

FROG CALL

No. 194, December 2024



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MEETING FORMAT

Friday 6th December 2024

6.30 pm: Lost frogs: Priority to new pet frog owners. Please bring your membership card or join FATS on the night and \$50 donation. CREDIT CARDS accepted (purchases over \$10), but bring cash for raffle, unless spending over \$10. Your current NSW NPWS amphibian licence must be sighted on the night. Rescued and adopted frogs can never be released. Contact us before the night and FATS will confirm if any frogs are ready to rehome.

7.00 pm: Welcome and announcements.

7.45 pm: The main speaker is Anthony Waddle who will tell us about Frog Saunas!

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 and informative year of meetings, and all entrants in the Frog-O-Graphic Competition. We look forward to the same in 2025.

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

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President's Page

Arthur White

As you know, this will be my last President's Report. I have a long association with FATS and was lucky enough to be around when FATS was formed in February 1991. I was the Scientific Advisor on the first FATS executive. I never suspected that I would become President in 1999 and still be there 25 years later.

During my time as President I have known and worked with a lot of wonderful people – far too many to name them all, but a few I must mention. Harald Ehmann was the inspiration for FATS and the driving force behind the ground-breaking EndFrogs project which resulted in the first ever review of threatened frogs in any state in Australia. Harry moved to Adelaide and the biggest force in FATS from then on was Lothar Voigt. Whenever I mention Lothar's name, people who knew him always smile. Who could forget the broccoli box man – he could build a three-level frog house with running water features out of those white foam boxes. I still remember Lothar sitting in a small plastic frog pond in Centennial Park, wearing his flippers and FATS T-shirt, spruiking frogs to all of the kids nearby. Monica Wangmann joined as a mum from Ashfield who had a passion for frogs and being active. Monica is still the editor of FrogCall after 27 years, despite moving to Melbourne. And, of course, Karen White, who took on the Treasurer's job in 1998 when FATS had little money and our accounts were in a mess. Today we are solvent and are able to take on projects that other societies cannot do because they do not have the resources behind them. Most people also talk about Karen's great cooking, her catering for Executive meetings and the goodies provided at public meetings such as this.

I mention these few people because FATS has become the great society that it is because of the people in it. In the early days, we decided that FATS was not going to become a self-serving society. FATS was to be a science-based society that would take on practical activities to help frog conservation and raise public awareness about the plight of frogs. Of course, we wanted FATS to be fun as well and so we have strived to maintain a level of social activity within the group, as well as having our escapes to Smith's Lake and other field trips.

I have been lucky. During the 25 years that I have been President I have had a great group of people taking on jobs on behalf of FATS. FATS works because people in FATS do not try to set up exclusive sub-groups or cliques – we try to be all inclusive. We do not confine our interests to frogs but are happy to include anything that touches the natural world. In short, FATS people enjoy being alive and experiencing as much as the world can offer.

This year I have had another great support team of workers. Karen White again managed our accounts with aplomb and Monica Wangmann continues to publish six FrogCalls a year. The December FrogCall is our glorious colour edition and for that we rely heavily on Marion Anstis' expertise in editing, layout and formatting. Jillie Streit has been our Secretary and Phillip Grimm our Membership Officer and Web Site manager. Kathy and David Potter, and the rest of the Potter clan are the backbone of our community day exhibitions. Robert Wall looks after our field trips, Punia Jeffery has been our Chairperson and Luc Streit and Andre Rank have been executive supporters. Many other people have helped out in undefined jobs, such as at community events or during the meetings or workshops.

So, as I hand over the reins to the incoming President, I thank you all for letting me have such a good time with FATS. Although I am standing down as president, I will not be leaving FATS, there are too many good things happening to leave it!



Welcome to our Incoming Committee for 2024!



At the recent Annual General Meeting in August, Arthur and our long-serving committee stepped down. We would like to now give a **BIG WELCOME** to our new incoming committee, who have made it possible for FATS to continue as the wonderful and viable society that it has been for over 30 years!

President: Michelle Toms

Vice President/Assistant Editor: Peter Spradbrow

Secretary: Jillie Streit

Assistant Secretary, Memberships Officer: Cassie Thompson

Treasurer, Public Officer: David Potter

FrogCall Editor: Monica Wangmann

Chairperson: Rhys Cairncross

Webmaster: Hugh Speck

Exhibitions Coordinator: Kathy Potter

Field Trip Coordinator: Robert Wall

Frog Helpline Coordinator, Frog Adoptions: Harriet Potter

Committee Members: Punia Jeffery, Luc Streit, Andre Rank, Peter Vickery

Most of our outgoing committee and some incoming members are pictured below at our last executive dinner. We thanked Arthur and Karen for their untiring devotion to FATS over 25 years! Unfortunately, a number of our outgoing committee members could not be there.



Some FATS memories...



One of our many happy Smith's Lake field trip groups



Darkes Forest day trip tadpole hunting
Wendy Grimm



Karen and Arthur with our 25th Anniversary cake



Darkes Forest tadpole hunting
Wendy Grimm



A night field trip to Jervis Bay in 2006

Ken Griffiths

Banjo Frogs – a taxonomic reshuffle

Mike Swan

At certain times of the year, there are places in Australia where you could be forgiven for thinking you have stumbled into an unknown site of blue grass culture in the Appalachian Mountains of North America. The deafening sound of so many banjo frogs calling could easily be mistaken for some secret hoedown with the participants plucking away on numerous instruments!

The Australian banjo frogs or pobblebonks are a distinctive group of globular shaped, medium to large terrestrial, burrowing frogs, so named because of their distinctive single note advertisement call. The call is similar to a single string of a banjo being plucked and sounds like a resonant 'bonk'. They are endemic to Australia and occur mostly in eastern Australia with four species and four subspecies, and one species restricted to south-western Australia. Some species prefer the moist coastal areas and regularly enter suburban gardens, while other species have penetrated semi-arid zones. Hybrid zones are known to form at contact points between multiple species, based on the presence of intermediate morphological and advertisement call phenotypes

that are within these zones, (Martin,1972). Banjo frogs belong to the family **Limnodynastidae**, commonly known as the Australian ground frogs. This is a family of frogs found in Australia, New Guinea and the Aru Islands. They were formerly considered a subfamily of the **Myobatrachidae**, the other large radiation of terrestrial frogs in Australia, but are now considered a distinct family. Both Limnodynastidae and Myobatrachidae are thought to be the only members of the superfamily **Myobatrachoidea**. Limnodynastidae lay eggs in a floating, foamy mass with mostly high white domes that float on the water's surface for some days, often to the point of hatching. Because of this unique reproductive strategy, females have a flange or flap on one or more fingers. This is used for transferring saliva from her mouth as the eggs are laid, and assists her as she beats the jelly of the spawn into a distinctive foamy mass. All species have a prominent distinctive tibial gland on each of their back legs, a thick white or cream glandular ridge and a horizontal pupil. With the exception of the newly classified *Limnodynastes superciliaris* and *Limnodynastes terrareginae*, for which

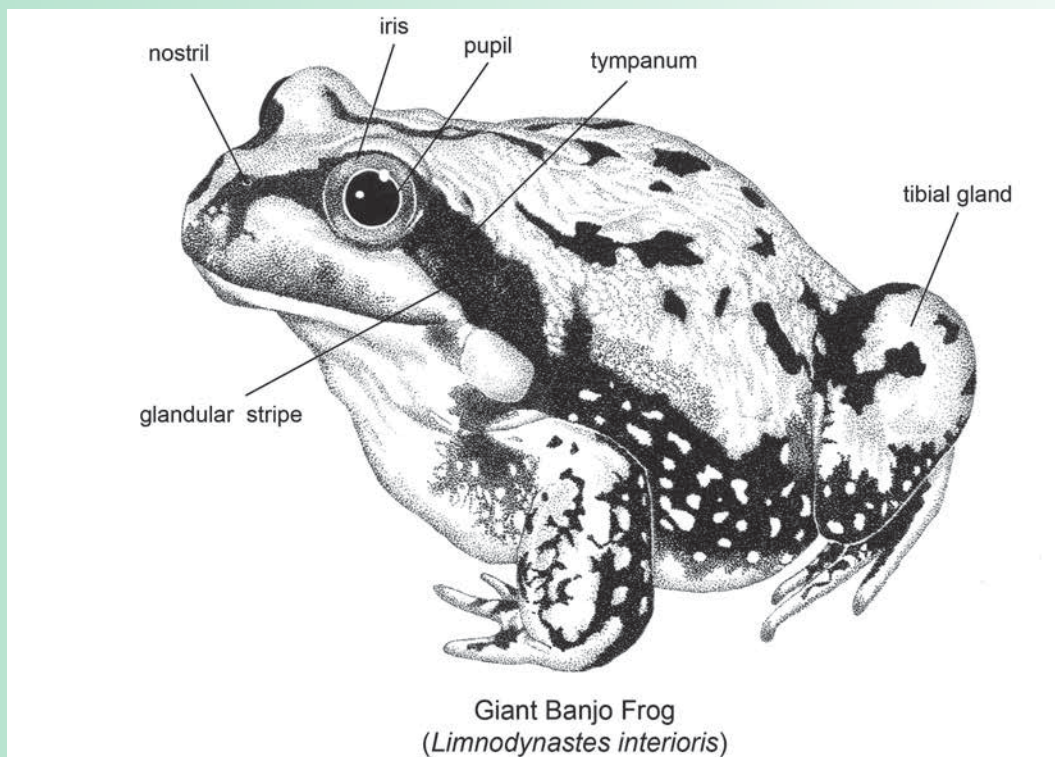


Illustration by R. Hammond



Floating foamy egg mass typical of this species group
sufficient data is absent, all species have an IUCN
Conservation status of least concern.

Taxonomy

The Australian banjo frogs have been known to science for a long time. The taxonomy has been quite stable, with eight species and subspecies recognised. The frogs, eggs, tadpoles and metamorphs have been described by Anstis (2013) and the frogs in a number of field guides. Also refer to N. Clemann and M. G. Swan 2023 “Frogs of Victoria” publication for detailed descriptions of most of the species that occur in Victoria. This book was reviewed by FATS in FrogCall 188, December 2023.

In 2024 there was a reassignment of some scientific names in this group and one prior available name was applied to different populations, increasing the species and subspecies from eight to nine, Parkin et al (2024). The current list of species are:

Western Banjo Frog *Limnodynastes dorsalis* (Gray, 1841)

South-eastern Banjo Frog *Limnodynastes dumerilii dumerilii* (Peters, 1863)

Snowy Mountains Banjo Frog *Limnodynastes dumerilii fryi* (Martin, 1972)

Southern Banjo Frog *Limnodynastes dumerilii insularis* Parker, 1940

Variegated Banjo Frog *Limnodynastes dumerilii variegatus* Martin, 1972

Northern Banjo Frog *Limnodynastes grayi* (Steindachner, 1867)

Giant Banjo Frog *Limnodynastes interioris* Fry, 1913

Coastal Banjo Frog *Limnodynastes superciliaris* (Keferstein, 1867)

Superb Banjo Frog *Limnodynastes terraereginae* Fry, 1915

Meet the Species:

1. Western Banjo Frog *Limnodynastes dorsalis*



Western Banjo Frog, *Limnodynastes dorsalis*, Dryandra, WA

The males grow to about 64mm and females to 73mm. It is a large globular frog which has a light brown dorsum with darker patches, a distinct, cream vertebral stripe and a stripe on each side from the tip of the snout to the arm. The sides are often white with black marbling and the groin and back of thighs have bright red patches. The ventral surface is smooth and white or yellowish. These frogs occur mostly in wetlands, permanent ponds and stream pools from the south-west coast to the wheat-belt of WA. Males call from winter to spring and eggs are laid in floating foamy clumps among vegetation.

2. South-eastern Banjo Frog, *Limnodynastes dumerilii dumerilii*



South-eastern Banjo Frog, *Limnodynastes dumerilii dumerilii*, Moama, NSW

Males grow to about 70mm and females 73mm. South-eastern Banjo Frogs are a very familiar species in south-eastern Australia and a common sight around human settlement. They often venture into suburban gardens and can be heard calling prior to rainstorms. The body is large and globular. The dorsum is granular with low scattered warts.

Colouration varies from olive-brown to dark brown, generally with a yellow or orange mottling on the flanks and without a vertebral stripe. There is a dark stripe from the tip of the snout through the eye and tympanum to the base of forelimb, bordered below by a thick orange or yellow glandular ridge. The ventral surface is marbled with brown or yellow. Their range and habitat is associated with ponds, dams and stream pools through dry woodlands, farmlands, heath and mallee of south-eastern Australia.

3. Snowy Mountains Banjo Frog, *Limnodynastes dumerilii fryi*



Dave Hunter

Snowy Mountains Banjo Frog, *Limnodynastes dumerilii fryi*, Kosciuszko NP, NSW

Males reach up to 75mm and females to 83mm. The Snowy Mountains Banjo Frog is a large globular frog with a granular, grey to olive-brown dorsum and many scattered low warts. There is no vertebral stripe. The flanks are generally mottled with yellow or pale orange. A broad, dark stripe runs from the tip of the snout through the eye and tympanum to the base of the fore limbs. It is bordered below by a prominent, thick orange-brown or golden glandular ridge from the eye to the arm. The ventral surface is smooth and marbled with cream or yellow. It is mostly associated with wetlands, permanent ponds, dams and stream pools of the Snowy Mountains in south-east Australia.

4. Southern Banjo Frog, *Limnodynastes dumerilii insularis*

The males reach 60mm and females 61mm. The Southern Banjo Frog, a sub-species of the South-eastern Banjo Frog, is a large, globular frog with a strongly granular dorsum scattered with low warts. It has a light brown to dark brown dorsal region



Mike Swan

Southern Banjo Frog, *Limnodynastes dumerilii insularis*, Cape Conran, Vic

with darker patches and a distinct thin, cream coloured vertebral stripe. There is a dark stripe from the tip of the snout to the arm. Sides are pale with blue tinges in the flanks and groin. The ventral surface is smooth and white or yellowish with grey mottling. It is mostly associated with wetlands, permanent ponds, dams and flooded ditches and restricted to south-eastern New South Wales, southern Victoria and Tasmania.

5. Variegated Banjo Frog *Limnodynastes dumerilii variegatus*



Mike Swan

Variegated Banjo Frog, *Limnodynastes dumerilii variegatus*, Little Desert, Vic

Males reach 64mm and females 65mm. The Variegated Banjo Frog is a large, globular frog with a strongly granular dorsum and many scattered low warts. It has a light brown or dark brown to pale orange dorsal region with larger irregular blotches with only a remnant of a vertebral stripe. There is a dark stripe from the tip of the snout to the arm. The ventral surface is smooth and cream, mottled with dark-grey to purple-black patches. It is mostly

associated with wetlands, permanent ponds, dams and stream pools through wet and dry forest to mallee woodlands and restricted to south-western Victoria and King Island.

6. Northern Banjo Frog *Limnodynastes grayi*



Mike Swan

Northern Banjo Frog, *Limnodynastes grayi*, Dalby, Qld

In a recent study by the Australian Museum researchers, the phylogeographic diversity within the Northern Banjo Frog and its close relatives was researched by analysing variation in genetic structure, body shape and appearance (morphology) throughout the species range. They also used a comprehensive analysis of call recordings submitted by citizen scientists to the Australian Museum's Frog ID project to investigate geographic variation in mating calls. A genetic analysis confirmed the Cape York populations as distinct from the southern populations. In a new scientific paper (Parkin et al. 2024), they described this far northern population as The Superb Banjo Frog (*Limnodynastes terraereginae*) while reclassifying the population covering the remainder of their original southern range as the Northern Banjo Frog or Scarlet-sided Banjo Frog (*Limnodynastes grayi*).

The Northern Banjo Frog is a large globular frog. Males reach 76mm and females 79mm. The dorsal skin is smooth or finely granular, grey to olive-brown dorsum and sometimes has a vertebral stripe. The flanks of breeding males may be flushed with bright rusty orange or yellow-orange. A broad, dark stripe runs from the tip of the snout through the eye and tympanum to the base of the fore limbs. It is bordered below by a thick orange-brown or golden glandular ridge from the eye to the arm. The groin, inner surfaces of the thigh and armpit are bright red. The ventral surface is smooth and

white or yellowish. The Northern Banjo Frog has the largest distribution of all the banjo frog species, encompassing a variety of wet to semi-arid habitats from flooded grasslands and roadside ditches, wetlands and farm dams along the coast, ranges and western areas from central NSW to Cairns, Far North Queensland, and central New South Wales to northern Queensland. Remarkably, some populations of this species, like the Coastal Banjo Frog further south, even thrive in the acidic coastal 'wallum' swamplands of eastern Australia, earning these species a title as being among the most acid-tolerant animals in the world.

7. Giant Banjo Frog *Limnodynastes interioris*



Mike Swan

Giant Banjo Frog, *Limnodynastes interioris*, Eubalong, NSW

Males reach 90mm and females 88mm. The Giant Banjo Frog, is probably the largest of all the species. They are a very large globular frog with a granular, grey to olive-brown, and often pale orange dorsum with many scattered low warts and have prominent large black blotches towards the posterior region and down the sides. There is no vertebral stripe. The flanks are generally mottled with black and orange. A broad, dark stripe runs from the tip of the snout through the eye and tympanum to the base of the fore limbs. It is bordered below by a thick orange glandular ridge from the eye to the arm. The ventral surface is smooth and lemon-yellow to orange. They are associated with permanent ponds, dams and stream pools, mostly in the Murray-Darling Basin of NSW, and often occur in semi-arid woodlands with sandy and clay soils. They are also recorded from Northern Victoria.

8. Coastal Banjo Frog *Limnodynastes superciliaris*

Aaron Payne



Coastal Banjo Frog, *Limnodynastes superciliaris*, Kurnell, NSW

Males reach 60mm and females 55mm. A recent study by Australian Museum researchers confirmed that one of the subspecies of the South-eastern Banjo Frog formerly known as (*Limnodynastes dumerilii grayi*) was a taxonomic error. They reclassified the species as the Coastal Banjo Frog (*Limnodynastes superciliaris*), resurrecting the original scientific name that had been assigned to a specimen collected in Sydney over 160 years ago. It is the smallest of all the species and has the most restricted distribution, occurring only coastally in

lowland sandy heath and wallum swamplands from Sydney to the mid-north of New South Wales.

Because of its restricted distribution and the overlap of its habitat with areas of intensive coastal urban development, it may be that this species is being pushed towards extinction. It is a moderate-sized globular frog with a granular, brown to light brown dorsum and many scattered low warts. There is a thin, pale vertebral stripe, the flanks have darker mottling and a broad, dark stripe runs from the tip of the snout through the eye and tympanum to the base of the forelimbs. It is bordered below by a thick orange-brown or golden glandular ridge from eye to arm. The ventral surface is smooth and white to yellow with a grey wash.

9. Superb Banjo Frog *Limnodynastes terraereginae*

These frogs reach up to about 90.4 mm in length. Australian Museum researchers recently determined that the Cape York population of *Limnodynastes terraereginae* was different from the remaining population, and applied the common name of Superb Banjo Frog. This newly recognised species is excessively stout, with a textured dorsum covered in irregular tubercles. Its yellow vertebral stripe can be distinct, broken, faded or absent. The ventral surface is plain, unpatterned cream to pearl and edged in yellow. There are bright

Tom Parkin



Superb Banjo Frog, *Limnodynastes terraereginae*, Cape York, Qld

magenta patches on the inner thighs and groin. The posterior of the thigh has scarlet to orange blotching. The vocal sac is dark brown to orange and mottled in breeding males. The head is large and broad with large bulbous eyes, a round pupil and slightly raised nostrils. The dorsal surface is light brown with strong dark brown to black blotching, and orange and yellow patches on the sides. The arms and legs are short and powerfully built, with a prominent oval shaped tibial gland. They are restricted to the eastern coast of the Cape York Peninsula Bioregion in far north Queensland, from Cooktown in the south to Somerset at the tip of Cape York. They occur in *Melaleuca* woodlands, ephemeral swamps, littoral monsoon forest, vine thicket, coastal heath, and riparian habitats with clay or sandy substrate.

The Australian Museum comments that much is still left to be learned about the distribution and ecology of these species, particularly the Superb Banjo Frog. Due to the remoteness of their habitat in Cape York Peninsula, there are relatively few records of the species that exist on public databases. With that in mind, we send out a call to any Frog ID users who live or travel in Cape York Peninsula – please listen out for the distinctive banjo-like ‘bonk’ and be sure to record it with the Frog ID app. Every recording adds to our knowledge of Australia’s incredible frog diversity!

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Acknowledgements

- Glenn Shea assisted with taxonomy.
- Tom Parkin provided extra information.



Angus Martin

One night stand! A mass spawning of the South-eastern Banjo frog, *Limnodynastes dumerilii dumerilii*, near Wandong, Vic.

The Smooth Newt –

Lissotriton vulgaris

Garth Coupland

*Contained within low, York stone walls, with topiary box surround,
Lies the lily pond, and, to me it calls,
For there the newts abound.
For there the newts swim up and down,
and round and round and round.*

In the 1950s, at Town Close House Preparatory School in Norwich, England, we were drilled on a parade ground and taught the loathsome songs of national glorification and victory over what was then a disintegrated Empire. We called ourselves by our surnames and spoke with accents reminiscent of WWII Spitfire pilots: “I say old chap, shall we *brrm...* our Dinky cars in the quad?” The British class system was rigid and unbending and was absorbed by us, through less than subtle indoctrination, in all that we experienced. Our young minds did not gloat or rejoice in being the children of the rich and privileged as I doubt if we understood that fact. We were beaten by the masters and recited Latin nouns and verbs in what seemed like pointless mantras to a cruel god. However, my six years of Latin informs me that *Lissotriton vulgaris* means, quite simply, the smooth, common newt, its other English name. And, of course, prep school provided pals that lived in big houses with big gardens with big ponds and big compost heaps with snakes and newts and frogs and toads. Pals like Jewson and Rackham.

The first newts that I ever saw were in a small, lily pond in the school grounds. A glancing view of



Male & Female Smooth Newts, *Lissotriton vulgaris*
(Pen & Ink & Watercolour) copy

two, surfacing quickly for air, kindled within me a burning desire to find and capture some for a closer look. I hadn't known it but the pond was, for obvious reasons, 'out-of-bounds', so I never visited it again but gazed at it from afar with huge longing. I did find newts eventually during a visit to Jewson's house. The virtually empty swimming pool and garden ponds were newt havens. Lying on our bellies or wading, we would spot and grab the wonderfully coloured, most interesting creatures from their dark, watery abode. On one occasion I looked down and it were as if a shark had glided by. I knew I had seen a Great-crested Newt. It

was enormous compared to the Smooth Newts and the frustration of not capturing it was almost like a physical pain to me. The quest to catch that huge newt continued for the rest of that day and on subsequent visits, but the species eluded me until much later in life. Even today the sight of a newt in a pond excites me with its tantalising shape and darting habits. Often they only betray their presence when they quickly rise to gulp air then dash for the cover of the weedy depths lest there be a Heron or a small, prep school fellow ready to catch them.



Lissotriton vulgaris larva, Wymondham, Norfolk

From Jewson's I brought home a jar full of Smooth Newts on the train. At age seven I often travelled alone from Reedham by steam train, and then by bus, across the city of Norwich to school. And so I was quite content to be admired with my jar of sinuous occupants as I rode the rails with my prize upon my knees. I kept them in a large fish tank and spent hours watching them. They could well be my favourite animal.

I was fascinated by the behaviours of the newts. The pheromone-wafting tail dance of the beautifully spotted, magnificently crested males was witnessed. I saw the females, when plump to bursting with eggs, using their hind feet to glue a water plant leaf around a sticky egg, deposited one by one around the tank. Their voracious appetites and seemingly fearless attacks upon prey, nearly as large

as themselves, was admirably satisfying for a small naturalist to observe. I watched, amazed, as they shed their incredibly thin skins. It seemed as if they were moving out of a wraith of themselves that removed itself complete, falling from their bodies.

My father had a first edition of Malcolm Smith's definitive book on British Herpetology and it was good for a young chap to learn how the observations of others and subsequent descriptions of behaviours were precise and true. I admired and wanted to emulate these men.

The Smooth Newt was a seasonal interest. I keep a journal of my finds and observations and it informs me that the main aquatic phase of the adults in Norfolk lasts from late February to late June. This seems to agree with the observations of others.



Lissotriton vulgaris, female (left) and male for comparison, Barningham, Norfolk



Lissotriton vulgaris, female, Barningham, Norfolk

On leaving the water they become dry and dull (compared to their colourful appearance during their aquatic phase), and difficult to find. When I have met them out and about on a damp night I am always taken by how sprightly and active they are on land. They are much harder to keep when terrestrial and so all the newts that I ever captured were released in June. One might find them still by turning over logs or lifting sheets in suitable habitats, sometimes in good numbers. But this is not a habit I would encourage as it disturbs the habitat unless performed with enormous care.

However, the larvae or tadpoles of newts continue living in water, breathing through feathery gills, until the Autumn. If hatched from late eggs they may well overwinter as larvae. One accidental experiment that occurred in the cellar of our home at Calthorpe House in Acle, Norfolk, showed some remarkable tadpole behaviours. I had kept some Smooth Newts in a fish tank and after releasing the adults in June the tank was placed down in the cellar with the water and weeds still in it. I cannot remember who did this or why and there certainly

seems no sense in it; but it happened nonetheless. The next Spring I found the tank and was amazed to find two, suspiciously large tadpoles.

The observations from this lead me to conclude that they had not metamorphosed because the conditions were not right for them to develop normally. The dark and cold cellar must have inhibited their growth and they could not exit the water, let alone the tank. They had no food other than their fellows and thus I can confidently assume that they were cannibals and certainly they endured long periods without food. Interesting as this incident was it has left me with a recurring 'guilt' nightmare, during which I find tanks of newts and frogs in cellars and conservatories that I have forgotten about and failed to nurture. They are extremely distressing dreams (fortunately not a reality), as the skeletal, pale and dying amphibians stare at me with accusing eyes through the glass that prevents them from escaping their inevitable but terribly slow fate.

The toughness of the Smooth Newt has been demonstrated to me on occasions. Dried newts,



Lissotriton vulgaris (juvenile in terrestrial, growing phase). Strumpshaw Fen, Norfolk



Lissotriton vulgaris, female, showing 'flanges' on sides of mouth. Barningham, North Norfolk

stiff, covered in fluff and hair after entering a house, and seemingly close to death, have been revived quickly by removing the covering and placing them in water. An accidental amputation of an arm resulted in a new one being grown. They can climb glass easily and will throw themselves off high places in a bid to escape captivity if the aquatic environment provided is not to their satisfaction.

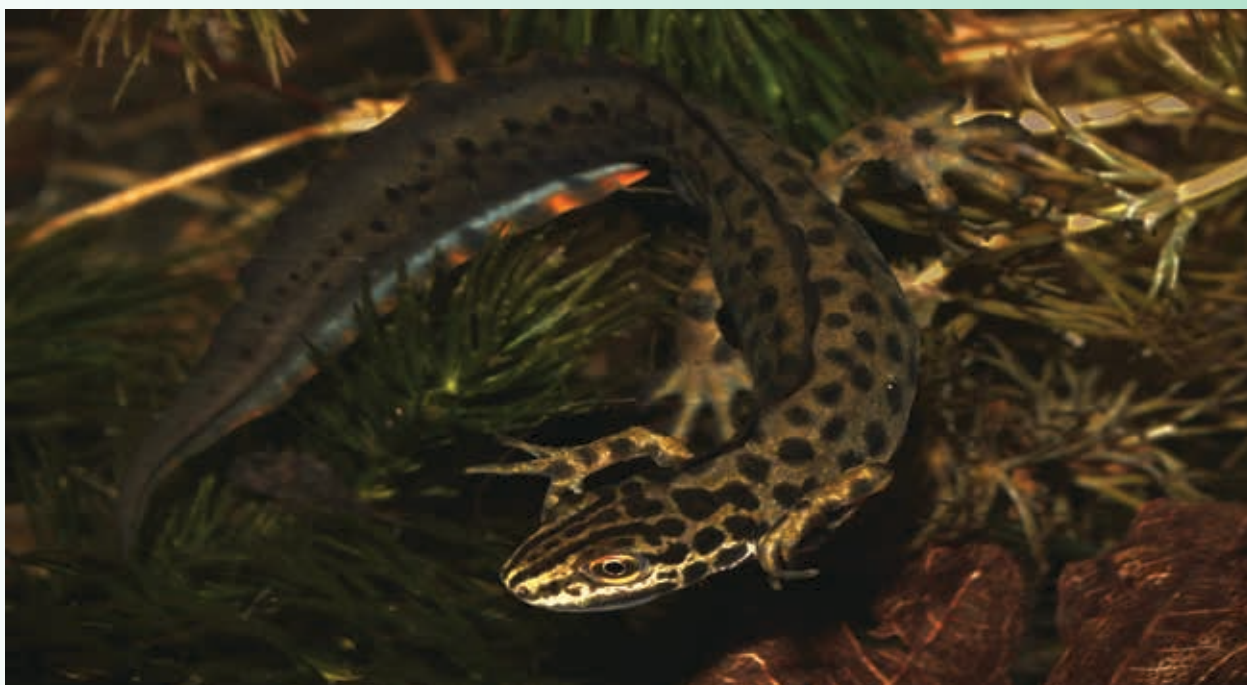
The Smooth Newt can occur in large numbers. A single sweep of a net in a suitable pond may bring up several individuals. There must be few environments so fecund and so full of life as a good, freshwater pond or lake, and food for newts will consequently be in great abundance. An illustration of this happened at my pal Rackham's

birthday party when we were about seven. Nasty little prep school brats, let loose in Rackham's garden, pushed the large, box-shaped, gardener's barrow into Rackham's pond. On hauling it out for more of the same bad behaviour, and after the water had drained off, we were astounded to see the whole of the bottom of the barrow writhing with countless Smooth Newts. It is an image that I will never forget.

The function of the "flange" would appear to be unknown and so hypothesising brings forth interesting theories but no conclusions. The German Herpetologist Michael Fahrbach writes about "saugschnappen". This is a name, adopted by science, for the feeding technique of opening the mouth to suck in prey; as seen in aquatic amphibians and fish. Perhaps the flanges aid the Newt in exercising this means of prey capture.

My theory, which I favour, is that whilst in water, creatures are able to develop more delicate appendages due to the support afforded by the aquatic environment, for example, the magnificent, flowing crests of the breeding males. These also disappear completely as the males exit the water in mid-summer. I therefore postulate that these delicate flanges can only be grown whilst in the water and act somewhat in the manner of mammalian whiskers in that they aid, by the sense of touch, the Newts daily doings underwater.

Whatever their function, these 'flanges' are a new discovery for me, after a lifetime of studying these wonderful animals. There is always something new



Lissotriton vulgaris, male, Barningham, North Norfolk



Lissotriton vulgaris, male, Barningham, Norfolk

and fascinating to find as we use our Human minds to probe the mysteries of the Universe.

The newts enter the water during February in Norfolk. My journals tell me that the males enter first as I have often seen only males in ponds at

this time; all in different stages of breeding dress. I theorise that they need to be in the water first in order to grow their magnificent crests that would simply lie flat on land. This gives them the time they need to be looking their best for the



Lissotriton vulgaris males courting anything that moves! West Runton Pond, Norfolk



Lissotriton vulgaris in enforced terrestrial phase due to drought. Syderstone Common, Norfolk

ladies' arrival on the dance floor! And speaking of dancing, it is not unusual at this time to see male newts performing their courtship dance to each other or anything else that moves for that matter!

During my teenage years I kept Smooth Newts in an amphibian pond enclosure. These newts all came from a pond in a large garden in Acle. The house and garden were about to be levelled to create a new housing estate so I rushed there to save what I could. I brought home some thirty newts and several frogs before the bulldozers set to work. They would all have died. I was sickened by this situation. I loved that pond. My late childhood had been liberally peppered with visits to the Hawksley's garden to see the newts in that pond.

Now it is no more. The memory of it lies under a housing 'development'. Development, progress and growth are words that simply masquerade as fine principles, because the truth is that they represent nothing more than our continual destruction and selfish use of the planet's spaces, resources, species and habitats.

What is that darting shape, Silhouetted by the green?

It is the first newt of the year, That I have just seen.

Hah! The year has started,

The Spring has now begun.

I'll go to get my newt net, and have some newt fun!



Lissotriton vulgaris male entering pond after hibernation, Vinegar Pond Norwich Norfolk

Frogs and Toads in Switzerland

Luc Streit

In June 2023, Jilli and I went to Switzerland. This article summarises some experiences with frogs and toads on our journey. We spent some time with friends in Brunnen, a town on Lake Lucerne, and with a schoolfriend of mine in Thun, an old town at the outflow of lake Thun.

First, a short introduction to the frogs and toads found in Switzerland.

Overview of species

There are 6 families in the order of Anura in Switzerland as shown in Table 1 and Table 2:

Table 1: List of native species in the Order Anura:

Family	Genus/Species	Common Name
Alytidae	<i>Alytes obstetricus obstetricus</i>	Common midwife toad
Bombinatoridae	<i>Bombina variegata variegata</i>	Yellow-bellied Toad
Bufonidae	<i>Bufo bufo</i>	Common Toad
	<i>Epidalea calamita</i>	Natterjack Toad
Hylidae	<i>Hyla arborea arborea</i>	European Tree Frog
	<i>Hyla intermedia</i>	Italian Tree Frog
Ranidae	<i>Pelophylax lessonae</i>	Pool Frog
	<i>Pelophylax esculoentus</i>	Edible Frog
	<i>Rana temporaria</i>	Common Frog
	<i>Rana dalmatina</i>	Agile Frog

Table 2: List of introduced, non-native species:

Family	Genus/Species	Common Name
Pelobatidae	<i>Pelobates fuscus fuscus</i>	Common spadefoot
	<i>Pelobates fuscus insubricus</i>	Italian spadefoot
Ranidae	<i>Pelophylax bergeri</i>	Italian pool frog
	<i>Pelophylax ridibundus</i>	Marsh frog
	<i>Pelophylax bedriagae</i>	Levant water frog
	<i>Pelophylax kurtmuelleri</i>	Balkan frog
	<i>Rana arvalis</i>	Moor frog

Central Switzerland, Alpine environment

We first visited friends who live in Brunnen on Lake Lucerne (Figure 1). Images prepared by Luc Streit.

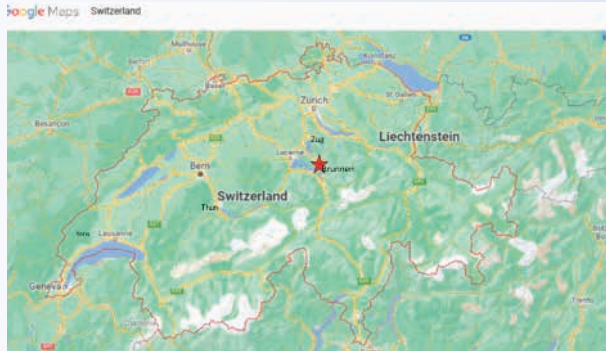


Fig. 1 Map of Switzerland with Brunnen marked in red

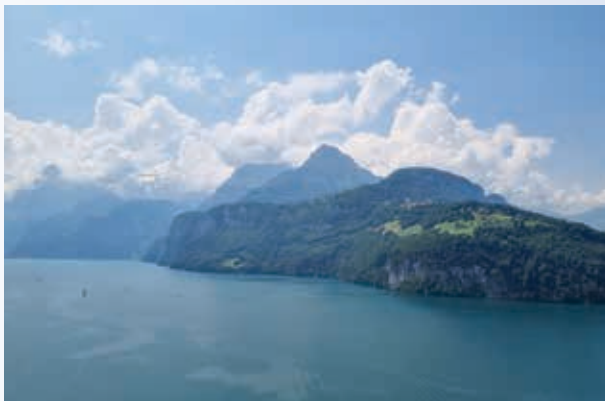


Fig. 2 View of "Urnersee" (part of Lake Lucerne) from a hill near Brunnen

The weather was sunny and hot. It was perfect for some small hikes in the surrounding hills to soak up the magnificent views (Figure 2). Our Friends kindly took us for a drive up the "Muotathal" as far as the end of the road. We then went up a mountain in a cable car and ended up in a high valley, Glattalp, where flowers bloomed on the South facing slopes, while plenty of snow persisted on the colder slopes (Figure 3 & Figure 4)

It is at this high altitude valley that frogs and toads sprang a surprise on us: A faint call came from



Fig. 3 High valley of Glattalp, 1900m

a small pool of melting ice water. The call was a common toad (*Bufo bufo*) calling, however, the video I took only shows the European common frog (*Rana temporaria*) active (Figure 5, Figure 6).



Fig. 5 Pond with snow melting, Common Toad recorded here



Fig. 6 *Rana temporaria* in the pond shown in Fig. 5. A pair in amplexus at right

While the common frog is very hardy and can even be found in Europe as far as the North cape beyond the arctic circle, hearing the call of a toad in this environment is very unusual, indeed. Common toads live and hibernate in forests and only venture to lakes and relatively deep ponds for reproduction. There are no trees on Glattalp, so the presence of toads would not be expected. The experts I contacted confirmed the call to be from a toad and gave the opinion that climate change is to blame, with slightly warmer temperatures suiting the frogs.



Fig. 4 Wildflowers, Glattalp valley

Temperate wetland



Fig. 7 Satellite image of Lake of Thun, Lake of Brienz (on the right) and Interlaken. The wetland is within the yellow circle.



Fig. 8 Lake Thun with Eiger (North Face), Moench and Jungfrau. Jungfrau peak is 4,225 m above sea level.

In late June, we stayed with a schoolfriend of mine on Lake Thun. The weather was sunny and hot with mild nights.

The satellite image in Figure 7 above shows the lay of the town of Thun, Lake Thun, Lake Brienz and Interlaken in the middle. The whole area is

heavily reliant on tourism, with a mild climate and easy access to the major ski resorts. Lake Brienz is a bright turquoise colour due to being fed by melt water from glaciers, hyper-saturated with air bubbles.

The lakes are over 350 meters deep. Sailing, kayaking and swimming can be done all year, although you have to be tough to swim in winter. The water in the lake remains ca 16–18° C in winter, but may drop lower in harsh winters.

Our hosts took us for a drive around the lake, and near Interlaken we went to a large nature reserve boasting a wetland along the lake. There was evidence of the presence of European beavers, as there were chewed logs that once had been young trees. We saw a grebe sitting on her nest and numerous birds flying about. There were ponds of various sizes and depths with waterlilies and reed thickets in some, and thick mats of algae and water weeds in others.

There were plenty of frogs having a rest in the water. The weather was hot, ca 30 degrees, so they just sat in the water staying cool. They didn't call during the day, but there is no doubt that there would have been plenty of noise at night. The species we saw were pool frog (*Pelophylax lessonae*) and edible frog (*Pelophylax esculentus*), Figures 9 and 10. They may also call during the day when the weather is cool. They are very common in stagnant waters. The ideal habitat is a pond with neither inflow nor outflow and no fish, as they are prone to predation by fish. The main predators are fox, birds and fish.



Fig. 9 Pool frogs, *Pelophylax lessonae*



Fig. 10 Edible frogs, *Pelophylax esculentus*



Figs. 11, 12 and 13 *Pelophylax* species, showing individual colour variation

***Pelophylax* Scientific Naming**

First recognised as a separate genus and named by Leopold Fitzinger in 1843. *Pelophylax* means 'mud sentinel'. Because Linnaeus had previously classified them as being in the genus *Rana*, this scientific name has persisted and is still used by people who are unaware of the changes. Molecular genetics has vindicated Fitzinger as being correct.



Fig. 13 *Pelophylax* sp.

Reproduction

P. esculentus is a hybrid from *P. Lessonae* and *P. ridibundus*. *P. lessonae* and *P. esculentus* are native to Switzerland, but *P. ridibundus* is not, and is not present at the wetland we visited.

Although *P. esculentus* is a hybrid, it can reproduce. It does so by ditching one of the parental genomes in its gametes. When *P. esculentus* mates with *P. lessonae*, the offspring is *P. esculentus*, as only the R genome is viable in this union. When *P. esculentus* mate with each other, only *P. esculentus* offspring survive. In Switzerland, offspring with both R genes do not survive, because the R genome has mutated over the years and is no longer viable on its own.

The link below is very useful for any information on amphibians in Switzerland. The only drawback is that it is in German, French and Italian!

<https://www.infofauna.ch/fr/services-conseil/amphibiens-karch/les-amphibiens#gsc.tab=0>





Eastern Stony Creek Frog
Litoria wilcoxii
© David Flack

FATS Frog-O-Graphic



BEST IMAGE WILD FROG: Dainty Tree Frog, *Litoria gracilentia*

David Flack



PEOPLE'S CHOICE: Fletcher's Frog, *Platyplectrum fletcheri*

David Flack

Competition WINNERS



MOST INTERESTING IMAGE: Splendid Tree Frog, *Litoria splendida*, checking out his internals!

Kat Fripp



BEST PET FROG IMAGE: SE Banjo frog and a Peron's Tree Frog await some food

Trish Nigro

FATS Frog-O-Graphic



BEST VIDEO WILD FROG: Crucifix Frog, *Notaden bennetti* feeding on ants

Rhys Cairncross



WILD FROG IMAGE Highly Commended: South-eastern Banjo Frog

Trish Nigro

Competition WINNERS



WILD FROG IMAGE: Highly Commended: Tusked Frog, *Adelotus brevis*

Cooper Tamayo



PEOPLE'S VOTE: Highly Commended: Red-eyed Tree Frog, *Litoria chloris*

Cassie Thompson

A Mass Deposit of Frog Fossils in Germany

Arthur White

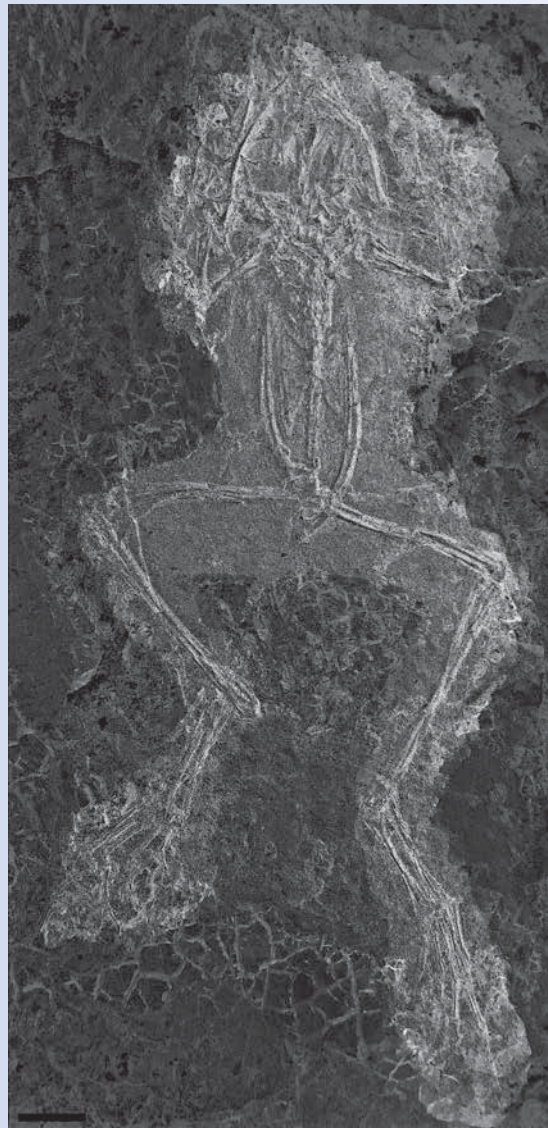
About 45 million years ago, when the North Sea covered half of Germany, hundreds of frogs were mysteriously killed in the swampy subtropical forests in what is now called Geiseltal in central Germany. Scientists analysed the remains of 168 frogs found at an old mining site in the Geiseltal valley in central Germany's Saxony-Anhalt region. The specimens were originally collected between the 1930s and 1950s, along with about 50,000 fossils of a variety of animals.

The fossilized frog bones (Fig. 1) date back to around 45 million years ago during the Eocene epoch. At the time, the site was a coastal swamp bordering the Paleo-North Sea, which covered most of northern Germany. Chemical conditions within the swamp delayed the decay of dead organisms until they could be fossilized by minerals in the water.

Sex Kills!

Most Geiseltal frogs follow a life on land until they return to their ponds for a short, but explosive breeding season. Analysis of the bones revealed that the frogs (mostly toads) weren't killed by predators or disease. The remains were intact at the time of death but the orientation of the skeletons was significant. Several possible causes of death were investigated, including extreme changes in the environment, flooding, drought and oxygen depletion.

Through the process of elimination, the scientists concluded that the most likely cause of death was sex. During mating, male frogs are known to sometimes hold females under the water for too long as they try to mount them, causing some females



to drown. The intact frog fossils were in a position that indicated that death by drowning during a mass breeding event was the most likely cause of death of some of the frogs. Sex can still be a death trap for modern toads and frogs that breed in water. Individual frogs are regularly overcome by exhaustion and can drown. Often many males compete on top of each other during a breeding frenzy, with the female(s) at higher risk as they are often pushed underwater beneath one or more competing males on top. Even today, mass toad graves can be found on migration routes and near, or in, breeding ponds. This is likely to be the same situation for the Geiseltal specimens.

Fig. 1 A fossilized frog skeleton from Germany

Daniel Falk



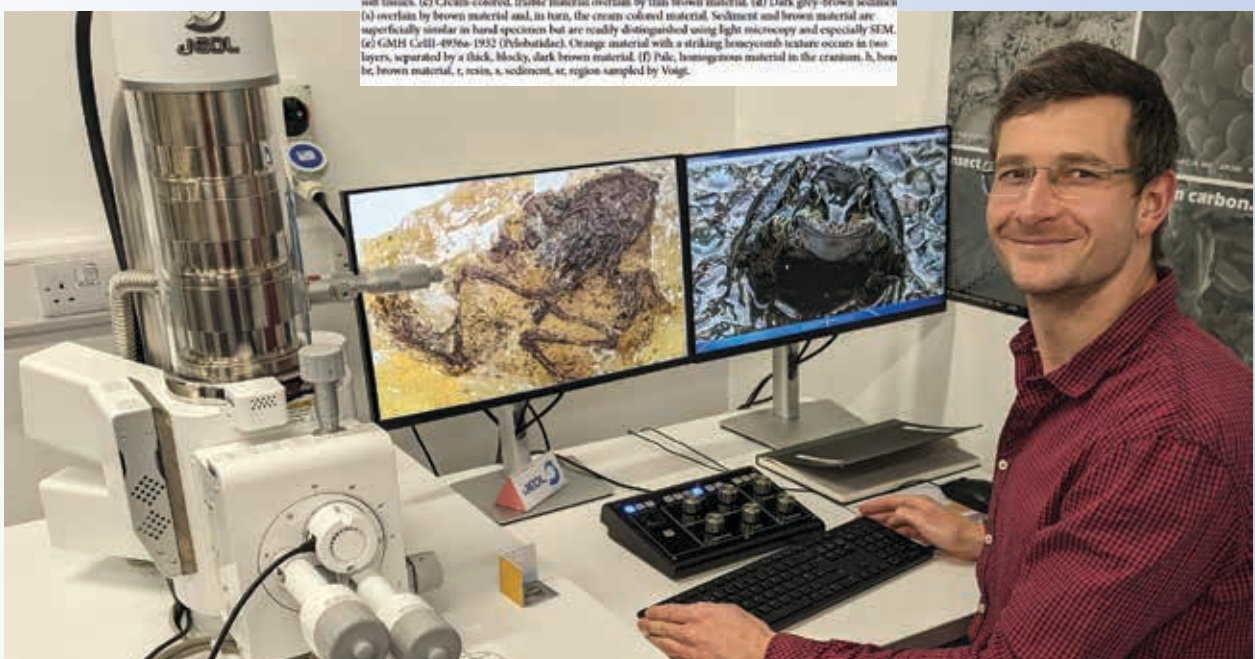
Above: Daniel Falk, a PhD student leading this study at the School of Biological, Earth & Environmental Sciences at University College Cork examines one of the Geiseltal fossils



Figure 1. Soft tissue preservation in anurans from the Eocene Geiseltal biota. (a-b) Photographs of specimens showing extensive soft tissues, visible in a cream-colored friable material and/or a dark brown material. Boxes indicate regions shown in (c), (d) and (f). Insets show color-coded line drawings of the bones. Legend in (a) applies to (b). (a) GMH Cell# 6098-1932 (*Pseudobufo*). The two parallel linear features crossing the torso are preparation artefacts. (b) GMH Cell# 6743-1932 (*Pseudobufo*). (c-f) Light micrographs showing details of the soft tissues. (c) Cream-colored, friable material overlain by thin brown material. (d) Dark grey-brown sediment (e) overlain by brown material and, in turn, the cream-colored material. Sediment and brown material are superficially similar in hand specimen but are readily distinguished using light microscopy and especially SEM. (e) GMH Cell# 4956e-1932 (*Pseudobufo*). Orange material with a striking honeycomb texture occurs in two layers, separated by a thick, blocky, dark brown material. (f) Pale, homogeneous material in the cranium. b, bone; br, brown material; t, tibia; s, sediment; ac, region sampled by Voigt.

Left: one of the figures prepared for the published research.

Below: Daniel at work on his computer showing equipment and some of the figures used for this research



<https://www.ucc.ie/en/eri/news/how-an-ancient-swamp-became-a-sex-death-trap-for-frogs.html>

The Seven Days of Sarawak:

How to turn a conference into a Bornean Frogging Adventure!

Grant Webster

All photos herein taken by Grant Webster



Permai Rainforest Retreat, Santubong Peninsula

For most people, Borneo needs no introduction; orangutans, hornbills, rainforests, palm oil plantations, 260-ish frog species (and well, the other herpetofauna should get a mention too). Borneo is the third largest island in the world, situated on the equator, and naturally covered predominately by dense tropical rainforest and peat swamp forests. It gets a lot of rain (Kuching averages 4,200 mm annually!). A biological paradise, but as for much of the industrialised world, it's not one without perils. Since the 1970s, modern agriculture (particularly oil palms) and timber harvesting has seen 30% of Borneo's forests disappear. When the forest goes, so does the fauna – by 2015 the orangutan population in Borneo was thought to have decreased by nearly 150,000 individuals in the preceding 16 years. Though in-line with global trends, all is not lost: extensive national parks; widespread conservation initiatives; and ecotourism (a bit of vindication for us froggers?), still ensures ample opportunity for a genuine Bornean “jungle experience”.

The island of Borneo is divided between three countries: Indonesia, Malaysia and Brunei. Malaysian Borneo is in the north of the island and separated into two states, Sarawak and Sabah. I only had the opportunity to visit Sarawak, where I was to give a talk at the World Congress of Herpetology to be held in Kuching (the state capital). During my stay I visited the three regions: the Santubong Peninsula, Kubah National Park in the Matang Range, and the Segong River near a town called Bau. Ordinarily, when attending a conference, it's best practice to book accommodation close to the venue, like a city hotel for example. But this was a conference in Borneo! I only had seven nights there, no time to waste hoping for a species or two in central Kuching! My plan was to stay in the forest, and move location every couple days. Having never been to Borneo, I first checked in with someone who had – Tom Frisby, a good friend and fellow FATS member. Tom recommended Kubah National Park, home to a famous frog pond and at least 60 species of



Permai Waterfall

frogs! I was also able to book a guided “frogging tour” there through an ecotourism company. Kubah provides a range of accommodation, though everything, except a tenuous “forest hut”, was currently under renovation. I was warned the forest hut wasn’t much more than a picnic table, but at 10 ringgit a night, how could I refuse?

I arrived in Kuching early in the morning on the 4th of August, a full day before the conference, which gave me plenty of time to checkout my first destination: **Permai Rainforest Retreat**, on the Santubong Peninsula. It was hot, humid and

sunny when I set off towards Permai Waterfall. The walk was mostly very steep and more challenging than I anticipated. I was also overly focused on a misconception that I would find frogs “everywhere” and it would be “easy”. But after rolling nearly every log and rock along the first maybe 500 m of the track, and finding absolutely nothing I realised my expectations weren’t even reasonable – why would the frogs be under rocks when there is an abundance of thick, damp leaf litter to hide in? By this stage, though, I had already spotted three reptile species....

Obsessing over finding frogs was also detracting from the rainforest experience. So, I decided to live in the moment and focus on the walk. It was beautiful, giant emergent canopy trees, moss covered rocky gullies and lots of native palm trees. Eventually I reached the waterfall which fell into a crystal-clear flowing creek, the perfect place to cool off for a bit. After a few minutes relaxing in the water, I looked to the rock beside me, and, entirely unexpectedly (!), was enthralled to sight my first frog! My patience had paid off. I immediately knew what it was, *Staurois guttatus* (Black Rock Skipper), a species famous for its visual signalling (hand waving and foot flagging). Up to that moment I didn’t even realise it was a Bornean species (I had intentionally kept myself somewhat naïve of the Bornean frog fauna, in the hopes of elucidating a more authentic original frogging experience), although I did know about its behaviour. In fact I had previously discussed it in a paper I wrote on frog communication. Moments later, movement on the waterfall caught my attention – two *Staurois* waving and flagging at each other! This went on for several minutes, long enough for me to record a



Staurois guttatus, Black Rock Skipper, known for its arm-waving behaviour



Duttaphrynus melanostictus, Black-spined Asian Toad

video. An amazing experience – very clearly, I was off to a good start! The clouds had been steadily building that afternoon, and the sound of distant thunder did not disappoint. It poured! The heavy tropical rain drenched the forest down to the leaf litter and I knew the night's frogging would be non-stop go! Word of the *Staurois* find had spread, and one of my old lab mates, Dan Hoops, was keen to see them as well and decided to come and meet me at Permai.

While I waited for him to arrive at the carpark I happened upon the second find of the day, *Duttaphrynus melanostictus* (Black-spined Asian Toad). This was one of the species I did know about already (I had previously seen their tadpoles in Singapore), and I was hoping to see it in Borneo. The night easily exceeded our expectations, by the time we had completed the waterfall loop walk we had recorded 17 species. The Permai Falls track supports dense rainforest and thick leaf litter throughout, ideal habitat for the so called "Litter Frogs", whose breeding habitats are primarily formed by an abundance of shallow and pooling first order gullies as well as some larger, rocky flowing creeks.



Ansonia leptopus, Brown Slender Toad



Kalophrynus meizon, Bornean Large Sticky Frog

Unsurprisingly, frogs were everywhere. The first creek stop of the evening, just metres from the reception building, produced four species – in about the same number of minutes. It was immediately apparent that frogging operates at a faster pace here, eyeshine after eyeshine. Here we found *Chalcorana raniceps* (Jade-backed Frog), which turned out to be one of the most ubiquitous and numerous species in Kuching. We also picked up our first *Ansonia* species (a genus of small, dainty, stream-dwelling toads), *A. leptopus* and two species of *Limnonectes* (of the family Dicroglossidae, not one we have in Australia); *L. hikidai* and *L. conspicillatus*. As we crossed the next gully (a gently flowing stream with sandy pools), Dan shouted from the bridge "fat headed frog!". We jumped down and found a pair of *Limnonectes kong* (yes, it was named after King Kong). This species is convergent to our *Adelotus*: males have a pair of lower jaw "tusks" presumably used to bite other males, on their "grotesquely large heads". Even the females are smaller and quaint (just like a female Tusk frog), and the preferred habitat is nearly identical to that of *Adelotus*. A little further down the walk we spotted a couple *Kalophrynus*



Leptobrachium ingeri, Inger's Black-eyed Litter Frog



Limnonectes kong, Large-headed Creek Frog

meizon, a microhylid that dwarfs most of the Australian microhylids. And this was all from the paved walk through the resort – we hadn’t even started on the bush track yet! Maintaining the status quo, the first hundred metres or so of the falls trail turned up three more species, all from the Megophryidae family, again not one we find in Australia: *Leptobrachium ingeri* (see photo), the larger *L. abbotti* (Lowland Litter Frog), and one of the most obligate South-East Asian species – the classic (and giant) *Pelobatrachus nasutus* [syn. *Megophrys nasuta*] or Malayan Horned Toad. After a longish stint of ‘more of the same’ (frogs at least, we did see a nice Green Pit Viper - below), Dan spotted another ranid that he reckoned “was something different”. It was, a young *Meristogenys jerboa* (Western Torrent Frog) – a good indication we were getting close to another creek. And this one was somewhat steeper and swifter, with a few cascades. Besides a bunch of the ‘regulars’ (can I use that term already?) – *Chalcorana*, *A. leptopus*, *Limnonectes spp*) – perched on a fern in the splash zone we noted another *Ansonia*, a bit slighter than the *leptopus* but also more vivid, and was our next newie, *A. minuta* (Dwarf Slender Toad). Now re-



Nyctixalus pictus, Cinnamon Tree Frog

exhilarated (I was getting pretty worn out by this point), we pushed on, and moments later I spotted another frog at the top of the creek crossing. So brilliantly patterned, I instantly (and ahead of my conscious awareness) shouted “SOMETHING REALLY DIFFERENT”! It was *Nyctixalus pictus* (Cinnamon Tree Frog), our first Rhacophoridae species, another family that never made it to Australia, but which is common across Asia and even into southern Africa. The rhacophorids are essentially the Bornean answer to Australia’s pelodryadid tree frogs. At last we made it to the waterfall, where Dan got his *Staurois*, and we found more of the same (including an *A. minuta* perched on the edge of the waterfall). We photographed some tadpoles (ID pending...) and then started our ascent back up the mountain. On the climb, Dan found another megophryid, smaller than the earlier species, this one was *Leptobrachella gracilis* (Sarawak Slender Litter Frog). Nearing the end of the walk, we knew our chances of additional species were diminishing. Most of the night we had been plagued by a firm “honk” noise resonating from throughout the forest canopy, we didn’t know what it was (or if it was even a frog), and our efforts



Tropidolaemus subbanulatus, Bornean Keeled Pit Viper



Ansonia minuta, Dwarf Slender Toad

to find it were in vain. We were back to the bottom of the mountain now, and nearing 'home' when Dan chanced another *Kalophrynus* amongst the leaf litter, surmising "it's probably the same as the others". Exhausted, I briefly inspected the frog and took two quick shots. Sadly, those words aged very poorly. Comparing my "record shot" photos (i.e. focused enough to tell what species, but so blurry that they otherwise would be deleted) against the field guide, it was clearly not *K. meizon*, but *K. intermedius* (Intermediate Sticky Frog)! Now it was time for some sleep. Permai saved one last surprise for the morning, a Proboscis Monkey browsing in the canopy above me!

It was day one of the conference, which would run for five consecutive days. My talk was on the final day, and I did my best to overwhelm the audience with as much information that the laws of physics permitted in the timeframe allowed. Otherwise, the congress was great, and exactly what you would expect from a world class event. That's all I'll say on World Congress of Herpetology no. 10, as naturally it had become secondary to the primary purpose of frogging. I arranged for a taxi get me to the next location – **Kubah National Park**.

Taxis in Kuching are very reasonably priced and an effective means of getting around the city.

My driver, whose name was Kong, considered me "a very brave man" for staying in a forest hut in a dense jungle alone for two days, and was equally impressed when I mentioned it was my personal preference. As far as taxi drivers go, Kong was definitely one of the best, he went above and beyond to make sure I safely got to all my destinations (especially helpful considering I can't speak Malay). Without Kong's mediation with the security guards at the Kubah park gates, I'm not certain they would have let me in. National Parks in Malaysia operate a bit differently from those in Australia. Security is taken seriously (armed guard patrols are frequent) and permits are generally required for access and accommodation. While I had a permit, the guards were confused as the standard accommodation was all closed, and were bewildered that I would opt for the fabled "forest hut". Kubah, much like Permai, was dense rainforest jungle, though it had a 'homelier' feel – plants I recognised(!), such as species of *Syzygium*, *Rhodamnia* and *Melastoma*. After settling into the forest hut, I had some time to look around before dark. I was instructed by the guards that I could only look for frogs around the campsite (which promisingly featured a small flowing stream). The frog pond was off limits without a tour guide, so that would have to wait until tomorrow. As night



Pelobatrachus nasutus, Malayan Horned Toad, brilliantly camouflaged for a life in leaf litter



Limnonectes leporinus, Giant River Frog (male)

fell, things picked up quickly: mozzies galore, cicadas screaming, geckoes everywhere: one landed on my head, another found its way into my red bull. And then the tour buses began arriving – for the frog pond guided walks. One after the next. All night it was almost a constant stream of herpetologists heading up and down the track. For a brief time, the World Congress of Herpetology had taken the form of an ant super colony, with clear purpose and focused direction.

Removed from the order (and distractions) of the masses, I was free to frog comfortably at my leisure around the campsite. It didn't take long to realise why Kubah is known of "the place of frogs". Within 10 minutes I found four species of frogs: *Polypedates leucomystax* (Four-lined Tree Frog); *Ingerophrynus divergens* (Forest Toad); *Limnonectes paramacrodon* (Lesser Swamp Frog); and *Ansonia spinulifera* (Spiny Slender Toad). I had seen none of these on the previous night. There were also a few familiar faces present too, *Limnonectes conspicillatus* and *Chalcorana raniceps*. While



Ingerophrynus divergens, Forest Toad



My 'fabled' Forest Hut, Kubah National Park!

most of the frogs were hanging around the rocky flowing part of the creek (except the *Ingerophrynus* which, in keeping with its namesake, was found amongst forest leaf litter and on low vegetation), there was also a "second half" of the creek, on the opposite side of the road. This part of the creek was shallow, sandy and had broad pools with little flow. A quick scan with the headtorch reflected dozens of frog eyeshines, but one in particular caught my attention. This frog had to be absolutely huge, easily as big as the largest of Australia's frogs. It was a male *Limnonectes leporinus* (Giant River Frog), Borneo's biggest frog. This species is sexually dimorphic, and females are substantially smaller. Fortunately for me, he was posed perfectly to get some good photos.

Continuing along the creek, a soft chuckling sound coming from the streambank captured my attention. Perched on an overhanging branch was a picturesque frog covered in brilliant golden yellow 'suarish' patches. One of Borneo's most impressive species, the aptly named *Pulchrana*



A gecko hangs out on my drink can, Kubah forest hut!



Pulchrana picturata, Spotted Stream Frog

picturata (Spotted Stream Frog). Unfortunately, this one didn't stick around for long and after a couple photos I moved on to check our next eye-shine (unlike frogging in Australia, Borneo offers no breaks between eye-shines...). A bit higher up the bank I spotted another 'perching' frog, this one on a fallen log. It had a similar stance and body shape to the *P. picturata*, but was mottled brown, lacking the vibrant colour patches. The similarities were no coincidence as they were closely related species, this one being *Pulchrana baramica* (Brown Marsh Frog). Along with the ever-present *Chalcorana raniceps* (Jade-backed Frog), and others, all of these species are sometimes classed in the genus *Hylarana*. Under this classification, *Hylarana* contains more than 100 species, and even includes

Australia's only ranid – *Papurana daemeli* (Wood Frog). By this time most of the tour groups had left, but I still had another hour or two in me. This was partially because, as for the previous night, I was being haunted by the persistent tonal "honk" sound emanating from the tree canopy. I was determined to find out what this animal was. They seemed to be everywhere, but always out of reach. Suddenly, one began calling within range of my forest hut, and sounded only a few meters above the ground. This had to be my chance! I tracked the sound through the forest to a thin, multi-stemmed tree, and probably only a meter or so above my head. I climbed the tree and looked amongst the branches – nothing. Worried I had frightened it into going quiet, I shut off my light and waited patiently. It



Chalcorana raniceps, Jade-backed Frog



Pulchrana baramica, Brown Marsh Frog

called again, merely centimetres from my face. It had to be right in front of me. I turned on my light to see I was looking straight at a thin tree trunk. At a loss, I noticed in the tree trunk that there was a small hollow, partially filled with water; and in it a tiny frog grumpily staring straight back at me. A very satisfying find – *Metaphrynella sundana* (Tree Hole Frog).

Tired and drained, I decided it was time for bed. I had hoped to see one of Borneo's famous flying frogs – especially considering the amount of tree scanning, and climbing I did to find that *Metaphrynella*. Alas, the night was not finished with me yet, and I still had one last tree to climb. Glancing through the canopy as I approached my forest hut, a big set of frog eyes was shining back down at me. The frog was about 10 m up, well out of reach, but through the camera zoom I recognised it as *Rhacophorus pardalis* (Harlequin Flying Frog). I had come too far not to get a good look at it so I had to climb the tree. Tapping into my memories of childhood, whilst embracing some kind of primal instinct, the ascent was underway. I had no idea what I was doing. The tree had no low branches, it was smooth barked, thin and somewhat flimsy. Pure determination left me in some kind of subconscious trance; a separation of body and mind – my mind was on the frog; my body was getting me to it. And it worked. I took dozens of photos, it was a spectacular looking animal: bright red webbing on the large hands and feet with broad discs; ornate yellow, blue and red marbling on the flanks; lichen coloured patches across a ruddy dorsum; and bright yellow-orange long fingers and upper arms..... What a way to finish the night!

Day two of Kubah was the night I had arranged the frog pond tour. Our tour leader was “Borneo Bruce” Teo – a very knowledgeable naturalist and photographer, who knew where to find everything and had



Metaphrynella sundana, Tree Hole Frog

no problems identifying species. We had a group of eight people on the tour including a few notable international herpetologists (Amael Borzée and Yuchool Shin) as well as some other Aussies, including my old honours supervisor Martin Whiting, and PhD student Maddi Holmes, both from Macquarie University. Whilst looking at a tree viper near the start of the trail, we could hear a soft creaking sound coming from near a cluster of pitcher plants (*Nepthenes spp*). Bruce informed us this was the call of *Microhyla nepenthicola* (Pitcher



Rhacophorus pardalis, Harlequin Flying Frog



Nepenthes plant, breeding site for *Microhyla nepenthicola*, Pitcher Plant Frog

Plant Frog) a tiny (~17 mm long) frog species that breeds inside the water filled pitchers. Looking into one of these plants, we could see a dozen of the smallest tadpoles I had ever seen swimming freely in the pitcher.

The first frog we spotted on the walk up was a Horned Toad (*P. nasutus*), which despite its enormous size, was perfectly camouflaged amongst the leaf litter. The higher up the mountain we climbed, the more numerous the frogs became. A slight stream (more of a drainage gutter) flowed alongside the trail. Torrent Frogs (*M. jerboa*), Jade Frogs (*C. raniceps*), Rivulet and Creek Frogs (*L. hikidai* and *L. conspicillatus*), Brown Dwarf Toads (*A. leptopus*), Forest Toads (*I. divergens*), and even the Rock Skipper (*S. guttatus*) were all around. A familiar sound from yesterday drew my attention, as another Spotted Stream Frog (*P. pictuarata*) briefly posed for a photo before quickly darting off.

We continued the walk, Maddi pointed the eyeshine of a big frog just off the track, a male Greater Swamp Frog (*L. malesianus*). Further along I spotted another recognisable frog, the small but flashy Cinnamon Tree Frog (*N. pictus*). By this



Meristogenys jerboa, Torrent Frog



Limnonectes malesianus, Greater Swamp Frog (male)

stage we were nearing the frog pond, but Bruce said there two more species we had to lookout for first. Drawing our attention to a large stand of pitcher plants – where another group of congress delegates were busy photographing something. They were photographing exactly what we were after, the Pitcher Plant Frog itself. Although comparable in size to some of Australia's *Cophixalus* species (also of the Microhylidae family), the reproductive mode is completely different, all of Australia's microhylids are direct developers, with no tadpole stage. Bruce then turned our attention to a dense thicket of ferns, overhanging a very shallow series of trickling pools. It didn't take long for us to spot a small, pale green tree frog, perched on a fern frond. This was *Feihyla kajau* (Charming Tree Frog), a rhacophorid species with a specialised reproductive habit – eggs are laid in jelly clusters on the ferns and hatched tadpoles drop into the water below (not unlike that our of own *Litoria longirostris*). Now, it was time for the frog pond.

The Kubah pond is a natural formation, a deep depression in the ground which has had a boardwalk built around it for access. To protect



Feihyla kajau, Charming Tree Frog



Ansonia spinulifera, Spiny Slender Toad



Limnonectes paramacrodon, Lesser Swamp Frog

the pond, no one was allowed off the boardwalk. Despite the pond being drier than normal, there were frogs and eyeshines galore. Arboreal frogs predominated, many I was already familiar with: *C. raniceps*, *P. leucomystax*, even the flying frog *R. pardalis*. One new species here for me was *Polypedates macrotis* (Dark-eared Tree Frog), a variable but moderate sized tree frog. Perhaps the reason the ground frogs were scarce was the number of Giant River Frogs (*L. lepirobus*) sitting around the pond's bank – if I was a small frog I'd want to keep my distance from a mouth that size! Towards the end of the pond loop track, I noticed one of the Litter Frogs (*Leptobrachium abbotti*) which I was busily photographing as the rest of the group moved on. A few days later, Yuchael showed me some of his photos from the night, including one of a File-eared Tree Frog (*Polypedates ottilophus*), which he told me was from the frog pond – yet I had no idea about it! I was shocked and envious that I missed this signature Bornean tree frog (which now gives me more reason to return one day!). But we can't be in two places at once... they found the *P. ottilophus* when I was off looking at the *Leptobrachium*.



Polypedates macrotis, Dark-eared Tree Frog



Fejervarya cancrivora, Crab-eating Frog

The walk back down the hill provided just as many frogs as the walk up. A couple new ones for the evening (though ones I had seen at Santubong) were *Leptobrachella gracilis* and *Ansonia minuta*, both calling from secluded locations along the trackside gully. The call of *Metaphrynella sundana* echoed through the tree canopy almost continuously, though we weren't fortunate enough to see that species tonight. After we had returned to camp and the rest of the group went home, I stayed up a little longer to see what else was hanging around. While I didn't see any different frogs compared to the previous night, I did see a freshwater crab, a gigantic snail, more geckos, and even heard a Pitcher Plant Frog only meters from my forest hut! This was easily the biggest day of frogging for the trip – 22 species in one night!

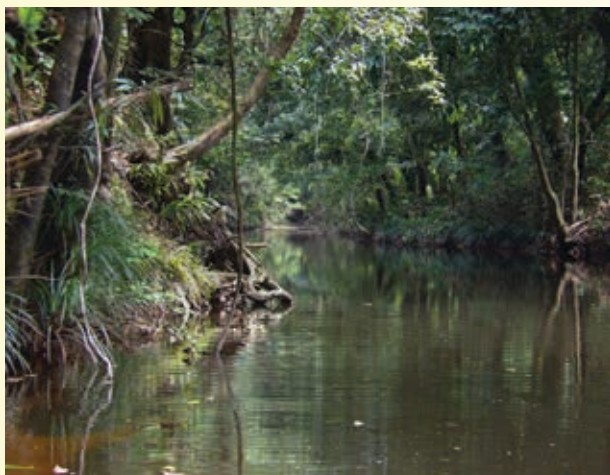
For day four I was headed back to the Santubong Peninsula, but this time was booked in to a more "western style" tourist resort, called The Culvert and located at **Damai Beach**. After three nights of intense frogging, I needed an easy night. I opted for an easy walk along the beach to some nearby mangroves with a single target in mind – the Crab-eating Frog (*Fejervarya cancrivora*). This species



Limnonectes hikidai, Rivulet Frog

is famous not only for eating crabs but also for its tolerance of estuarine water (where it breeds) and is commonly found within metres of the ocean. The first frog of the evening (amongst the hermit crabs crawling along the sand) was a Black-spined Toad (*D. melanostictus*), but approaching the mangrove zone the eyeshines started popping up. Lots of eyeshines. The first one I approached was *F. cancrivora*, a formidable, sand-coloured, and robust frog. I was very happy to see this species. Some were calling, a short “gerk” sound. I followed a small stream up from the beach and found a few other species – *Polypedates leucomystax* and three *Limnonectes* species including: *L. kong*, *L. hikidai* and *L. paramacrodon*.

For my second night at Damai, I decided to head a bit further up the road to a creek in Santubong National Park. Along the road, in a street tree I picked up an eyeshine – a Slow Loris! A little further down the road was a congregation of *P. leucomystax* around an open drain full of water, and tadpoles; clearly a good breeding site for this species. The creek was larger than the ones I visited at Permai, and flowing much more rapidly. While



Segong River

I didn't find any 'new' species here, there was an abundance of frogs. Particularly common was the Western Torrent Frog (*Meristogenys jerboa*), which reminded me of our *Litoria lesueuri/wilcoxi*, with small yellowish males scattered across the boulders and the occasional gigantic female perched on the bank. Other common species here were *Ansonia leptopus*, whose musical trilling call rose above the sound of the rushing water, Jade Frogs (*C. raniceps*), *Limnonectes conspicillatus* (which seemed to favour sitting in cascade zones) and *L. paramacrodon*. Along one of the smaller tributaries I noticed a *L. kong* poking its giant head out from a concealed creekside cavity. The last frog of the evening was a *Leptobrachium ingeri*, nestled into the forest leaf litter. And with that it was time to head back to my 'culvert' (literally, the hotel rooms were old concrete culvert pipes – very niche!) for a practice run of my conference presentation, which was on the next day.

Following the end of the congress, I was off to my final destination for the week – 'The Stranded Cabin' ("Pinggir Siak") on the **Segong River**, well outside the metropolitan area of Kuching City. With no direct road access to Pinggir Siak, the closest road gets you to an indigenous village where there is a start of a vague, muddy jungle walking track that involves multiple narrow bamboo bridge crossings. It's not really something for the faint-hearted and one needs to pack lightly for the journey. There is also little mobile phone reception and no internet. This is exactly what I had in mind for a genuine experience in the wilds of Borneo and was looking forward to my time here alone. I also chose this area to stay at because of its proximity to the Segong River, a much larger waterway than anything I had frogged in Borneo thus far.

I arrived at the start of the trail at night, perfect timing for frogging along the way. Most of the frogs around the village were *Fejervarya limnocharis* (Grass Frog), a species I hadn't yet seen and one more common in 'disturbed' or modified habitats (especially agricultural lands). Along the track, I also picked up *Polypedates macrotis* and *Kalophrynus meizon* (the latter being a particularly flashy coloured individual). Although I was getting pretty tired by this stage, after settling into my cabin I couldn't resist a quick look along the river. On the opposite bank of the river, staring straight at me was a pair of frog eyes that rivalled that of the Giant River Frog. To my surprise it was a ranid, rich green on the dorsum and brown on the flanks this was one of the most impressive frogs I had seen all week. It was *Odorrana hosii* (Poisonous Rock



Odorrana hosii, Poisonous Rock Frog

Frog), this species secretes toxins from its skin (presumably as a defensive mechanism) that are even known to kill smaller frogs. It's a remarkable looking frog and has been described as "the most handsome species in Borneo". Apart from the more familiar Black-spined Toads (*D. melanostictus*), Jade-backed Frogs (*C. raniceps*), Common Tree Frogs (*P. leucomystax*), and Malesian Frogs (*L. malesianus*), I encountered one other species along the river that night, another 'new' one for me; *Hylarana erythraea* (Green Paddy Frog), a moderate-sized ranid, that like *F. limnocharis* tends to be found around agricultural areas.

Waking up to the final day of my Bornean adventure evoked both sensations of melancholy and gratefulness, but more than anything I was looking forward to returning home to my family. I spent the day relaxing by the river, and exploring the jungle and local village. The indigenous Iban people were friendly, though spoke little English, and the children played by the river all day. Life here seemed simple and very peaceful, far removed from that of the city only an hour or so away.

During the whole day, clouds had been building, and a storm seemed like it could be on the cards. Good rain would make my last night of frogging that much better. Just on dark it poured! I couldn't have been happier and after the rain I set out. There were frogs everywhere, all over the tracks, through the grass and on the rocks in the river. I started out in the clearing around the cabin, with plenty of *F. limnocharis* around, calling as well (very similar "girk" sound to that of *F. cancrivora*), *H. erythraea*, and I found an amplexing pair of *P. leucomystax* by a temporary puddle. Along the river, frogs were non-stop; lots of *Limnonectes paramacrodon*, plus *Pulchrana baramica* – a species I hadn't seen since Kubah. The very same *Odorrana hosii* was back in



Chalcorana megalonesa, White-lipped Frog

the same spot. After about an hour in I was getting tired of the back-and-forthing through the river – it was rocky, slippery, and fast flowing. Most of the eye-shines I saw on both sides of the river were of Jade-backed Frogs. I'd probably seen more of these frogs than any other species.

I'd almost given up when I saw one more frog to check out. At first glance I was sure it was a *Chalcorana raniceps*, but it was really big, also its back was brown, not green. I was aware of similar species, *C. megalonesa* (White-lipped Stream Frog), an almost identical species, but larger, with a brown back, and an occupant of larger muddy rivers, just like the Segong. After a bit of deliberation, I was sure I was looking at *Chalcorana megalonesa* this time! The tiresome river crossing had been worth it. It was late, and my flight out of Kuching was tomorrow, but I decided I had the stamina for one last walk down the jungle track. After seeing more of the regulars, I spotted a *Limnonectes* that didn't quite look right for *L. malesianus*, the skin texture was fine and it was less reticulated. It was *Limnonectes ingeri* (Inger's Swamp Frog), and would be the last new frog species for me on this trip, bringing me to a total of 35 species from the seven days! On my final approach to the river I almost stepped on what I thought was a piece of colourful electrical cable; turned out to be a highly venomous Red-headed Krait – a very impressive looking elapid snake! The last frog of the night was a Cinnamon Tree Frog, a delightful species at any rate and a good one to see me off. As I climbed into bed that night, the rain I had been hoping for all day hit with vengeance. It POURED all night. I can only imagine how the following night's frogging would have been even better! Regardless, Borneo was all I imagined it would be and more – and I look forward to the day that I return!

Future FATS Field Trips

Please book your place ahead on field trips, as due to strong demand, numbers are limited. Be sure to leave a contact number. Regardless of prevailing weather conditions, we will continue to schedule and advertise all monthly field-trips as planned. It is YOUR responsibility to re-confirm in the last few days, whether the field trip is proceeding or has been cancelled. Phone Robert on 02 9681 5308. There may be additional field trips offered this Spring/Summer season. We will email any additional notices for December or January and place information in the February 2025 FrogCall.

Sunday 1 December Australian Reptile Park, Somersby Herpetological groups Christmas Party BBQ

Meet inside the Australian Reptile Park, Pacific Highway, Somersby. Please take your membership card. The annual interclub ARP Herpetological groups Christmas party BBQ commences at 10.00 AM, but you may turn up at any time before 3 PM. There is usually a behind-the-scenes look at the reptile centre and free shows throughout the day. You need to present your current membership card upon entry. The free entry is for those on the membership card only. There are picnic facilities. You can bring your own lunch or purchase from the kiosk. No need to book for this one, just turn up! It's best to call the ARP and confirm details.

Saturday 18 January The Watagans Leader: Cassie Thompson

PLEASE NOTE OUR NEW MEETING PLACE FOR THIS FIELDTRIP!

Meet at the McDonalds Restaurant, Morisset, only 400m from our previous meeting point. From Sydney, take the M1 freeway north. After approximately 83 km, take the Morisset/Cooranbong exit. Turn right and travel about 2.5 km to the corner of Mandalong Rd and Ourimbah St, Morisset. McDonald's is on the corner. Meet in the carpark.

Historically, when a plant or animal was first discovered and collected, it was sent off to the authorities, usually the museum or herbarium, and the specimen was formally "described". It was then preserved and stored with accompanying notes (usually the date, location of collection and by whom it was collected). This became known as the Type specimen (technically, the "Holotype" but often abbreviated and simply referred to as the "Type"). This became a very important reference point for future researchers. Today, many scientific articles will refer to the Type or the Type locality i.e the place where it was found.

There will also be frequent references to a species being "described".

It is important for all biology students to understand and be familiar with these terms.

This weekend, Cassie will be on hand to explain the importance of, and protocols accompanying, Type specimens. We will also discuss why museum collections are not merely antiquated items of curiosity but in fact serve a crucial research role.

Cassie is a biodiversity specialist working with the State government. She works to find solutions to complex ecological problems, particularly as these relate to linear infrastructure and the impact on biodiversity. She has been visiting the Watagans for many years. She worked on a project with State Forests getting breeding ponds built and a citizen science program started for local threatened frog species.

In the event of uncertain frogging conditions e.g. prolonged or severe drought, hazardous and/or torrential rain, bushfires etc., please phone 02 9681 5308. Remember rain is generally ideal for frogging!

Children must be accompanied by an adult.

Bring enclosed shoes that can get wet (gumboots are preferable), torch, warm clothing and raincoat. Please be judicious with the use of insect repellent. Frogs are very sensitive to chemicals! Please observe all directions that the leader may give. Children are welcome, however please remember that young children, especially, can become very excited and boisterous at their first frogging experience. Parents are asked to help ensure that the leader is able to conduct the trip to everyone's satisfaction. All fieldtrips are strictly for members only. Newcomers are welcome to take out FATS membership before the commencement of the fieldtrip. 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>

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, Andrew Nelson, Wendy & Phillip Grimm, Marion Anstis, George Madani and Punia Jeffery. 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 Easter Friday), June, August, October and December. If the FATS meeting falls on Easter Friday, then the meeting will probably be one week earlier. 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 exhibits at many community fairs and shows. Please contact Events Coordinator Kathy Potter if you can assist at any of these events, 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. From 2025, credit cards can be used for raffle and other purchases over \$10.

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FATS ON FACEBOOK: FATS has over 5,000 Facebook members and visitors 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 13 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. 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 visit to a vet unless obviously sick. Please take your new, 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>

NB: FATS has student memberships for \$20 annually with electronic FrogCall (but no hard copy mail outs). <https://www.fats.org.au/membership-form>

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