

# FROG CALL



NEWSLETTER No. 98  
The Year of the Frog  
December 2008

THE FROG AND TADPOLE STUDY GROUP OF NSW INC  
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Frog sketch Georgia Moore September 2008

Please join us at our Christmas meeting  
AND PARTY  
Arrive at 6.30pm for a 7.00 pm start  
**Friday 5<sup>th</sup> December 2008**  
end of Jamieson St. (off Holker St),  
Follow the signs to Building 22  
Homebush Bay, Sydney Olympic Park  
Accessible by bus or train. Call for details.



## MEETING FORMAT for 5<sup>th</sup> December 2008

- |         |  |
|---------|--|
| 6.30 pm | Many lost frogs needing homes. Please bring your FATS membership card, donation & amphibian licence to adopt a froggy friend.  |
| 7.00 pm | Welcome and announcements.   |
| 7.30 pm | The main speaker is Barbara Harrison from All things Slimy. She is talking about the Cairns Frog Hospital and new Frog Diseases.   |
| 8.15 pm | Frog-O-Graphic competition and the People's Choice award.  |
| 8.45 pm | Field trip reports and five favourite slides. Tell us about your recent frogging trips or experiences. If you have slides or other images, bring them along as well. Evenings will end with a guessing competition and <b><u>Christmas Party Supper.</u></b> |

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### LAST MEETING 10<sup>th</sup> OCTOBER 2008

**G**rant Webster opened the meeting and welcomed everyone.

**Arthur White announced that FATS has donated the Frogmobile to the RSPCA. As members will recall, the Frogmobile had reached the end of its useful life and needed considerable repair and modification. It had become unviable to keep and use. Although we regret its loss, FATS is pleased that it will have found a good home.** The V8 racing competition at Homebush Bay was discussed.

Congratulations to Steve and Lisa Weir on the birth of their fourth child, Charlton. FATS welcomed our overseas members Anthony and Anne Peaston. Reminders were made about the Frog-o-graphic Competition. Winners will be announced at the December meeting. Frog surveys will occur in late November and early December at Homebush. Please contact Arthur White if you wish to participate.

Our main speaker was Jodi Rowley. Her photos and the recounting of some of her journey were so spectacular, that no-one spoke throughout her presentation, until question time. She has been working for an international conservation organisation based in the USA. Jody was the amphibian researcher, identifying missing information and new species in Burma, Phom Pen, South China and Cambodia. She organised a team, to train and teach amphibian biology. She worked with a team of mammal, bird and turtle specialists, scaling mountains including near the Mekong River.

It rained the whole trip. The terrain was dangerous and conditions extreme - out of control leeches on faces and body, stinging trees, diagnosing via email and overcoming scrub typhus, scaling waterfalls and steep and slippery terrain.

One "super leech" left her bleeding for 5 hours. "Sweat" bees would fly into your eyeballs. Rice was the staple diet. At times there was insufficient drinking water or food. In the cloud forest, with the beach only 40 minutes away, there were less insects but 11 degree temperatures.

She looked for signs of Chytrid. None was found in mainland SE Asia. She worked on how many frogs were to be found, call recording, species identification and collecting tadpoles. The frog species were abundant and beautiful. Some species made foam nests of spawn which dropped tadpoles into the water, some eggs were green, some frogs "flew", others burrowed and some frogs called ultrasonically in streams, like bats. One frog used belly suckers to cling onto the waterfall rock walls.

Jody saw her first caecilian. The caecilians are an order (*Gymnophiona* or *Apoda*) of amphibians that superficially resemble earthworms or snakes. They mostly live hidden in the ground, which makes them the least explored order of amphibians, and widely unknown.

The biggest threat was unsustainable exploitation of the rainforests and the pet trade. Salamanders were being harvested for traditional medicine. Pet trade activity was of concern. Rangers were being trained to address the problems.

Another challenge will be the race to identify frogs. The scientific processes used by different countries may put Australia at a disadvantage when recording and identifying new species.

Viet Nam was the place to be. The dozens of photos were wonderful - leaf litter frogs, horned frogs calling near waterfalls, amplexing micro hylids, big "edible" frogs and snakes eating giant tadpoles.

Thank you to Jody for your presentation and giving us a glimpse of frog wonderland. We are very glad you are home safe and sound.

David Nelson spoke about the cold and wet FATS "flood" trip to Smith's Lake in early September 2008. Despite the extreme weather, many species were heard or seen, eastern small eyes snakes and *Litoria revelata* amplexing in the reeds. In July 2008 a field trip to the Simpson Desert near Bourke uncovered many local species including the burrowing desert frog. The meeting ended with conversation and a light supper. **MW**



Photo George Madani Nyngan *Uperoleia rugosa* Wrinkled Toadlet



Tue 13 Jan  
 Many animals use the fly pads. Grab some binoculars and spot some of the interesting waterbirds in Centennial Park. 10.00 am - 11.00 am. Children (2-6 yrs) \$10.50. Friends \$8.50. Meet Shelter Pavilion. Parkes Drive. Bookings Essential (02) 9359 6699

**THE HAWKESBURY HERPETOLOGICAL SOCIETY**

is offering copies of their twice a year publication, "the Hawkesbury Herpetologist" to FATS.

\$16 PA plus \$4 for postage and handling. Mail a copy of the application form below.

Application Form 2008/2009  
 The Hawkesbury Herpetological Society.  
 As a member of (Society):  
 Please send me this years copies of The Hawkesbury Herpetologist  
 Postage of \$4. Total: \$20

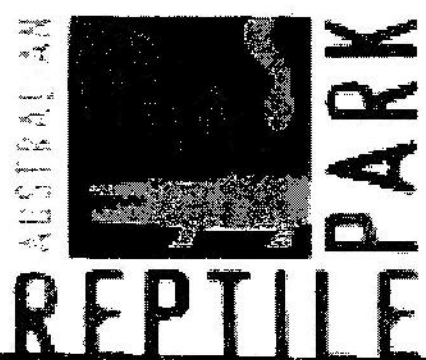
Send to: \_\_\_\_\_  
 At: \_\_\_\_\_  
 \_\_\_\_\_

Post application to the:  
 Hawkesbury Herpetological Society  
 PO Box 30  
 Emerton  
 NSW 2770

or  
 Phone Frances for other information on 9628 806 (AH)

**FROG WEEK AT BOBBIN HEAD**

**F**rog Week for the under 5's was celebrated at Bobbin Head in Ku-ring-gai Chase National Park by the Chase Alive volunteers, lead by Kerry Yates. Wendy Grimm, from FATS, talked about the frogs of the Sydney district with tadpoles, posters and taped frog calls. After Wendy's talk the volunteers presented a puppet show on the problems of urban pollution. Frog fact sheets, membership forms and web site details were provided to interested visitors and volunteers. **Regards, Phillip Grimm**



## CANE TOAD FENCE TO BE BUILT IN TOP END TO STOP FURTHER INVASION

**A**n anti-cane toad group in the Northern Territory is working to stop the spread of the cane toad, by building a toad-proof fence. Cane Toads are the scourge of northern Australia, and are on the march west, but not if a group of Territorians has anything to do with it.

The toadbusting group, Frogwatch has received Federal Government funding to help stop the pests in their tracks. Frogwatch coordinator, Graeme Sawyer says the \$180,000 grant will fund a trial where toad fences, traps and mustering are combined to create a toad free zone.

"We're going to try to create an area cane toads can't get to because they have to pass through a buffer zone to get there and they'll get taken out during that process."

Mr Sawyer says the group recently caught 52,000 cane toads in one fortnight near Timber Creek. "Sadly cane toads have almost completely covered the Northern Territory, the Top End. They're only a couple of km's off the WA border as we speak." He says it is important people learn the difference between cane toad and native tadpoles. "It's important that people know the difference and don't start getting rid of tadpoles just because of the risk that they're a cane toad.

"The likelihood is that they're not. But they need to make sure." Mr Sawyer says the knee high fence will not be a risk for native animals. **21 Nov sent to FATS by Steve Weir**

### WHAT FROGS DO YOU HAVE IN YOUR BACK YARD?

**W**e've been keeping a list of what's about in our backyard as far as fauna goes. In the almost five years here we've got five species of skink and two snakes, dozens of birds and about a hundred insects, and recently recorded the fifth species of frog in our backyard at Charlestown (Newcastle). It's just a suburban block in an area established during the mid-1950's, but we do have some remnant bushland nearby, and most of our neighbours have some trees and gardens.

So far we have

*Litoria peroni*

*Litoria phyllochroa*

*Litoria fallax*

*Limnodynastes peroni*

*Limnodynastes ornatus*

We can hear *Crinia signifera* across the road, but they've yet to be seen or heard on our side. Can anyone else in suburbia match our list?

Regards, **Steve Weir**

## 'EXTINCT' FROG FOUND NEAR CAIRNS

**A** species of frog thought to be extinct has been found thriving in far north Queensland.

The armoured mist frog was last seen in 1991 and was thought to have been wiped out by a fungal disease.

But James Cook University frog expert, Professor Ross Alford, says the frog has been found thriving in rainforests to the north and west of Cairns.

"It turns out that these frogs are living in an area that we wouldn't have expected them to be living at," he said.

"Out past the western edge of the rainforest, particularly if the climate changes the edges may become the centres, so we need to conserve not just the best possible habitat, but a whole sample of the places species might live."

<http://www.abc.net.au:80/news/stories/2008/09/12/2362564.htm> Sent in to Frogcall by Steve Weir

## TOWN JUMPS AT CHANCE TO STAGE CHARITY FROG RACE

**P**unters are on the hop in the far north Queensland Gulf of Carpentaria community of Croydon and getting ready for an unusual race meeting today that will raise money for a local school.

More than 250 frogs will make up the field.

Residents have been searching local waterways for the one that will get the jump on its competitors.

Croydon publican Steve Woolhead says the amphibians are awaiting starters orders in a glass container behind the hotel's bar.

"I was talking to the kids etc, a bit of a meeting [with the] P and C and said 'what are we going to do, a bit of fun, a bit dangerous [fun] with mud crabs etc', so we said, 'okay let's go the next one, let's go frogs'," he said.

Sent to FATS by Steve weir article by Penny Timms  
<http://www.abc.net.au/news/stories/2008/11/04/2409449.htm>

Photo by George Madani *Litoria booroolongensis*





## GLOVES AND TADPOLES

**A** recent article published in *Herpetological Review* reports lethal effects of some types of gloves on tadpoles and is likely of interest to anyone working with amphibian larvae.

Tadpoles are studied in a variety of fields including husbandry, developmental physiology, toxicity testing, and basic biological and ecological research. In many instances it is necessary to use gloves when handling tadpoles or during water changes to protect the experimenter (e.g. teratology research) or to promote hygiene and prevent the transfer of pathogens between tadpoles (Retallick et al. 2006; Sobotka and Rahwan 1999). While investigating aspects of the virulent amphibian fungal pathogen *Batrachochytrium dendrobatidis*, we discovered that a variety of gloves can be lethal to tadpoles. We present here two case studies, one in the lab and one in the field, and two experiments, all demonstrating the lethal effect of gloves on tadpoles. Following exposure to the *Herpetological Review* 39(3), 2008 299 various glove treatments, all tadpoles were categorized as either fine, listless, or dead.....

Within two hours of handling, all tadpoles that had been in contact with latex or nitrile gloves were dead or listless. Those that were listless died within 24 h..... Listless tadpoles had little to no tail function and the usually dark black tail had a discolored, dead-looking, gray appearance. This discoloration was most pronounced where direct contact with the gloves occurred. Particles in the water soon began to attach to the epidermis of the dying tail, giving it a fuzzy appearance. None of the tadpoles handled with either vinyl gloves or bare hands suffered noticeable ill effects and all survived to metamorphosis..... The next ten captured tadpoles were processed with vinyl gloves that were rinsed in a bucket of water prior to handling. All of these tadpoles survived and appeared normal suggesting that a substance on the outside of the vinyl glove was toxic and that rinsing successfully removed it. ....All tadpoles were held for 24 h for observation. From this point on we incorporated the rinsing of vinyl gloves into the standard field protocol. Vinyl gloves were rinsed in a 10 L bucket of water which was changed after at most ten tadpoles. This was adequate to ensure the glovewash residue did not attain a high

enough concentration to cause harm. To date over 2500 tadpoles have been handled with washed vinyl gloves with no ill effects.....

Our results show that unwashed latex, nitrile, and vinyl gloves can be toxic to tadpoles. Unwashed latex and nitrile gloves caused up to 100% tadpole mortality following only 30–90 seconds of direct contact..... Rapid, localized necrosis of tissue at the point of contact was observed grossly. Even five minutes of partial glove submersion was sufficient to cause mortality in the latex and nitrile treatments.

As a result of the apparently more toxic nature of latex and nitrile gloves compared with vinyl, and the ability to eliminate toxicity in vinyl gloves through rinsing, we recommend the use of well rinsed vinyl gloves when handling tadpoles or cleaning aquaria. However, all glove brands and types are potentially toxic and should not be used until proven safe with tadpoles of the particular species being handled. Even then, handled tadpoles should be observed carefully as toxicity may vary between production runs. It is important to note that gloves have not been found to affect juvenile or adult amphibians negatively. The use of gloves to handle amphibians is widespread in the field and lab. Changing gloves between amphibians remains an important hygiene measure to prevent transmission of infectious agents such as *B. dendrobatidis* and ranaviruses between individual amphibians and aquaria. However, given our tadpole results, it would be useful to investigate potential non-lethal effects of gloves on adult and juvenile amphibians to ensure that gloves really are entirely non-injurious.....

[http://www.parcplace.org/Cashins\\_etal\\_2008\\_glovesandtads%20.pdf](http://www.parcplace.org/Cashins_etal_2008_glovesandtads%20.pdf) EXTRACTS *Herpetological Review*, 2008, 39(3), 298–301. © 2008 by Society for the Study of Amphibians and Reptiles Lethal Effect of Latex, Nitrile, and Vinyl Gloves on Tadpoles SCOTT D. CASHINS<sup>1,2\*</sup> ROSS A. ALFORD<sup>1</sup>and LEE F. SKERRATT<sup>2</sup> <sup>1</sup>School of Marine and Tropical Biology and Amphibian Disease Ecology Group James Cook University, Townsville 4811, Australia <sup>2</sup>School of Public Health, Tropical Medicine and Rehabilitation Sciences and Amphibian Disease Ecology Group James Cook University, Townsville 4811, Australia \* Corresponding author; e-mail:scott.cashins@jcu.edu.au



Photo by George Madani

## REVIEW OF THE IMPACTS OF GAMBUSIA, REDFIN PERCH, TENCH, ROACH, YELLOWFIN GOBY AND STREAKED GOBY IN AUSTRALIA

The final version of the report is available on the Department of the Environment, Water, Heritage and the Arts website at:

<http://www.environment.gov.au/biodiversity/invasive/publications/introduce-fish.html> Regards Julie Quinn  
Invasive Species Section Department of the Environment, Water, Heritage and the Arts GPO Box 787, Canberra, ACT 2601 Ph 02 6274 1294 Email [julie.quinn@environment.gov.au](mailto:julie.quinn@environment.gov.au) sent to FATS by LV (extracts) Summary, conclusions and recommendations

**10.1 Summary** The principal aim of this report was to collate and review the information on the environmental impact of six species of alien fish that have established feral populations in Australian waters (Chapter 1). This has been accomplished and both the ecological and genetic impacts of the species have been considered on an Australia-wide basis (Chapters 4 and 5 respectively) and are discussed below. This assessment necessarily involved a preliminary review of the wide range of environmental impact assessment methods currently used in order to define the strengths and weaknesses of the various approaches. This methodological review (Chapter 3) revealed the complexity involved in unravelling the effects of such alien species on the native fauna from other factors affecting the fauna such as land or water use. The review also revealed the high and often impractical levels of proof required to establish the presence of impacts with scientific certainty. As a consequence, the wide range of ecological studies carried out on two of the species in Australia (e.g., gambusia and redfin perch) were categorised into one of the five progressive stages of impact assessment in order to provide an overview of the cumulative burden of proof. This expresses not only the type of study used and its result, but the overall weight of evidence for impacts. This approach was possible for these two species because of the large number of studies carried out in Australia to date. However, this was not possible for the other species which are much less studied. Hence the assessment of impacts of tench and roach depended largely on the collation of anecdotal information in Australia with knowledge of impacts gained from studies carried out in other countries. This is a more theoretical and hence less robust approach and is more akin to the process of hypothesis generation rather than the provision of proof of impact. Information on the two remaining species (yellowfin and streaked goby) was sparse at both an Australian and international level and so it was not even possible to generate hypothetical models of the impacts of these species. This lack of information meant that it was impossible to assess their potential impact on the Australian environment. Although the approach taken to impact assessment was a species-based one, the synergistic effects of several alien species also need to be considered, especially as gambusia and redfin perch can co-occur, the distribution of tench overlapped that of roach, and both the yellowfin and streaked goby inhabit the inshore marine waters around Sydney and Melbourne.

A review of potential ecological impacts requires knowledge of the species distributions in order to assess the scale of the impacts. New up-dated maps of the current 'known' distribution of each species are therefore presented to provide this information (Chapter 2). The maps illustrate both the geographic distribution of each species at the level of catchments occupied, but also indicate the location of individual populations because these are the basic units for managing alien fish. The information used to generate these maps has been stored in Excel files, which can be added to and amended as knowledge of distribution improves, and so provide a template for a national surveillance scheme.

Although some alien species have few redeeming features, others are valued by society for their food or recreational values despite the impacts they may have on the biota and its environment. Therefore, environmental impacts need to be considered within the context of sociological and economic cost-benefits. A sociological and an economic assessment of the potential impacts of the six alien species is therefore included to consider both their societal benefits as well as their potential liabilities (Chapters 6 and 7 respectively). Few studies of this type have been attempted before and it was not surprising that this task proved challenging and suffered from a lack of hard information. Nevertheless, the information that is available was reviewed and whereas the limited hard information is presented, the gaps have also been noted to provide guidance on future socio-economic studies on these species.

This review of impacts was also tasked with over-viewing the current management tools and methods available for the control of these alien species and the policy and legislative environment that directs and constrains their management. An in-depth review of the complex state and federal law surrounding the management of alien fish was beyond the scope of this review, and could be the subject of a book in its own right, nevertheless a summary of the major features of the policy and legislative environment is provided (Chapter 8) together with an account of the main management tools that have been successfully used to control populations of these alien species both in Australia and in other countries (Chapter 9). This information shows that, despite the lack of management tools, useful management is still possible and, in particular, that public education can and needs to play a large role in the management of these fish.

**10.2 Conclusions on impacts of gambusia** There is now a weight of evidence provided by a large number of studies in Australia indicating that the primary ecological impact of gambusia is its effect on populations of native fish and amphibia (Chapter 4). No individual study provides irrefutable proof of impact and it is apparent that, in many locations, the impact of gambusia on native fish and amphibia is exacerbated by the impact of human-induced changes in stream habitats. The wide range of environmental factors that can modify the impact of gambusia on native species means that it is difficult to disentangle the effects of individual stressors. This multi-variable nature of the problem is the main impediment to obtaining scientifically defensible proof of impact, and means that proof can only be obtained by an experimental approach that manipulates the abundance of gambusia while the native

fauna is monitored to detect change and other variables remain constant. Such field experiments are required for convincing proof of impact and need to be encouraged and supported. Such experiments are likely to be possible at locations where state agencies carry out programmes to control and/or eradicate gambusia and it may be possible to encourage such 'manipulation' studies in conjunction with these control programmes through the provision of targeted funding.

Scientific proof of the impact of gambusia on indigenous biodiversity is likely to be required in the future as management efforts to control gambusia increase in number and size and therefore attract closer public scrutiny of cost and necessity. Even though there are alternative native fish species that can also control mosquito larvae, any increase in human health problems related to mosquitos (e.g., as a consequence of climate change) may result in increased public pressure to use gambusia as a mosquito larval control. Proponents of this will scrutinise the evidence on the impact of gambusia and will need to be convinced of their deleterious effect on the environment. Thus, clear proof of impact will be required to address concerns raised by those people who are concerned about costs of control as well as those people who may wish to spread gambusia for mosquito control. There will be a need for an economic component in such evaluations of cost/benefit and a basis for this has been provided (Chapter 7).

Even though clear and irrefutable proof of the impact of gambusia is currently lacking, the number of independent studies that provide some evidence of an impact on native fish and amphibia is large. This evidence adds to the growing weight of evidence from studies in other countries to indicate that this species can create ecological damage through a reduction in indigenous biodiversity. However, it is also clear that gambusia is not a major problem in some waters, especially those where its densities are kept low (e.g., river reaches subject to large variations in flow). These differing results indicate that the ecological impact of gambusia is modified by a range of environmental factors and can be expected to vary in intensity between locations. At present there is insufficient knowledge of these factors to predict where gambusia will or will not pose a problem, or how much of one.

The wide distribution of gambusia within southern Australia implies that the geographic scope for a reduction in indigenous biodiversity in habitats occupied by this species is potentially large. In this respect, the potential ecological impact of gambusia could surpass that produced by other pest fish species (e.g., common carp), even though it is unlikely to rival that created by the combined effects of land-use changes and water management (e.g., damming, diversion, water abstraction) on aquatic habitats. At present, there is no easy way of comparing the relative impacts of such stressors on aquatic biodiversity except in a qualitative and subjective manner. Common carp are not as widespread as gambusia, but can have a devastating effect on water transparency where they occur. The effect of such a change in water clarity on fish habitats and fish populations is more difficult to gauge because of a lack of studies on the

relationships between high turbidity, macrophyte loss and fish habitat. However, it is unlikely that common carp will be solely responsible for localised extinctions of indigenous species of fish and amphibia whereas this is a distinct possibility for gambusia. The impacts of common carp are much more visible than those of gambusia and in this sense gambusia may tend to be overlooked. The fact that biodiversity decline is less obvious to the public eye than water quality decline does not mean that it is ecologically less important. Both affect ecological systems and reduce their resilience and sustainability.

The growing weight of evidence that gambusia does pose problems in many locations in Australia has resulted in the precautionary principle being applied by a number of states and the spread of gambusia is now widely discouraged through public education programmes. Although gambusia has now been spread widely in Australia there are many suitable areas, particularly in the north of Australia where it is not present but where it could be spread to. More widespread and targeted public education about gambusia is therefore needed to counter its spread into such areas. However, there is a danger that management will end here rather than develop proactively to meet future threats. Better information on environmental factors affecting the extent of impacts by gambusia is needed not only to identify new tools for its control but to better predict locations where problems will be greatest and where control will have most effect. In this sense, research will be needed to inform future management so that it develops beyond the public education phase. The Department of the Environment, Water, Heritage and the Arts (DEWHA) will need to facilitate this.

One of the major constraints on management will be the need to develop a national as against a state perspective on gambusia spread and control. For example, it is apparent that gambusia threatens some rare and localised species of indigenous fish and the loss of these would be of national as against state significance. Furthermore, state agencies charged with management do not have the resources to develop tools for gambusia control and, because a lack of tools will hamper management, tool development needs to be accomplished by organisations with a national as against a state focus (e.g., the Invasive Animals CRC). DEWHA therefore needs to support research on alien fish that can be applied across a number of states and therefore has national value. Furthermore, some sort of national coordination in management approaches will be needed because gambusia does not recognise state boundaries. Management of gambusia downstream may be compromised by a lack of management upstream. Finally, there is a need for coordination of a national surveillance system to monitor the status and spread of not just gambusia but other alien pest fish. The DEWHA needs to take the initiative in establishing this through the maintenance of a national database either directly or via another organisation with an Australia-wide focus (e.g., Australian Society for Fish Biolog

**10.6 Recommendations** Lintermans (2004) and Koehn and MacKenzie (2004) have produced a comprehensive series of recommendations aimed at national coordination of the management of alien freshwater fish in Australian freshwaters. The following recommendations amplify and extend these.

1. We recommend that a system is developed for the reporting of fish species occurrence throughout Australia so that a national database can be compiled for both occurrence and absence. This is required for all freshwater fish, not just pest species, and the Australian Government is well placed to promote the development of a set of 'standard' or 'minimum' information requirements for the different sampling methods used so that this key information is recorded and available for future use in the management of fish species. This could be achieved through relevant coordinating groups such as the Pest Fish Working Group (PFWG) and/or the Australian Society of Fish Biologists to develop a reporting system that can be adopted by all states such that the occurrence data are easily imported into state or federal databases.

2. There is a need to ensure that data on fish species occurrence is readily available to all fish managers, and to ensure that databases do not become privatised and/or commercialised to an extent that fishery management and research is compromised. A catchment-wide approach to fish management is required for many fish species, including pest species, so this is especially important where rivers cross state boundaries. This issue has been resolved for the Murray-Darling River network (through the Murray-Darling Basin Agreement) but it also needs to be addressed in other catchments that cross state boundaries. Such catchment-based coordination will be important for the future management of all freshwater fish in Australia, not just pest species, and the Australian Government can play a role in achieving this through the provision of support and guidance to the relevant management agencies.

3. There is an urgent need to ensure that the isolated records of redfin perch and gambusia in river catchments identified in this report are physically checked to determine whether these species still occur at such remote locations and, if so, to determine the desirability and feasibility of their elimination before they spread downstream and damage a much wider area. Populations of gambusia in inland catchments and springs as well as in the Northern Territory are examples of such isolated populations where elimination may be possible as an urgent and high priority. (4 omitted)

5. There is a need to develop a strategy for community (including indigenous community) and stakeholder consultation and education over the management of alien pest fish species at both regional and national scales. Whereas state agencies with responsibilities for pest fish management can be encouraged to carry this out at a state level, a national strategy is required and could be supported by the Australian Government and addressed by agencies with national representation such as the PFWG.

6. We recommend that more public education is provided to restrict the spread of gambusia and redfin perch. For example, information on alternative controls for mosquito larvae in small ponds and water bodies needs to be made more readily available to the public.

7. We recommend that full BACI (before/after control/impact) and/or manipulation-type studies are

undertaken for the assessment of impacts of alien fish species on indigenous species. Such impact assessment studies are still required for gambusia and perch despite the weight of evidence for their impact on indigenous fauna. The reason for this is that future management to contain and or control specific populations of such pest fish will come under close public scrutiny because it is likely to be costly and/or the methods proposed may be opposed by some sectors. A major argument used to prevent or delay management of pest fish species is a lack of scientifically defensible evidence of impact. We recommend that governments do all in its powers to ensure that such robust impact studies are carried out by encouraging universities and research agencies (e.g., to carry out the research). In connection with this, we recommend that the Australian Government and key stakeholders identify mutually agreed levels of 'proof of impact' for gambusia and redfin perch respectively as without this, acceptance of impacts and the need for control may be resisted.

8. We recommend that economic baselines on the costs and benefits of gambusia and redfin perch be established as both these species will require increasing management to reduce impacts on indigenous biodiversity. Data on the economic cost/benefit of management will be required to underpin future management strategies.

9. There is no 'one-size-fits-all' approach to the control of alien pest fish species. The development and use of a wide range of tools for pest fish control and impact mitigation needs national support. In particular, there is a need to ensure that the use of toxicants (such as rotenone) are not prevented because of unfounded fears and/or misinformation about the use of such chemicals. There is also a need to ensure that some research addresses the need for low-tech tools to mitigate impacts (e.g., via habitat manipulation and rehabilitation) and to reduce, as against eradicate, pest fish. Such support can be provided by collating and disseminating information on the use and success/ failure of various pest fish control methods used in Australia and overseas, and by encouraging the development of new tools. Chapter 8 provides an overview of such tools and there are a number of options that are not well developed or utilised because they are as yet untested.

10. Where state agencies carry out a pest fish control exercise, it is necessary to ensure there is support for proper 'before-and-after' studies not just to assess the effectiveness of the control methods on the target species but also to provide tangible evidence of improvements in indigenous species resulting from the control.

11. There is a growing need to coordinate the management of alien pest fish species at a national level through an overarching national management strategy that; (a) identifies priorities at a national level, (b) identifies roles and responsibilities at appropriate geographic scales, and (c) which can provide advocacy of national requirements such as database formation, review and coordination of state legislation in accordance with federal legislation, and targeted publicity to generate better public understanding of the issues and more widespread support for the need to manage these species.





D. MAITLAND/WILDLIFE PHOTOGRAPHER OF THE YEAR 2008

**Deadlock**

**D**avid Maitland said the photo was just a snapshot in the struggle between a tree-frog and cat-eyed tree-snake that lasted for hours through the night in the tropical forests of Belize. Forwarded by Andrew Nelson [http://news.bbc.co.uk/2/shared/spl/hi/picture\\_gallery/08/sci\\_nat\\_wildlife\\_photographer\\_of\\_the\\_year/html/4.stm](http://news.bbc.co.uk/2/shared/spl/hi/picture_gallery/08/sci_nat_wildlife_photographer_of_the_year/html/4.stm)

**PESTICIDE, FERTILISERS LINKED TO DECLINE OF AMPHIBIANS: STUDY**

**A** pesticide compound commonly used in the United States is linked to the growth of tiny parasites that sicken and kill frogs and also harms the amphibians' immune defences against infection, according to a study published Thursday.

The impact of this chemical is boosted in the wild by phosphate fertilisers, the investigators believe. Runoff from fertilisers into ponds encourages the proliferation of snails that are a natural host to the flatworm parasites, they say. The flatworms, called trematodes, are notorious for causing limb malformations, kidney damage and sometimes death in several species of frog.

The new study points the finger at atrazine, an active ingredient in several herbicide products manufactured by a Swiss-based company, Syngenta. Atrazine was banned in the European Union in 2004 after the chemical showed up in drinking water, but has over the last 15 years become a leading farm chemical in the United States, especially in corn-growing regions.

In a field survey led by Jason Rohr of the University of South Florida, scientists measured more than 240 variables in 18 Minnesota wetlands that could account for the rate at which frogs are infected by trematodes.

The strongest link by far was with atrazine concentrations, which accounted for more than 50 percent of the likelihood that the amphibians would become diseased. When the presence of atrazine was combined with traces of phosphate fertilizer -- runoff from nearby agricultural plots -- the rate of diseased frogs went up to 75 percent.

Seeking to find out more, the researchers raised tadpoles for four weeks in several 290-gallon (1,100-litre) tanks containing snails, leaves and insect larvae, to approximate a natural environment. In tanks where atrazine was added in concentrations found in wetlands, four times as many snails grew compared with the population that was in water free of

the herbicide. The population of the parasitic flatworms exploded too.

Green frogs used in the experiment showed significantly higher levels of trematode infection, while pickerel frogs experienced high rates of mortality. He cautioned, though, that these findings did not by themselves explain a massive slump in American frog populations, a fall that began in the mid-1990s and is mirrored by shrinking populations of amphibians elsewhere in the world. Global warming, inflicting a loss of wetland habitat, has been blamed as one of the causes.

Syngenta, asked to reply by AFP, said in a statement: "50 years of use and a vast amount of research has shown that (atrazine) can be used safely with no long-term detriment to ecosystems." The concentrations of the chemical in wetlands reported in the Rohr study were well below the "level of concern" thresholds established by the US Environmental Protection Agency (EPA), it noted. Rohr added that there could be other chemicals in addition to atrazine and fertilizers that affected disease risk.

"Many chemicals can be immuno-suppressive, and standard toxicity tests used to register chemicals in the United States and Europe are conducted on isolated individuals, ignoring interactions with other species, such as their parasites. The study was published on Thursday in the London-based journal Nature. Rohr said that a senior biologist from the EPA, Thomas Steeger, had requested a copy of the study.

In its latest evaluation of atrazine, the EPA concluded in 2006 that the product posed no threat to human health.

**Paris by Marlowe Hood 30/10**



**Red-crowned toadlet, *Pseudophryne australis***

**Photo by David Nelson**

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**SUNDAY 7<sup>TH</sup> DEC. INTERCLUB XMAS PARTY AUSTRALIAN REPTILE PARK, SOMERSBY**

**T**he once a year get-together of the herpetological societies is within the a few hours drive. **John Weigel is Santa and a big croc gets a Christmas treat.** FATS members may get a behind the scenes tour. Not to be missed!! Free entry to FATS financial members.

Please take your current membership card. **MW**

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**FOREVER YOUNG PUBLIC SEMINAR  
PROFESSOR KEN STOREY  
CRYOPRESERVATION, A SECRET WEAPON  
IN THE ANIMAL WORLD?**

**I**magine if you could stop time. If you could freeze yourself when times get tough and emerge unscathed only when things are brighter. For the medical field of cryonics – the low temperature preservation of humans – the ability to resuscitate after freezing is their holy grail.

Although currently physiologically impossible for humans, a variety of other animals have learnt the secrets of whole body freezing survival. Several northern hemisphere frog and turtle species survive winter by freezing 70% of their body water - in essence making a frog popsicle! Frozen animals have no heartbeat, no breathing, no muscle movement and no brain activity, yet when thawed, all of these vital processes are reactivated within minutes.

Professor Ken Storey, a world leader in the field of biochemical adaptation, will reveal newly discovered mechanisms of freeze tolerance in vertebrates – including cryoprotective mechanisms, the regulation of central energy metabolism, and the freeze responsive genes that are activated. Professor Storey's seminar will illuminate a fascinating biological phenomenon that is proving to have multiple applications for the improvement of human tissue and organ cryopreservation.

Professor Ken Storey holds the Canada Research Chair in Molecular Physiology in the Institute of Biochemistry at Carleton University. He studies the molecular mechanisms that allow animals to endure severe environmental stresses such as deep cold, oxygen lack, and desiccation. Ken is the author of over 500 research articles, has edited six books, and delivered over 300 university and public lectures on every continent (including Antarctica!). **Date: Friday 5 December 2008 3:00 pm – 4:00 pm Eastern Avenue Lecture Theatre, The University of Sydney Free Carla Avolio Science Communicator School of Biological Sciences The University of Sydney Room 518, Carslaw F07 Sydney, NSW 2006 9351 4543 F9351 2175 Mob + 61 434 070 338 [carla.avolio@bio.usyd.edu.au](mailto:carla.avolio@bio.usyd.edu.au) [www.bio.usyd.edu.au](http://www.bio.usyd.edu.au)**

Photo by George Madani *Litoria brevipalmata*



Photo by George Madani  
*Mixophyes fasciolatus* - Great Barred Frog

**CENTRAL COAST GREEN & GOLD BELLFROGS**

**T**his is the 4th year in a row that our little friends, the Green & Gold Bellfrogs have come back to live. Here is a photo of one of these frogs discovered today in our little Frog grotto. Bleating Tree Frogs have now joined us at our Central Coast home. **Virginia**



Photo by George Madani Nyngan *Cyclorana* calling



## FIELD TRIPS

*Please book your place on field-trips; due to strong demand, numbers are limited - phone 9681-5308 .*

**Be sure to leave a contact number. Regardless of prevailing weather conditions, we will continue to schedule and advertise all monthly field-trips as planned. It is YOUR responsibility to re-confirm, in the final days, whether the field-trip is proceeding or has been cancelled. Phone Robert on ph. 9681-5308.**

**6 December 8-15p.m.**

**Ourimbah.**

**Leader : Chloe Neuman.**

Follow the F3 north. Take the Ourimbah exit & turn right at the roundabout. Travel 200m and look for the Shell Service Station on the left. Meet at the service station. Frogs subtly partition the resources of an environment in a variety of ways. Many species will breed at different times of the year or may call at different times of the night. Others may occupy slightly different zones around a pond. Scientists call this *temporal* (time) and *spatial* separation. By these means, many frog species avoid direct competition with each other. Understanding these concepts can help us in our search for a particular species. Tonight, we will look at some frogs and we will try to determine the ways in which they divide up the resources of a pond. Most members would be more familiar with Chloe's strikingly beautiful photographic work. Few realise she has quickly become an accomplished fieldworker who has accumulated considerable experience studying the frogs of both the coastal region as well as the more remote parts of NSW.

**17 January 8.15p.m.**

**Strickland State Forest, Gosford.**

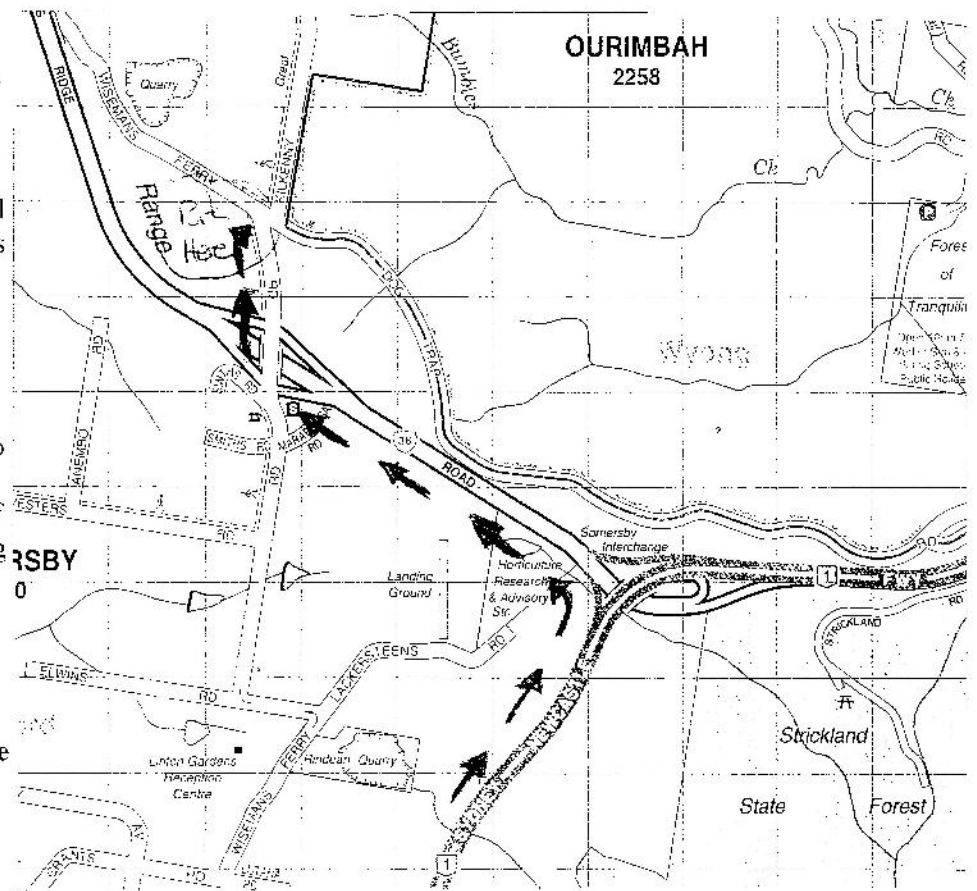
**Leaders : Brad & Matt McCaffery.**

To drive only an hour or so north of Sydney we begin to see the subtle transition to the taller, wetter forests and rainforest environment indicative of far northern NSW. This weekend we will examine the stark contrasts between the Sydney landscape and the increasing luxuriance and diversity we encounter as one proceeds north. The Central Coast contains many spectacular frog species and deservedly is a regular destination for frogging aficionados. Tonight, we will consider the impact of climate, topography, soil, and fire regime and their combined influence upon both the vegetation and froglife of this region. Regular expeditions to the far north coast have seen Brad and Matt gain a well-regarded expertise of the frogs of the dense northern rainforests. Tonight, using their unique and intuitive feel for frogs, they will show us some of those more remarkable species occurring closer to home.

**Strickland State Forest (Gosford)**

**Field Trip - Directions.**

**Take the F3 freeway north. Turn-off at the SECOND Peats Ridge Rd exit. After approx 2km, exit and turn right into Wisemans Ferry Rd. Travel 150m, pull over and park on the left hand side on Wisemans Ferry Rd. See map on right.**



In the event of uncertain frogging conditions (e.g. prolonged / severe drought, hazardous and/or torrential rain, bushfires etc.), please phone 9681-5308. Remember! - rain is generally ideal for frogging! Children must be accompanied by an adult. Bring enclosed shoes that can get wet (gumboots are preferable), torch, warm clothing and raincoat. Please be judicious with the use of insect repellent - frogs are very sensitive to chemicals! Please observe all directions that the leader may give. Children are welcome, however please remember that young children especially can become very excited and boisterous at their first frogging experience - parents are asked to help ensure that the leader is able to conduct the trip to everyone's satisfaction. All field trips are strictly for members only - newcomers are however, welcome to take out membership before the commencement of the field-trip. All participants accept that there is some inherent risk associated with outdoor fieldtrips & by attending agree to; a release of all claims, a waiver of liability, and an assumption of risk.

**Frog sketch Georgia Moore Sept 2008**

