

## FEBRUARY 2021

Happy New Year from Frogs Vic!

Thanks to everyone for your support through the craziness that was 2020. Special thanks to Michael McFadden and Jodi Rowley for their great talks last year.

Onwards to 2021! We hope to see you back in the pub this year – starting on March 4<sup>th</sup> for our AGM and then again for more frog events starting in April.

We are currently looking for more committee members, so if you're keen to influence the year, please consider getting involved. And if you have any suggestions for talks (either your own, or someone else's!) please do let us know.

In the meantime, please enjoy our latest newsletter, including the lowdown on Victoria's newest species of frog – the Large Brown Tree Frog, *Litoria watsoni*. Thanks to Mike, Rena and Marc for their expert contributions to this issue.

As always, please don't hesitate to get in touch if you have any ideas, questions, or suggestions.

Thanks for your ongoing support.

For the frogs,  
Lynette Plenderleith, Pobblebonk Editor

## 2020 WASN'T ALL BAD!

Many thanks to our speakers in 2020. There were only two, but they were amazing!

**Dr Jodi Rowley**, Curator of Amphibian & Reptile Conservation Biology at the Australian Museum and UNSW Sydney (The University of NSW) presented "Adventures in amphibian conservation" about expeditions in Asia and FrogID, a national citizen science project. If you missed it, [catch the video online](#).



**Michael McFadden** is the supervisor of the Herpetofauna Department at Taronga Zoo in Sydney, where he oversees the zoo's amphibian and reptile collection and conservation programs. Michael discussed some of the conservation breeding programs he has been involved with at Taronga Zoo, including those for the Southern and Northern Corroboree Frog and the Yellow-spotted Bell Frog. [Watch his talk online](#).

Thanks to both Jodi and Michael for their fantastic talks!

## UPCOMING ANNUAL GENERAL MEETING

7:30 pm, 4<sup>th</sup> March 2021 - Elgin Inn, Hawthorn. Don't forget your mask!

Come along to the AGM, hear 2020's reports and share your thoughts and ideas for 2021.

We encourage you to join the committee too!

Please email [secretary@frogsvic.org](mailto:secretary@frogsvic.org) if you would like to nominate yourself for a position.

What is an AGM anyway?

Incorporated organisations like Frogs Vic have a legal obligation to hold an annual meeting to report on finances and activities from the previous year. It's also an opportunity to look ahead to the next year, make exciting plans and, because it's Frogs Vic, all get together for a social event!

If you can't make it and you are a financial member, you can get someone (a proxy) to vote on your behalf if necessary. They don't have to be a financial member, but you should let us know who is going to be voting for you, before the event (email us: [secretary@frogsvic.org](mailto:secretary@frogsvic.org)).

More details at [www.frogsvic.org/events](http://www.frogsvic.org/events) or [info@frogsvic.org](mailto:info@frogsvic.org)



## LARGE BROWN TREE FROG, *LITORIA WATSONI*. A NEW SPECIES OF TREE FROG IN THE *LITORIA EWINGII* SPECIES GROUP

**Professor Michael Mahony, University of Newcastle**

For over a decade, field ecologists pointed to the low number of observations of Littlejohn's Tree Frog, *Litoria littlejohni*, which prompted us to examine its distribution and abundance. Because we can learn so much about population ecology from genetics, we included the collection of genetic samples in our study. Accumulation of material was a slow process since observations of the frog, especially in the south of its range, were few and far between. We placed automated sound recorders at 11 well defined historic sites in NSW for about 18 months. The frog was only recorded at three of those sites. Our observations returned similar outcomes and confirmed those made by field ecologists. Once tissue samples were collected from across the range, we conducted some preliminary genetic testing, which showed differentiation between northern and southern populations. However, before considering that the genetic differences were sufficient to recognise the north and south as different species, it was necessary to apply a test of the evolutionary species definition. The test, in this case, was to ensure there was no evidence of gene flow where the southern and northern taxa meet. This was a difficult task since it was necessary to determine where the two taxa came close enough or overlapped in nature and that evidence of gene flow was not occurring. It took several rounds of intense field work to close the geographic gap between the northern and southern taxa. This occurred at the southern boundary of the Sydney Basin bioregion and we found no evidence of gene flow between the southern and northern taxa. Investigations of morphology and mating calls showed statistically significant mean differences between the species, however because of overlap in measurements, none are particularly useful for field identification, and geography is the best way to determine species identity. We chose to name the southern species *L. watsoni* in recognition of Dr Graeme Watson for his contributions to our knowledge of the evolutionary ecology of Australian frogs.

Sadly, our field studies, observations of museum collections and a review of field records led us to conclude that both species are seriously threatened. Littlejohn's Tree Frog (*L. littlejohni*) is somewhat of an enigma. In one relatively small area at the southern edge of the Sydney Basin it is reasonably abundant, while at the same time it has almost totally disappeared from the vast Greater Blue Mountains region much of which is in a World Heritage Reserve. The predicament for the Large Brown Tree Frog (*L. watsoni*) is similar. At the northern limit of its range there are several robust, but geographically restricted populations, and large gaps occur between these and isolated localities in southeast NSW and East Gippsland. Lastly, the fires of the 2019-20 summer burnt fiercely in the known habitat of several populations of both species, and it will be some time before we can fully understand the impact on both species.



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Left: Large Brown Tree Frog, *Litoria watsoni*. By Matt Clancy;  
Right: Large Brown Tree Frog tadpoles. By Rena Gaborov

## LARGE BROWN TREE FROG, *LITORIA WATSONI* – POST BLACK SUMMER BUSHFIRES

*Rena Gaborov*

Early in 2020, I was part of a landscape scale project in East Gippsland for the Arthur Rylah Institute (commenced pre-fire), to detect the Large Brown Tree Frog, *Litoria watsoni*, and determine a habitat model for the species. I also did some opportunistic surveying in spring and in early summer for The Department of Land, Water and Planning (DELWP) at sites where the species had recently been detected.

The forest at Martins Creek was severely burnt for the second time in seven years, but with trees still smouldering, audio recorders first picked up Large Brown Tree Frog calls in mid-February, after rain. Throughout 2020, tadpoles were found at four burnt sites post-fire, three of four I would consider severely burnt (death of canopy). Tadpoles at two sites resulted from late summer/autumn breeding and at two sites tadpoles were produced by late winter/spring breeding. The sites were spread across Drummer Forest, just east of Cann River, to Waratah Flats Road in the Snowy River National Park to the west. Breeding has halted at one known burnt site, on Mount Jersey. It had Large Brown Tree Frog tadpoles in December 2019, but the species has not been detected there post-fire and the site currently has no water.

Although four breeding sites is not a large amount, it is not that different to pre-fire records. Apart from being rare, as you may know, the Large Brown Tree Frog is also very cryptic (hard to find), despite its low standards of waterbodies for breeding, such as culverts and muddy puddles!

We know that adults have some mechanisms to survive the direct impacts of fire and some adults survived, but further research is needed to find out what those behavioural traits are.

The indirect impacts of fire are typically unclear. In the two sites that had tadpoles in autumn, one had no tadpoles in spring and the other may have had late winter breeding but dried out in late November. The former site was very dry when I visited early December (strangely much drier than in 2019 which was the driest year on record and the third year of drought). Similarly, the latter site had never been known to dry up since it was found in 2015. This site is a log and may have been compromised by fire. Alternatively, or additionally, these sites may be drying because of increased evaporation due to decreased canopy cover and/or decreased ground water from vegetation regeneration post-fire. This hypothesis would need much further investigation but does illustrate the lack of clarity of indirect impacts on the Large Brown Tree Frog post-fire.

There are some Large Brown Tree Frog sites on the Errinundra Plateau that did not burn. In 2020 frogs have been found at three of these sites and two additional sites have had tadpoles.



Left: Large Brown Tree Frogs, *Litoria watsoni* in amplexus (mating). By Rena Gaborov;  
Right: Large Brown Tree Frog habitat, post-fire (NSW). By Matt Clancy

## LARGE BROWN TREE FROG, *LITORIA WATSONI*: ACTIONS FOR RECOVERY

**Marc Perri, A/ Program Manager, Natural Environment Program, Department of Environment, Land, Water and Planning**

Since Rena Gabarov's first contemporary observation of the Large Brown Tree Frog, *Litoria watsoni*, she and many others have continued to search for the species as part of structured surveys funded by DELWP and Zoos Victoria, and even on their own time. There are now records from 37 sites and five active breeding sites. The most significant of which is known as 'The Log', a large tree that was felled for road safety after wildfire in 2014. This log has held a pool of water since early 2015 and has almost continuously supported Large Brown Tree Frog tadpoles since then.

Since 2015, surveys have focussed on waterbodies close to roads with most detection sites associated with road drains and culverts. These are known to be unreliable breeding sites as they fill with sediment and are prone to human and vehicle disturbance.

As managers of species and land, DELWP evaluated risks to Large Brown Tree Frogs and subsequent actions to improve outcomes for the species. Some of the usual strategies involve establishing 30 hectare land protection areas around known populations by changing Forest Zoning statuses. DELWP also developed processes for field and road maintenance staff to assess waterbodies for signs of frogs, eggs and tadpoles before commencing any works. While these activities help, there still existed one predominant issue – that frog eggs and tadpoles located in road drains and culverts have never completed their lifecycles by transitioning to adults.

Several ideas were discussed like translocating eggs to more appropriate water bodies, digging ditches in the bush with machines, carving fallen trees to mimic habitats like 'The Log' and finally, constructing artificial ponds.



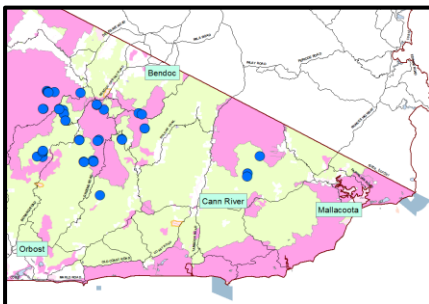
Artificial structures that survived the 2019-20 East Gippsland fires. By Tony Mitchell, DELWP

In 2017, Tony Mitchell with the DELWP Natural Environment Program team at Orbost constructed a prototype design with a sheet of corrugated iron supported on a frame to feed water into a plastic tub – a self-sustaining frog pond! From there, we added rocks, logs and a wire grate to exclude predation such as birds feeding on tadpoles and other species such as Sambar Deer from using these tubs to drink. Tony set this up in his backyard and, encouragingly, within days recorded Peron's Tree Frogs, *Litoria peronii* using it.

DELWP received funding to build 12 of the prototypes, partnering with Moogji Aboriginal Council, Orbost to construct the ponds near sites where the Large Brown Tree Frog had recently been observed. By June 2018, twelve structures had been installed, and we soon began to see and hear Large Brown Tree Frogs near the structures.

It was November 2019 when we knew these tubs were working – one tub had Large Brown Tree Frog tadpoles and two tubs had adult frogs present – mimicking the habitat provided by 'The Log' had worked!

This success unfortunately, was short lived. The 2019-20 East Gippsland fires burnt 11 of the 12 sites, destroying nine. DELWP began prioritising the replacement of these tubs as part of the Victorian Government's Bushfire Biodiversity Response and Recovery funding. Over the next three months, DELWP will again work with Moogji to build 27 new artificial habitat structures for the species. Building upon the documented success of the pre-fire trial, it is vital for the species' survival to increase the opportunity for successful breeding in the field to in turn, increase the known population in its native habitat.



Left: Known sites of Large Brown Tree Frogs in East Gippsland, January 2021;

Right: Large Brown Tree Frog in tub, By Rena Gabarov

## FROGGY FAQS: HOW LONG DO FROGS LIVE?

**Dr Lynette Plenderleith, President, Frogs Victoria**

The short answer:

It depends... on species, conditions, location etc...

The long answer:

Life is hard for frogs. Frogs lay many, many eggs and most of them are not expected to make it to tadpole-hood and of those that do, even fewer will metamorphose to fully-grown frogs! Of those that do make it to maturity, threats are ever present – the weather, predators, human activity, diseases, other stuff I haven't thought of...

So for some individuals, life is only a few hours long. But for a few danger-dodgers, pond life can exceed over a decade. Well cared for in captivity, some individuals can make it 20 or 30 years or more! But reports of frog longevity are generally anecdotal and not made by amphibian authorities. Which is not to say that the records are unreliable, particularly, just that I'm not keen to repeat them without verification!

There are some age records published in the scientific literature though. A large-scale study carried out by researchers Stark and Meiri (published 2018) at Tel Aviv University, found that as a general rule, "large, captive amphibians, those that live in cold regions, those that use poison as a defence against predators and those that are active at night live longer". So there are some loose rules about estimating frog lifespan.

Aging wild frogs is not easy – it relies on either the recapture of marked individuals (which will only tell you how long it's been between the first and most recent captures), or by skeletochronology - counting the layers of bone tissue (like tree rings!).

Growling Grass Frogs, *Litoria raniformis* are thought to live about 4-5 years but most individuals in the population studied by Reinier Mann and collaborators (published in 2010) were only 2-3 years old. The closely related Green and Golden Bell Frog, *Litoria aurea*, has been documented to live until 15 years old in captivity (Pyke and White 2001). Older frogs are known from the wild too – Spotted Tree Frogs, *Litoria spenceri*, from the Australian Alps are thought to live more than 14 years (Gillespie 2011)!

Frogs never seem to have straight answers for anything and their longevity is no exception! How long do frogs live? It depends...

Thanks to Bill Noble for the inspiration for this piece.

### Literature Cited:

Gillespie, Graeme R. "Life history variation in the spotted tree frog, *Litoria spenceri* (Anura: Hylidae), from southeastern Australia." *Herpetologica* 67.1 (2011): 10-22.

Mann Reinier M., Hyne Ross V., Selvakumaraswamy P., Barbosa Sergio S. Longevity and larval development among southern bell frogs (*Litoria raniformis*) in the Coleambally Irrigation Area – implications for conservation of an endangered frog. *Wildlife Research* 37 (2010), 447-455.

Pyke, G.H., and White, A.W. "A review of the biology of the green and golden bell frog *Litoria aurea*." *Australian Zoologist* 31.4 (2001): 563-598.

Stark, G, and Meiri, S. "Cold and dark captivity: drivers of amphibian longevity." *Global Ecology and Biogeography* 27.11 (2018): 1384-1397.



The Green and Golden Bell Frog, *Litoria aurea* may only live a short life in the wild but more than a decade in captivity.

By Lynette Plenderleith



It is with great sadness that Frogs Victoria acknowledges the passing of herpetology great, Professor Phil Bishop. Phil was an inspiration and friend to many froggers as researcher at the University of Otago and worldwide herpetological conference stalwart. He will be greatly missed by us all.

### SHOW US YOUR FROGS!

Have you got an idea for a talk? It doesn't have to be scientific, it doesn't have to be long, it just has to be about frogs!

We are looking for speakers for the 2021 season and would love to see you talk. Please email [events@frogsvic.org](mailto:events@frogsvic.org)



Matilda made an army of Corroboree Frogs



Sophie, aged 7, collaged a Sloane's Froglet

### THE FROGS ARE CALLING YOU

Frogs Vic is collaborating with Department of the Environment, Land, Water and Planning to run a citizen science program in regional Victoria.

If you live in or travel to northern or western Victoria, you are eligible to join in! More information can be found at [www.frogscalling.org](http://www.frogscalling.org).

Frogs Victoria thanks Matt Buttress who was instrumental in helping us set up the online side of Frogs Victoria in the first few years. Matt is no longer officially our IT support and he will be missed!

Have something you'd like to contribute to Pobblebonk? If you have an idea for a newsletter article, or a photo you'd like us to include, please email the editor: [ed@frogsvic.org](mailto:ed@frogsvic.org)

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