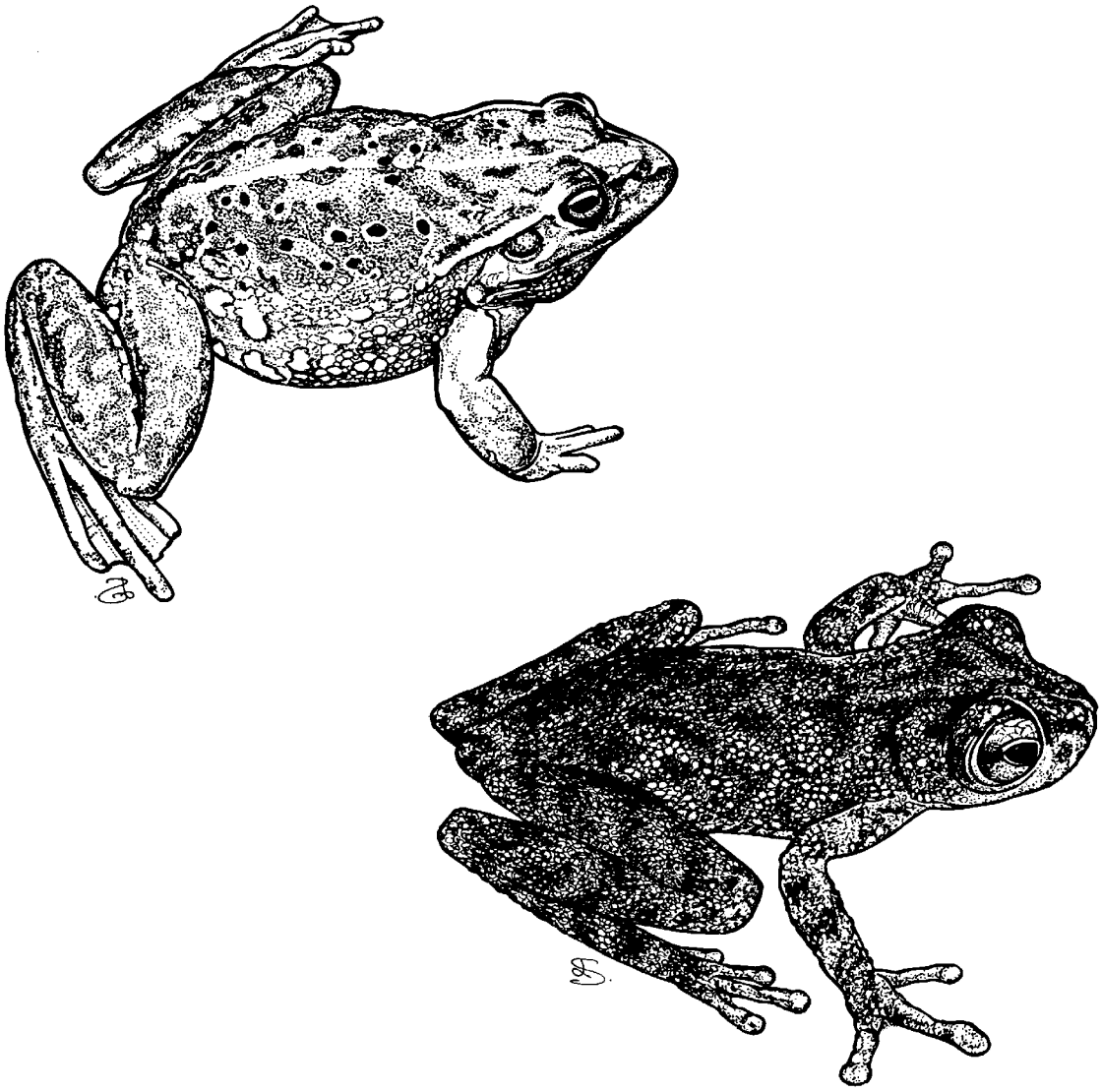
Approved Recovery Plan

Yellow-spotted Bell Frog (*Litoria castanea*) and Peppered Tree Frog (*Litoria piperata*) Recovery Plan



July 2001

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

NSW National Parks and Wildlife Service
43 Bridge Street
(PO Box 1967)
Hurstville NSW 2220
Tel: 02 95856444
www.npws.nsw.gov.au

For further information contact
Threatened Species Unit
Conservation Programs and Planning Division, Northern Directorate
NSW National Parks and Wildlife Service
Locked Bag 914
Coffs Harbour NSW 2450

Tel (02) 66 515 946

Email <michael.murphy@npws.nsw.gov.au>

Cover illustrations: Yellow-spotted Bell Frog (*Litoria castanea*) and Peppered Tree Frog (*Litoria piperata*).
Illustrator: Lynn Skillings

This plan should be cited as follows:

NSW National Parks and Wildlife Service (2001). Yellow-spotted Bell Frog (*Litoria castanea*) and Peppered Tree Frog (*Litoria piperata*) recovery plan. NPWS, Hurstville, NSW.

ISBN 0 7313 6275 6

Yellow-spotted Bell Frog (*Litoria castanea*) and Peppered Tree Frog (*Litoria piperata*) Recovery Plan

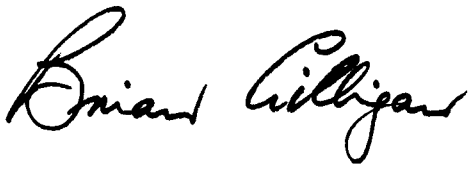
Foreword

The conservation of threatened species, populations and ecological communities is crucial for the maintenance of this State's unique biodiversity. In NSW, the *Threatened Species Conservation Act* 1995 (TSC Act) provides the framework to conserve and recover threatened species, populations and ecological communities through the preparation and implementation of recovery plans.

The preparation and implementation of recovery plans is identified by both the National Strategy for the Conservation of Australia's Biological Diversity and the draft NSW Biodiversity Strategy as a key strategy for the conservation of threatened flora and fauna. The object of a recovery plan is to document the research and management actions required to promote the recovery of a threatened species, population or ecological community and to ensure its ongoing viability in nature.

The TSC Act requires that the Director-General of National Parks and Wildlife prepare recovery plans for all species, populations and ecological communities listed as endangered or vulnerable on the TSC Act schedules. Similarly, the Federal *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) requires the Commonwealth Minister for the Environment ensure the preparation of a recovery plan for nationally listed species and communities or adopt plans prepared by others including those developed by state agencies. Both Acts include specific requirements for the matters to be addressed by recovery plans and the process for preparing recovery plans. This recovery plan has been prepared to satisfy both the requirements of the TSC Act and the EPBC Act.

This recovery plan describes our current understanding of the Yellow-spotted Bell Frog and the Peppered Tree Frog, documents the research and management actions undertaken to date, and identifies the actions required and parties responsible in addressing the conservation of these species in the wild.



Brian Gilligan
Director-General

Bob Debus MP
Minister for the Environment

National Parks and Wildlife Service Recovery Planning Program

Table of Contents

Tables

Figures

Appendices

.

1.0 Introduction

The Yellow-spotted Bell Frog and the Peppered Tree Frog are two frog species endemic to the highlands and tablelands of New South Wales. The Yellow-spotted Bell Frog also occurs in the Australian Capital Territory. Neither species has been definitely recorded in the wild since the mid 1970s, and concerns are held for their continued survival. In a formal response to these concerns, both species have been listed under the NSW *Threatened Species Conservation Act* 1995 (TSC Act). The aim of this recovery plan is to assist in returning these two species to a position of viability in nature.

2.0 Description and distribution

2.1 Yellow-spotted Bell Frog

The Yellow-spotted Bell Frog (*Litoria castanea*) (Steindachner 1867) is a large (53 to 85 mm) terrestrial hylid frog belonging to the Australian Bell Frog complex. It is known from the New England Tableland and South Eastern Highland biogeographical regions of south-eastern Australia (Heatwole *et al.*1995; Osborne *et al.*1996). Thomson *et al.* (1996) documented morphological differences between the New England Tableland and South Eastern Highland populations, but concluded that insufficient information was available to warrant recognition of the two forms as distinct species. The Yellow-spotted Bell Frog is distinguished from other species of Bell Frogs by the fully webbed toes and the presence of black and yellow marbling on the ventral surface of the legs (Thomson *et al.* 1996).

The species has a restricted distribution on the New England Tableland, with all known locations occurring in an area approximately 50 km by 25 km in an altitudinal range between 1000 and 1500 m Australian Height Datum (AHD) (Ehmann 1997). The species' distribution on the South Eastern Highlands was described by Osborne *et al.* (1996) as ranging from Lake George south to the Bombala area in an altitudinal range between 700 and 800 m AHD. Previously undocumented photographic records of a *Litoria castanea*-like Bell Frog from near Orange and Bathurst in central western NSW in the late 1960s to mid 1970s may extend the known distribution of the species to include the northern part of the South Eastern Highlands (D. Binns pers. comm.; White and Pyke 1999). The distribution of records of the species is shown in Figure 1.

2.2 Peppered Tree Frog

The Peppered Tree Frog (*Litoria piperata*) (Tyler and Davies 1985) is a small (20 to 27mm) hylid frog belonging to the leaf green tree frog species complex. It is distinctive from other related species because of its small size, dorsal colour pattern of darker brown-grey peppering on a dark green background and lack of an obvious lateral stripe.

The Peppered Tree Frog occurs only within NSW with a geographic range extending from south of Armidale to the Gibraltar Range, comprising the headwaters of numerous rivers over an altitude range from 800 to 1000 m AHD. The distribution of records of the species is shown in Figure 2.

3.0 Current conservation status

There have been no confirmed records of the Yellow-spotted Bell Frog in the wild since 1973 (Mahony 1996). The species is currently listed as critically endangered (category A1ac) on the IUCN Red List (International Union for the Conservation of Nature 1997).

The Peppered Tree Frog has not been definitely recorded in the wild since the collection of the type series in 1973; however, some populations of uncertain taxonomic status have been detected recently adjacent to and to the north of its historic range, which may prove to be the species. The Peppered Tree Frog is currently listed as critically endangered (category A1ac) on the IUCN Red List (International Union for the Conservation of Nature 1997).

Concern is currently held for the continued survival of both the Yellow-spotted Bell Frog and the Peppered Tree Frog; however, insufficient survey has been undertaken to date to discount the possibility of small populations persisting in remote or unsurveyed areas.

4.0 Relevant legislation

The Yellow-spotted Bell Frog is listed as an endangered species on both the TSC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

The Peppered Tree Frog is currently listed as a vulnerable species on both the TSC Act and the EPBC Act.

5.0 Habitat and ecology

5.1 Yellow-spotted Bell Frog

The habitat of the Yellow-spotted Bell Frog comprises ponds, wetlands and slowly moving streams with abundant marginal growth of bulrushes and other vegetation (Heatwole *et al*. 1995; Tyler 1997). Gillespie *et al*. (1995) noted that the southern population occurred in both woodland and improved

pastoral areas. The lagoons of the New England Tableland and Monaro Plateau may have evolved in a similar manner (Walker *c*. 1970), suggesting a possible geomorphological factor in the species' distribution.

Behaviour and ecology appears to be similar to other Bell Frog species. Courtice and Grigg (1975) noted that the Yellow-spotted Bell Frog could be found at night on reeds, that males called while floating in open water, that adults were known to bask in the sun during the day, usually on grassy banks or emergent reeds, and that adults over-wintered in hollow logs and in earth amongst the roots of fallen trees. It is presumed that the breeding biology of the Yellow-spotted Bell Frog is similar to that of other Bell Frogs (Courtice and Grigg 1975). Breeding activity of these species occurs during the warmer months, usually following reasonable rainfall. The frogs breed in still or slowly flowing water bodies, laying large spawn masses on the water surface, usually attached to emergent vegetation. Osborne *et al.* (1996) reported the southern population calling at water temperatures ranging from approximately 13 to 18^{o} C.

5.2 Peppered Tree Frog

The Peppered Tree Frog has been collected from rocky streams flowing eastward from the New England Tableland within an altitude range of 800 to 1010 m AHD (Mahony 1996). The general area in which this species has been recorded has been referred to as the "dry eastern escarpment" (NPWS 1994). Common streamside vegetation at sites where records were made includes *Lomandra*, *Leptospermum* and *Casuarina* (Mahony 1996).

Very little is known about the ecology of the Peppered Tree Frog. Adults are active in bushes or on rocks at the edge of creeks and on one occasion an aggregation of 22 animals was found by day in cracks in a dead tree limb next to a stream (Webb 1973). Nothing is known of the site of egg deposition or larval ecology of the species. It is presumed breeding activity occurs during the warmer months, following reasonable rainfall, although there are no reports of male mating calls.

6.0 Recovery plan implementation

The TSC Act requires that a public authority must take any appropriate measures available to implement actions included in a recovery plan for which they are responsible. In addition, the TSC Act specifies that public authorities must not make decisions that are inconsistent with the provisions of the plan. The public authority responsible for the implementation of this recovery plan is the National Parks and Wildlife Service.

The EPBC Act specifies that a Commonwealth agency must not take any action that contravenes a recovery plan.

6.1 Critical habitat

The TSC Act makes provision for the identification and declaration of critical habitat. Under the TSC Act, critical habitat may be identified for any endangered species, population or ecological community occurring on NSW lands. Once declared, it becomes an offence to damage critical habitat (unless the TSC Act specifically exempts the action) and a species impact statement is mandatory for all developments and activities proposed within critical habitat.

At present, no critical habitat has been identified or declared for the Yellow-spotted Bell Frog. This recovery plan proposes consideration of declaration of critical habitat under the TSC Act for this species in the event that an extant population is found in NSW. The Peppered Tree Frog is currently listed as a vulnerable species and is therefore not eligible for identification of critical habitat. This recovery plan proposes a review of the listing of the Peppered Tree Frog in Year 2 and Year 5 of the plan.

Under the EPBC Act, critical habitat may be registered for any nationally listed threatened species or ecological community. When adopting a recovery plan the Federal Minister for the Environment must consider whether to list habitat identified in the recovery plan as being critical to the survival of the species or ecological community. It is an offence under the EPBC Act for a person to knowingly take an action that will significantly damage critical habitat (unless the EPBC Act specifically exempts the action). This offence only applies to Commonwealth areas. However an action which is likely to have a significant impact on a listed species is still subject to referral and approval under the EPBC Act.

This recovery plan (section 5) identifies those habitat features currently known to be critical to the survival of the Yellow-spotted Bell Frog and the Peppered Tree Frog as required by the EPBC Act.

6.2 Environmental assessment

The New South Wales *Environmental Planning and Assessment Act* 1979 (EPA Act) requires that consent and determining authorities, and the Director-General of National Parks and Wildlife, as a concurrence authority, consider relevant recovery plans when exercising a decision-making function under Parts 4 and 5 of the EPA Act. Decision-makers must consider the conservation strategy outlined in this plan when considering a proposed development or activity that may

affect either the Yellow-spotted Bell Frog or Peppered Tree Frog.

Any other action not requiring approval under the EPA Act, and which is likely to adversely affect the Yellow-spotted Bell Frog or the Peppered Tree Frog, may be licensed under Part 6 of the TSC Act.

As the Yellow-spotted Bell Frog and the Peppered Tree Frog are both listed nationally under the EPBC Act, any person proposing to undertake actions likely to have a significant impact on either species should refer the action to the Commonwealth Minister for the Environment for consideration. The Minister will then decide whether the action requires EPBC Act approval. This is in addition to any State or Local Government approval requirement specified above for the NSW EPA Act.

Administrative guidelines are available, from Environment Australia, to assist proponents in determining whether their action is likely to have a significant impact. In cases where the action does not require EPBC Act approval, but will result in the death or injury of a member of the Yellow-spotted Bell Frog and the Peppered Tree Frog and the member is in, or on a Commonwealth area, a permit issued by the Commonwealth Minister under the EPBC Act, will be required.

7.0 Management issues

7.1 Threats and reasons for decline

The causes of the decline and apparent disappearance of the Yellow-spotted Bell Frog and the Peppered Tree Frog are not clear. Tyler (1997) listed threats that are currently under consideration. These factors include:

- disease;
- increased ultraviolet radiation;
- drought;
- predation of eggs and tadpoles by introduced fish species;
- chemical use; and
- habitat destruction/modification.

An additional factor in the decline of the species may have been over-collection of specimens by research institutions. Significant numbers of Yellow-spotted Bell Frogs were collected on the New England Tableland in the early 1970s. The Peppered Tree Frog has not been definitely recorded in the wild since the collection of the type series in 1973. This recovery plan recommends, in the event that either species is rediscovered in the wild, or animals thought to be either species discovered, that specimens not be vouchered without the specific approval of the NPWS.

7.2 Social and economic consequences

This recovery plan recommends consideration of potential impacts on the Yellow-spotted Bell Frog and the Peppered Tree Frog by consent and determining authorities considering activities in areas of potential habitat or at known historical sites of the species.

Estimated costing for the implementation of recovery actions has been costed at $52000. If extant populations are located an additional cost of $47000 will occur.

The recovery plan could have social benefits for local communities, increasing general public awareness of natural heritage values on the New England Tableland and South Eastern Highlands.

7.3 Biodiversity benefits

The widely publicised decline and extinction of a number of amphibian species at a state, national and international level is a cause of serious concern for biodiversity conservation.

The management actions outlined in this recovery plan will assist in definitively determining the conservation status of the Yellow-spotted Bell Frog and the Peppered Tree Frog. Through awareness of the fate of the Yellow-spotted Bell Frog and the Peppered Tree Frog, the profile of all threatened species will be raised in the general community. This in turn will lead to greater opportunities for the conservation of threatened species and increased protection of biodiversity.

8.0 Previous actions undertaken

8.1 Survey

An expert survey on the New England Tableland for both the Yellow-spotted Bell Frog and the Peppered Tree Frog was undertaken, during suitable environmental survey conditions, between 1994 and 1996 (Mahony 1996). The survey covered known historical sites, nearby areas of suitable potential habitat and other areas across the region. No sightings were recorded.

A survey for the Yellow-spotted Bell Frog, including 16 historic sites and approximately 30 areas of potential habitat on the New England Tableland and South Eastern Highlands between 1992 and 1996 by the NSW Frog and Tadpole Study Group Inc. (FATSG), recorded no sightings (Ehmann 1997). Similarly, a FATSG survey for the Peppered Tree Frog which included five historic sites and approximately 20 areas of potential habitat on the

New England Tableland recorded no sightings (Ehmann 1997).

Expert surveys of the majority of known historical sites of the Yellow-spotted Bell Frog in the ACT and nearby areas of NSW on the South Eastern Highlands between 1985 and 1995 recorded no sightings (Osborne *et al*. 1996). Surveys of the northern section of the South Eastern Highlands for extant populations of *t*he Yellow-spotted Bell Frog in 1999/2000 were unsuccessful in locating any extant populations; however, photographic records of the previous occurrence of *Litoria castanea*-like animals in these areas were located (Mahony *et al*. 2000).

8.2 Community involvement programs

A community awareness program was undertaken on the New England Tableland between 1996 and 1997 to assist members of the public (in particular landowners and amateur naturalists) in identifying the Yellow-spotted Bell Frog and the Peppered Tree Frog. Although the level of public concern and positive feedback appeared to be very high throughout the region no sightings were reported to NPWS following the distribution of over 2000 leaflets, a number of public displays and local media coverage.

A five-year community awareness program was launched by NPWS in 1999, for the northern section of the South Eastern Highlands, focusing on the Bathurst and Orange areas. This program aims to assist members of the public in identifying the Yellow-spotted Bell Frog. An information sheet, with identification and habitat details, has been produced and distributed (see Appendix 1). The information provided on this sheet also includes a brief outline of appropriate habitat protection measures.

8.3 Protection of habitat

A number of areas of habitat previously supporting the Yellow-spotted Bell Frog in NSW are protected in NPWS estate including Little Llangothlin and Mother of Ducks Lagoon Nature Reserves on the New England Tableland and Namadgi National Park on the South Eastern Highlands. Areas previously supporting the Peppered Tree Frog protected in NPWS estate include Oxley Wild Rivers National Park and Mann River Nature Reserve.

Habitat protection measures for the Yellow-spotted Bell Frog and the Peppered Tree Frog within production forests have been incorporated into the Terms of the Threatened Species Licence for the Upper and Lower North East Regions of the *Forestry and National Park Estate Act* 1998 negotiated for the Integrated Forestry Operations Approval (NPWS and SFNSW 1999).

Predictive habitat distribution models for the Yellow-spotted Bell Frog and the Peppered Tree Frog were developed in the Upper and Lower North East regions as part of the Comprehensive Regional Assessment process.

8.4 Genetic studies

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 the leaf green tree frog complex (Donnellan *et al.* in prep.). Further work involving mitochondrial DNA analysis is required. No genetic study of the Yellow-spotted Bell Frog has yet been undertaken.

9.0 Species' ability to recover

Given the current information base available, the ability of these species to recover is unknown. Neither has been definitely recorded since the 1970s. Successful recovery of these species, to meet the criteria of the TSC Act for downlisting, is largely dependent on the identification and protection and any extant populations.

10.0 Recovery objectives

The overall objective of this recovery plan is to clarify the current status of the Yellow-spotted Bell Frog and the Peppered Tree Frog, and to maximise the opportunity for the viability of these species in the wild. Proposed measures to increase the level of habitat protection provide a safeguard in the event that currently unidentified populations survive.

Specific objectives for the first five years of this Recovery Plan are listed below.

- Objective 1: to assess the current status of both species through community involvement and scientific research;
- Objective 2: to encourage the location and identification of any remaining extant populations in the wild;
- Objective 3: to resolve the identity of possible Peppered Tree Frog populations recently recorded;
- Objective 4: to increase protection of potential habitat through community awareness and involvement;
- Objective 5: to effectively protect and manage any extant populations which may be located in the future;
- Objective 6: to determine agents which contributed to the species' decline; and
- Objective 7: to resolve the taxonomic status of the New England and Southern Tablelands forms of The Yellow-spotted Bell Frog and the taxonomic status of the Peppered Tree Frog.

11.0 Recovery performance criteria

Recovery performance criteria are listed below.

- Criterion 1: current conservation status is determined;
- Criterion 2: any identified extant populations are protected and population numbers increased;
- Criterion 3: protection of potential habitat is increased through community awareness and involvement;
- Criterion 4: agents which contributed to the decline of the species are determined and actions taken to control them; and
- Criterion 5: the taxonomic status of both species is determined.

12.0 Recovery actions

12.1 Survey and research

1. Survey of previously inadequately surveyed potential habitat on the southern Monaro and eastern edge of the South Eastern Highlands for extant populations of the Yellow-spotted Bell Frog by suitably qualified and experienced people. *(Objectives 1 and 2; Performance criterion 1)*

2. Development and implementation of a community awareness program, based on the production and distribution of an information pamphlet, to encourage and assist identification of any extant populations of the Yellow-spotted Bell Frog and the Peppered Tree Frog on the New England Tableland. Programs to be developed specifically for each species, and any program should be co-ordinated with local interest groups. *(Objectives 1, 4 and 5; Performance criterion 3)*

3. Development and implementation of a community awareness program based on encouraging and assisting the identification of any extant populations of the Yellow-spotted Bell Frog in the southern part of the South Eastern Highlands. Program to be based on the production and distribution of an information pamphlet, and should be coordinated with local interest groups. *(Objectives 1, 4 and 5; Performance criterion 3)*

4. Continuation of the community awareness program for the Yellow-spotted Bell Frog in the northern part of the South Eastern Highlands. Program should be coordinated with local interest groups. *(Objectives 1, 4 and 5; Performance criterion 3)*

5. Cooperation and coordination of recovery programs between NPWS and Environment ACT regarding the status and reasons for decline of the Yellow-spotted Bell Frog on the South Eastern Highlands. *(Objective 6; Performance criterion 4)*

6. Verification of historic records of the Yellow-spotted Bell Frog and the Peppered Tree Frog to document historic range and habitat requirements of the species. *(Objectives 1 and 2; Performance criterion 1)*

7. Research to determine the causative agents in the decline of the Yellow-spotted Bell Frog and the Peppered Tree Frog to be supported. This may form part of a broader program to assess threats to a wide range of amphibians. Research into the possible role that increased levels of ultraviolet radiation and *Batraochytrium dendrobatidis* (chytrid fungus) have played in the decline of both the Yellow-spotted Bell Frog and the Peppered Tree Frog is considered a high priority.*(Objective 6; Performance criterion 4)*

8. Genetic studies using museum collection specimens to resolve the taxonomic status and nomenclature of the southern and northern populations of the Yellow-spotted Bell Frog and that of the Peppered Tree Frog will be supported. *(Objectives 3 and 7; Performance criterion 5)*

9. Resolution of the identification of possible Peppered Tree Frog populations recently recorded through the examination of type specimens from these populations and type specimens of *Litoria pearsoniana* (Pearson's Tree Frog). *(Objectives 3 and 7; Performance criterion 5)*

10. The NPWS will recommend that field researchers working in areas of potential habitat for the Yellow-spotted Bell Frog or Peppered Tree Frog abide by the hygiene protocol for the control of disease in frogs developed by the NPWS (NPWS 2001). (*Objectives 5; Performance criterion 3*)

Outcome

Assessment of conservation status and taxonomic status of the Yellow-spotted Bell Frog and the Peppered Tree Frog, identification of any extant populations and determination of agents which have contributed to the species' decline.

12.2 Protection of potential habitat

11. State and Local Government authorities and community groups with responsibilities relevant to the protection of the Yellow-spotted Bell Frog and the Peppered Tree Frog and their habitat will be made aware and kept informed by the NPWS of the species' conservation requirements and the location of known populations and potential habitat. Relevant authorities are identified in Table 3. (Objectives 4 and 5; Performance criteria 2 and 3)

12. Design of community involvement programs (actions 2 - 4 above) will incorporate measures to encourage protection and appropriate management of potential habitat for the species. (Objective 4; Performance criterion 3)

13. Environmental Impact Assessment guidelines will be prepared by NPWS, to assist those required to prepare or review assessment of likely impacts on the Yellow-spotted Bell Frog or the Peppered Tree Frog in relation to proposed developments or activities. *(Objectives 2, 4 and 5; Performance criterion 3)*

Outcome

Increased protection of habitat of the Yellow-spotted Bell Frog and the Peppered Tree Frog.

12.3 Legislative status

14. Review of the legislative status of the Yellow-spotted Bell Frog and the Peppered Tree Frog in the TSC Act and the EPBC Act. Should an upgrade in status be required, NPWS will make a nomination submission to the NSW Scientific Committee and/or responsible commonwealth authorities. *(Objective 1; Performance criterion 1)*

Outcome

Legislative status of both species reflects current conservation status.

12.4 Protection of any extant populations identified

15. Development of an *ex situ* establishment protocol to be implemented in the event that an extant population of either the Yellow-spotted Bell Frog or Peppered Tree Frog is found and it is determined that establishment of a captive population is necessary. This protocol is to include required approvals so that appropriate procedures are in place should decision be made for urgent establishment of an *ex situ* captive population. *(Objective 5; Performance criterion 2)*

16. Confirmation by field investigation of reasonable reports from the public of extant populations of the Yellow-spotted Bell Frog and the Peppered Tree Frog in NSW. *(Objectives 2, 3 and 5; Performance criterion 1)*

17. If reports of extant populations of either species are confirmed, an assessment of the site's habitat attributes and a survey for the species in areas with similar habitat in the vicinity will be undertaken by suitably qualified and experienced people, to identify the extent of the population. Specimens are not to be vouchered without the specific approval of the NPWS. *(Objectives 1, 2 and 5; Performance criteria 1, 2 and 3)*

18. If any populations of the Yellow-spotted Bell Frog are confirmed in NSW declaration of critical habitat under the TSC Act will be considered in consultation with landowners. Critical habitat will be protected as a high priority (same for the Peppered Tree Frog if TSC Act status changed to endangered). *(Objective 5; Performance criteria 2 and 3)*

19. Protection and management of confirmed extant populations of the Yellow-spotted Bell Frog and the Peppered Tree Frog in NSW through Voluntary Conservation Agreements under the *National Parks and Wildlife Act* 1974 (NPW Act) or Joint Management Agreements under the TSC Act to be investigated as a high priority. *(Objective 5; Performance criteria 2 and 3)*

20. If extant populations of either species are found, appropriate management strategies are to be devised and implemented as a high priority in consultation with landowner or manager. This is to include consideration of the establishment of *ex situ* populations. *(Objective 5; Performance criteria 2 and 3)*

21. Research relevant to the management of sites with extant populations to be supported. *(Objective 5; Performance criterion 3)*

Outcome

The protection of any extant populations that are identified in the future.

13.0 Implementation

Table 1 allocates responsibility for the implementation of recovery actions specified in this plan to relevant government agencies for a period of five years from the time this recovery plan is adopted. Table 2 identifies costs associated with each recovery action.

14.0 Preparation details

This document was prepared by the NSW National Parks and Wildlife Service. Authors: Michael Murphy, Michael Mahony, Ross Knowles and Pamela Gray. Background information and assistance was provided by Doug Binns, Will Osborne, Robyn Molsher and Katrina McKay.

15.0 Review date

This Recovery Plan will be reviewed within five years of the date of publication. The plan includes a review of the conservation status of the Yellow-spotted Bell Frog and the Peppered Tree Frog at the end of the five-year life of the plan. Should extant populations be identified during the life of this recovery plan, the plan will be revised appropriately to achieve the recovery of the species. If no extant populations have been identified over the life of the plan, the species will be proposed for listing as presumed extinct in NSW under Schedule 1 Part 4 of the TSC Act.

16.0 References

Courtice, G. and Grigg, G. (1975). A Taxonomic Revision of the *Litoria aurea* Complex (Anura: Hylidae) in South-eastern Australia. *Australian Zoologist* 18(3): 149-163.

Donnellan, S. C., Knowles, R. and Mahony, M. (in prep). Genetic resolution of species boundaries in frogs of the *Litoria phyllochroa* species group (Anura: Hylidae). Report to Environment Australia, Endangered Species Program and the NSW NPWS.

Ehmann, H. (1997) (ed.). *Threatened Frogs of New South Wales: Habitats, Status and Conservation*. Frog and Tadpole Study Group of NSW Inc., Sydney, NSW.

Gillespie, G., Osborne, W. S. and McElhinney, N. A. (1995). *The Conservation Status of Frogs in the Australian Alps: a Review*. Report to the Australian Alps National Parks Liaison Committee, Canberra.

Heatwole, H., de Bavay, J., Webber, P. and Webb, G. (1995). Faunal survey of New England. IV. The Frogs. *Memoirs of the Queensland Museum* 38 (1): 229-249.

International Union for the Conservation of Nature (1997). IUCN Red List categories. IUCN Species Survival Commission, Gland, Switzerland.

Mahony, M. J. (1996). Final Report - Research Plan for the Yellow-spotted (*Litoria flavipunctata* (*castanea*)) and Peppered (*Litoria piperata*) Tree-frogs. Report to Australian Nature Conservation Agency, Endangered Species Program and the NSW NPWS.

Mahony, M.J., Lane, S., Hamer, A. and Browne, R. (2000). *Survey for* Litoria castanea *in the Orange area*. Report prepared for NSW NPWS Western Directorate.

NSW National Parks and Wildlife Service (1994). *Fauna of north-east NSW Forests*. North East Forests Biodiversity Study Report No. 3. Unpublished report. NSW NPWS.

NSW National Parks and Wildlife Service (2001). Threatened Species Management Information Circular No. 6. *Hygiene Protocol for the Control of Disease in Frogs*. NSW NPWS, Hurstville.

NSW National Parks and Wildlife Service and State Forests of NSW (1999). Terms of License Under the Threatened Species Conservation Act for the Integrated Forestry Operations Approval for the Upper North East and Lower North East Forest Agreement Regions.

Osborne, W. S., Littlejohn, M. J. and Thomson, S. A. (1996). Former distribution and apparent disappearance of the *Litoria aurea* complex from the Southern Tablelands of New South Wales and the Australian Capital Territory. *Australian Zoologist* 30(2): 190-98.

Steindachner (1867). *Amphibien. In Reise der Osterreichieschen Freggate Novara um die Erde in den Jaren* 1857-1859. *Vienna Zoologische Thiel* 1(4): 1-70.

Thomson, S. A., Littlejohn, M. J., Robinson, W. A. and Osborne, W. S. (1996). Taxonomy of the *Litoria aurea* complex: a re-evaluation of the Southern Tableland populations of the Australian Capital Territory and New South Wales. *Australian Zoologist* 30(2): 158-69.

Tyler, M. J. (1997). *The Action Plan for Australian Frogs*. Environment Australia, Canberra, ACT.

Tyler, M. J. and Davies M. (1985). A New Species of *Litoria* (Anura: Hylidae) from New South Wales, Australia. *Copeia* 1985(1): 145-149.

Walker, G. T. (*circa* 1970). Origin of the New England Lagoons, Unpublished Report, Department of Geography, University of New England.

Webb, G. (1973). Field notes accompanying registered *Litoria piperata* specimens in Australian Museum.

White, A.W. and Pyke, G.H. (1999). Past distribution of *Litoria aurea* and *Litoria castanea* in the Bathurst-Orange Area of New South Wales. *Herpetofauna* 29 (1): 2-9.

.

17.0 Acronyms used in this document

AHD	Australian Height Datum
DLWC	Department of Land and Water Conservation
EPA Act	*Environmental Planning and Assessment Act* 1979
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999
FATSG	Frog and Tadpole Study Group
IUCN	International Union for the Conservation of Nature
JMA	Joint Management Agreement
NPW Act	*National Parks and Wildlife Act* 1974
NPWS	National Parks and Wildlife Service
SFNSW	State Forests NSW
TSC Act	*Threatened Species Conservation Act* 1995
VCA	Voluntary Conservation Agreement

Table 1: Implementation schedule

Allocation of responsibility for implementation of recovery actions specified in this Plan to relevant government agencies for a period of five years. Priority is categorised as 1 (essential), 2 (highly desirable) or 3 (desirable). Each action is costed in Table 2.

Description	Responsibility for implementation	Timeframe	Priority
12.1 Survey and research			
Action 1: expert survey of Monaro and eastern edge of southern SE Highlands	NPWS (Southern Directorate)	subject to funding	1
Action 2: community information pamphlet New England Tableland	NPWS (Northern Directorate)	Year 1 then ongoing	1
Action 3: community information pamphlet SE Highlands (southern section)	NPWS (Southern Directorate)	Year 1 then ongoing	1
Action 4: community information pamphlet SE Highlands (northern section)	NPWS (Western Directorate)	Ongoing	1
Action 5: liaison with ACT	NPWS (Southern Directorate)	Ongoing	2
Action 6: verification of historic records	NPWS	Ongoing	1
Action 7: research into causes of decline	NPWS, Research Institutions	subject to funding	2
Action 8: genetic study of Museum specimens	NPWS	subject to funding	1
Action 9: genetic study of extant unresolved populations	NPWS, Research Institutions	subject to funding	3
Action 10: hygiene protocol	NPWS, Research Institutions	Ongoing	1
12.2 Protection of potential habitat			
Action 11: advice to other agencies	NPWS	ongoing	1
Action 12: community programs to encourage protection of habitat	NPWS	ongoing	1
Action 13: EIA guidelines	NPWS	Year 1	1
12.3 Legislative status			
Action 14: review of legislative status	NPWS	Year 2 and Year 5	3
12.4 Protection of extant populations identified in future			
Action 15: *ex situ* establishment protocol	NPWS	Year 1	1
Action 16: field investigation of sightings	NPWS	ongoing as required	1
Action 17: site assessment/local survey	NPWS	as required	1
Action 18: consideration of critical habitat	NPWS	as required	1
Action 19: investigation of VCA or JMA	NPWS	ongoing as required	1
Action 20: Devise and implement appropriate management strategy	NPWS	as required	1
Action 21: Research concerning management of extant populations	NPWS, Research Institutions	as required subject to funding	2

Table 2: Costing table

Estimated costs of implementing the actions identified in the recovery plan are provided below. Separate estimates are provided in the event that extant populations are identified. Cost actions are subject to funding availability unless noted as funding secured. Estimates do not include Goods and Services Tax.

Recovery action	**Year of implementation**					
A: Cost of actions assuming extant populations not discovered	**1**	**2**	**3**	**4**	**5**	**Total**
Survey and research						
Action 1: survey Monaro/E edge SE Highlands	4000	-	3000	-	-	**$7000**
Action 2: community information pamphlet New England Tableland	2000	ψ	ψ	ψ	ψ	**$2000**
Action 3: community information pamphlet SE Highlands (southern section)	2000	ψ	ψ	ψ	ψ	**$2000**
Action 4 community information pamphlet SE Highlands (northern section)	ψ	ψ	ψ	ψ	ψ	**-**
Action 5: liaison with ACT	ψ	ψ	ψ	ψ	ψ	**-**
Action 6: verification of historic records	ψ	ψ	ψ	ψ	ψ	**-**
Action 7: research into causes of decline	10000	5000	5000	-	-	**$20000**
Action 8: genetic study of Museum specimens	-	8000	5000	-	-	**$13000**
Action 9: genetic study of extant unresolved *L. piperata* populations	8000	-	-	-	-	**$8000**
Action 10: hygiene protocol	ψ	ψ	ψ	ψ	ψ	**-**
Protection of potential habitat						
Action 11: advice to other agencies	ψ	ψ	ψ	ψ	ψ	-
Action 12: encourage community habitat protection +	-	-	-	-	-	-
Action 13: EIA guidelines	ψ	-	-	-	-	-
Legislative status						
Action 14: review of legislative status	ψ	-	-	-	-	-
Protection of extant populations						
Action 15: *ex situ* establishment protocol	ψ	-	-	-	-	-
Action 16: field investigation of sightings	ψ	ψ	ψ	ψ	ψ	-
Total cost of implementing actions (A)	**$26000**	**$13000**	**$13000**	**-**	**-**	**$52000**
B: Additional costs if extant populations found in Year 1						
Protection of extant populations						
Action 17: site assessment/local survey	5000	-	-	-	-	**$5000**
Action 18: critical habitat	ψ	ψ	ψ	ψ	ψ	-
Action 19: VCA/JMA	ψ	ψ	ψ	ψ	ψ	-
Action 20: management of sites	10000	10000	5000	5000	5000	**$35000**
Action 21: research into management	4000	3000	-	-	-	**$7000**
Total cost of implementing actions (B)	**$19000**	**$13000**	**$5000**	**$5000**	**$5000**	**$47000**
TOTAL COST OF RECOVERY PLAN (A + B)	**$40000**	**$25000**	**$13000**	**$5000**	**$5000**	**$99000**

+ Costs incorporated into community survey costs above
ψ Costs covered by NPWS core duties

Table 3: Agency Responsibilities

Public authorities and community groups with responsibilities relevant to the protection of the Yellow-spotted Bell Frog and the Peppered Tree Frog and their potential habitat (apart from NPWS) are listed below.

Organisation	Relevant responsibilities
Relevant Local Councils include Armidale Dumaresq, Guyra, Tenterfield, Blayney, Bathurst, Evans, Queanbeyan and Bombala Councils.	• Preparation of Local Environmental Plans under Part 3 of EPA Act. • Consent authorities for development proposals under Part 4 of EPA Act. • Approval authorities for Council works under Part 5 of EPA Act. • Responsibilities under *Rural Fires Act 1997*. • Management of Council reserves.
Department of Land and Water Conservation	• Approval authority for native vegetation clearance applications under *Native Vegetation Conservation Act 1997*. • Management of Crown Land with potential habitat. • Coordination of Regional Vegetation Committees, total catchment management and Landcare programs.
Department of Urban Affairs and Planning	• Development of policy and strategies for land-use planning and environmental assessment. • Advice and assistance on environmental planning matters. • Assessment of major development applications.
State Government authorities	• Approval authorities for activity proposals under Part 5 of EPA Act.
Rural Fire Service	• Preparation of Bushfire Risk Management Plans. • Fire management.
Landcare Groups and Bush Regeneration Teams	• Community groups formed to tackle local land degradation and habitat rehabilitation issues.

Figure 1. Distribution map showing records of the Yellow-spotted Bell Frog.

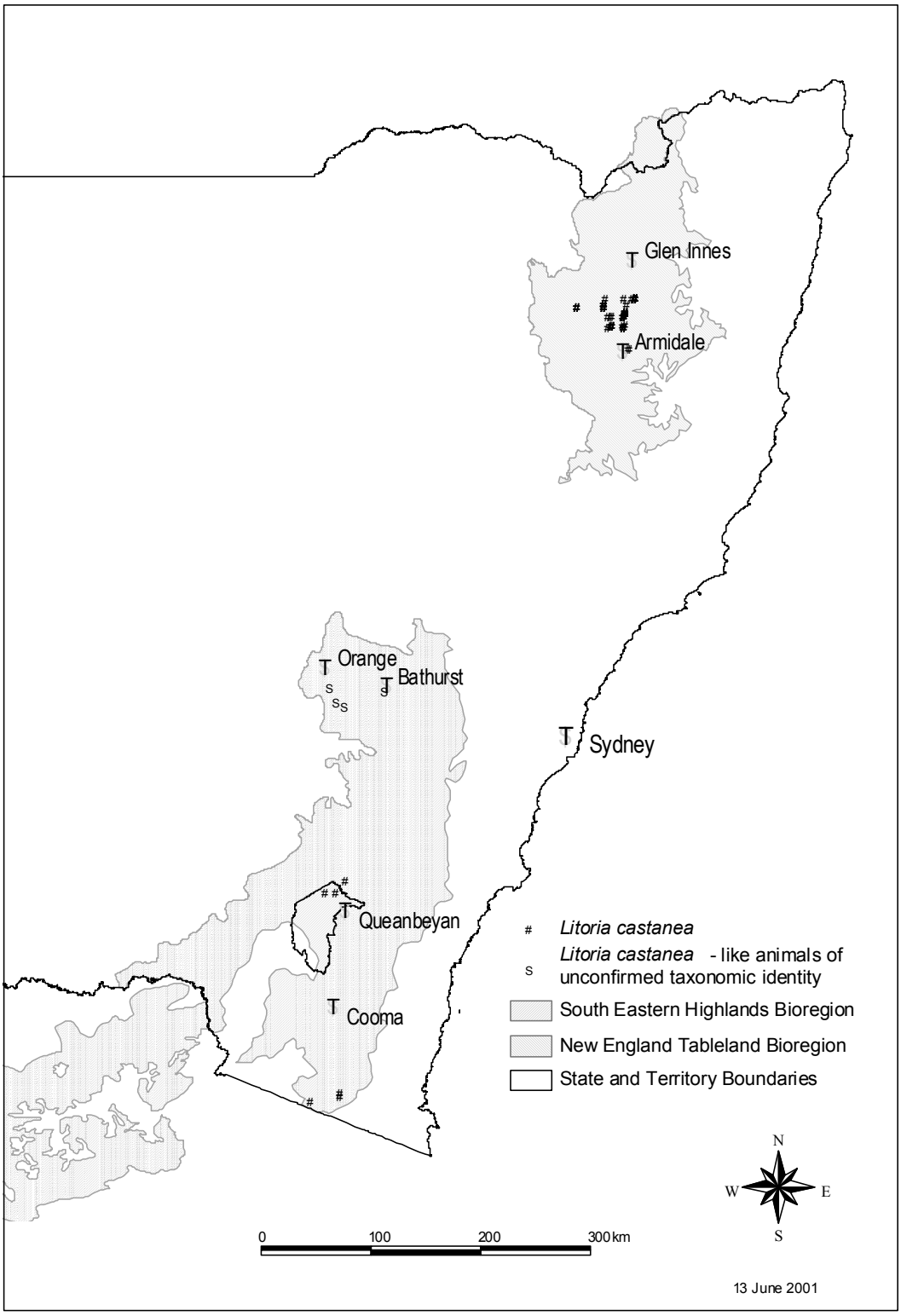
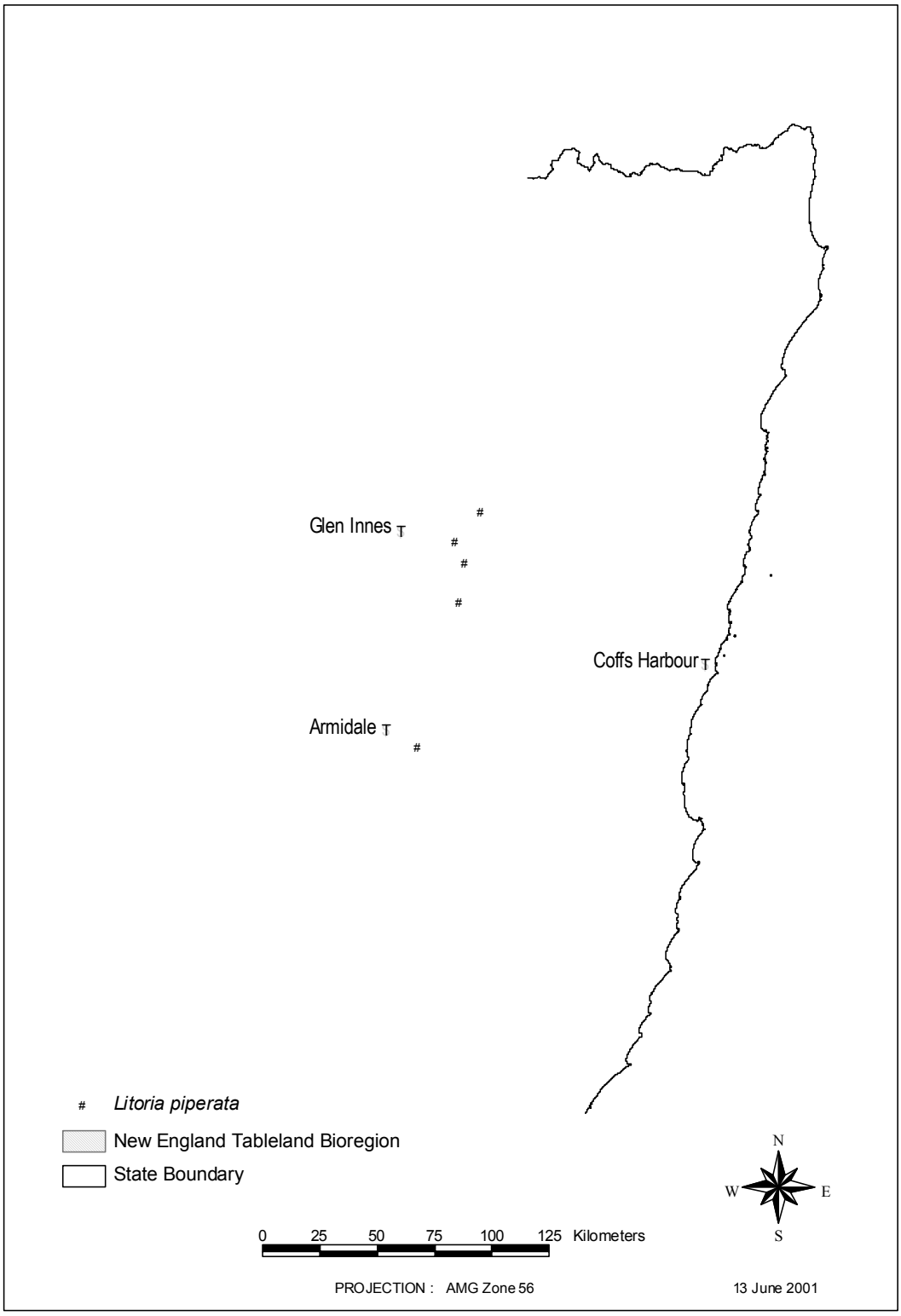


Figure 2. Distribution map showing records of the Peppered Tree Frog.



Appendix 1. Community awareness pamphlet produced and distributed by NPWS Western Directorate.

HAVE YOU SEEN THE YELLOW-SPOTTED BELL FROG?

Photo by G. Grigg

The Yellow-spotted Bell Frog (*Litoria castanea*) is a large lime-green frog reaching up to 8cm in length. It is often found in bulrushes and other emergent vegetation in or at the edges of permanent water. Lakes, dams, ponds and slow moving streams may all provide suitable habitat. By day, adults rest on reeds or bask on grassy banks. By night, adults are active on grassy banks or floating on the water's surface. During autumn and winter, they shelter under fallen timber, rocks or debris. These frogs are more often heard than seen as they have a very loud and distinctive call. It sounds like a series of "grunts" sometimes lengthened into a growl.

The Yellow-spotted Bell Frog is now a threatened species in NSW, that is, a species at risk of extinction. It has not been definitely recorded in the wild since the mid to late 1970s. However, it is possible that it still occurs in the region so please keep a lookout. The South Eastern Highlands (as far north as Orange/Bathurst) is a good place to start looking as they were recorded there in the past. The species also formerly occurred on the New England tablelands. Possible threats to this species include the destruction of habitat (through clearing of wetland vegetation, trampling by grazing animals, alteration of flood regimes by weirs and channels and the clearing of fallen timber), predation on eggs and tadpoles by exotic fish species, pesticides and increased salinity.

You can help this species, and other frogs, by retaining vegetation in and around wetlands and dams and by controlling stock access to these areas. Limiting the use of pesticides near water bodies will also benefit frog populations.

OTHER THREATENED BELL FROGS

Green and Golden Bell Frog
(*Litoria aurea*)

Photo by M. Murphy

Southern Bell Frog
(*Litoria raniformis*)

Photo by M. Lemmon

If you see a Yellow-spotted Bell Frog
(or either of the bell frogs pictured above)
PLEASE contact your nearest NPWS Office or
Robyn Molsher at NPWS Dubbo on 02 6883 5342.

Please record the date, location and habitat of the frog and if possible take a photo of the frog.

April 2000

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

43 Bridge Street
Hurstville 2220
(02) 9585 6444