

FROG CALL

THE FROG AND TADPOLE
STUDY GROUP OF NSW INC.

ABN 34 282 154 794

NUMBER 52 - March 2001

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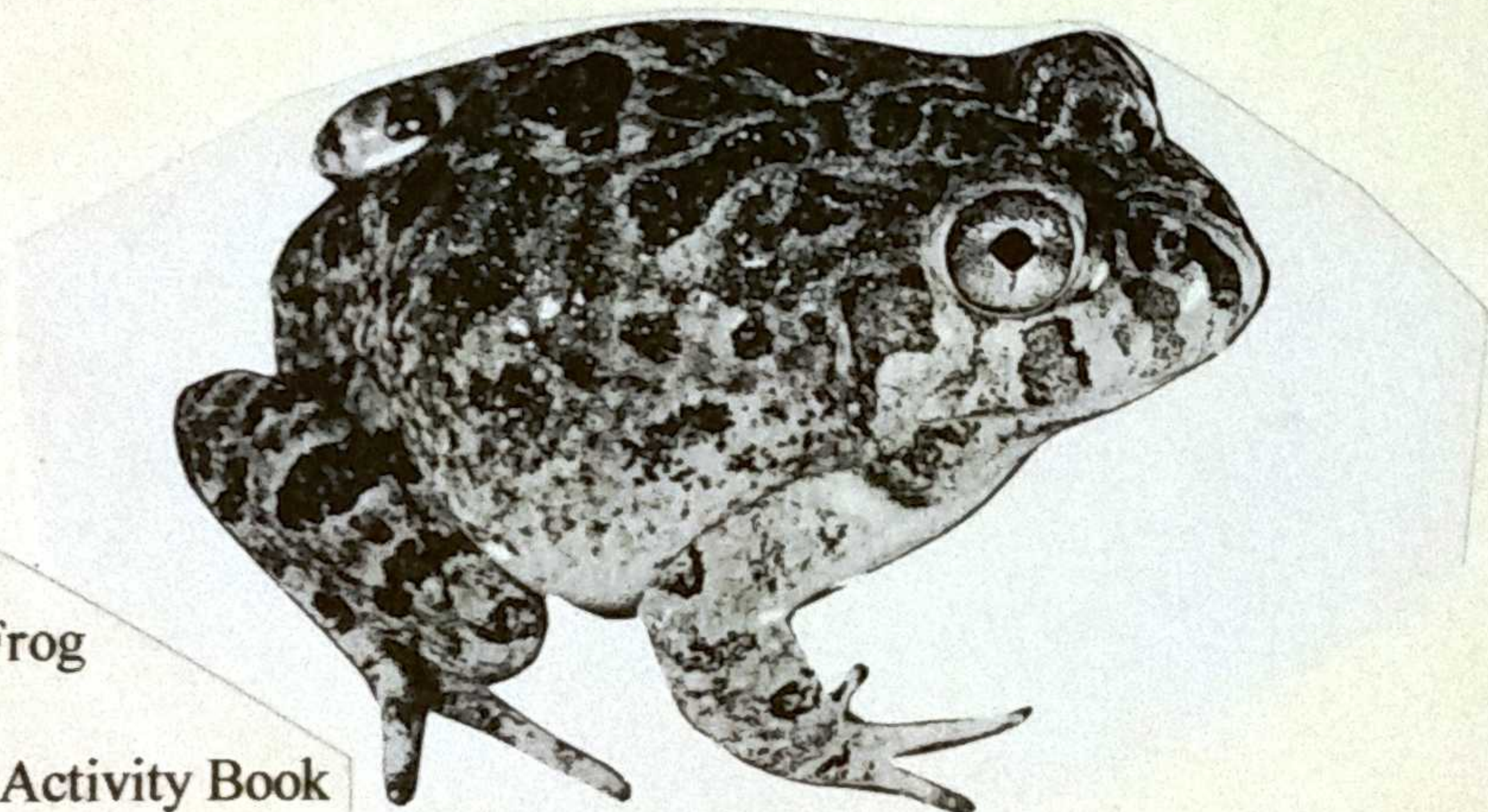
wangmann@tig.com.au for editorial material

6.30 PM for a 7.30 PM start, FRIDAY

6th April 2001 AUSTRALIAN MUSEUM, WILLIAM ST ENTRANCE

FATS is helping National Parks and the World Wide Fund for Nature in a *survey of Green Tree Frogs in New South Wales*. If you fail to observe Green Tree Frogs in areas where you frequently see them, please fill in and send back the *survey form* (in the January issue of FrogCall). Survey forms will be available at the April meeting. Negative results are just as important as positive sightings.

The door prize, a lovely frog plate will be on display before the meeting. \$2 per ticket. See Katherine



Mixophyes iteratus
Ornate Burrowing Frog
photo Darran Leal
Small Pond Sticker Activity Book



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MEETING FORMAT for 6th April 2001

6.30pm: -	Some of the Rescued Frogs dispersed to FATS members
7.30 pm	Lou Petho "Frog photography"
8.00 pm	Trent Penman "Smiths Lake field trip"
8.30 pm	Arthur White "Frog Common Names & Frog Workshop"
8.45pm	Panel Question Time
9.00pm	5 favourite frog slides <u>or</u> 5 minutes
9.30 pm	Door prize "Frog plate" and Auction
9:45pm	Remaining rescued frogs placed with FATS members
10.00 pm	Finish for tea, coffee & biscuits

SUMMARY OF FROG RADIO-TRACKING STUDIES

Frank Lemckert has been undertaking radio-tracking studies of two species of threatened frogs as part of his research into the impacts of forestry activities on our native fauna.

The first of these species is the giant burrowing frogs (*Heleioporus australiacus*) that I have looked at in both Yambulla State Forest, south of Eden, and Olney State Forest, west of Wyong. These are large and impressive looking frogs that live in more open forests of the coast and ranges and are rarely seen and even more rarely heard. They have been tracked to find out more about their habitat requirements and the potential effects of any type of habitat disturbance. Individuals were found to spend nearly all their time well away from water bodies (50-1000 metres or more) rather than retreating to moister habitats as conditions dry. Movements are generally confined to a an area of around a 30-40 metre diameter radius over several months, which are then followed by a rapid (over several days) movements of several hundred metres to a new area of forest. They then settle down again to use another small area. These movements can be uphill, downhill or across the hill and can occur in most any month of the year. Large movements are dependent on rainfall, however frogs don't necessarily move just because it rains. Their burrowing behaviour has also been interesting with individuals mostly burying themselves only just below the surface, probably wherever they happened to be when dawn approached. Burrowing depth appears to increase as conditions become dryer. A couple of individuals re-used burrow sites, although not exactly the same burrow, and may be relatively familiar with some parts of their range. Logs and fallen branches were also used a couple of times, but burrowing was the favoured means of finding shelter.

The study provided valuable insights into the likely impacts of different types of disturbances in their habitats. In regards to disturbances, frogs were found to move into logged areas, even ones that had been logged very recently and had minimal regrowth of the vegetation. What they did at these times was unclear and whether they were able to lead a normal "lifestyle" is unknown. Their ability to burrow may make it easier for them to use such habitats as they can find shelter just about anywhere. The shallow burrowing behaviour most of the time suggests that individuals may be sensitive to fire as temperatures at the soil surface can be quite high even during low intensity burns. Perhaps fortunately, fires are most likely to occur when conditions are dry and at these times frogs may be burrowed deeper. The shallow burrowing behaviour also indicates burrowed frogs can be killed if run over. Further study is required into the means of conserving this species in forestry areas, particularly into just how much effect these disturbances really pose. Their occasional long distance moves means that even the reservation of 200 hectare undisturbed protection zones around record sites may not cover the areas being used by a frog for very long.

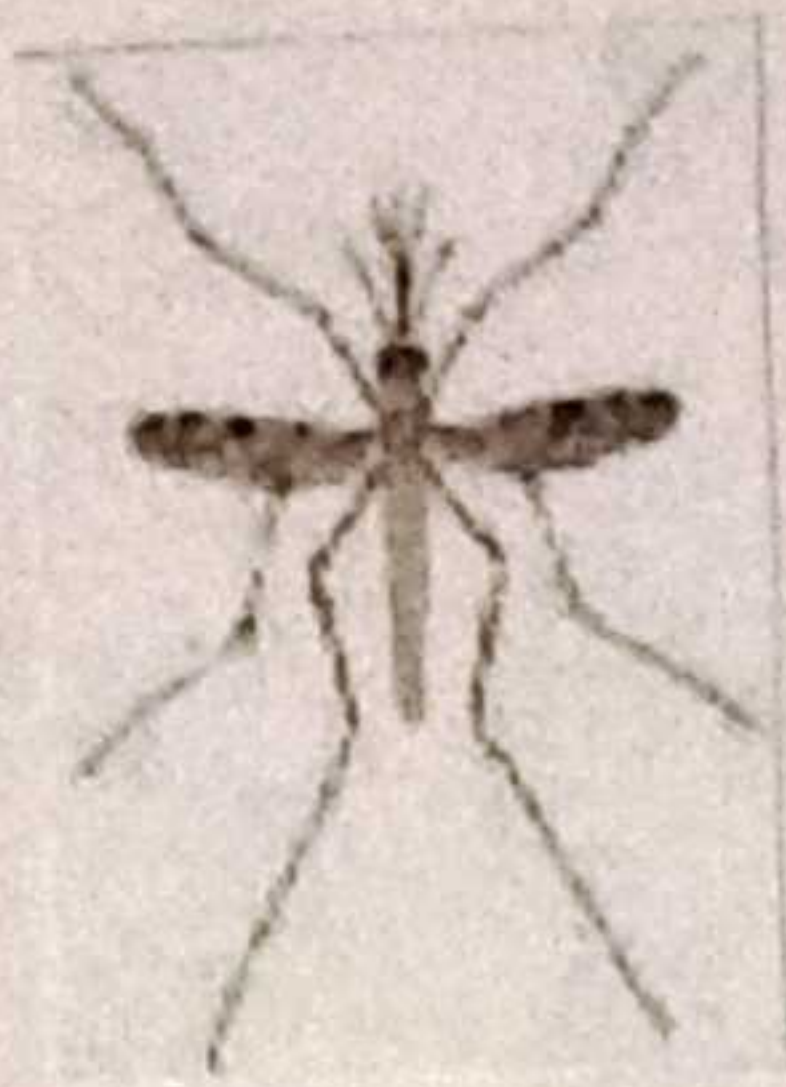
The other species studied is the giant barred frog *Mixophyes iteratus*. This very large, golden-eyes frog inhabits wet sclerophyll forests and rainforest adjacent to larger streams in NSW and Queensland. Externally mounted transmitters and cotton spools were used to follow their short-term movements within the Dorrigo/Coffs Harbour area. This species was found to be very different in habits compared to giant burrowing frogs. On any given night they may move tens to hundreds of metres, but usually end up back or near to the same retreat site where they rest for the day. More importantly, they rarely ever move more than 20 metres from the stream, regardless of the weather conditions, so that the long distance movements involve jumping up and down the corridor of stream-side vegetation. During the day both males and females can be found burrowed under thick leaf litter, but more often than not they will be found sitting under low vegetation watching what is going on around them. Even exposed like this, their camouflage makes them almost impossible to see and these positions are always only a jump or two away from water so they are very well protected from predators.

Protection of this frog from disturbances appears much more straightforward. Buffer zones of undisturbed vegetation around the streams on which they breed should protect the habitat used by the adult frogs almost exclusively. Strips thirty metres either side have been used, which appear to be a good option in selectively logged forests, however this protective option needs longer-term evaluation to determine if it is as good as it looks. Currently, the large streams that these frogs breed on most usually have 50 metre wide strips either side of the stream (for water quality protection) and so they receive additional protection anyway. We need to know more however, of the habits of the juveniles and sub-adults and be sure that water quality is maintained in these streams.

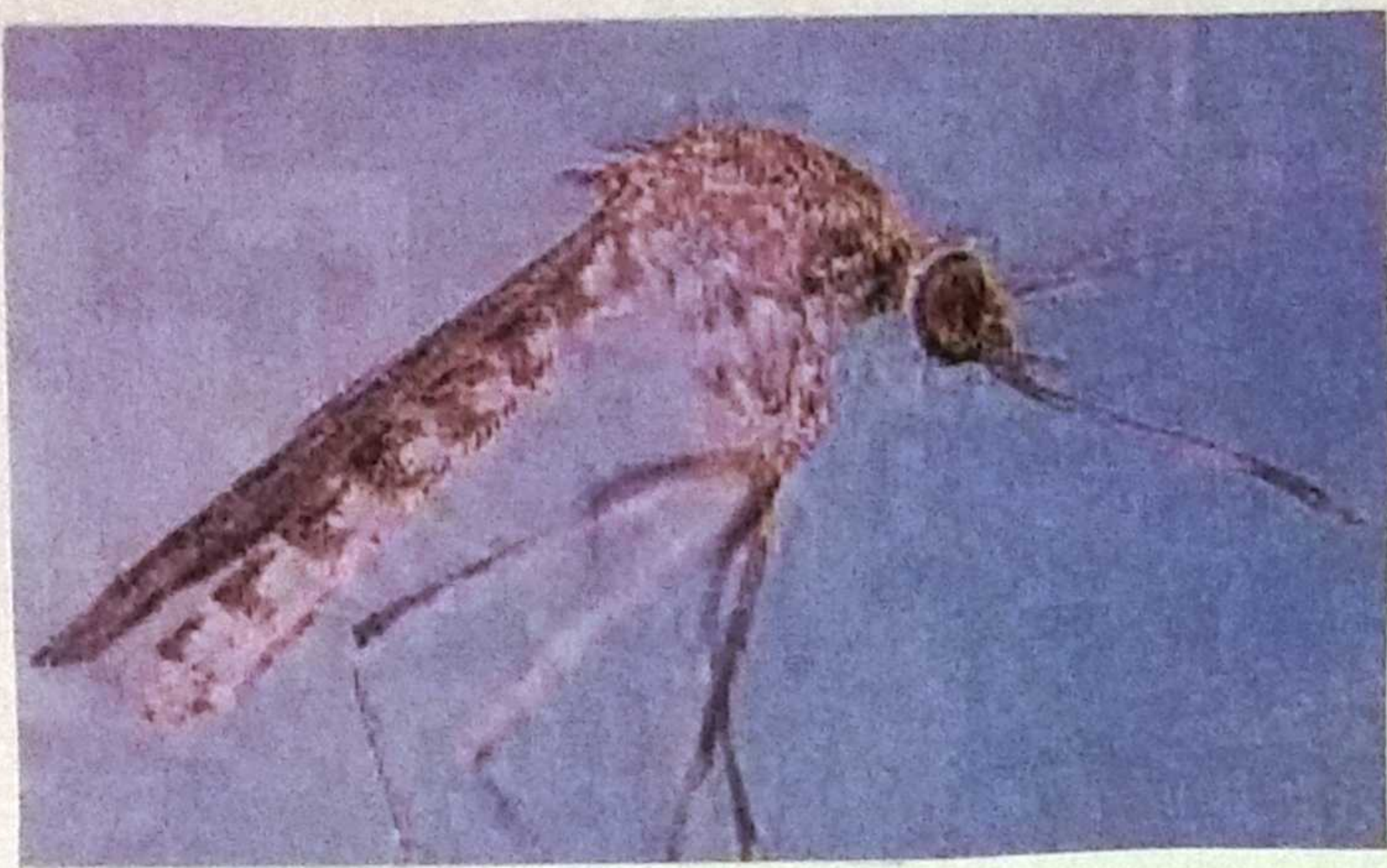
This species is notable for a couple of interesting biological characteristics. The males having large nuptial spines on both of their thumbs as well as many small spines on their fingers. These spines are undoubtedly used to assist in amplexus, but they appear to also be used as part of a combat system to determine who gets to call at a breeding site. Some of the preserved males specimens in museums show scarring on their sides that indicate they use the spines to slash the sides of other males. Anecdotal observations even suggest that they may kill each other.

The other notable aspect of there frogs are their defensive strategies. When they feel threatened, individuals will inflate their lungs as fully as possible and face their broadest side to a potential predator in order to make themselves appear to be too big too eat. As a further defence they can exude a sticky white liquid from glands in the skin. This secretion is like woodworking glue and is likely to at least taste bad and may very well be toxic to some degree. If this also fails, individuals can resort to an amazing scream that sounds like an electric catcall. This is presumably designed to scare any potential predator and certainly works on researchers when they first hear it.

Frank Lemckert



http://www.biols.susx.ac.uk/Home/Neil_Crickmore/



MIXING MOSSIES AND FROGS IN BACKYARD PONDS.

When encouraging people to build a frog pond, one of the commonest questions is, "what about the mossies?". Well, the simple answer is that if you build it, the mossies will come. However, that isn't all bad news because the mossies that take up residency in your newly created pond may not be guilty of causing a nuisance.

There are hundreds of different mosquito species in Australia and they can be found in just about every habitat imaginable. They have adapted to live in all manner of habitats from the saltwater conditions of estuarine wetlands and coastal rockpools to large freshwater wetlands and irrigated agriculture to containers around the house. Some species bite humans while others don't, some transmit disease, others don't, some species even feed exclusively on frogs!!!

The most common species associated with backyard ponds is *Culex australicus* and, interestingly, this species doesn't bite humans!!! This species is pale coloured and prefers permanent water bodies with vegetation and tends to be more abundant during Spring and early Summer.

Another pale coloured mosquito commonly found in ponds is *Culex quinquefasciatus*. This species prefers slightly polluted water so if you have a lot of dead leaf material in your pool this may be your mosquito. It is known to bite humans and quite often comes indoors. This is probably the mosquito keeping you awake on summer nights.

In backyards across Sydney, the mosquito that ruins most afternoon barbeques is *Aedes notoscriptus*. This dark, mosquito with striped legs breeds in your pond but most commonly is found in containers around the house like old aquaria, tins, buckets, blocked drains etc. It lays eggs around the top of small containers so that when it rains and the containers are filled, the eggs hatch. This species is the major nuisance biter in suburban Sydney and it is also the major carrier of dog heartworm. **An easy way to control the numbers of this species is to make sure all the containers in your back yard are tipped out regularly, especially following rain.**

For those of you living close to bushland, species that breed in rainwater pools may fly into back yards and cause problems. Species like *Aedes alboannulatus* and *Aedes procax* are both nuisance biters and are commonly collected in bushland areas of Sydney.

For those of you living near extensive estuarine wetlands, like the Georges River, Towra Point and Homebush Bay, the saltmarsh mosquito, *Aedes vigilax*, may bother you. This large, dark mosquito is capable of flying up to 20kms and is a severe nuisance biter and often causes problems in residential areas close to estuarine wetlands.

To make your pond a little less friendly to mosquitoes, the best option is to minimise the amount of aquatic vegetation and make sure you remove dead plants from the pond. The introduction of a placid, preferably native, fish (eg. the Pacific Blue-eye) will help keep numbers down and reducing the quantity of vegetation will help the fish find the mosquito wrigglers. Most mosquitoes that breed in ponds lay their eggs as rafts on the water surface, if you install a small fountain, the disturbance to the water surface will discourage many species from laying eggs.

One of the best measures to control mosquitoes is patience. As your pond gets older it will become home to dragonfly, mayfly, beetle and a host of other insect larvae which will eat mosquito larvae. The larvae of two mosquitoes, *Culex halifaxii* and *Toxorhynchites speciosus*, will happily munch through all the other mosquito larvae without a second thought. Although you may see a lot of wrigglers during the spring, these probably won't cause any problems and by the middle of the summer, a lot of other insects will have taken up residency in the pond and will help keep numbers to a minimum.

**Cameron Webb Vector Ecologist Department of Medical Entomology University of Sydney Westmead Hospital
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cameronw@icpmr.wsahs.nsw.gov.au**

Thank you Cameron Webb and Frank Lemckert for your presentations and transcripts. Our Frog meetings continue to draw large crowds due to excellent talks, and the depth of knowledge of the speakers. Our success is a result of the regular involvement of Barbara Bohdanowicz, Steve and Lisa Weir, Dominic Borin, Elizabeth Pidd, Arthur and Karen White, Lothar Voigt, and all our current and past committee members, (apologies to anyone overlooked) and many of our members and their families (behind the scenes), who provide support so that these frog activities can occur. **MW**

FATS IS A VOLUNTARY GROUP

In the last 12 months I have been approached by several people who were under the mistaken belief that FATS is a commercial enterprise. They were surprised to find out that we were not. Some were very sceptical about this considering how many services we offer. All FATS people offer their time and expertise because they know it is a valuable service for frogs and people alike.

All of you can help. We are always looking for helpers at stalls, public displays, organising workshops, organising public meetings, preparing FrogCall, etc etc. If you would like to help, you do not need to be a frog "know-all". There are enough of them around. We need people who are keen and have some time that they are prepared to spend on frog-related matters. **Arthur White**

A DYING METAMORPH CASE STUDY

In February and early March the Frogwatch Helpline got 140 telephone calls from the public concerning the Green Tree Frog *Litoria caerulea*, and a few more are still coming in as I write. This is part of a survey the FATS Group is conducting together with NPWS. Arthur White placed articles in numerous papers including the local press, NPWS offices handed out and sent out our joint survey form and I went on the ABC country radio and on Radio 2QN.

Among all the others who responded, five residents of one small corner of Cronulla, all within easy hopping distance of each other, reported sightings and hearings of the Green Tree Frog in their back gardens. That part of Cronulla was already known to me as a GTF stronghold but with some trepidations: Three years ago, just before the world got to hear about the Amphibian Chytrid Fungus, some GTF metamorphs from there had died in what I thought were suspicious circumstances.

The current sightings were all the more pleasing because two of these neighbouring families actually had GTFs spawning in their swimming pools and had masses of tadpoles. One of the residents had scooped the fresh spawn out, rinsed the chlorine off and placed it into broccoli boxes that were in full sunlight and bursting full of fast-growing water plants which kept the taddies' water good. Green Tree Frogs had also spawned directly into a larger box that was standing next to the broccoli boxes. When I came over, on a boiling hot day, there were almost more tads than water, and the first baby frogs were getting stuck into the fruit flies among the melon peel he had left out under some cover.

The second residents have a sunny pool that's mostly empty, with some of the sloping floor exposed. They left the tads to grow up in there and stayed in touch with me on raising information and on the observations they made. After most of the young frogs had already left the pool, the family noticed that the remaining ones were not looking too well. So the next morning Reg Rosenbaum and I went out to have a look. About 20 metamorphs, some with still a bit of a tail, were lying flat at the water's edge, some still weakly stirring, and most with their legs half angled off in a typical chytrid dying position. We took samples (the results will be some time yet), and the distraught family proceeded to disinfect their pool.

The two pools are only one block away from each other.

The sample tads I was given by the first resident were nice and big but nothing like as large as the ones that had a whole pool to themselves even though they then turned into a sickly lot.

Dominic Borin raised some of the sample tads in quarantine conditions, unheated at 18 - 20°. I raised mine, also in quarantine, at 28°. His died after metamorphosis, mine didn't. So I added 100 mg/l of salt (the frogs and tads could have coped with more but probably not the plants I was using), and I cranked the water temperature up to 31°, leaving the temperature on the land part to range between about 22 and 27°. So far so good until I ran through a food bottleneck for a few weeks. I had tried a new method of hatching fly pupae in styro coffee cups which didn't work well when the pupae were very dry and electrostatic; and the baby crickets had grown up to become a mouthful.

So I thought little of it when three baby frogs had drowned, two still with a cricket in the mouth. But then the next lot of flies hatched, in droves and the baby frogs ate their fill. The next morning there were eleven dead ones, among them the biggest ones of the lot, and all floating - none had died on land.

About two years ago, Michael Mahony showed the FATS Group slides of frogs that had died of chytrid, some still in amplexus, a presumably oxygen-consuming exercise. With frogs in quarantine, where there was chytrid in the cage, I noticed that death often came after a large meal, at a time when the need for oxygen is higher. And bloated baby frogs that swim in very warm water may not get as much oxygen as those that sit on land.

Raising the temperature and salinity appears to have prolonged the metamorphs' lives but has not cured them. I'm now going to split the remaining ones into four lots: (a) with a heated land (say 35°) and unheated water area which also keeps the humidity lower, and with 500 mg/l salt; (b) ditto, with daily spraying of medication; (c) ditto, with double the medication; (d) leave some in the set-up as it is now. I'd like to do at least one duplicate of the series, and perhaps one with bare tanks and one with substrate and rainbars, but I have a feeling there is (was?) a limit to what I can wedge into the house. (Remember that this is "keeping" and not "research" which needs a different licence. Also, bear in mind that I don't have lab confirmation yet on the cause of death.)

Just like in some other areas, that pocket in Cronulla may have had chytrid for several years, with many adults surviving and breeding and with many healthy-looking juveniles emerging in summer from pools and ponds. Whether some of them remain healthy when it gets colder would be really good news. A survey on teenage Green Tree Frogs might help. L.V.

PLAGUE MINNOW *GAMBUSIA HOLBROOKII*

The NSW National Parks and Wildlife Service has initiated the preparation of a Threat Abatement Plan to address the impacts of the listed key Threatening Process - 'Predation by the Plague Minnow (*Gambusia holbrooki*)'. To assist with the preparation of the plan, the NPWS is seeking information from land managers, researchers and the community on current programs which aim to:

- * better understand the biology, ecology and impacts of *Gambusia* on native frog and fish species
- * control or eradicate the plague minnow from waterways &
- * control mosquito populations using other alternative methods such as native fish

The NPWS is particularly interested in the extent of these programs, methods used and results achieved to date. Additional information on programs currently introducing the Plague Minnow into the wild for the purposes of mosquito control and the success of these programs would also be of assistance. Please forward information to the address below **Ron Haering Senior Threatened Species Officer Biodiversity Management Unit National Parks & Wildlife Service 02 9585 6426**
gambusia@npws.nsw.gov.au

My owners' biology teacher said
"that its not how I look
but what's inside me that counts?"



FROGBITS AND TADPIECES

Dainties at Port Macquarie: About 10 of them on the road just north of the ferry. Too bad they were squashed.

The Chytrid Fungus Workshop: Unless you have already done so, please leave your name and phone number on the workshop sheet at the meeting, or with Arthur (9599 1161) or Lothar (9371 9129) if interested.

Congratulations to Sam Field who bred White-lips. Also congratulations to Dominic Borin who couldn't resist breeding them too.

And congratulations to Phillip Witchard from Ballina who had Green Tree Frogs spawning in a kitty litter tray right by his swimming pool. And to Leonie Tasker in whose garden near Sawtell Green Tree frogs spawned in a dog bowl.

Leonie raised her tads not in the dog bowl but in four broccoli boxes. Three lots are fine, one lot is growing up badly deformed. All raised in the same way. What's going on?

A school near Lismore has Green Tree Frogs in (and I mean right in) the kids' toilets. This is serious: Some of the children will no longer go to the loo at school, for fear of being jumped at again. Relocating them has not worked (neither has relocating the frogs). The Principal will now designate one cubby as a safety house with a good dose of toilet blue in the water, in case that keeps them out (the frogs) - and all the kids queuing up for the blue loo.

The Narrabeen frog talk on 7th February drew in some 60 attendees (thanks, Manly Daily) and a kind donation for the FATS Group (thanks, Pittwater Council).

A frog and pond demo for kids will be on at Centennial Park on Wednesday, 18th April. For enquiries ring them on 9339 6699 (Mo. - Fr.). L.V.

NOTICE OF AGM

The Annual General Meeting of the Frog and Tadpole Study Group NSW inc will be held on Friday 1st June 2001 at 7.30pm. Nomination forms are available from Arthur White, at the April meeting or write to our Rockdale post office address. Anyone interested in nominating for any position is greatly encouraged to do so as the committee is always short of at least a couple of people, (in particular secretary and a field trip officer). MW

FATS FROGS AT NEXT MEETING

There won't be anything coming out of quarantine for the next meeting, it being that time of the year. We will have are baby Peron's Tree Frogs needing good, stable, loving, committed homes. If interested, come around 6.30 pm. Bring your licence number. There may be a few left at the end of the meeting, for those who come a bit later. L.V.

DISINFECTING PLANTS IN SALTY WATER

In January I yanked some pond plants out, and a few handfuls from the frog tanks, and soaked them in salt water for varying periods. Why? To see how much they can stand. And hopefully, to kill any chytrid fungus spores on them, although I couldn't test for that.

This is the set-up: Five 5-l-plastic tanks, each with an equal amount of Java Moss, Java Fern, Utricularia, Anubias, Ranunculus and Water Syngonium. Filled them up with 1% table salt solution and gave the plants a soak for 3, 15, 75 and 375 minutes respectively, and zero minutes for the fifth one, the control. Then rinsed them and left them in clear water for a few weeks to recover, with the Syngonium sticking out over the top but with all the others submerged. I made sure they all had the same amount of good indirect light.

And this is what happened:

3 min	all plants ok
15 min	Utricularia died, the rest ok
75 min	Utricularia and Ranunculus gone, rest ok
375 min	Ut. and Ran. gone, Syngonium and Anubias lost most leaves during first week but later recovered, rest ok
0 min	Syngonium lost 1/2 its leaves but later recovered, rest ok

The control group of course showed that plants can also die for unrelated reasons, and that it would have been better to buy some extra salt and containers and run a few replicates.

All this goes to show that you can safely dunk Java Moss and Java Fern for 5 hours, and Syngonium and Anubias for 1 hour, if you use a 1% salt solution. (I didn't use a stronger one and shorter durations because I wanted to give it some time to soak in, especially if there just might be a blob of dried infected frog skin on one of the plants.)

I then went and got new specimens of those four plants and repeated the whole thing with 1/2 ml/l "Alive-O Aqua-Remedy" and 10 mg/l benzalkonium chloride (from Sanpic toilet cleaner - don't use that stuff on frogs!) added to the 1% salt solution. The result was the same; the plants were not bothered by the extras - but hopefully any remaining chytrid is.

So this is what I do when I set up a new frog tank:

Six litres water in a bucket + 60 g salt + 3 ml Aqua-Remedy + 3 ml Sanpic or Nu-Clenz; soak for 1 hour if Syngonium or Anubias or for 5 hours if Java Moss or Java Fern; rinse well. (And then wait for a new sensitive test to come out for chytrid, otherwise just hope for the best. At least you haven't killed the plants.)

Would you please let me know what tolerances you have discovered with your plants? Or do your kids need a useful project? We could then put a table together. I'm on 9371 9129 or 0419 249 728. L.V.

GETTING TO CENTENNIAL PARKLANDS

Regular bus services run from City and Bondi Junction rail stations to Centennial Park, Moore Park and Queens Park. Centennial Park is a 40 minute walk from Central Station and a 25 minute walk from Bondi Junction Station. Phone 131 500 for timetable details.

CENTENNIAL parklands
centennial park moore park queens park
Locked Bag 15
PADDINGTON NSW 2021
Phone (02) 9339 6699
Fax (02) 9332 2148
Email: info@cp.nsw.gov.au
www.cp.nsw.gov.au

29 Tuesday MAY
A TALE OF TWO TADPOLES

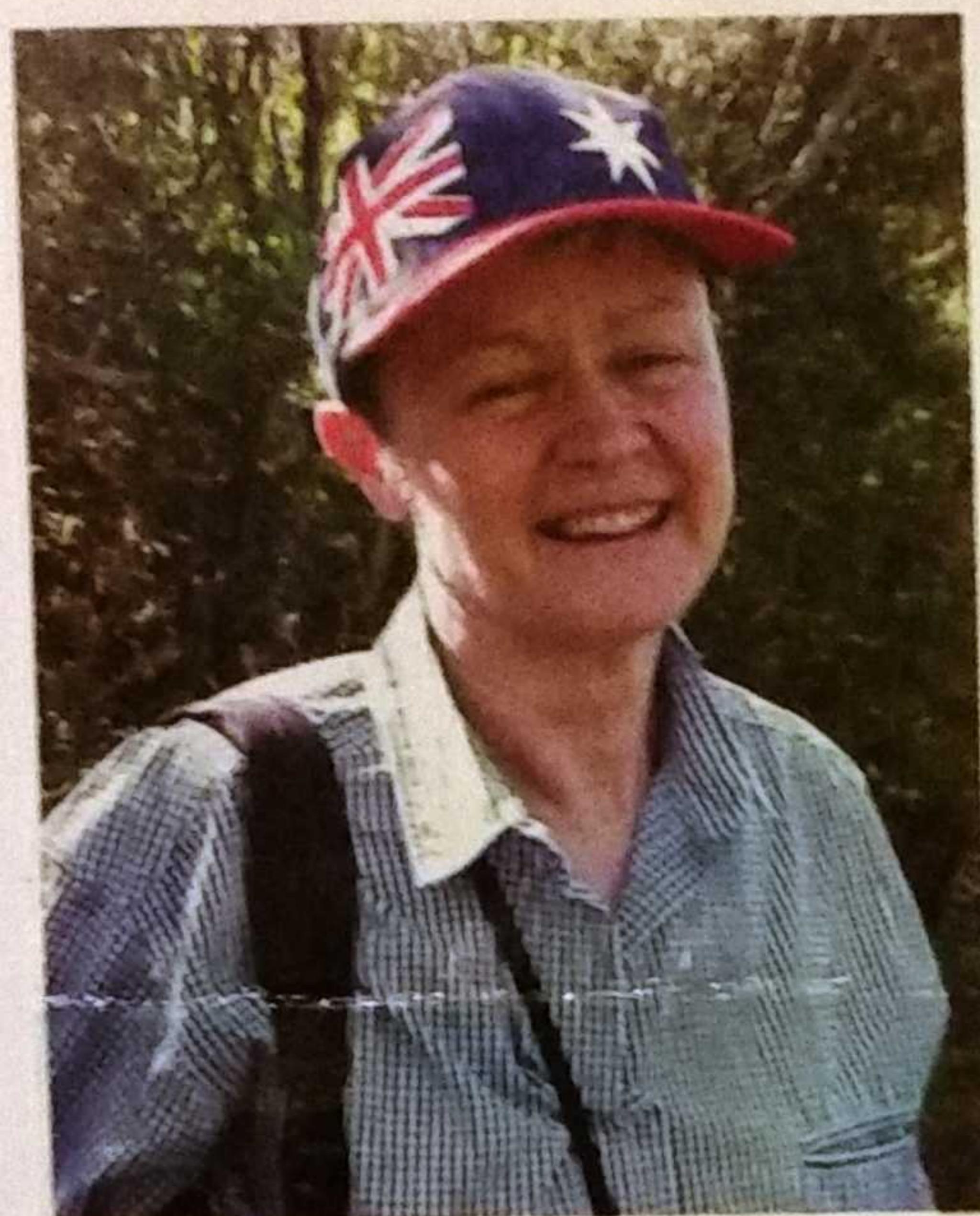
+ 19 April 10-11AM
2-5 year olds



Mosman Bushland Matters



Australian 19-1-01



Photographed by Adam Burrowes

Barbara Harvey

Fauna sighted!

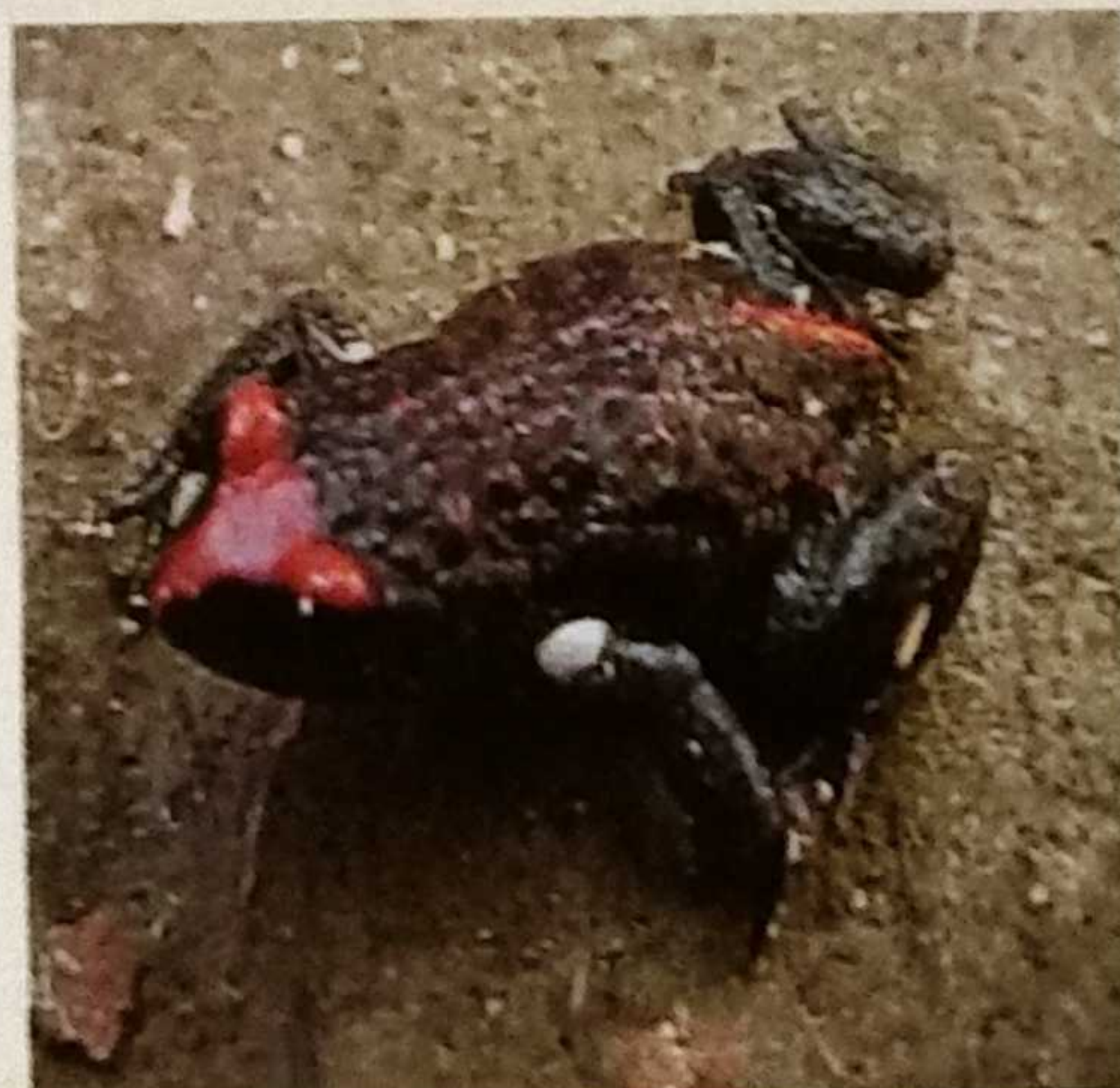
Recently, Don Goodsir and Mosman's Bushland Officer were taken on a fauna exploration walk by Mosman's frog guru, Barbara Harvey. Within minutes of walking she was calling to Red Crowned Toadlets... and they called back! Due to her skills, photos of this rare frog featured in the Fauna Profile for this issue were taken. It was a very special moment. Along the way White-browed scrub wrens and a Sacred Kingfisher were spotted.



What have you seen?

Contact Adam Burrowes
Bushland Officer 9978 4025
a.burrowes@mosman.nsw.gov.au

Native Fauna Profile



Red Crowned Toadlet
Pseudophryne australis

This special frog is found only in Hawkesbury Sandstone country within a 160 km radius of Sydney. Though they are found in Mosman, they are rare. The species is endangered due to habitat destruction from urban encroachment.

It is a small frog, with adults growing 1.8 - 2.7 cm, about the size of a jellybean. The bright red or orange patch on the head distinguishes them from most other frogs. They also have a white patch on the top of their forearms and a mottled black and white underbelly.

Some have described their call as being similar to the sound like the squelch of a squeaky leather boot.

Frogs have been very active with the recent rain. Common Eastern Froglets and Striped Marsh Frogs can be heard at Balmoral Reserve.

Who let the frogs out?

SHOULD the seemingly rather far-fetched plan for a 10km-long cane toad-proof fence to be built across the neck of the Cobourg Peninsula ever come to fruition, Melba wonders if we will see a new breed of rugged outback fence-fixers like those worn and weathered blokes who used to patrol the great dingo fence across central Australia. We also wonder just how high and wide a cane toad-proof fence would have to be and how the builders would stop almost every other animal in the territory from flattening it.

Surely the real answer to the cane toad migration problem is simply to equip everyone in the top half of the Northern Territory with a five iron with an all-weather grip — the implement Melba's friends in far north Queensland reckon is the only real defence against invading toads.

Kindness killing frog population

By SIMON BENSON
Environment Reporter

IN THE search for reasons why frogs the world over are disappearing, scientists have discovered a new threat to their existence — conservationists.

Amateur and even professional conservationists may be inadvertently spreading the disease believed to be responsible for mass frog deaths.

In a report in *New Scientist* magazine, scientists claim they are worried that well-meaning environmentalists have been reintroducing species into new ponds and new areas and at the same time introducing the diseases that kill them.

They are also introducing species where they are not native, creating feral populations.

"There are many risks," said herpetologist and manager of the Amphibian Research Centre Gerry Marantelli.

"Gene flow into new areas, introduction of new species and obviously spreading disease."

Alex Hyatt, of the CSIRO's Animal Health Laboratory, said: "Pathogen pollution is a problem that is on the increase and not only for frogs. Both professional and amateur conservationists need to reassess what they are doing."

It is believed one of the main reasons for plummeting frog populations is a fungus called chytrid.

Conservationists have tried to help frog populations by moving tadpoles to new locations.

"We are desperately trying to stop the practice," Dr Marantelli said.

Daily Telegraph 6-9-00

FROG HYGIENE WORKSHOP

An all-day workshop has been organised for Saturday, 19th of May 2001. The workshop is aimed at frog keepers, frog carers and people handling frogs. A range of speakers, including Dr Michael Mahony (Uni. of Newcastle) and Mr Ross Wellington (NPWS) will be addressing specific issues.

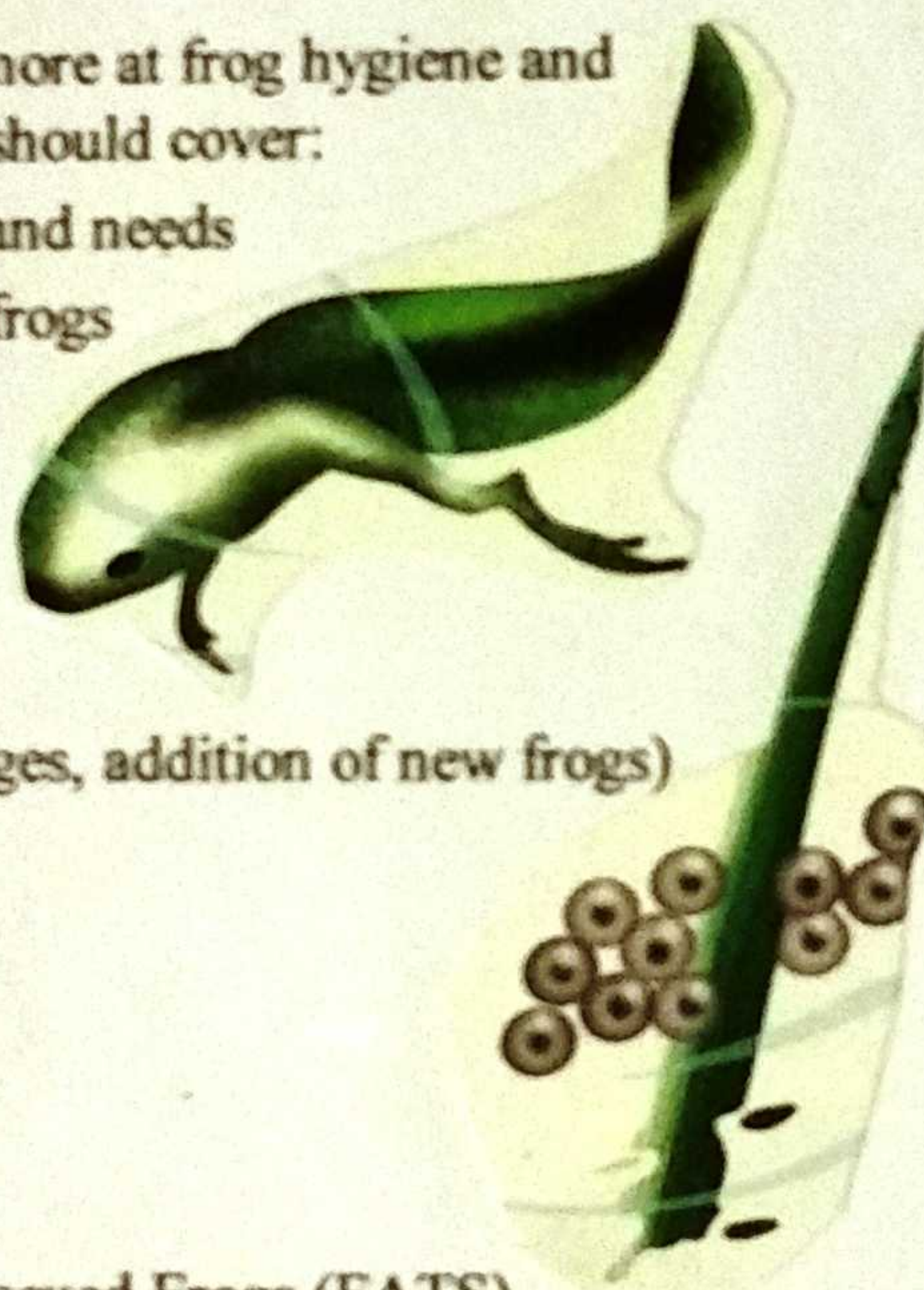
Audience: primary target is for frog carers e.g. WIRES, Syd. Metro Animal Rescue, frog keepers, vets, private pet shops, FATS members. Secondary target group are animal workers such as NPWS, State Forests, NSW Dept of Agric. etc.

The workshop will run from 10 a.m. to 4 p.m. and be split into two sessions. The first session is informative and covers areas such as:

1. Frog Diseases in Australia
2. Common Diseases in Captive Frogs
3. Epidemiology of Infectious Diseases
4. Case Study: Chytrid Fungus in Australia

The second session is directed more at frog hygiene and preventative care. This session should cover:

1. Normal frog behaviour, diet and needs
2. The special needs of captive frogs
3. Recognising sick frogs
4. Treating sick frogs
5. Register of dead frogs
6. Hygiene Protocols for:
 - i) captive frogs (esp water changes, addition of new frogs)
 - ii) tadpole rearing
 - iii) frogs in backyard ponds
 - iv) field trips
 - v) school-held animals
 - vi) frog rescue
7. Case Study: Quarantine of rescued Frogs (FATS)



A printed set of notes summarising the facets of the workshop will be available for each attendee. The notes summarise the points covered in the workshop and should act as a handbook for anyone keeping or handling frogs. A fee will be charged to cover the cost of the hire of venue, the printing of notes, and morning and afternoon tea.

If you are interested in attending and haven't already notified Arthur or Lothar, please do so. There are only 45 places available and we expect these to go quickly. AW

COLLECTION OF RESCUED FROGS

At our last meeting it was arranged that frogs (out of quarantine) were to be collected BEFORE the start of the FATS meeting. This worked well and so we will continue this practice indefinitely. You can collect your frog from between 6.30 p.m. and 7.15 p.m.

If there are unclaimed frogs left at the end of the meeting, these can be procured after the meeting. Remember – bring your Amphibian Keepers Licence with you. You will be asked for it if you are to collect a frog. AW

FROG QUARANTINE OFFICER

At the next FATS AGM (to be held on the 1st of June) a new executive position will be proposed; namely that of Quarantine Officer. The Quarantine Officer will be responsible for advising the executive on matters relating to the frog quarantine procedure, improving our methods of holding and treating frogs, and dissipating information on frog care to all frog rescuers.

As an interim measure, Dominic Borin has been asked to act as a Temporary Quarantine Officer. At the AGM the position of Quarantine Officer will be created and all persons interested in the position should nominate themselves or be nominated by a friend. If you have any queries about the job, contact Arthur or Lothar. AW

THANK YOU FROM SOFAR

Dear Arthur and FATS members,

On behalf of the Hunter Valley Society of Frogs and Reptiles (SOFAR) I would like to thank FATS and yourself for the generous donation of \$200.00 toward our Frog rescue program. We have only been operating this service for the last 10 months and have already rescued about 30 frogs that may have otherwise perished. These frogs now enjoy a safe life in captivity as pets with responsible club members.

During our visit to the FATS meeting in December we were given the opportunity to visit Dominic and Vicky at their home. We were impressed by Dominic's friendly welcome, his eagerness to answer all our questions and the professional manner in which the frog rescue operates from within his home. It is with this knowledge that we have undertaken to simulate our frog rescue program.

Finally, I would like to again thank you for your generosity and will look forward to our next opportunity to attend one of your meetings and thank you in person. Yours Sincerely,
Robert Wood Secretary rjjwood@hunterlink.net.au

ENVIRONMENTAL POLLUTION

Environmental contaminants could be a leading cause of frog deformities and declining amphibian populations. Published by University of New Hampshire researchers in the November issue of Environmental Health Perspectives, the pilot study shows that frogs with developmental deformities, like missing or malformed limbs, also have irregular levels of hormones that are central to reproduction and development. "It is clear that something is throwing off these frogs' hormones at a key developmental stage," says Stacia Sower, UNH professor of biochemistry and one of study's authors. The normal growth and development of amphibian larvae rely on healthy aquatic systems. Developing frogs are particularly susceptible to chemical contamination that accumulates in rivers, lakes and ponds. Potential sources of endocrine disrupting chemicals include municipal sewage, pulp mill effluents, agricultural runoff (pesticides and herbicides), and petroleum from bilge water and two-cycle boats. (extract) S Keeler sjkeeler@cisunix.unh.edu
<http://www.unh.edu/news>. Forwarded by Stan Orchard
National Co-ordinator - WWF Frogs Program

FROGGING ON THE NORTH COAST

Ever wondered what to do when you're away on holidays and it's been raining for a few days, especially at night? The options are quickly exhausted and boredom can easily set in, but there may be an option that you may not have considered. The title probably gave it away, and yes, it's frogging. Or at least a variation of it. In this variation there is no wading around swamps or marshes wearing raincoats and gumboots, no parking the car and walking down a track for who knows how far, and no problems of ending up in darkness because you ran out of batteries or drowned your torch. In this version you observe the wildlife from the safety of your own (or a friends) car. For the purists it may not be truly frogging, lacking most of the characteristic odors and sounds of a swamp at midnight, and offering limited opportunities to get acquainted with the other inhabitants such as spiders and leeches, but it does at a pinch.

The basic requirements are a reliable car with good headlights, a decent map of the area (and the ability to read it, or a good sense of direction), and a sense of adventure. Pick a road that you think should have very little traffic and runs through a rural, scrub, or forest area. Obviously the greater your knowledge of the area, the better your guess will be. If you are unfamiliar with the area, choose a few connected roads and then sort them out when you get there. It is important to choose a road that will have few cars traveling on it. You are more likely to see live frogs rather than squashed ones on deserted roads, and the slower you can travel the more you are going to observe and not squash the frogs, as well as not hold up other traffic or dazzle them with high beam. Also remember that stopping or swerving to avoid animals on wet roads can be dangerous, and the slower you are traveling the easier it is to maintain control of your vehicle.

If it is raining when you are driving, a plastic poncho or waterproof jacket along with a handheld torch makes for easier observation and identification of those frogs that you see on the road or make it to the verge. Having a field guide with you makes it easier to identify which frogs you have seen whilst the details of their features are still fresh in your mind. Within a short time you will be able to recognise the frog based on its size and its manner of hopping. You will get many false alarms, especially from leaves, but also from moths, snails, and the odd pebble. You will also get the odd welcome surprise, with many other animals such as bandicoots, kangaroos and wallabies, snakes, lizards, owls, bats, and large stick insects also coming out at night, to name but a few.

The situation I described earlier is what happened to Lisa and I on a trip up to Coffs Harbour between Christmas and New Year. It rained so much that even the rivers became muddy, and one of our favourite daylight pastimes of diving with freshwater turtles became impossible. So one night, after two days of rain, we headed north towards Grafton and took a turnoff

towards Yuraygir National Park. The road is sealed, and we had high hopes for observing some frogs. As we swung around a few bends we could hear Dwarf Green Tree Frogs (aka Eastern Sedge Frogs) *Litoria fallax*, calling from the farm dams near the road, and it wasn't long before we saw a few. Other frogs also began to show themselves, and within a kilometre or so we had observed Striped Marsh Frogs *Limnodynastes peroni*, Rocket Frogs *Litoria nasuta*, Bleating Tree Frogs *Litoria dentata*, Ornate Burrowing Frogs *Limnodynastes ornatus* and Emerald Spotted Tree Frogs *Litoria peroni*.

By now the rain had returned, reducing visibility. The roadside vegetation also changed, and within the next few kilometres we had added Green Tree Frogs *Litoria caerulea* and Pobblebonks *Limnodynastes dumerili* to our list. Our next find was both sad and yet exciting. On the edge of the road we found a large barred frog, one of the *Mixophyes* genus. It had been hit by a car and killed, but was still recognisable. After some deliberation Lisa and I tentatively identified it as a Great Barred Frog *Mixophyes fasciolatus* based on the barred patterning of the back legs. For us it was unusual to find one on the road, and we hoped we could find a live one to photograph. As luck would have it we found two more over the next kilometre or so, along with more of the other species we had seen.

As we headed towards the coast, from a roadside ditch Lisa heard a deafening chorus of a familiar call, but we couldn't place it. We descended the few feet below the roadside to see dozens of male Dainty Tree Frogs *Litoria gracilentia* calling from the vegetation above the shallow pond. The calls were even louder up close, and watching their small bodies and throat sacs alternatively filling with air it was hard to believe the level of noise coming from such a small animal.

Very shortly after this we turned around and began the slow trip back towards the caravan park, elated at the numbers of frogs and the different species we had observed in a few short hours. We had seen several hundred frogs from ten different species, all with the aid of our car, and consequently were neither wet, muddy or covered in leeches. A good night all round. On the way back Lisa filled in a survey form, noting the relevant information such as date, weather, location, species and numbers. I encourage anybody who looks for frogs at any time in any place to fill in a survey form and post it in. It is the easiest way for the average person to contribute to the overall knowledge of frog distributions and numbers, and is valuable information.

So next time you're out somewhere and it starts to rain, at least give some thought to a drive along a quiet road to observe some frogs. I should add that the next night we tried a new area, and were fortunate enough to find a flooded ditch on the side of the road that had dozens of calling Red-Eyed Tree Frogs *Litoria chloris*, with some pairs in amplexus. We literally opened our car door and there they were, no more than six feet from us on a relatively well used road. You really never can tell what you will find, and you won't know until you look.

Steve Weir

SMITH'S LAKE FIELD TRIP. MARCH 2001.

The Smiths Lake field trip, held between Friday 16th to Sunday 18th of March was a great success, with sixteen species of frog either heard or observed over two nights of fabulous frogging by a group of twenty-nine keen FATS members and friends.

The first frogs to catch our ears (just before dinner on the Friday) was the good old Common Eastern Froglet (*Crinia signifera*), followed shortly by the more unfamiliar and thus exciting call of the threatened Wallum Froglet (*Crinia tinnula*). Only minutes after hearing these calls, however, the field station came alive with the deafening sounds of a vast array of frog species, sending everyone scurrying around excitedly in search of the froggy culprits. All this commotion came to an abrupt halt when the noise-source turned out to be distinctly un-froggy – a frog call cd, being playing full-blast from Lothar's car. Well done Lothar- we were all had!

After dinner, we piled into two cars (most people attending the field trip didn't arrive until Saturday) and headed off to The Grandis, slamming the brakes on and jumping out of the cars in pursuit whenever a frog was spotted on the road (all such frogs spotted were Striped Marsh Frogs (*Limnodynastes peronii*)).



This little Green Leaf Tree Frog (*Litoria phyllochroa*), found near Stoney Creek was certainly not camera-shy.

Once at The Grandis, a single Lesuer's Frog (*Litoria lesueuri*) was spotted beside the muddy road. A single Green Leaf Tree Frog (*Litoria phyllochroa*) was captured after a few of the bravest froggers climbed down a small cliff towards loud calling. This individual served to please the frog-photo paparazzi (myself the ringleader), as it posed delicately on a leafy branch like a true professional. Further along Stoney Creek, despite no frogs being seen or heard, a Small-eyed Snake (*Cryptophis nigrescens*) was spotted, keeping everyone on their toes (particularly Lothar who ended up dancing around in one thong).

Away from the creeks, rising up from under a layer of leaf litter came a chorus of 'squelches', which were identified by Arthur to be the Red-backed Toadlet (*Pseudophryne coriacea*). A little triangulation and leaf-moving revealed a small, rusty coloured toadlet sitting in a moist hollow, surrounded by eggs. After some ogling and photo-taking, we replaced the cover of leaves and headed back to the field station. On the way, a stunning Diamond Python (*Morelia spilota*) was spotted on the road.

Once back at the field station (at around midnight), a few of us hardcore-froggers decided that it was too early to stop frogging, opting instead to head up a bone-shattering dirt/mud road through Myall Lakes National Park in search of more frogs. Stopping at most of the large puddles on the way, we only managed to capture a single Bibron's Toadlet (*Pseudophryne bibronii*). At the destination- a large, shallow swamp covered in reeds- we heard the Ornate Burrowing Frog, (*Limnodynastes ornatus*), Wallum Froglet and the Jervis Bay Tree Frog (*Litoria jervisiensis*). A plump Banjo Frog (*Limnodynastes dumerili*), however, was the first to be spotted, followed after much searching by a tiny Wallum Froglet, and a Jervis Bay Tree Frog. We returned as happy-froggers to a quiet field station at 4am.

After a day of cricket, eating, relaxing and bushwalking with the leeches at Wallingat Forest, the group (now filling five cars) set off for a Saturday night of frogging. First off was Wallingat Forest, a journey that included the compulsory slam-on-the-brakes-when-you-see-a-frog-and-narrowly-miss-a-five-car-pileup! After a short muddy walk from the cars, we reached several ponds. Metamorphs and adults of the Dwarf Tree Frog (*Litoria fallax*) and the Whirring Tree Frog (*Litoria revelata*) were heard and seen in large numbers, males of the Whirring Tree frog impressing us with their bright yellow colouration. Off in the leaf litter, Arthur managed to capture a Great Barred Frog (*Mixophyes fasciolatus*), which was the find of the trip for many. Lothar also managed to capture a beautiful little Northern Leaf-tail Gecko (*Phyllurus cornutus*). On the road out of the forest, a Rocket frog (*Litoria nasuta*) was also observed.

The last stop was a quarry site next to the field station. Most of the frogs that had been heard elsewhere were heard calling here, along with Haswell's Froglet (*Paracrinia haswelli*) and the Smooth Toadlet (*Uperoleia laevis*) (of which only the latter was observed). From here, six of us (in one car!) continued the frogging. We headed further up the bumpy road we had endured the night before, only to encounter a massive swamp full of very smart frogs that refused to call when we were within a metre away from them- no matter how long we stood in there.



A beautiful Whirring Tree Frog (*Litoria revelata*) poses momentarily on a palm leaf over a pond in Wallingat Forest.

Overall, a fantastic time was had by all. The trip certainly opened my eyes up to the diversity of frogs that are out there, and inspired me beyond belief. Thankyou to everyone that helped organise the trip, particularly Arthur and Karen White. Special thanks to Arthur for cheerfully answering the endless cries of "Arthur, what's that?" Jodi Rowley

POEM FOR SMITHS LAKE FIELD TRIP

16 – 18 March 2001

Field Station Afield

Morning brightens,
Bees hum in melaleucas.
Birds fearless from years of kind regard.
Studious plovers deliberate over grass blades
Kookaburras eye cricketers noting joyful yells
Magpies chorus assent.

We eat in a no-walled cave,
Grandstand to cricket and birds.
Like-minded conversations sparkle.
No feigned interest here.
Talk of craft, food and creativity,
University and the field.
Our kitchen, mouse protected,
Treasure trove, has every style of spoon
known to man.

Near Seal Rocks, a death adder on the rutted road.
Beach squeeks and twitters with every step.
Clear sea, fine sand swirls. Rays flap, hover.
No, not a nursery for grey nurse sharks;
Why do they gather here?
Nights, over Buladelah and Wallingat,
a-frogging we go. Sharp ears, bright beams
find *Litoria lesueuri*, *revelata*, *fallax*,
Names long known take form.

Mixophyes fasciolatus, *Litoria nasuta*, *Uperoleia laevis*
Visit in plastic terraria

Punia Jeffery



The rare s...s...stuttering frog is proving a nuisance for Delta Gold

A stuttering frog has become the latest thorn in the side of the Delta Gold board.

The frog, which is a cause celebre among environmentalists opposed to Delta's Timbara gold mine near Tenterfield, is allegedly under threat — again.

Harbour is aware that officers from the Environmental Protection Agency are investigating claims that contaminated water from the disused gold mine may have run into the Clarence River in northern NSW.

EPA spokesman Derek Hand said two officers had taken water samples from the site for testing.

Harbour was unable to contact Delta chief Terry Burgess for comment.

A spokesman for the nearby Wahlabul-Bandjalung Aboriginal community, Alan Oshlack, said tests at Southern Cross University found site water heavily contaminated with metals.

"What we are concerned about is this water is gathering in an area where there are several endangered animals such as the stuttering frog."

The pesky and endangered amphibian has plagued the Timbara mine since it was owned by Bertus De Graaf's Ross Mining.

Delta acquired the Timbara operations when it took over Ross in April last year.

Ross's main asset, the Gold Ridge mine in the Solomon Islands, has been shut since June 2000 because of the ongoing insurrection in that country.

Daily Telegraph 15-1-01

Stuttering frog *Mixophyes balbus*

With compliments

Matthew Kemplay-Hill

Hopping with glee over extra funds

AN endangered species of frog has a brighter future with further funds granted to continue the clean up of its Greenacre habitat.

The National Heritage Trust has awarded Strathfield Council an extra \$11,576 to revegetate and regenerate Cocks Creek Reserve, home to the green and golden bell frog.

It follows an \$18,000 grant from the trust two years ago to begin the remediation of the 1.65 hectare site.

Mayor Virginia Judge said council applied for a one-year continuation of the project in early 2000.

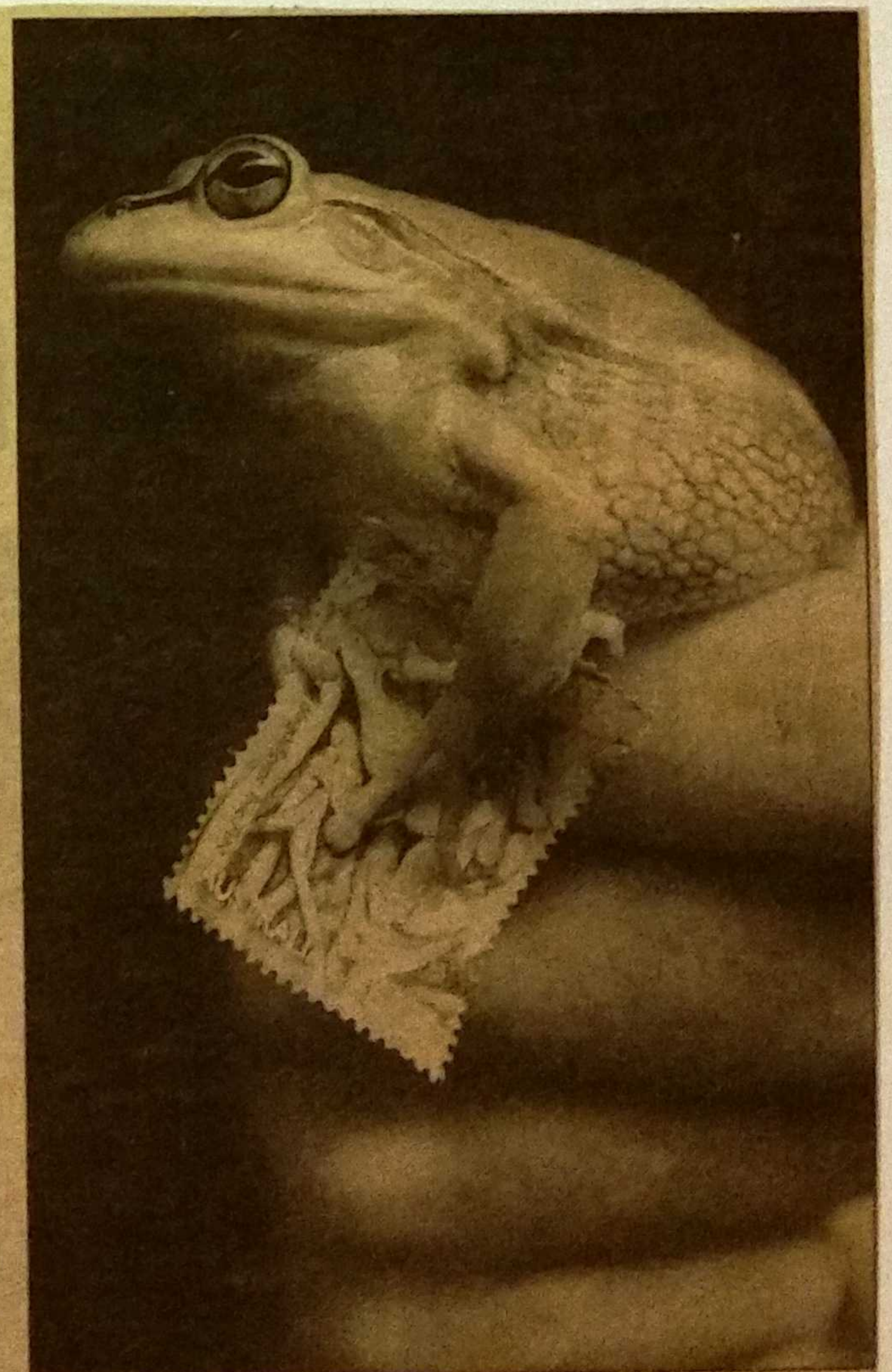
She said council will equal the latest contribution from its maintenance and restoration fund

and the Friends of Cocks Creek in-kind contribution.

Project manager Jon Stiebel said the reserve was a living museum of the type of vegetation that once thrived along the upper reaches of the Cocks River.

Mr Stiebel said the continuation of funding indicated the project's regional significance given the fierce competition for funding.

"This will go a long way to help reach our aims of preventing erosion of creek banks and siltation of the watercourse, extended fauna habitat in Cocks Creek Reserve and encourage further community participation in its management," he said.



Habitat funding . . . the rare green and golden frog which is found at the Cocks Creek Reserve

RIVERS OF SHAME RUN THROUGH A BLIGHTED STATE

The State's rivers are becoming increasingly murky as catchments suffer from chronic erosion and runoff from urban centres and farms.

Even rivers once considered to be almost pristine are declining in water quality, says the NSW State of the Environment 2000 Report. The worst affected waterways are those in inland areas such as the Namoi. The most crystal clear measured in NSW was the Tumut River beside the Snowy Highway, and the muddiest was the Mehi River near Collarenebri. As a group, the cleanest rivers in the State are on the far South Coast, but even these are becoming more turbid.

The Tuross River, whose catchment is mostly wilderness and farmland, is increasing in turbidity at a rate of more than 15 per cent per year. The Deua River, which also flows through wilderness for much of its length, is becoming 20 per cent more murky each year, the Towamba River is worsening by 24 per cent a year, the Clyde River by 9 per cent and the Brogo River by 17 per cent.

A spokesman for the Department of Land and Water Conservation, Mr Simon Williams, said it was too early to say whether the trend towards increasing turbidity would continue or whether extra sediment loads in waterways were the result of climate cycles as opposed to human impacts.

Mr Williams said that rivers in South Coast systems such as the Tuross were starting from such a clean base that turbidity would have to increase markedly for it to have an impact on the ecological health of the system.

The environment report also said no formal system of protected areas had been established to conserve rivers and that such reserves may help riverine biodiversity. "Almost all river habitats that are formally protected are located within terrestrial national parks and are therefore only protected incidentally," the report says.

One of the biggest threats to the biodiversity of the State's rivers is "thermal pollution". "In NSW, serious cold water pollution occurs downstream of at least 17 dams," the report says. "Temperature suppression of up to 15C below natural has been observed, although it is more usually around 8-12C."

The cold water means that the summer breeding period is delayed in some rivers by up to 10 weeks, and the natural rapid temperature rise in spring is eliminated altogether. Up to 3,000 kilometres of NSW rivers are thought to be affected by this insidious problem and may include nearly the whole length of the Murrumbidgee River.

Groundwater is another threatened part of the NSW aquatic environment.

"Agricultural practices such as clearing of native vegetation, tillage of soils, fertiliser application and excreta from grazing animals contribute to high levels of nitrate groundwater contamination."

Another problem facing groundwater identified in the report is that up to 20 per cent of the nation's 10,000 service stations show some sign of leaking hydrocarbons into the soil and/or groundwater.

Wetlands are also under considerable stress in NSW, says the report. "There are 94 wetlands in NSW listed as 'nationally important' ...encompassing an area of approximately 2,171,737 hectares. Of these 51 per cent are subject to some form of sheep or cattle grazing, 29 per cent are used for recreation ... 12 per cent support commercial fisheries and 11 per cent are used for cropping." At least one third of these wetlands are "severely affected" by changes to water regimes, weed invasions and pollution. Only about 20 per cent of the State's wetlands are free from disturbance.

James Woodford, Environment Writer SMH 22/3/01

KNOW ANY VETS IN YOUR AREA? LET US KNOW HOW TO CONTACT THEM.

Mark Simpson BVSc
Sugarloaf Animal Hospital
Carrington Street
West Wallsend NSW 2286
ph 02 4955 1833 fax 02 4955 1970 email
sah@hunterlink.net.au

ANIMAL HOSPITAL CHANNEL 9 8PM

The Frog Group's rescue service may be on Animal Hospital in mid April 2001. Maybe 12/4 or 19/4. Unfortunately I had no confirmed date at time of printing this newsletter. **MW**

Linda Doherty

Rare critters hop, step and flap out of the ruins



Where the wild things are... a lesser long-eared bat, above, and a holy cross frog found in the Darling Riverine Plains area. Photos: Edwina Pickles

At night under the black sky of north-western NSW, farmer Mrs Jenny Anderson watches as a procession of native animals wanders out to feed.

She's long known her cattle and wool-growing property near Coonamble has kangaroos, emus, snakes, possums and birds

that flock in their hundreds, although she hasn't seen many lime-green holy cross frogs since her childhood.

But like many other landholders in the heavily cleared Darling Riverine Plains, she didn't know of the rich biodiversity that has survived

more than a century of grazing and cropping.

Mrs Anderson, 60, left her job as an entomologist and her Bondi home seven years ago to farm Avoca, which has been in her family since her convict settler ancestors took up the land 150 years ago.

By the time she returned to the farm full-time, the land was in poor condition. "What was destroyed in 150 years can't be brought back in 10 years but I've improved it and encouraged tree growth. It's a start," she said.

"One of my great-great uncles spent 20 years cutting down trees."

"The frogs have been phenomenal," Ms Cooper said. "One night we trapped 400 in one trap that's only 60 centimetres deep."

Unexpectedly, farmers have been enthusiastic about getting surveys done on their land. Instead of being at loggerheads with the NPWS, they are turning up for barbecues and checking their traps to see what has been caught during the night.

Mr John Searle, whose farm is near Mrs Anderson's, said he was curious to know the extent of "what's in my backyard".

"But it's more than a catchphrase, being sustainable. If you overstock your land for only 10 to 20 years it catches up with you," he said.

HOW TO BOOK
Contact the Bookings Coordinator 9am - 4pm, weekdays
BOOKINGS & PRE-PAYMENT ESSENTIAL Ph: (02) 9763 1844
Minimum fee applies for group bookings
A surcharge may apply on weekends & public holidays
Prices valid until 31/12/2001

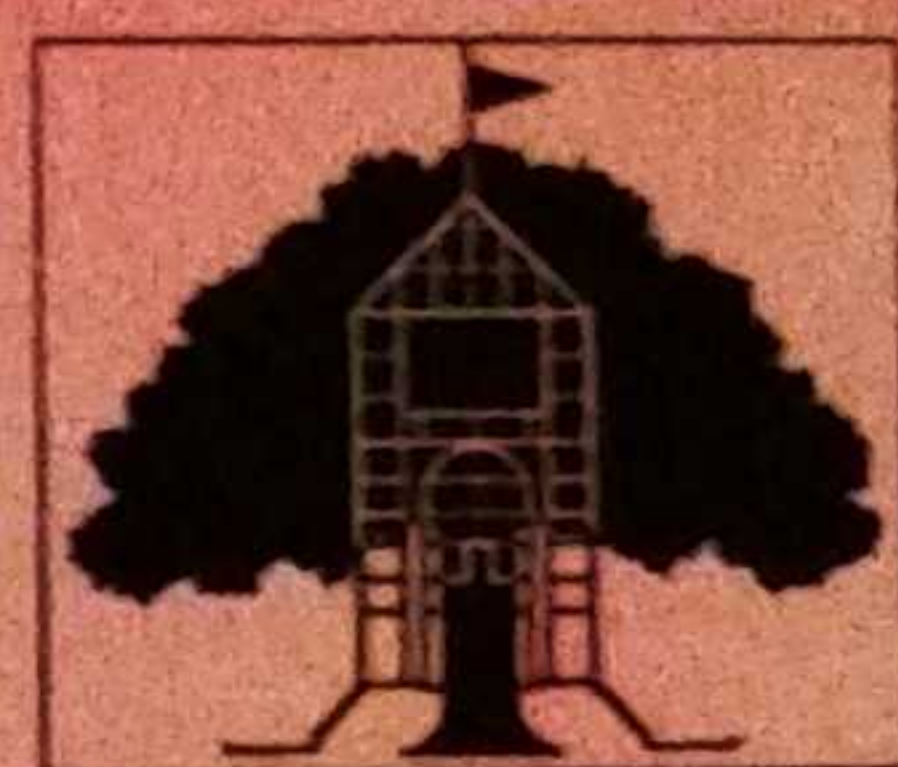
Contact the Bookings Coordinator 9am - 4pm, weekdays
Ph: (00) 2762

BOOKINGS & PRE-PAYMENT ESSENTIAL Ph: (02) 9763 1844

Minimum fee applies for group bookings

A surcharge may apply on weekends & public holidays

Prices valid until 31/12/2001



BICENTENNIAL PARK
— HOMEBUSH BAY —

Leap into the fantastic world of Frogs.

- Become a "Frogger"
- Search for frog habitats in the Park
- Discover how to be frog friendly
- Play *Frog Squash*



Party Outline

All parties start with great games led by your Interpretive Guide.

- Party favorites with a wetlands twist
- Games that involve everyone
- Wetland prizes for all

Choose a special theme for your party (see opposite for themes).

- Each theme will be tailored for the ages of the children

Get wrapped up in party craft.

- A variety of crafts are available
- A craft suitable for the age of the children will be selected by your guide
- All craft can be taken home

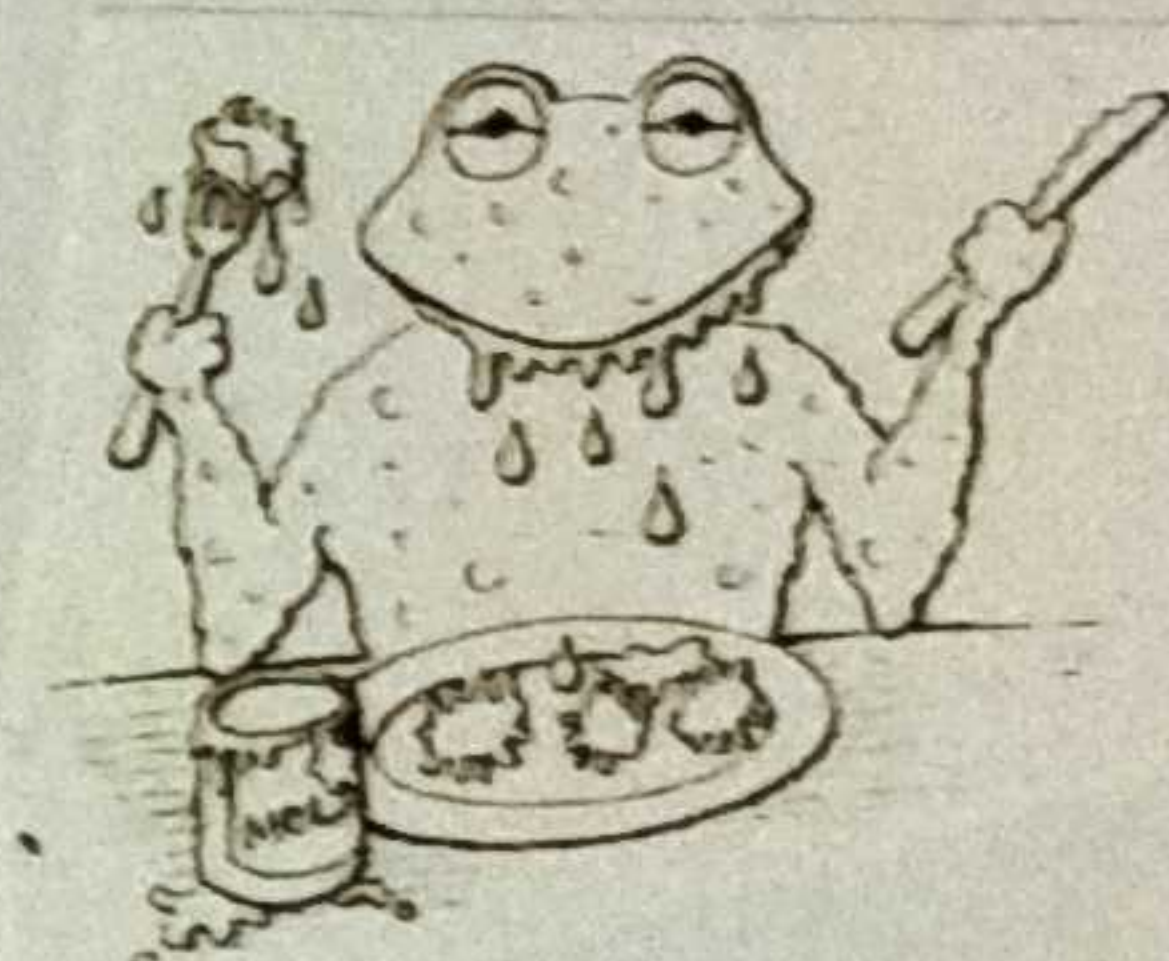
- Party lolly bags for all children
- Gift for the birthday child
- Prizes

**\$16.50 (inc. GST) per child,
Minimum fee \$270 (inc. GST)**

2 hours

Recommended maximum group size
20 children.

- Children must be supervised by a parent/carer at all times.
- Party food & birthday cake are not included in the activity.
- Catering is available upon request.



Bok! Bok! Yirrup! Yirrup!
A frog eats cockroaches dipped in syrup.

Laughing jackasses
or bats wearing glasses,
a toad eats anything dipped in molasses.

A BUCKET OF TOADS

Arthur White	President	(02) 95991161 (h)	fax 9599 1161 (h)	A BUCKET OF TOADS
Barbara Bohdanowicz	Chairperson	(02) 9665 9330 (h)		
Lisa Weir	Secretary	(02) 9792 7675(h)		
Karen White	Treasurer	(02) 9599 1161 (h)	fax 95991161 (h)	
Steve Weir	Membership Officer	(02) 9792 7675 (h)	prefer to be contacted on 9710 6866 (w)	
Lothar Voigt	Publicity / Exhib Officer	(02) 9371 9129(h)	for fax, phone home number first	
Elisabeth Pidd	Publicity / Exhib Officer	(02) 9181 3073 (h)		
Martin Reuter	Field Trip Co-ordinator	0245 668376 (h)	0429 131111(w) email ozyredeye@access1.com.au	
Monica Wangmann	Editorial Panel	(02) 9797 6543 (h)	fax 9797 0603 email wangmann@tig.com.au	
Punia Jeffery	Editorial Panel	(02) 9969 1932		
Vacant	Editorial Panel			

We hold six informative, informal, topical and practical meetings each year at the Australian Museum, Sydney (William Street entrance). Meetings are held on the first Friday of every **even month** (February, April, June, August, October and December) at 6.30 pm for a 7:30pm start. **NO MEETINGS ARE HELD ON GOOD FRIDAY so check newsletter for alternate dates.** Visitors are welcome. We are actively involved in monitoring frog populations and in other frog studies, and we produce the newsletter *FROGCALL* and *FROGFACTS* information sheets. All expressions of opinion and information are published on the basis that they are not to be regarded as an official opinion of the Frog and Tadpole Study Group Committee unless expressly so stated.

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Thank you to all those who contributed to the newsletter ☸ ☸ ☸ 🌸🌸🌸 😊😊😊