

FROG CALL

No. 182, December 2022



THE FROG AND TADPOLE STUDY GROUP NSW Inc.

Facebook: <https://www.facebook.com/groups/FATSNSW/>

Email: fatsgroupnsw@fats.org.au

Frogwatch Helpline 0419 249 728

Website: www.fats.org.au

ABN: 34 282 154 794

MEETING FORMAT

Friday 2nd December 2022

6.30 pm: Lost frogs: Priority to new pet frog owners. Please bring your membership card and cash \$50 donation. Sorry, we don't have EFTPOS. Your current NSW NPWS amphibian licence must be sighted on the night. Rescued and adopted frogs can never be released.

7.00 pm: Welcome and announcements.

7.45 pm: The main speaker is Arthur White, who will present "Smiths Lake Recollections".

8.45 pm: Frog-O-Graphic Competition Prizes Awarded.

9 pm: Raffle, Christmas supper and a chance to relax and chat with frog experts.

Thanks to all speakers for an enjoyable year of meetings (both via Zoom and face to face), and all entrants in the Frog-O-Graphic Competition. Let's hope for continued face to face meetings in 2023!

Email monicawangmann@gmail.com to send an article for FrogCall.

CONTENTS

President's Page	Arthur White	3
Herping in Gundabooka National Park	Marion Anstis	4
A Crazy Idea that just might work	Tiffany A. Kosch	12
A Giant Burrowing Frog Breeding Event in the Blue Mountains	Vic Giniunas	16
Lamington National Park	Rob Burns, Ken Griffiths and Karen Russell	18
Centrefold Photo, <i>Limnodynastes salmini</i>	David Flack	22
Frog-O-Graphic Competition Winners		24
James Fowler Wilcox and his Eponymous frog, <i>Litoria wilcoxii</i>	Glenn Shea	28
When are frogs not what they seem to be? The Story of "Anstisia"	Grant Webster	34
FrogCall turns 30!	Monica Wangmann & Marion Anstis	41
Field Trips	Robert Wall	42
FATS Meeting Directions and Acknowledgements		43
About FATS, Committee members contact details		44

Cover photo: Two male Tyler's Tree Frogs (*Litoria tyleri*) in combat

Brad McCaffery

President's Page

Arthur White

2021-2022 was yet another difficult year for FATS. COVID-19 lockdowns and restrictions on gatherings continued and again forced us to cancel many of our public events. Fortunately, we are finally able to hold public meetings face to face again.

2021 was the year that FATS commenced the Strathfield Green and Golden Bell Frog project. Land has been made available at Greenacre and we have had frog ponds installed and the site re-landscaped. In December 2021 the first GGBFs arrived – and bred. This will be a long term project for FATS. We held a few working bees at the site and more are planned, as well as an Open Day in September 2022.

This year we were able to hold a few field trips, but many were cancelled either because of COVID restrictions or floods. But again, we are hoping that this season the field trips will occur without too many disruptions.

Frog rescues have been sporadic. Last year, east coast Australia experienced a major Chytrid and possible Ranavirus outbreak amongst frogs and we have had to modify our advice to people who find sick frogs so that they don't breach health restrictions. This winter a smaller outbreak has occurred – the impact of the second outbreak is still being assessed.

The one activity that has continued relatively unaffected by all these events has been the production of FrogCall. Monica Wangmann, our long-serving Editor has managed somehow to continue to produce FrogCall six times a year on time. As many members have not been able to travel around to meetings or events because of restrictions, FrogCall has been their only contact with the frogging world and remains our best contact with members at present. Monica and Marion will be producing another special collector's December colour edition. Despite the chaos, FATS has retained a loyal following and our membership remains strong. COVID restrictions will be in place for some time yet and planning of future events remain uncertain.

FATS remains financially strong, thanks to our long-standing Treasurer Karen White. We had one application for a student research grant this year, which was awarded.

FATS completed the annual Bell Frog auditory surveys at Sydney Olympic Park in November and December 2021. Thanks to SOPA for supporting FATS and thanks to the members who came and helped on the night surveys.

Robert Wall organised a great series of field trips but many of these had to be cancelled at short notice because of COVID restrictions and weather issues. He has planned a full programme for the upcoming spring and summer but again we cannot guarantee that they all will run.

Kathy and David Potter organise our events programme and they have had to cancel many events at the last minute as well due to COVID disruptions. Punia Jeffery and Marion Anstis shared the role of meeting spokesperson and both help out with various other activities of Council. Phillip Grimm has two roles, membership officer and webmaster and does both with great efficiency. He also prepared the Frog-O-Graphic competition submissions for the FATS committee to judge.

Jilli Streit has been our secretary and has done a good job in that role. Many thanks also to our other executive members: Andre Rank and Luc Streit. Each has contributed whole-heartedly and helped keep FATS alive and well.

Finally, I would like to thank all of our members for being so loyal and patient during these trying times and for making FATS such a great group to be in.

Editor's Note: The FATS committee thanks our President Arthur White and his wife, treasurer Karen White, for all the volunteer time they provide throughout the year, and the donations for FATS Arthur acquires through his frog advocacy on our behalf.

Herping in Gundabooka National Park, NSW

Marion Anstis



Ephemeral wetland area in Gundabooka National Park, NSW.

I joined a group of keen and experienced members of the Australian Herpetological Society (NSW) and Victorian Herpetological Society for a trip to Gundabooka National Park in late January to early February this year. It was organised by Kelly Nowak, and was a very worthwhile experience. It had been so long since I had been herping or frogging in far north-western NSW, so it was great to finally experience this amazing dry mulga habitat again. Given the uncertain weather, with possible further rain expected that could make the roads impassable, we weren't sure whether we would be able to get there, especially given

the recent rains. However, we were lucky as the rain held off, and on the long drive into the park, we came across some temporary water (above), where there were tadpoles of the Water-Holding Frog (*Cyclorana platycephala*), so I was able to explain the tricks in identifying



Tadpole of Water-holding Frog, *Cyclorana platycephala*



Redbank Homestead, Gundabooka National Park.

Ken Griffiths

these big fat tadpoles. The one we looked at would probably metamorphose within a week (they develop very fast in warm water), which was just as well because the water level was getting very low.

We stayed in a big homestead (Redbank homestead) which was leased at very fair rates by

NPWS, on the bank of a very full Darling River. It was amazing to see the river so wide and full, and the wildlife was everywhere.

The contrast I noticed on either side of the park boundary fence which separated the national park land and the abutting private sheep-grazing land, was stark. The loss of



Darling River almost overflowing.

groundcover vegetation and low native shrubs and reduced number of trees were obvious. While there were really good numbers of Red Kangaroos and many more low trees for the birds on the national park side, there were hardly any 'roos or birds visible on the grazing property, so it was very obvious how important these parks are.

We had a week to explore and photograph wildlife, mostly from the herpetological world, but also mammals, insects, arachnids and basically anything that moved!

While most herpos were busily engaged in chasing reptiles during the day, setting some pit traps and finding various species for us to photograph (lots of rubbish heaps and old ruins were visited!), a few of us decided to go looking for birds as well, armed with our cameras and long lenses. Lots of lovely species abound in that country, including Crimson

Chats, Mulga Parrots, Brown Treecreepers, birds of prey and we were regularly visited at the Redbank Homestead by a flock of Red-tailed Cockatoos.

We also were lucky enough to find three little dunnarts asleep under corrugated iron sheets at one site near some historic old buildings and one female had tiny babies attached to her teats. These precious marsupials are struggling to survive threats from feral cats.

Nights were reserved for frogging (and arachnids etc.), but our first encounters with Desert Tree Frogs (*Litoria rubella*) were when we had a shower. They were sitting around fast asleep on the walls in the shower. Under the grid covering the drain of one shower Karen found a whole group of them. Even more interesting, some would say, was the neighbouring shower I was in... someone looked under the grid there after I had come out and a young King Brown



Red-tailed Cockatoo pair



Crimson Chat (male)



Diamond Dove



Mulga Parrot (male)



King Brown Snake from my shower!



Sudell's Frog, *Neobatrachus sudellae*



Green Tree Frog, *Litoria caerulea*, with a small beetle on his back.



Inland Carpet Python, *Morelia spilota metcalfei*

Snake crawled out! He became a star subject for photographers later on. Little did I know my bare feet were often right above his hiding place throughout my shower!

On the first night after a little rain, there were a few *Notaden bennetti* (Crucifix Frog) out eating ants not far from our homestead, *Neobatrachus sudellae* (Sudell's Frog) and the ever-present Desert Tree Frogs and Green Tree Frogs (*Litoria caerulea*) as well as many geckoes all around on the building walls. The above two frog species were thoroughly engaged in chasing the summer insect supply on the windows around the buildings as well.

But the best night frogging came two days before we left, when the heat was broken by a heavy downpour early that morning. Later spotting some temporary water bodies using a drone after the rain, we headed off to explore them that night through some Mulga scrub

and eroded gullies. The first big shallow area of water we reached produced some lovely Crucifix frogs just coming up from their burrows and sitting in the shallow water, Green Tree and Desert Tree Frogs, a Salmon-striped Frog (*Limnodynastes salmini*) and Sudell's Frogs (*Neobatrachus sudellae*). Unfortunately, I had a sudden problem with my flash not



Yellow and Black Mud Dauber Wasp with spider prey.



Crucifix Frog (*Notaden bennetti*) just emerging after rain.



Crucifix Frog absorbing water.

working so I had to head back the long walk to the homestead to change gear (hoping I could find my way back to this site by torch light in the pitch black night afterwards!). When I eventually managed to find my way back there after about $\frac{3}{4}$ hour, there was no one there...

Way in the distance I heard a big frog chorus, so I figured the group had gone there, but not knowing if I could find it (and, if the group wasn't there, then find my way back?), I decided to take a few pictures of any frogs I could find where I was and head back to the



Crucifix Frog (*Notaden bennetti*) calling while afloat in shallow water.



Water-holding Frog pair in amplexus.



Water-holding Frog (*Cyclorana platycephala*) calling.

homestead. Finally, back at the homestead I was putting my gear away, when Kelly Nowak and Adam Sapiano came rushing in shouting excitedly for me to go back with them, saying they had found a megga frog chorus of several different frogs which they said I just HAD to see!

So I got my gear together again and traipsed back for a fifth time through the mallee scrub with them (this time it was a much further distance), and when we finally got there it was a great site with good numbers of chorusing frogs – all the species present mentioned above (except the Salmon-striped Frog), plus the



Salmon-striped Frog (*Limnodynastes salmini*)



Gould's Sand Monitor (*Varanus gouldii*)



Central Netted Dragon (*Ctenophorus nuchalis*)



A mother Walleroo and baby, with wet coats after the rain.

Water-Holding Frog (*Cyclorana platycephala*), the Wrinkled Toadlet (*Uperoleia rugosa*), the Desert Froglet (*Crinia deserticola*) and one Peron's Tree Frog (*Litoria peronii*). Although

the frogs had now become more wary after the group had been wandering around the site for some time before I arrived, and less were calling as actively, I managed to get a few photos



An example of the magnificent nightly sunsets we enjoyed at the Redbank Homestead.

of the Water-holding frogs in amplexus and the Crucifix frog calling, which was great. Thanks to Kelly and Adam for making the effort to come back and get me, it was well worth the effort, even though after six long walks back and forth, I crashed that night!!

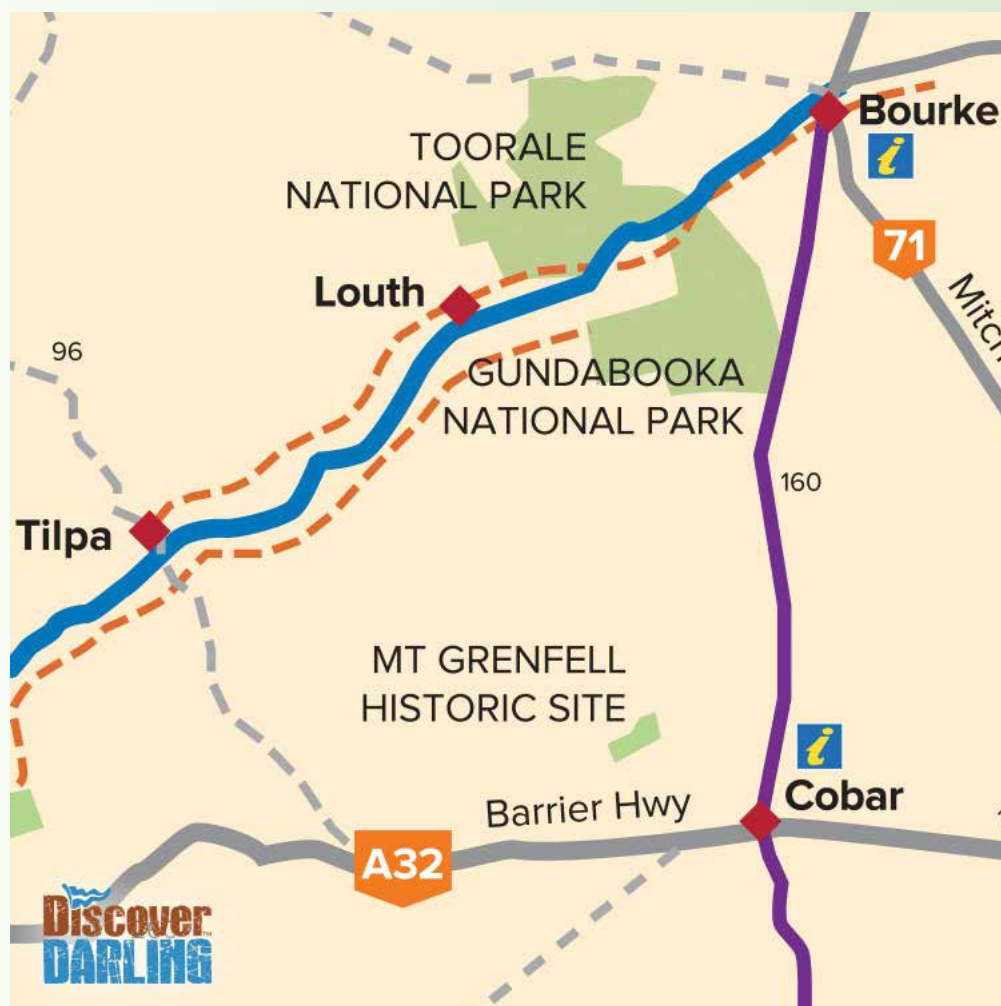
Sadly, I knew the shallow water at the site mostly would be dried up in a few days if there was no more rain (which ended up being the case), so any eggs produced at this breeding mecca would have been lost – a common story for western-breeding frogs, unfortunately. No doubt they will have had more rain since we

left though, given the wet weather trends during that time and the current spring rains.

Overall it was a great trip with a good list of reptiles, frogs, birds and mammal sightings, plus many invertebrates (they bombarded us in the homestead every night!). One of the most interesting reptiles was a Black-headed Monitor (*Varanus tristis*), a very uncommon western tree-dwelling species. And there were a large number of Red Kangaroos, and also Western Grey Kangaroos and even some Wallaroos. An absolute wonderland of wildlife I hope to see again in the future!

Thanks to Kelly Nowak (AHS) for organising this trip and to the great group of people who went along from both States, making it such a good time for all.

All photographs other than Redbank Homestead taken by Marion Anstis. Map image online source: MurrayRiver.com.au



Gundabooka NP, situated between Bourke and Cobar on its eastern border and Bourke and Louth at the north-western end.

A Crazy Idea That Just Might Work: How understanding the Genetic Underpinnings of Resistance may Restore Southern Corroboree Frogs

Tiffany A. Kosch

One Health Research Group, Faculty of Veterinary and Agricultural Sciences, University of
Melbourne, 250 Princes Highway, Werribee, VIC 3030



A captive Southern Corroboree Frog (*Pseudophryne corroboree*)

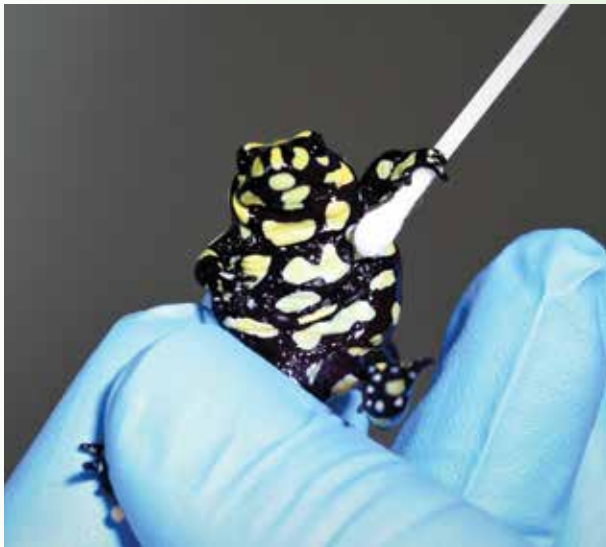
Corey Doughty

Southern corroboree frogs (*Pseudophryne corroboree*) are one of Australia's most threatened frogs. This species was driven to near extinction after the emergence of the fungal pathogen *Batrachochytrium dendrobatidis* (Bd) in Australia. Luckily, these frogs were saved from extinction by the foresight of zoos and conservation practitioners, who set up a conservation program to breed this species in captivity and reintroduce them to the wild.

The next big challenge for Southern Corroboree Frogs is restoring them to the wild if the Bd-pathogen cannot be eradicated.

My research group at the University of Melbourne is investigating options to allow these beautiful little frogs to survive in the wild alongside the Bd-pathogen. Luckily for us, we don't have to reinvent the wheel as we expect the same methods that have been used for millennia to selectively breed livestock and companion animals should work in frogs. We are also investigating the feasibility of using innovative approaches such as genetic engineering to increase immunity if we don't find enough natural resistance in the species.

We have coined our adaptation of these



A Southern Corroboree Frog getting tested for Bd
Corey Doughty



Frogs being inoculated with the Bd-pathogen
Tiffany Kosch

approaches from agriculture and biomedicine to conservation, Targeted Genetic Intervention (TGI). TGI works by increasing the incidence of alleles that increase Bd-resistance in populations by approaches such as artificial selection, genetic engineering, or translocation.

Before we can test how well TGI approaches work for improving Bd-resistance in frogs, we first must increase our understanding of the genetic basis of resistance to the disease. In September of this year, we began the first study to do exactly this.

University of Melbourne PhD student, Miki Davidson, is leading a project that involves infecting juvenile Southern Corroboree Frogs with the Bd-pathogen. Miki will monitor the frogs for progression of disease and compare the genetics of frogs that are more resistant to those that are susceptible to identify alleles unique to the resistant frogs.

What Miki finds may be critical to improving survival in this species. Once we understand the genetic basis of immunity, we will begin testing what TGI approach works best. This



Our laboratory setup for studying the genetic basis of Bd-resistance

Tiffany Kosch



Captive adult Southern Corroboree Frog

Corey Doughty



Southern Corroboree Frog enclosures in Kosciuszko National Park

Michael McFadden

will involve generating TGI frogs and testing if the approach increases their resistance to the Bd-pathogen.

Evaluating TGI-frogs for eventual release in the wild will be a long process. Once we have evidence of efficacy, we will screen the TGI frogs for any off-target effects that may have resulted from the TGI method. These may occur if the alleles we selected for in our approach have unforeseen effects (for example they might make the frogs more susceptible to other diseases), or if the TGI method induces random mutations in the frogs' genomes.

If our frogs pass all these checks, we will then evaluate if the frogs can survive in the wild in the presence of natural pathogens and environmental stressors. This will initially be done in outdoor enclosures such as the ones shown here. Eventually, TGI frogs may be released in the wild if they pass all the necessary checks of efficacy and risk.

Preparation to release TGI-frogs also has a large social component. We will need to ensure that all impacted communities and stakeholders are on-board with this approach. We will also ensure we have regulatory approval necessary for their release. This will be more challenging if the frogs are modified using genetic engineering approaches. Although approaches such as TGI have yet to be applied for conservation, they are being

considered in species including American Chestnut Trees and corals threatened by climate change. Regulatory approval in these other species may help pave the way towards such approval in frogs. Although our program faces significant hurdles, we feel that it's worth the effort given that it may provide a means for one of Australia's most charismatic amphibians to again survive in the wild.

More information

Kosch, T. A. (2022). Some endangered species can no longer survive in the wild. So should we alter their genes? *The Conversation*.

Kosch, T. A., A. W. Waddle, C. A. Cooper, K. R. Zenger, D. J. Garrick, L. Berger, and L. F. Skerratt. (2022). Genetic approaches for increasing fitness in endangered species. *Trends in Ecology & Evolution* 37:332–345.

Acknowledgements

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Captive adult with two unhatched tadpoles

Michael McFadden

Giant Burrowing Frog Breeding Event in the Blue Mountains, post 2017–2019 Drought

Vic Giniunas



Giant Burrowing Frog (*Heleioporus australiacus*)

Marion Anstis

Lower Blue Mountains, 23 May 2020. The drought and bushfires had since passed and we had experienced several months of decent and at times heavy rainfall. Myself and some bushwalking friends were about to explore a small creek with the possibility of finding aboriginal axe grinding grooves and maybe some rock engravings.

We dropped off the ridge and made our way down the gully. Eventually the creek started to take shape and we came across the first pools. Masses of large, dark tadpoles were disturbed as we approached.

Monica turned to me, “OK frog boy, what do you reckon they are?”

“Probably Striped Marsh Frogs,” was my reply.

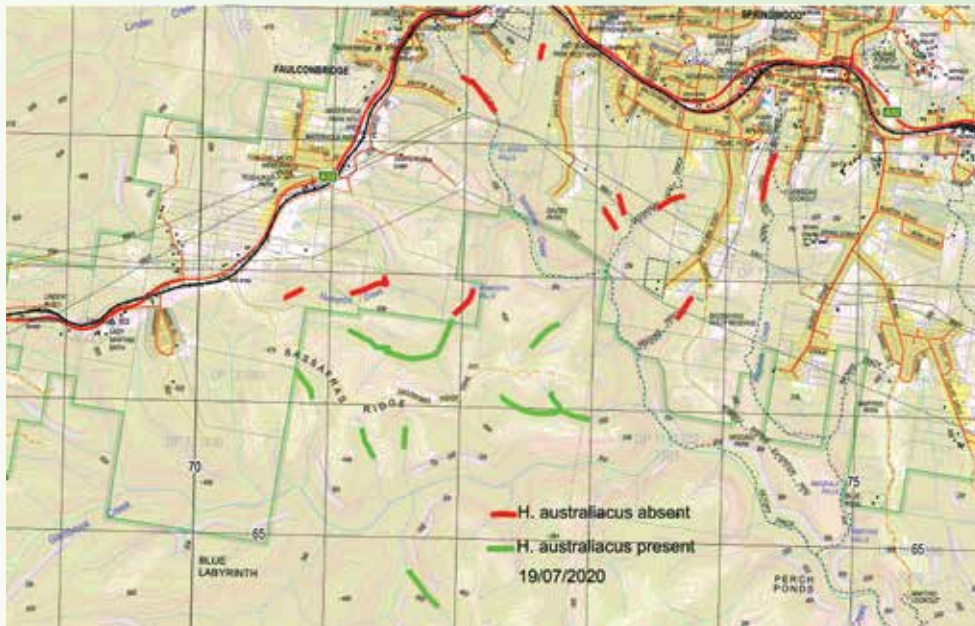
Monica was not convinced. “They’re a bit big don’t you think?”

She was right. They were big. The thought of squash balls with tails crossed my mind! Well, maybe not that big! Then I noticed the blue-grey sheen on their underside. Definitely not stripeys. But

what could they be? Definitely from a large frog. Southern Barred Frog (*Mixophyes balbus*) perhaps? I knew they had been recorded in the mountains in the past. I also knew they were more likely to be found in rainforest or wet sclerophyll forest. Whereas where we were now was dry sclerophyll woodland.

We descended the creek for another hour or so and in every pool it was the same. Swarms of fat tadpoles scurrying as we approached. I’ve been exploring the Blue Mountains for over 25 years and never had witnessed anything quite the same.

Back home that evening, I consulted my copy of “Tadpoles of South Eastern Australia” by Marion Anstis, and soon found a candidate that ticked all the boxes in terms of appearance and habitat. The Giant Burrowing Frog (*Heleioporus australiacus*). Could not be anything else. They are listed as vulnerable and here there were squillions of their tadpoles in one of my local creeks! This got me quite excited, and prompted me to go out and check other creeks in the area.



Map of Blue Mountains showing sites where tadpoles of the Giant Burrowing Frog tadpoles were found. Vic Giniunas

Through the winter of 2020 I made mini expeditions to the upper sections of most creeks around Springwood and some further afield. A pattern soon emerged. All the first and second order streams with “pristine” catchments, carried large populations of GBF tadpoles, whereas they were glaringly absent in the streams that had even a small amount of urbanisation high up. The tadpoles were still there in numbers throughout 2020 and most of 2021. How many generations this represented I don’t know.

5 June 2022. I’ve returned to one of the pools that had had large numbers of tadpoles the previous two winters. Now there were none. The big breeding event of 2020–2021 appears to have run its course.

What triggered it in the first place? This area had escaped the bushfires so it could not be a response to that. To me it seems the real reason was the extraordinary dry period of 2017 to 2019 followed by torrential rains in early 2020. Thus, like flowers blooming in the desert, so did our Giant Burrowing Frogs respond to the improved conditions. It’s nice to believe our GBF’s have at least had a big population boost.

It may be some time before we witness such an event again and while I’d dearly love to, I’m in no hurry to live through another dry period with the threat of bushfires, if that’s what it takes to make it happen!



Giant Burrowing Frog tadpoles Vic Giniunas



Giant Burrowing Frog tadpole size Vic Giniunas

Lamington National Park

Rob Burns, Ken Griffiths and Karen Russell



View of the Lamington National Park from O'Reilly's Guest House

Ken Griffiths

O'Reillys Guesthouse resort, and the whole of Lamington National Park in south-eastern Queensland, is probably one of the best birdwatching spots in Australia. It also just happens to be a great place for frogs, reptiles, subtropical rainforest plants and mammals.

Ken Griffiths, Karen Russell and I have been visiting O'Reillys and the Lamington National Park together for many years now. I first visited in 1971 during a Scout jamboree after being fascinated with the 1937 Stinson airline disaster, where a plane crashed in the Border Ranges and survivors were rescued by the owner of the property, Bernard O'Reilly. My Dad had kept newspaper clippings of the reports from when he was a child. It was a fascinating story of discovery and resilience and bush skills. It was even turned into a film in 1987.

Since then I have been back numerous times, as has both Karen and Ken. It is a

photographer's paradise. All the trips have been memorable in some way, as there is always something different going on.....

We won't mention the infamous trip down the windy mountain road with no brakes though.....that is another story for another time!

Anyway, during late 2019 BC.... (before Covid), Karen and I booked another trip up there as she wanted to take her dad Bill, who had been a bit poorly, up there for a spot of birdwatching. We decided to book a couple of guesthouse rooms for September 2020. As we all know, Covid hit in February 2020 and subsequently, the world went mad, the border to QLD closed and we all went into lockdown. During July/August it appeared we were not going to be able to go, so we postponed the trip till mid-October, hoping that Covid related things would ease up.....they didn't.



Litoria pearsoniana, Woolgoolga

Ken Griffiths



Lechriodus fletcheri Woolgoolga

Ken Griffiths

So we rescheduled for December, even though it wasn't an ideal time to go up there, and luckily the borders reopened about a week before, so, off we went!

Our usual agenda when travelling north is to drive to Woolgoolga the first night and stay over. There is a terrific little state forest walk that Ken and I do every time we travel up that way and it always produces plenty of frog photography opportunities. We regularly see *Litoria peronii*, *L. caerulea*, *L. fallax*, *L. pearsoniana*, *Adelotus brevis*, *Lechriodus fletcheri*, *Crinia* sp, *Pseudophryne coriacea*, *Limnodynastes* and *Mixophyes* species. There are also glowworms, Diamond Pythons, Small Eyed Snakes, Rough Scaled Snakes and Angle Headed Dragons to be seen.

With our spotlighting done and dusted and many photographs taken, the next morning we

hit the road to Lamington National Park. The road up to the Lamington Plateau from Canungra is a very steep, very windy and narrow strip of unsealed road with lots of blind corners and very, very steep unprotected roadside dropoffs.....not the sort of road to have catastrophic brake failure on!

We arrived mid afternoon and got settled in our rooms and went off for a beer or two and to check the surroundings. There are a lot of easy relatively level walks in the area and some more challenging ones too, depending on your fitness.

We went for a stroll along the Booyong Track, adjacent to the guest accommodation, and saw a few species of birds that are regulars to the area, such as Riflebirds, Yellow Robins, Whipbirds, Catbirds, Regent and Satin Bowerbirds, Albert's Lyrebirds and lots of smaller birds.



Adelotus brevis (male)

Ken Griffiths



Litoria wilcoxii (female), Woolgoolga

Ken Griffiths



Mixophyes iteratus pair in amplexus

Ken Griffiths

These are regularly fed by the guests and local guides, so are easy to approach and photograph.

After dark we headed off for our first spotlight walk. It had been reasonably dry so we didn't expect much in the way of frog action, but almost immediately we came across a *Myxophyes fleayi*, sitting on the track. We also saw some giant land snails, and an Angle Headed Dragon.

During the days there are plenty of walking tracks to explore, and during certain times of the year they have a free flight bird show, which is a great opportunity to get some birds in flight photos. The next night we decided to redo a walking track we had explored during the day. The Wishing Tree Track leads from the guest house accommodation down a steepish winding track to a Morans Creek at the bottom. We were hoping for some frog action and weren't disappointed. Firstly on the upper



Red-eyed Tree Frog

Rob Burns



Lamington Crayfish

Ken Griffiths



Juvenile Wedge-tailed Eagle

Rob Burns

section of the track we became surrounded by fireflies which is a very cool experience. When we reached the creek, we were stunned by eye-shine everywhere, as there were hundreds (if not more) *Mixophyes fleayi* in the creekline. There were also plenty of the supposedly elusive Lamington Crayfish, a stunning, blue, white and red crayfish only found in this area and other localised areas above 300m in elevation. I had seen the occasional one on some previous trips, but on this night they were everywhere. This section of the walk also has a large overhang area which is inhabited by glow worms so it is well worth the walk.

The next day we visited the orchid gardens, a part of the resort which was created by the O'Reilly's groundskeeper/gardener (beginning in the 1950s) from all the plants brought down by storms in the area. Many years later the garden still has some surprises in store. A big family of Land Mulletts live there, and are easily photographed. Also we spotted Red Bellied Black Snakes, and an abundance of Richmond River Birdwing butterflies which would also normally be a rare sight.

In the afternoon the Free Flight Bird show showcased Barking Owls, (my favourite), Barn Owl, Nankeen Kestrel, Kites, a Wedge-Tailed Eagle and a few other raptors.

The early morning "guided" bird walks are always interesting as you can hand feed and photograph a variety of bush birds that have been accustomed to a feed from the rangers and guests. We saw Whipbirds, King Parrots,



Karen Russell feeds Regent Bowerbirds

Marie Callins

Crimson Rosellas, Eastern Yellow Robins, Satin and Regent Bowerbirds, Brush Turkeys, Prince Albert Lyrebirds and numerous others.

The next night was sort of a repeat of previous nights, but there's always something new. Red-Eyed Tree Frogs and Rough Scaled Snakes were the order of the night...

The next day it was time to pack up and begin our journey home. Lucky we left when we did as the next day the borders closed again. We were "lucky" to escape.

Another night at Woolgoolga presented us with more frog species to photograph and a few leeches as well. The joys of lying on the ground taking photos in the rain....

So if you get the chance, and you are interested in frogs, birds and wildlife photography, you have to pay Lamington National Park a visit!



Mixophyes fleayi

Rob Burns





Salmon-striped Frog
Limnodynastes salmini

© David Flack

FATS Frog-O-Graphic



BEST IMAGE: Above: Two male Tyler's Tree Frogs, *Litoria tyleri*, fighting for dominance Brad McCaffery

Competition WINNERS



MOST INTERESTING IMAGE: Above: Sleeping Australian Lacelid, *Litoria dayi*

Josie Styles

MOST INTERESTING IMAGE: Below: Wotjulum Frog, *Litoria wotjulumensis* in stream

Rachael Melrose



Frog-O-Graphic Winners



BEST PET IMAGE: Above: Tasmanian Tree Frog *Litoria burrowsae*

Craig Broadfield

ADDITIONAL ENTRY: Below: Underside of *Litoria burrowsae* laying eggs

Craig Broadfield



Frog-O-Graphic Winners



BEST IMAGE: Above: Salmon-striped Frog, *Limnodynastes salmini*

David Flack

BEST PEOPLES' CHOICE IMAGE: Below: *Litoria barringtonensis*

Michelle Toms



James Fowler Wilcox and his Eponymous Frog *Litoria wilcoxii*

Glenn Shea

Sydney School of Veterinary Science, University of Sydney, NSW

The Australian frog fauna includes many species which honour early naturalists and zoologists in their names. Among these is *Litoria wilcoxii*, a species described by Albert Günther of the British Museum in 1864 as *Hyla wilcoxii*. The name spent many years in the synonymy of *Litoria lesueuri*, but was resurrected when Donnellan and Mahony (2004) divided that species into three.

A Mr Wilcox was noted by Günther as the collector of the specimens he based the species name on, obtained from the Clarence River, and still preserved in what is now the Natural History Museum of the United Kingdom. But who was Wilcox, and why was he collecting frogs from the Clarence River to be sent to London?

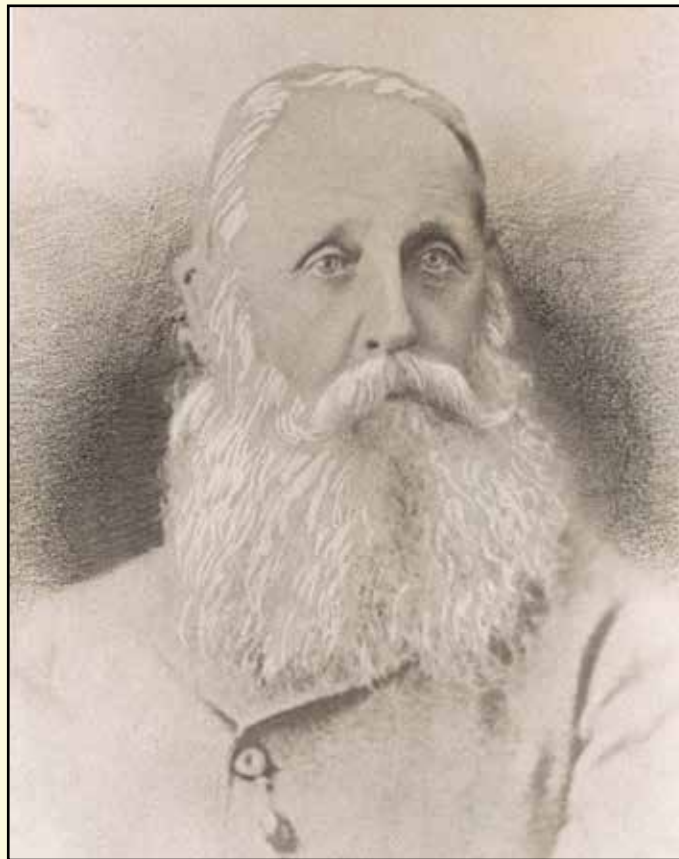
James Fowler Wilcox was a significant figure in early Australian natural history, though now largely forgotten.

His date of birth is uncertain. While several sources concur that he was born in Somerset, England in 1823 (an obituary gives the date of birth as 2 February, 1823 (Anon 1881)); his tombstone in South Grafton Cemetery gives his age as 58 years 6 months on the date of his death on 11 July, which would give a birth date of January 1823 or the previous month; Maiden (1908) repeats

the date as 2 February 1823, and Halliday (2017) gives the date as 1823, the latter author noting that he was the son of a “journeyman carpenter” (1823 is also given as the year of birth in several online family trees on ancestry.com). Online baptismal records from Somerset give the only James Fowler Wilcox in Somerset as baptized on 18 March 1818 at Evercreech, Somerset, the son of James Wilcox, a gatekeeper, and his wife Mary of Pecking Mill, with three other children to the same couple: Frederick, born about January 1816 (baptism certificate 31 June 1816 at Pilton, Somerset, with James being described as a carpenter of Bruton); George (born March 1820; baptism 11 January 1821 at Pilton, with James being described as a carpenter of Wincanton), and Louisa Melina (baptized 31 March

1822 at Pilton, with James being described as a carpenter of Pilton). This would fit with the description of his father as a journeyman carpenter (Halliday 2017), but the dates are five years earlier. It is possible that the 1818 James Fowler Wilcox died young, and the couple had a second child given that name for whom there is no extant baptism or birth record.

Assuming the latter, his father died in August 1828 at Pilton while James Fowler Wilcox was still a child. Maiden (1908) reported that James Fowler came to



James Fowler Wilcox Image from the archives of the National Library of Australia

Australia in 1823, while still in his infancy. This is presumably the source from which Beolens et al. (2013) claim the family came to Australia in that year, but is contradicted by his obituary (Anon 1881), where the young James Fowler Wilcox is described as having had “the ordinary curriculum of studies” after which “he, at the age of 16 years, chose Natural History for special study, and was under the tutelage of the Bishop of Norwich”. Halliday (2017), his great-great-granddaughter, stated that he was employed as a groom by the Bishop.

Edward Stanley, the Bishop of Norwich, had a long-term interest in natural history and was, during the period 1837–1849, the President of the Linnean Society of London. It was presumably through the Bishop that James Fowler Wilcox was introduced to Captain Owen Stanley, the Bishop’s son. Possibly as a result of the Bishop’s connections in science along with a desire to have a personal natural history collector in a position to add to his own collections and those of local museums under his patronage, it was arranged that James Fowler Wilcox would accompany Owen Stanley on his voyages. Initially, James was aboard HMS Blazer, commanded by Stanley in 1845 (Anon 1881; Maiden 1908), during which time the paddle steamship accompanied the beginning of the final, fatal, voyage of Sir John Franklin to the Arctic, towing Franklin’s ship, the Erebus, to the Orkney Islands, after which time the Erebus departed under its own power, never to be seen again.

The following year, Stanley was given command of the ship HMS Rattlesnake, commissioned to conduct surveys of the Queensland and New Guinea coast. Again, it was arranged for the young Wilcox to join the voyage, with the official duty of carpenter’s mate and responsibility for maintaining the captain’s cabin, but unofficially to make collections for the Bishop and for the Norwich, Ipswich and

Kings Lynn Museums (Halliday 2017). The voyage also had an official naturalist, John MacGillivray, who had experience with naval surveys in the region, having been naturalist aboard the earlier surveying voyage of HMS Fly (1842–1846), and who had only just returned to England at the time the Rattlesnake sailed, and another up-and-coming naturalist, Thomas Henry Huxley, who would later become a major figure in zoology as the champion of Charles Darwin’s theory of Natural Selection. Huxley’s official position was Assistant Surgeon.

All three were still young when the Rattlesnake left Portsmouth on 3 December 1846: MacGillivray, the eldest, was just about to turn 25; Wilcox was 23, and Huxley just 21. Travelling via the usual Indian Ocean route to Australia, the Rattlesnake stopped at Rio de Janeiro, Mauritius and Hobart, then Sydney, arriving there in July 1847 (MacGillivray 1852). The Rattlesnake would use Sydney as a base for several surveys of northern waters: the first between October and December 1847 to Queensland; the second from April to December 1848 to Queensland, Torres Strait and Port Essington (which Owen Stanley had previously visited aboard the Britomart, when that settlement was established; West 1867), and finally to New Guinea and the Louisiade Archipelago between May to Decem-

ber 1849 (MacGillivray 1852; Anon 1881; Huxley 1935). Stanley grew increasingly worried about the risk of attacks from the local tribes and allowed only limited access by the naturalists to land-based collecting sites, something that increasingly frustrated Huxley (Huxley 1935; Desmond 1994). However, they were able to spend three weeks ashore at Rockingham Bay with Edmund Kennedy’s overland expedition, the Rattlesnake having accompanied and supported the ship that brought that expedition to its starting point (MacGillivray



Look familiar?! Author Glenn Shea in the laboratory at the Australian Museum. Jodi Rowley

1852; Anon 1881; Desmond 1994; Halliday 2017). Luckily, none of the Rattlesnake naturalists were able to get permission to accompany the expedition itself on its trek to Cape York, during which most of the members perished.

The long shore periods in Sydney between surveys led to romance for the naturalists. During the first visit in 1847, Huxley would meet and fall in love with his future wife and life partner, Henrietta (Nettie) Anne Heathorn, although they would delay their marriage until 1855 (Desmond 1994). MacGillivray married Sydney girl Williamina Paton Gray, in 1848 (Calaby 1967), while during a break in the survey in early 1849, James Wilcox would meet his future wife, Mary Ann West, the daughter of a well-known Sydney resident and landowner, Obed West (Curnow 2005; Halliday 2017).

Shortly after the Rattlesnake returned to Sydney in early 1850, following the final survey of New Guinea waters, Captain Owen Stanley died after a prolonged debilitating illness, and James Wilcox took the opportunity to leave the expedition, settling there with his new wife, marrying her on 3 February 1851 in Paddington with her father Obed and eldest sister Sarah as witnesses (NSW Marriage Records).

Wilcox set up business as a natural history dealer in Sydney, initially at a house in William Street, Woolloomooloo (Wilcox 1851a), but after 8 months, he had moved to a shop at 30 Hunter Street (Wilcox 1851b). He was one of several animal dealers on the street, buying not only taxidermy specimens of mammals and birds, but also live animals, operating the premises as a menagerie and museum and including imports of exotic animals (Halliday 2017).

A bizarre variety of live animals were imported and advertised to bring the crowds to his shop: firstly a “boa constrictor lately received from India”, likely an Indian or Burmese Python (Wilcox 1852), then about two and a half years later a young orangutan (2 feet high and “quite free from vice”; Anon 1854a). Two years after acquiring the orangutan, Wilcox advertised for sale a pair of live eagles (Wilcox 1856a) and a few days later was advertising for viewing in his shop the “boa”, orangutan, the two eagles, along with an emu and some black swans (Wilcox 1856b). The following year saw the arrival of a cheetah in June (Wilcox 1857a), and just two months later, a cassowary (Anon 1857a).

On top of his business interests, Wilcox was heavily involved in pigeon shooting. Earlier described by MacGillivray (1852) as the best shot among the three Rattlesnake naturalists, Wilcox was frequently mentioned in shooting club news in the Sydney press, and kept up a sideline of gun sales from his taxidermy business. On one occasion he suffered a major injury, losing the end of his thumb while unloading a gun after a competition. The report suggests he was lucky not to suffer more serious injury – the blast resulted in the shattered bones from his thumb being lodged in his face and requiring surgical removal (Anon 1854b).

The expansion of the business led to him taking on a partner, with the business being renamed J.F. Wilcox and Co. in August 1856. However, even this did not improve the situation for long. In 1855, with health issues, Wilcox had accompanied his father-in-law on a visit to the Clarence River and decided to move there permanently (Anon 1881; Halliday 2017). Breaking the partnership with John B. Turner to return the business to his own control in October 1857 (Anon 1857b), he then sold it to a Mr W. Allan in December (Anon 1857c). Allan kept it going for another six months. In January, he was still advertising the cassowary for viewing, plus an African lion (Allan 1858), but on 23 June 1858, the entire stock was sold at auction (Anon 1858a).

Wilcox moved with his wife and three surviving children (the first child, Owen, died in infancy) to the Clarence River in 1858 (Anon (1881) reports the year as 1857, and Halliday (2017) reports it as late 1859, but in February 1858 he was still living in his property at Rushcutters Bay (Wilcox 1858) and the property and all contents were advertised for sale by auction a month later (Anon 1858b).

With money from the sale of his Sydney properties, Wilcox was able to speculate on land sales in the recently named Grafton (first named in 1851), building his wealth. However, his primary residence was a property and house “Dallinga”, on land overlooking Cowans Creek and the Clarence River, where he developed extensive gardens and orchards, including native species received in exchange from the Melbourne Botanic Gardens, where Sir Ferdinand von Mueller was keen to obtain specimens of the Clarence River flora (Halliday 2017). He also continued to trade animal specimens, both to Australian institutions such as the Australian Museum and to buyers in England, including one collection to the Carlisle Museum (Anon 1862a).

Within a few months of arriving, he was sending specimens to the Australian Museum. These included insects (Anon 1859a), fish, snakes and frogs (Anon 1859b), a grey kangaroo and two jacanas (Anon 1859c), pygmy geese (Anon 1859d) and lizards and snails (Anon 1859e).

It was presumably the frogs from 1859 that were subsequently sent by Gerard Krefft, the new curator of the Australian Museum, to Günther at the British Museum. Günther (1864) credits Krefft as the donor of the types of *Mixophyes fasciolatus* and *Hyla wilcoxii*, while noting that the two syntypes of the latter species were collected by Wilcox. One year earlier, Günther (1863) had reported on frogs donated by Krefft, which included three other species from the Clarence, described by Günther as *Limnodynastes affinis* (now *L. tasmaniensis*), *Platyplectrum marmoratum* (now *Platyplectrum ornatum*), and *Cryptotis brevis* (now *Adelotus brevis*). The specimens were originally registered in the British Museum as parts of three blocks of mixed reptile and amphibian specimens from a variety of localities received from Krefft, 62.10.26.1-5, 63.6.16.1-100 and 64.7.6.1-36 (indicating they were registered on 26 October 1862, 16 June 1863 and 6 July 1864). It is likely that all five species are based on specimens collected by Wilcox.

A second collection of frogs from Wilcox, identified as *M. fasciolatus*, *H. wilcoxii* and *C. brevis*, was donated to the Australian Museum in May 1864 (Anon 1864). As they were identified under those names in the May list, Krefft must have already received information about the names Günther would be using. While the descriptions of *Hyla wilcoxii* and *Mixophyes fasciolatus* were not published until July 1864 (Duncan 1937), the paper was presented at the meeting of the Zoological Society of London on 9 February, giving just enough time for Günther to have sent the information to Krefft by mail. Günther (1872) would later also describe the skink *Chelomeles reticulatus* (now *Coeranoscincus reticulatus*) from a specimen (62.10.23.1) sent by Krefft with the locality Clarence River. This, along with other reptiles and frogs with that locality sent by Krefft between 1861 and 1864, are likely to have been originally collected by Wilcox.

In these early years in Grafton, Wilcox was also involved in a scheme to introduce Clarence River Cod (*Maccullochella ikei*), a species then thought to be the same as the Murray Cod, to Sydney, a proposal encouraged by the Acclimatisation Society of New South Wales. He had discovered the species

in 1859, sending a large specimen to the Australian Museum (Anon, 1859f). Between 1862 and 1863, he shipped what was claimed to be 5000 young cod to Sydney in several batches, where they were released first into ponds at the Botanic Gardens, and later directly into the Nepean River by the Acclimatisation Society. However, some doubt was expressed that these were all cod, with MacGillivray expressing the view that they were gobies, a view rejected by Wilcox (Anon 1862b,c; 1863a,b; MacGillivray, 1863a,b; Wilcox, 1863).

In August 1864, MacGillivray joined Wilcox in Grafton, and the two set up a partnership for the next two years (Iredale 1937). On one occasion in 1865, they travelled by horse 130km to Casino and then Lismore to collect specimens over three months, a trip that was documented by MacGillivray in the local and Sydney press (MacGillivray 1866). Other details of their time together are provided in correspondence between MacGillivray and Edward Pierson Ramsay in Sydney, published by Iredale (1937). Their joint collections culminated in a large Clarence and Richmond Rivers display at the 1866 Intercolonial Exhibition in Melbourne, and they shared medals for both the “large collection of natural history” in Class II Section 6, and also for “an excellent collection of stuffed kangaroo and bird skins” in Class II Section 4A (Furs, silks and feathers). MacGillivray also received honorable mention for “very superior specimens of ring-tailed and brush opossum skins” (Anon 1867). Wilcox travelled to Melbourne as the Commissioner for the district and took the opportunity to sell surplus skins and mounted specimens while there (Wilcox 1866; Iredale 1937).

For his work for the New South Wales Committee, both for the Melbourne Exhibition and the subsequent Paris Universal Exhibition of 1867, he received a silver medal (Anon 1870). MacGillivray meanwhile returned to Sydney, and died there on 6 June 1867 of a heart attack, possibly exacerbated by asthma (Calaby 1967).

Following the Exhibitions, Wilcox appears to have moved away from natural history trade (although Maiden (1908) reports one final expedition to New Guinea in 1876 with a son to collect birds and plants). He would become an important figure in Grafton society, becoming a magistrate in 1869 (Anon 1869a) and a trustee for the South Grafton cemetery, the public school and the racecourse (Anon 1869b; Halliday 2017).

He was also instrumental in the establishment of Susan Island in the Clarence River as a wild-life sanctuary, now Susan Island Nature Reserve. Wilcox spent much time there, recording 127 bird species along with numerous insects and molluscs (Anon 1870b). With the effects of cedar logging already apparent, Wilcox pushed for the residual rainforest on the island to be protected, becoming one of the five initial trustees of the reserve (Forster 1870).

As well as numerous interactions with members of the zoological and botanical communities, Wilcox also befriended the poet Henry Kendall (author of the classic poem “Bell-birds”, among others) while he was living in Grafton in 1861-62, with Kendall becoming godfather to one of Wilcox’s sons (Halliday, 2017).

Wilcox and his wife had a large family, with 13 children born between 1851 and 1874, 11 surviving to adulthood. James Fowler Wilcox died of pneumonia and asthma on 11 July 1881, aged 58, leaving “Dallinga” to his wife, to be divided on her death between his 11 surviving children (Halliday 2017). Wilcox is buried in the South Grafton Cemetery that he was a trustee for over many years. The property “Dallinga” remains, at 279 Ryan Street, South Grafton (Gardiner 2010).

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Eastern Stony Creek Frog, *Litoria wilcoxii* George Madani

When Are Frogs Not what they seem to be? The Story of “Anstisia”

Grant Webster



Habitat of *Geocrinia laevis*, Cradle Mountain, Tasmania

Grant Webster

In 1973, a group of small ground-dwelling Australian frogs were officially recognised as distinct from the well-known and widespread genus *Crinia*, which we commonly know as ‘froglets’, given their small size. The new genus was named *Geocrinia* (“geo” referring to Earth, in reference to their terrestrial breeding habits which differed from the species of *Crinia*). *Geocrinia* species lay their eggs on land, while *Crinia* species (at least those species known at the time) laid their eggs in water.

While the *Geocrinia* and *Crinia* species look superficially similar as adult frogs – small, brownish, and usually non-descript – the differences between the two extended beyond egg deposition sites. Firstly, while *Crinia* tadpoles developed entirely in water (i.e. ‘standard’ aquatic development), the *Geocrinia* species

spent part, or all, of their tadpole development out of water. Secondly, while *Crinia* species were known from across Australia, in every state and territory from the driest and hottest to coldest and wettest environments, the *Geocrinia* were completely confined to the cooler and wetter areas of southern Australia – with two species in Victoria and Tasmania (and just into adjacent parts of eastern South Australia and southern New South Wales) and the three species known in 1973 from the south-west corner of Western Australia.

The life cycle (including egg laying sites and tadpole development) of the *Geocrinia* might seem very unusual for frogs, which are famous for their ‘amphibious’ aquatic tadpoles and terrestrial adults, but it is not as surprising as you might think. All around the world, dif-



Geocrinia laevis, Cradle Mountain, Tas Grant Webster



Geocrinia victoriana, Eden, NSW Grant Webster

ferent frog species have evolved various “life history strategies”, which are modifications on the ‘normal’ aquatic tadpole/terrestrial frog life cycle, with some species, known as “direct developers”, even foregoing the tadpole stage entirely – hatching from eggs on land as baby frogs! Further, within the frog family Myobatrachidae (which contains *Crinia* and *Geocrinia*); there are six distinctly different life history strategies among the 14 genera and 91 species.

For this reason the Myobatrachidae are most unusual amongst frogs, as within this family, all but two globally known frog life history strategies are represented, including some very unique and bizarre strategies such as the “paraviviparous” *Rheobatrachus* (the extinct gastric brooding frogs) – where tadpoles develop within the mother’s stomach, and the “exoviviparous” *Assa* (the hip-pocket frogs) – where males raise the tadpoles in tiny skin pockets (i.e. ‘pouches’) on their flanks. As a

general rule though, species within a single genus all have the same life history strategy, mostly..

Having a life history strategy in common within a genus is not a coincidence, as frogs in the same genus share recent ancestry and close evolutionary ties, as well as ecological adaptations such as behaviours, niches and environmental or physiological requirements. It only takes a quick look at any frog field guide to see that species within a genus have similarities in appearance, calls and tadpoles, compared to species in other genera. Well, except the spurious “genus” *Litoria*... so maybe don’t look at that one! [Hint: *Litoria* is ‘unfinished’ business in the scientific world, much like *Crinia* was prior to 1973!]

Since the *Geocrinia* species were separated from *Crinia* in 1973, two more species were discovered in south-western Western Australia



Anstisia lutea, Walpole, WA Grant Webster



Anstisia alba, Witchcliffe, WA Grant Webster



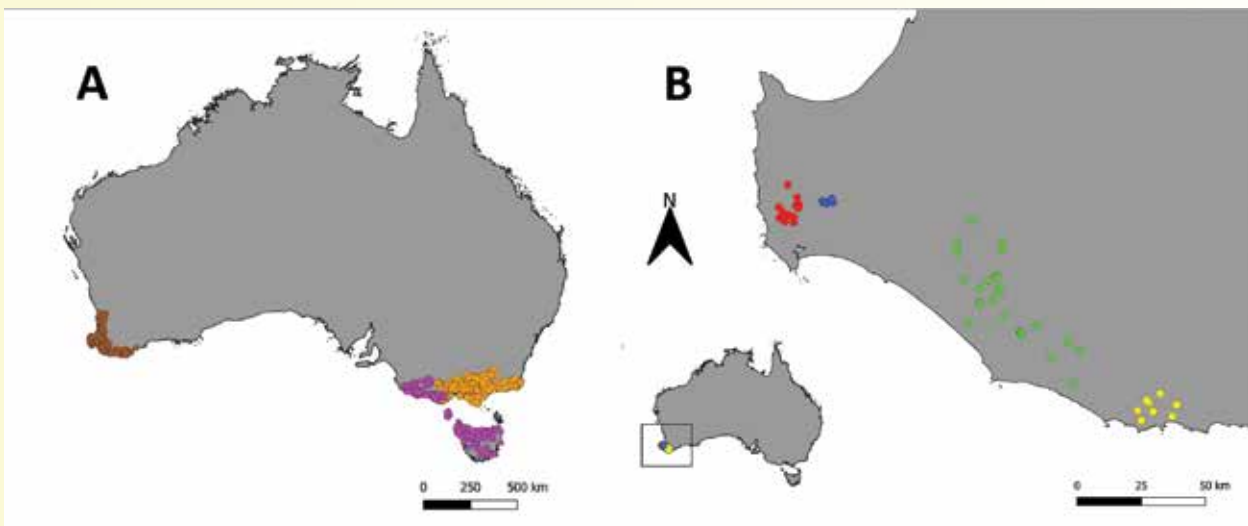
Swampy habitat of *Anstisia rosea*, Pemberton, WA

Grant Webster

and given the names *Geocrinia alba* and *G. vitellina*. With a total of seven species now in the genus, Western Australia appeared to be a ‘hotspot’ for these frogs. The south-west of WA is a unique area of global biodiversity significance, and many species found in that region are found nowhere else (i.e. ‘endemic’). It is also an important area for the Myobatrachidae family – eight of the 14 myobatrachid genera occur here, with five of these being endemic.

With the discovery of *G. alba* and *G. vitellina*, both of which were immediately recognised as threatened species given their very small distributions and restricted habitat, much scientific attention was turned to a group of four Western Australian *Geocrinia* species that became known as “the *Geocrinia rosea* group”.

These four species are extremely similar in almost every way (so much so that Mike Tyler



A = Distribution of the three *Geocrinia* species and B = the four *Anstisia* species

Ian Bool, Grant Webster

once considered *G. rosea* and *G. lutea* to be the same species!), including:

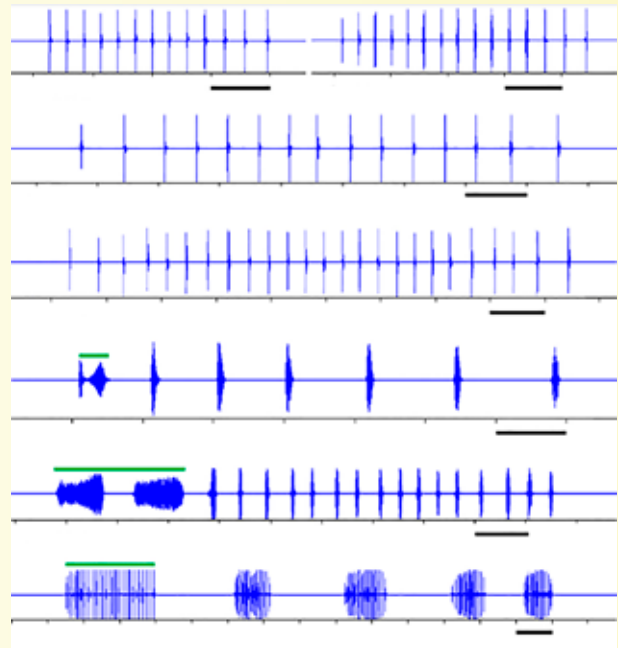
- call – a simple “tik” sound repeated in sequence
- reproductive season – spring breeding and calling, after seasonal winter rains
- geographic distribution – the south-west corner’s high rainfall zone
- habitat – seepages and damp gullies within forest
- tadpoles – very small in size and without feeding mouthparts; and significantly:
- a “nidicolous” life history – where tadpoles complete development within the “jelly egg nest”, never entering water, and are entirely nourished by yolk reserves in the gut.

The frogs are so much alike that the only obvious differences, other than the fact that no two species live in exactly the same area (i.e. they are ‘allopatrically’ distributed), is the belly colour of the adult frogs: white (*G. alba*), dark cream with yellow-brown (*G. lutea*), pink to reddish-orange (*G. rosea*), and egg yolk yellow-orange and white with (*G. vitellina*). If you know your Latin, you might notice that each of these species is actually cleverly named after their respective belly colour!

Now, what about the rest of the *Geocrinia*?

While the four *G. rosea* group species were initially subject to much interest due to their apparent rarity, the remaining three species, labelled as “the *Geocrinia laevis* group” also attracted much scientific interest (particularly the two eastern species), but for other reasons.

Unlike the *G. rosea* group, the species in the *G. laevis* group are not threatened and are commonly encountered across their broad distributions. The species were documented to have complex, highly structured calls, with distinctive “introductory” and “secondary” notes. These were ultimately established to serve different functions in one species (*G. victoriana*), with the introductory notes directed at other males to defend territory and the secondary notes directed at females for the purpose mate attraction. The call of the other eastern species (*G. laevis*), which has less distinction between the note types, was found not to serve the



Call patterns of *Anstisia* (*A. alba*, *vitellina*, *rosea*, *lutea*) top three lines and *Geocrinia* (*G. leai*, *victoriana*, *laevis*) bottom three lines, compared. The green bar in *Geocrinia* calls is the longer introductory note. Grant Webster

same dual function. The complex calls of these three frogs (including the western *G. leai*) were ultimately directly linked to male-male competition and access to mating opportunities in the species: the more polyandrous (i.e. where females mate with more than one male), the more complex the call.

As with the *G. rosea* group, the frogs in the *G. laevis* group are again very similar in almost every way:

- call – a multi-note complex biphasic structure
- reproductive season – autumn calling and breeding before seasonal winter rains
- habitat – ephemeral (i.e. temporary) ponds and pools along gullies or swamps
- tadpoles small in size with ‘normal’ aquatic feeding mouthparts; and significantly:
- a “terrestrial/aquatic” life history – where tadpoles develop initially within the “egg capsule” before hatching into water and completing development (as most tadpoles do) and feeding to sustain their growth.

Between these three species, the most obvious difference in the adults is the “biphasic” calls, with all featuring audibly different notes and arrangements, easily



Anstisia rosea calling male in burrow showing pink on expanded vocal sac. Pemberton, WA Marion Anstis



Anstisia rosea recently hatched tadpoles in liquid jelly within the small nest bowl Marion Anstis

distinguishing the species. The western *G. leai* also is visibly leaner in appearance relative to the eastern species, which themselves are not readily distinguishable by appearance. They also largely differ in distribution (i.e. are 'allopatric'), although *G. laevis* and *G. victoriana* overlap (i.e. are 'sympatric') in western Victoria where they also hybridise.

By about 2010, virtually all the biological and ecological 'facts' about the *Geocrinia* species were known and documented through research by various scientists, in particular Dale Roberts, Grant Wardell-Johnson, Murray Littlejohn, Graeme Watson, Angus Martin, Don Driscoll and Marion Anstis. The validity of the two species groups was well accepted in



Above: *Anstisia lutea* tadpoles in nests in sphagnum, Walpole, WA Marion Anstis

Below: *Anstisia lutea* with four legs, metamorphosing in one of the nests shown above Marion Anstis



Geocrinia leai recently laid eggs in reeds above a pond Marion Anstis



Geocrinia laevis recently laid eggs beneath damp leaf litter in dry pond later to be flooded Marion Anstis

the scientific literature, however by this time a more modern and increasingly important aspect of biological science, “molecular systematics” (commonly known as “phylogenetics” or simply “genetics”) was being used to describe and identify the evolutionary relationships between species.

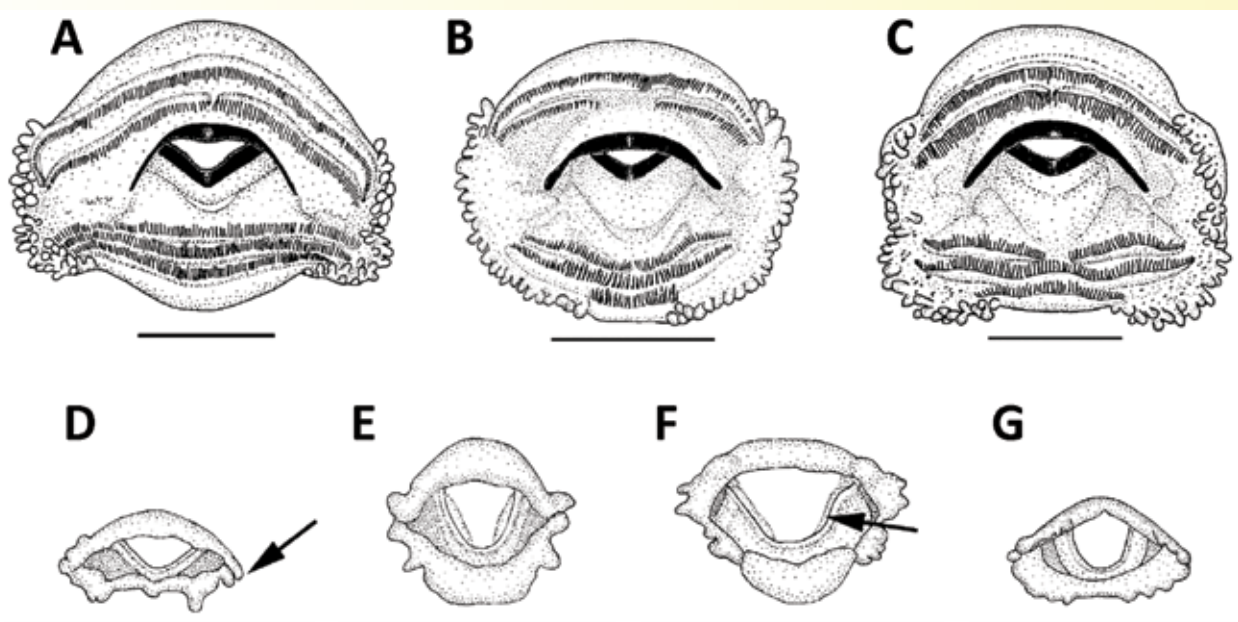
The genetic relationships between some of the *Geocrinia* species were initially examined in 1985, but it wasn't until 2001 when a thorough investigation of the phylogenetics of the myobatrachids was conducted. This study focussed on the relationships between *Geocrinia* and *Crinia*, aiming to establish whether *Geocrinia* was a “good” (or ‘viable’) genus.

Before the widespread application of molecular systematics, taxa (i.e. species, genera, families, etc.) were grouped by taxonomists based on apparent morphological, behavioural and ecological similarities. Genetics showed us that these old methods were not always correct. A “good genus” (or any taxa for that matter) must meet one strict requirement – genetic monophyly: i.e. where every species in the genus shares the same common ancestor.

The 2001 study confirmed that *Geocrinia* was monophyletic, and therefore a legitimate “good genus”. At the same time the monophyly of the *G. laevis* group was also established. However,

only six of the seven species were sampled in this investigation, and therefore the relationship of the excluded species, *G. lutea*, relative to the rest of *Geocrinia*, could not be determined. This issue was resolved a few years later, when in 2007 a genetic study of the *G. rosea* group was conducted, which clearly showed that *G. lutea* belonged in this group, and therefore the monophyly of both the *G. laevis* and *G. rosea* groups was unequivocal. The significance of this would not be truly appreciated for a number of years, and research on the *Geocrinia* was for the most part concluded.

Sometime around 2013, and somewhat catalysed by the publication of Marion Anstis’ ‘Tadpoles and Frogs of Australia’, I became quite interested in the *Geocrinia* species. I was familiar with the two eastern species, having seen both of them in the wild. I was also aware of the two “species groups”, but didn't know much about the Western Australian frogs. When I first read the *Geocrinia* section in Marion's book, and the paper she wrote on the life histories of *Geocrinia* in 2010, the differences between the two groups could not have been more stark – looking at the mouthparts of the tadpoles alone spoke volumes to me, and then the fact that one group had terrestrial nidi-colous development (which I naively used to think was ‘direct developing’) while the other featured terrestrial and aquatic development.



Mouthparts of the two genera compared: A–C = *Geocrinia leai*, *laevis* and *victoriana*; D–G = *Anstisia alba*, *lutea*, *rosea* and *vitellina* Bar = 1 mm Drawings from Anstis, 2013; Fig. 2, Grant Webster

This indicated to me that these two groups were in fact very different. I discussed this with my dear late friend, Aaron Payne, who agreed the differences were dramatic – we casually postulated that they probably were different genera and thought invariably this would be recognised.

I first visited Western Australia in 2013 hoping to see some *Geocrinia* while I was there. Not really knowing where to look or what I was doing, I had been inspired by frogging stories from an old friend, Adam Parsons, who had described the remote and challenging locations he had seen these frogs. It all sounded a bit much for me, but I did encounter *G. vitellina* on this venture, wandering off into a huge expanse of wet heath where I was surrounded by the endless, and disorienting, “ticking” sound of numerous frogs. Immediately I thought this frog was very different from *G. laevis* and *G. victoriana*, further convincing me the two groups could be two genera.

It wasn't until 2016 that I would next get to see *Geocrinia* in Western Australia. Aaron Payne had just returned from a trip to the south-west of WA with our mutual friend, Ian Bool, and they were fortunate enough to encounter all five of the local *Geocrinia* species on their travels – which facilitated me to visit areas where the frogs were; collecting information on their habits and habitat, as well as photographing the frogs when I saw them and record their calls. This would all prove to be highly valuable a few years later.

Ian Bool was also convinced the differences between the two *Geocrinia* species groups warranted further investigation, so one day I suggested we should write a paper separating the two into different genera, should the data and literature support our position. This was the beginning of our paper titled ‘A new genus for four myobatrachid frogs from the south-western Australian ecoregion’ that would later be published. The main differences in the groups – call (monophasic or biphasic), breeding season (spring or autumn), tadpole morphology (size and mouthparts), tadpole

biology (non-feeding or feeding) and life history strategy (nidicolous or terrestrial/aquatic) were all well documented in the literature and strongly supported our hypothesis. The critical and essential factor of genetic monophyly of the two groups (or “reciprocal monophyly”) however wasn't supported by the 2001 study (the only relevant genetic analysis I was aware of), until Ian brought the 2007 study to my attention. This was the last piece of the puzzle and we knew we had the evidence we needed to proceed – the two groups were justifiably two genera!

After preparing a draft of the manuscript I consulted Marion Anstis about our hypothesis and what we were planning, and she agreed the taxonomic change was appropriate, but was rather surprised when I told her we wanted to name the new genus after her! We had thought long and hard about what name the genus should be, both Ian and I preferred a descriptive name, rather than one honouring a person (an alternative name we considered, *Nidicola* – meaning “nest inhabiting”, was a very close contender), but we also thought that Marion's unparalleled contribution to our understanding of Australia's frogs and tadpoles deserved special recognition. Marion was also yet to receive acknowledgement in the scientific name of frog and we thought this was well overdue.

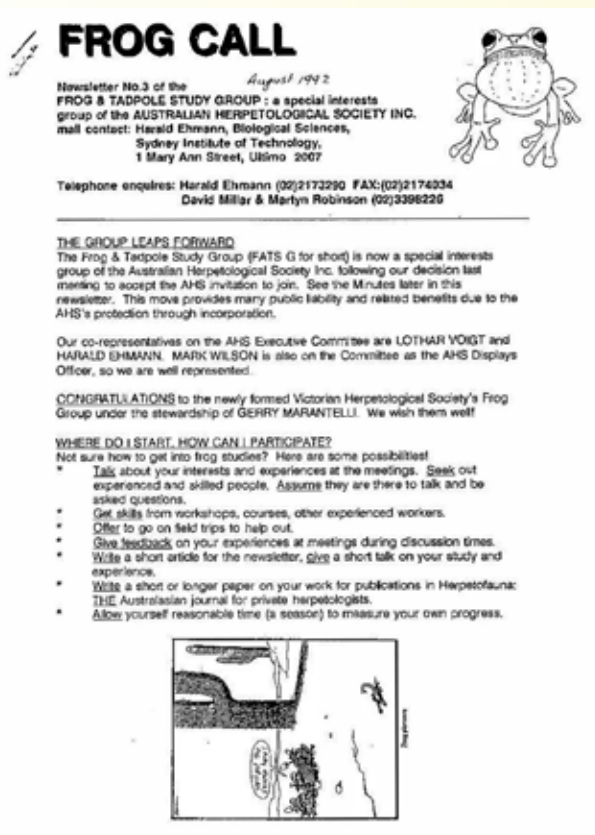
Eventually, Marion accepted the idea and gave us the okay to use the proposed name, recognising her in not one, but four, species of frogs: *Anstisia alba*, *Anstisia lutea*, *Anstisia rosea* and *Anstisia vitellina*! I'm sure all would agree that this is a very well deserved and prestigious acknowledgement of her contributions and work. And what could be more fitting than naming a genus of frogs characterised by their unique reproductive history and tadpole development after the tadpole master herself!

Reference (see this paper for further references):

Webster, G. N. & Bool, I. (2022). A new genus for four myobatrachid frogs from the SW Australian region. *Zootaxa* 5154 (2): 127–151.

FrogCall reaches 30 years of age!

From this (August 1992)...



FrogCall was initially begun by Editor **Harald Ehmann** in **August 1992**. The early FrogCalls were printed in black and white and served the purpose of a regular newsletter to keep frog lovers in touch with others and to provide a platform for gaining knowledge and a better understanding of frog conservation, which has become the mantra of FATS FrogCall ever since.

Following editors included **Karen Thumm** and **Lothar Voigt**. In 1997, Lothar kindly showed Monica Wangmann how he produced FrogCall and Monica took over the role, flying solo in July 1997!

It has been a gradual evolution, improving in line with improvements in technology and software. The earlier issues were much more of a struggle due to limits of software and printing costs.

FrogCall issues were initially mailed out to members and more recently also emailed.

To this (December 2022)...

Our current editor, **Monica Wangmann** has taken up the task with incredible diligence and dedication, providing up to date news to members and articles related to frogs both in captivity and in the wild, always with an emphasis on frog welfare and conservation.

Between 2008 and 2010 the newsletters were slowly migrating to totally digital PDFs. No more cut and paste with scissors and glue - hurray!

FrogCall 100 was the first beautiful full colour glossy edition in April 2009 (designed by Alistair MacDougall) and mailed in colour to members. Since then, Monica has joined with **Marion Anstis** to produce our annual December full colour printed collector's copies mailed to all FATS members. **FrogCall 110**, December 2010, was the first edition of FrogCall produced by the Marion Anstis and Monica Wangmann combo! It then became an annual event.

FrogCall can only survive with the dedication shown by people like Monica, and FATS is indebted to her for her wonderful efforts!



Field Trips

Please book your place on field trips. Due to strong demand, numbers are limited. Be sure to leave a contact number. We will schedule and advertise all monthly field-trips as planned, but in the event of bad weather or other issues, we may have to cancel. It is YOUR responsibility to re-confirm in the last few days as to whether the field trip is proceeding or has been cancelled. Phone Robert Wall on (02) 9681 5308.

Saturday 3 December, 7.45 PM Homebush Bay Leader: Josie Styles

Meet in the carpark at Wentworth Common. The carpark is in Marjorie Jackson Parkway, about 150m from the intersection with Bennelong Parkway.

The Sydney Olympic Park precinct is known for its population of endangered Green and Golden Bell Frogs. The frogs here soared to public prominence during the planning and construction of the Sydney Olympics venue. These frogs had long-occupied this derelict and largely-forgotten site. The Bell Frogs were facing an uncertain future in the face of a construction project that was perhaps the largest ever undertaken in Australia. The public watched as degraded wetland sites were enhanced to ensure the long-term survival of Bell Frogs. This recovery program was necessary to fulfil environmental obligations to the International Olympic Authority and to placate an international audience that had been given many desperate assurances by the Government that Sydney would be the “Green Games”. Tonight, we will look at how the Bell Frogs are faring a twenty-odd years later. Josie has accumulated vast experience as a professional biologist. She is well-acquainted with the Bell Frogs of Sydney Olympic Park as she previously spent many years with the Australian Museum monitoring the Bell Frog population here. Tonight, she will share her vast experience of this site, and will discuss some of the interesting trends occurring here.

Sunday 4th December 2023: Australian Reptile Park, Somersby Annual BBQ for Herpetological Societies.

The Australian Reptile Park Pacific Hwy, Somersby NSW (02 4340 1022), will host their annual herpetological societies free entry and BBQ for society members on Sunday 4 December. Please contact the ARP to confirm the date, details and entry requirements. <https://www.reptilepark.com.au/contact/>

Saturday January 14th, 2023. 12.00pm-4pm. Darkes Forest Tadpole Hunt.

Leader: Marion Anstis.

Take the Princes Hwy south (not the freeway), then take the Darkes Forest Rd turn-off. Meet 200m from the corner.

NB: We may be visiting a private property on this fieldtrip. We will definitely require contact phone numbers and email addresses of all participants so that we can co-ordinate the day's activities.

Tadpoles are an important indicator of local frog populations. By examining which tadpole species are present, we can infer with great certainty which adult species are present in the vicinity. Importantly, looking for tadpoles can also be easily carried out in the daytime. At some sites, this can make wildlife surveying a great deal safer and easier. This is an important consideration for both enthusiasts and ecological consultants. Tadpoles though, can be difficult for the newcomer to identify. Today, Marion will take us through the sometimes-tricky steps of identifying tadpoles. She will also explain the seasonal considerations we need to take into account when we looking for tadpoles. We will start at midday and finish in daylight hours. There is no night-time spotlighting on this outing. We will have lunch first, hopefully at the Cafe in Glenbernie Orchard. Details will be available closer to the day.

Marion is the author of many of the definitive guides to Australian frogs and tadpoles, and is perhaps the ultimate authority on Australian tadpoles. She has travelled extensively around Australia researching our tadpoles.

Saturday 11 February, 7.45 PM West Head, Ku-ring-gai N.P. Leader: Cassie Thompson

Meet at the Duckholes Picnic Area in West Head Rd, near the corner of McCarrs Creek Rd, Terrey Hills. Research shows that “.....all roads, even minor service trails, have a disproportionate and negative impact upon aquatic environments and adjoining bushland”. Problems of silting, re-routing of water-flows, increased access for both native and feral predators and the inadvertent introduction of pollutants, weeds

and disease all become evident. Roads can be responsible for the significant fragmentation of habitat. Subtle changes in the micro-climate may also occur. Often, frogs are amongst the first to suffer. While incidences of roadkill are generally more obvious to the public, tonight we will consider some of the more insidious and far-reaching impacts of roads and drainage upon our bushland and wetland environments. Cassie is a Biodiversity Officer with Transport For NSW. She is perfectly placed to show us some of the unique frogs of West Head. She will also explain the impacts of roads, bridges and other developments on our wildlife, and what mitigation measures can be taken in the planning stages of new infrastructure works.

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 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. All participants accept that there is some inherent risk associated with outdoor fieldtrips and by attending agree to; a release of all claims, a waiver of liability, and an assumption of risk.

Directions to Meetings

FATS meets at 7pm, on the first Friday of every EVEN month at the **Education Centre, Bicentennial Park, Sydney Olympic Park.**

An easy walk from Concord West railway station and straight down Victoria Ave. By car: enter from Australia Ave at the Bicentennial Park main entrance, turn off to the right and drive through the park. It’s a one way road. Just follow it and turn right at the P10f parking sign. Or you can enter from Bennelong Road/Parkway. It is a short stretch of two-way road. Park in P10f car park, the last car park before the Bennelong Rd exit gate. Take a good torch in winter. It is a short walk from the car park to the Education Centre, which is a single storey building with an adjacent tall tower. Both can be seen from the car park. Directions from your home:

<http://www.sydneyolympicpark.com.au/maps/getting-to-the-park?type=venue&id=384059>

FATS has student memberships for \$20 annually with electronic FrogCall (but no hard copy mail outs).

<https://www.fats.org.au/membership-form>

THANK YOU to the committee members, FrogCall supporters, talented meeting speakers, Frog-O-Graphic competition entrants, events participants & organisers, David, Kathy and Harriet Potter, and Sarah and Ryan Kershaw. The FrogCall articles, photos, media and webpage links, membership administration and envelope preparation are all greatly appreciated. Special thanks to the many newsletter contributors, Robert Wall, Karen & Arthur White, Wendy & Phillip Grimm, Marion Anstis and Andrew Nelson. Special thanks also to Marion Anstis who has produced our glossy colour collector’s edition of FrogCall each December.

The FATS meeting commences at 7 pm, (arrive from 6.30 pm) and ends about 10 pm, at the Education Centre, Bicentennial Park, Sydney Olympic Park, Homebush Bay. FATS meetings are usually held on the **first Friday of every EVEN month** February, April (**except Good Friday**), June, August, October and December. Call, check our web site, Facebook page or email us for further directions. We hold 6 informative, informal, topical, practical and free meetings each year. Visitors are welcome. We are actively involved in monitoring frog populations, field studies and trips, have displays at local events, produce the newsletter FROGCALL and FROGFACTS information sheets. FATS exhibit at many community fairs and shows. Please contact Events Coordinator Kathy Potter if you can assist as a frog explainer at any event, even for an hour. No experience required. Encourage your frog friends to join or donate to FATS. Donations help with the costs of frog rescue, student grants, research and advocacy. All expressions of opinion and information in FrogCall are published on the basis that they are not to be regarded as an official opinion of the FATS Committee, unless expressly so stated.

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FATS ON FACEBOOK: FATS has about 4,300 Facebook members worldwide. Posts vary from husbandry, disease and frog identification enquiries, to photos and posts about pets, gardens, wild frogs, research, new discoveries, jokes, cartoons, events and habitats from all over the world. The page was created 11 years ago and includes dozens of information files – just keep scrolling to see them all. <https://www.facebook.com/groups/FATSNSW/>

RESCUED FROGS are at our meetings. Contact us if you wish to adopt a frog. A cash donation of \$50 is appreciated to cover care and feeding costs. We have no EFTPOS. FATS must sight your current amphibian licence. NSW pet frog licences can be obtained from the NSW Department of Planning, Industry and Environment (link below). Please join FATS before adopting a frog. This can be done at the meeting. Most rescued frogs have not had a vet visit unless obviously sick. Please take your formerly wild pet to an experienced herpetological vet for an annual check-up and possible worming and/or antibiotics after adoption. Some vets offer discounts for pets that were rescued wildlife. <https://www.environment.nsw.gov.au/licences-and-permits/wildlife-licences/native-animals-as-pets/frog-keeper-licences>

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FATS COMMITTEE CONTACTS

Name	Phone	Email
Arthur White, President	(02) 9599 1161 h	arfawhite@gmail.com
Marion Anstis, Vice President	(02) 9456 1698 h	frogpole@tpg.com.au
Punia Jeffery, Chair		puniamje@gmail.com
Jilli Streit, Secretary	(02) 9564 6237 h	jillistreit@yahoo.com
Karen White, Treasurer	ph/fax: (02) 9599 1161 h	arfawhite@gmail.com
Phillip Grimm, Memberships, Website and Facebook Manager	(02) 9144 5600 h	phigrimm@gmail.com
Kathy Potter, Events Coordinator	0403 919 668	kathy@the-pottery.org
Robert Wall, Field Trips Convenor	(02) 9681 5308 h	rjw2008@live.com.au
David Potter, Frog Helpline Coordinator	0413 210 789	david@the-pottery.org
Monica Wangmann, Editor		monicawangmann@gmail.com
Andre Rank, Luc Streit	General Committee members	

FROGWATCH HELPLINE: 0419 249 728

FATS MAILING ADDRESS: PO Box 296, Rockdale NSW 2216.