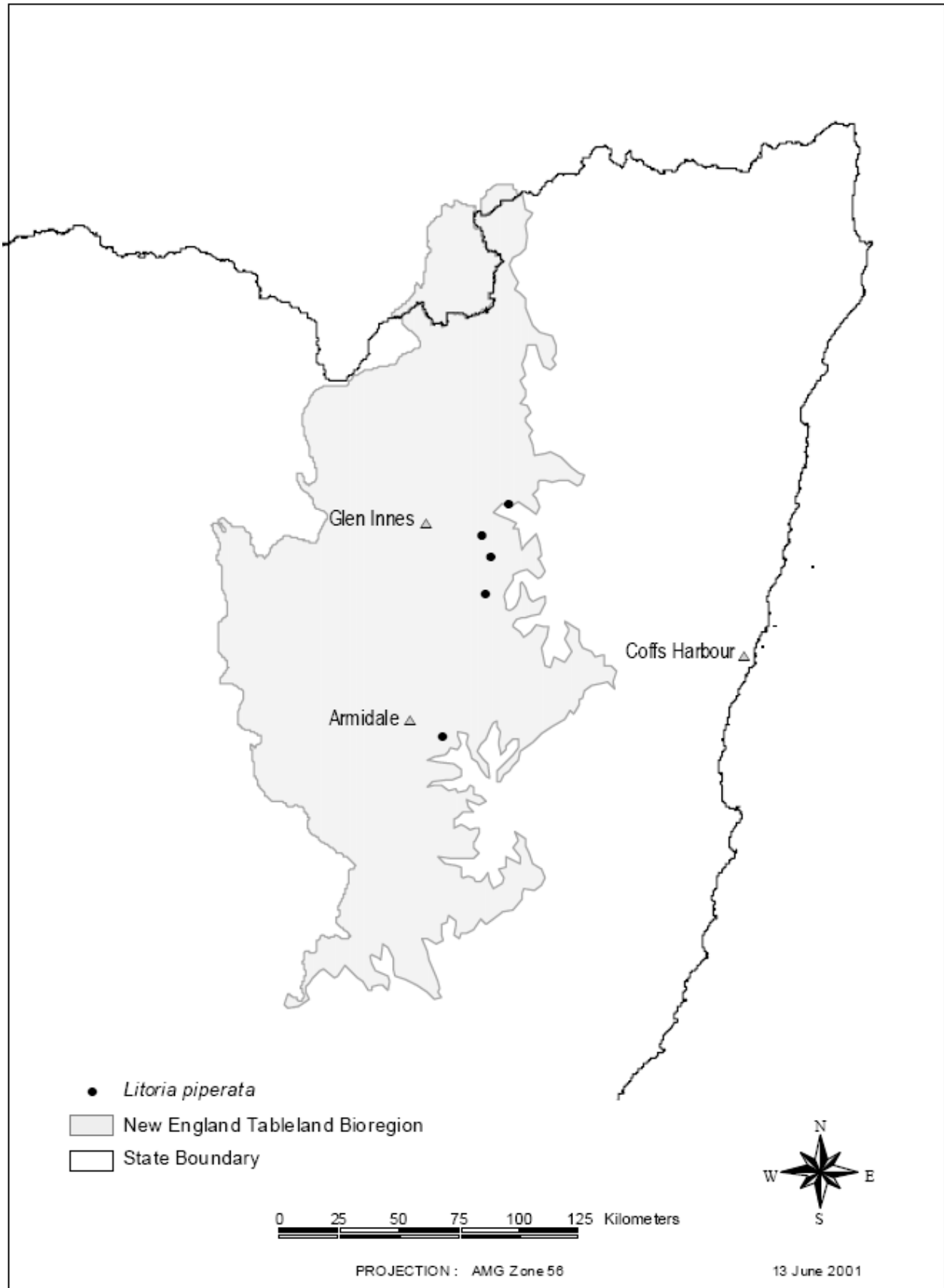
The species was formerly known from the Oxley Wild Rivers National Park (Gara River Nature Reserve), Mann River Nature Reserve and Mitchell State Forest (NSW NPWS 2001). The Type specimens were taken on freehold and leasehold land in the vicinity of Glen Innes (Tyler 1997).

## **Surveys conducted:**

Between 1994 and 1996 a survey on the New England Tableland for the Peppered Tree Frog was undertaken, during suitable environmental survey conditions (Mahony 1996). The survey covered known historical sites, nearby areas of suitable potential habitat and other areas across the region. No sightings were recorded (NSW NPWS 2001).

A NSW Frog and Tadpole Study Group Inc. (FATSG) also conducted a survey for the Peppered Tree Frog, which included five historic sites and approximately 20 areas of potential habitat on the New England Tableland. They failed to record the species (Ehmann 1997; NSW NPWS 2001).

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**Figure 1.** Distribution map showing records of the Peppered Tree Frog (Source: NSW NPWS 2001).

ESTABLISHED UNDER THE THREATENED SPECIES CONSERVATION ACT 1995

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## **Ecology:**

### Key habitat requirements

The Peppered Tree Frog has been found in streamside vegetation and under rocks and fallen timber along rocky streams flowing eastward from the Tablelands at altitudes of 800 to 1 120 m (Mahony 1996). The general area in which this species has been recorded has been referred to as the 'dry eastern escarpment' (NSW NPWS 1994). Common streamside vegetation at recorded sites includes *Lomandra*, *Leptospermum* and *Casuarina* (Mahony 1996; NSW NPWS 2001).

### Life history

Little is known about the biology of the Peppered Tree Frog. The morphological similarity this species to *L. pearsoniana* and *L. phyllochroa* suggests that ecological characteristics may also be similar (Gillespie & Hines 1999).

It is presumed that breeding activity occurs during the warmer months following reasonable rainfall (NSW NPWS 2001). Advertisement call is not known (Gillespie & Hines 1999).

Sexual maturity of the Peppered Tree Frog is thought to occur around two to three years (Frogs Australia Network) and individuals are thought to live up to seven years (expert advice, 2008). Hence generation length (IUCN 2008) is estimated to be four to five years.

## **Number of mature individuals:**

Given that the last confirmed records of the species dates from more than 30 years ago (1973) and that several searches of previously confirmed locations and potentially suitable habitats have failed to detect any specimens, there is a possibility that the Peppered Tree Frog may be Extinct in the Wild (IUCN 2001). There is also a possibility that some individuals of the Peppered Tree Frog persist and remain undetected, as some further areas of potentially suitable habitat have yet to be searched. Given that a substantial search effort has not yielded any evidence of extant populations, the number of mature individuals of the species is almost certainly less than 50 and possibly zero.

## **Threats:**

The causes of the apparent declines are unknown. However, most of the historic sites and other streams in the region have undergone significant habitat alteration and degradation through clearance of streamside vegetation, grazing and timber harvesting (Gillespie & Hines 1999). Predatory fish species (Eastern Gambusia *Gambusia holbrooki* and salmonids) introduced into streams formerly occupied by the species may have resulted in predation upon larvae and displaced frog populations (Gillespie & Hines 1999). Trout predation has impacted on other members of this frog complex and it is also thought that Peppered Tree Frogs are likely to be vulnerable to these fish (Gillespie & Hines 1999). In addition, chytrid fungal disease may also threaten the species (NSW NPWS 2001).

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'Infection of frogs by amphibian chytrid causing the disease chytridiomycosis', 'Clearing of native vegetation', 'Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)' are listed as Key Threatening Processes under the TSC Act in NSW.

## **Extreme fluctuations:**

There is no information/evidence of this species experiencing extreme fluctuations in population size or habitat.

## **Population reduction and continuing declines:**

Despite survey efforts no more individuals of this species can be located. This suggests that all five known populations may have become extinct. Hence, it is likely that this species has undergone a decline of at least 80%, and possibly 100%. Population size before the decline is unknown.

## **Extent of Occurrence (EOO) & Area of Occupancy (AOO):**

Previous extent of occurrence for the species was estimated to be around 5 000 km<sup>2</sup> (Gillespie & Hines 1999), and the previous area of occupancy would have been at least 20 km<sup>2</sup> (based on 2 x 2 km grid cells, IUCN 2008). The current EOO and AOO could be zero or larger, depending on persistence of the species in unsurveyed suitable habitat.

## **Severe fragmentation:**

The population of the Peppered Tree Frog is likely to be severely fragmented as a result of local extinctions and clearing of native vegetation in suitable habitat.

## **References:**

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- Gillespie GR, Hines HB (1999) Status of Temperate Riverine Frogs in South-eastern Australia. In 'Declines and Disappearances of Australian Frogs.' (Ed. A. Campbell) pp.109-130. (Environment Australia: Canberra)
- IUCN (2001) 'IUCN Redlist Categories and Criteria Version 3.1.' (IUCN Species Survival Commission: Gland)

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IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.' (Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland).  
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Tyler MJ (1997) 'The Action Plan for Australian Frogs.' (Environment Australia: Canberra)

Tyler MJ, Davis M (1985) A New Species of *Litoria* (Anura: Hylidae) from New South Wales, Australia. *Copeia* **1**, 145-49.

## Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au).

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) Peppered Tree Frog *Litoria piperata*. Review of current information in NSW. July 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.