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**ACTHA Inc. News**

**Dec '17 - Jan '18**

*Newsletter of the  
ACT Herpetological  
Association Inc.*

## **Your Committee for 2017 - 2018**

President	Scott Keogh
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Excursion Officer	Mandy Conway
Conservation Officer	Joe McAuliffe
Committee Members	Jason Spurr Iris Carter Greg Flowers Roy Chamberlain Peter Child
Student Representatives	Vacant

*\* Denotes Life Members*

### **In this issue**

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**Northern Corroboree Frog breeding & release Program, Tidbinbilla ACT:** Dr Murray Evans, Senior Ecologist, TAMS, was our main guest speaker at the October '17 meeting and a detailed summary of his presentation starts on page 5.

### **The Australian & International Scene:**

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### **Diary date**

The *bi-monthly* meetings of the Association are usually held on the **third Tuesday of the month** at 7.30pm. Our usual venue is:

**Belconnen Soccer Club, Hawker  
(cnr Belconnen Way & Springvale Drive)**

**Upcoming meeting is the Christmas  
Party!**

## **Christmas party for ACTHA members**

**from 6pm, Friday 15th December 2017**

to be held at **Canberra Reptile Zoo, O'Hanlon Place, Gold Creek, Nicholls.**

A selection of food & drink will be available for all financial members.  
(Margaret will have her receipt book for *last minute membership subscriptions, \$20pa*)

**RSVP to [margaretning1@gmail.com](mailto:margaretning1@gmail.com) by Monday, 11 December 2016 pls**

*Of course we shall take the opportunity to discuss Snakes Alive! 2018; who can volunteer, who can provide animals and most importantly who can show off our beautiful animals to people attending the week-long event!*



## Is your pet reptile OK?

*By Mandy Conway (Ed.)*

At the ACTHA meeting of 17 October '17 this Ed. gave a talk on simple ways to tell when your pet reptile might be uncomfortable, unwell or have a more serious problem. 'Denise', pictured above, an adult 1.5m Diamond x Jungle Python, was there to help with a demonstration.

### Back to basics

It is often difficult to spot health problems in reptiles compared to more conventional pets, so adequate research into the proper care of a new pet reptile is important. Keeping a close eye on your new pet, maintaining a highly nutritional diet and ensuring the enclosure is kept clean will go a long way towards a happy and healthy animal.

### So, you've acquired a new snake:

Where did it come from?

Did you go and see the snake before purchase, taking note of the condition and cleanliness of enclosures and the condition of other animals at the seller's premises? Asking the seller to handle the snake to see if they're rough or scared of it is also a good idea.

I used Denise as an example during the presentation and as we went through some observations, I asked the audience whether she appeared to be happy and healthy.

She was given to me through a friend so I couldn't view her previous living conditions. She was quiet, a bit thin and felt 'un-muscular' but she generally looked ok. I was told she was fed 1 rat per month throughout the year.

### Uncomfortable, things to notice

#### Enclosure

Too small or too big? little snakes feel insecure in big spaces, especially if there aren't many hides. Consider how big the snake will get as it matures. One way of covering both bases is to

make or purchase an enclosure that would suit the reptile when it is an adult, but partition it to suit the animal whilst it is young.

#### Temperature

A thermo-gradient within the enclosure that is correct for the species being kept is essential. If the reptile is moving around a lot and/or staying in the cool zone it could be trying to avoid an over-heated enclosure. Staying on the heat mat may suggest the enclosure is too cold. An appropriate basking area together with an ambient heating source is a must, particularly for the non-endemic pythons in Canberra's colder climate.

### First observation:

Denise stayed curled up in a cool-ish corner, what might be the problem? An overly warm enclosure was my first thought, however the ambient temperature was 25°C and it was 29°C under the basking light. Ok, I added extra insulation to the tank and heat mats that covered the entire floor area, set at 25°C. She stayed curled up in the corner but was at least warm. Was she just settling in?

#### Feeding

The correct-sized prey item at the correct temperature is important. Too cold and your snake won't show much interest. Relatively warm to your touch is a good starting point.

Establishing a seasonal feeding pattern which mimics a reptile's natural habitat is optimal. In Denise's case, being fed 1 rat per month was not an appropriate feeding regime. Most snake species eat very little to nothing over our winter period with amounts increasing in Spring's warmer weather. An adult rat every 7-10 days would be suitable for a snake like Denise in Summer. Feeding will naturally taper off during Autumn.

Question: Could inadequate feeding over 18 months by the previous owner account for Denise's slightly thin and weak appearance?

### Second observation:

Denise jumped at the rat which I offered her 5 days after she arrived. I fed her another rat 5 days later, which she eagerly took, even though she hadn't pooped.

Ensuring your reptile poos properly is very important! My snakes poo 7-10 days after a feed during the Summer months, ensuring a consistent cycle.



### **Unwell, things noticed**

#### Enclosure

Denise's new home (above) was 1m tall, 500mm wide and deep with a full height rock background and several climbing branches: it was certainly a good python-appropriate enclosure.

#### Temperature

26°C - 28°C on the heat mat, 30°C under basking light, ambient temp 25°C.

Denise didn't move much, but I thought the enclosure was good so...

#### **Third observation:**

At around 15 days of ownership I noticed that Denise looked very bloated, similar in looks to the lower section of the woma pictured below (note this reptile was ok!). Something was definitely not right!



*(Is your pet reptile OK, cont'd,...)*

I took her outside for some sunshine and to encourage some movement. Her lower body flopped off my arm towards the ground; she didn't seem to be able to pull it back up. She really was weak I thought, but why? she wasn't that thin.

I supported her body really well and started massaging her under-body towards her vent to see if I could move what I thought was gas. Finally a very hard poo/urate was massaged out and then lots of bits of poo and liquid rushed out. (I was being very careful to manipulate slowly so as not to damage her vent.)

So she was constipated? Was this because she didn't move around or exercise? her faeces didn't look abnormal. More observation was needed.

### **Serious problem? probably**

#### Enclosure

Denise didn't move around as any other snake would, so I figured her enclosure didn't suit her or mimic her former dwelling. I put her in a smaller more horizontal enclosure (below) but



alas her stationary routine didn't change.

#### Temperature

I kept temperatures the same although she still managed to find the coolest spot. 26°C - 28°C on the heat mat, 30°C under basking light, ambient temp 25°C.

#### **Fourth observation:**

I fed Denise a bigger rat 2 days after I stimulated her to poo (I had now had her for 17 days). No poo ensued after a further 7 days so I once again massaged the length of her



*(Is your pet reptile OK, cont'd,...)*

under-body and poo readily came and looked normal.

Why was she predominantly immobile with abnormal bowel movement? her lower body seemed weak so had she injured her spine at some stage? My only other observations were that her pupils looked a bit strange, more round than slits.

### **Diagnosis for Denise**

After owning her for 24 days, and worried, I sought veterinary advice.

We agreed that her eyes really did look a bit weird, so we did some sight tests and she basically failed; she reacted to nothing in or around her left eye and only had a slight response to light/dark in her right.

She can nail a rat that is waved toward her, but jumps in fright if she is touched on any part of her body and rarely moves within her enclosure.

### **Is Denise happy and healthy? I asked the audience**

Well being blind certainly compromises her general health status but, she is now living with Jeffery, a male Brisbane Coastal Python who is roughly the same size as her and she finally seems settled. She follows Jeffery through the branches, staying very close. If they became separated she would have once curled up in a corner, but this 'response' has almost stopped. I think she is gaining confidence as she learns where things are in the enclosure, especially the hide over the heat mat.

Denise may not be completely 'healthy' but she seems happy in her new surroundings with her new mate. The only reason I would conclude that she is not happy is if she once again becomes immobile, unresponsive or fails to feed properly.

*Denise*

&



*Jeffery*





## Northern Corroboree Frog captive breeding and release program - an update

*Our Main Guest Speaker at the 17 October '17 ACTHA meeting was Dr Murray Evans, Senior Ecologist, Conservation Research, EPSD, who gave an update on the Northern Corroboree Frog's captive breeding and release program at Tidbinbilla. Murray presented results of recent broad-scale surveys to find populations in the ACT and gave an insight into the chances of survival of the species. This Summary by Mandy Conway.*

Corroboree frogs, with their black and yellow stripes, are one of Australia's most distinctive and easily recognisable frogs. With a highly restricted distribution - they are found only in the higher elevation areas of the Australian Alps, including the Brindabella Ranges (ACT) and Snowy Mountains (NSW) - they occur only where there are sphagnum moss bogs.

### There are two species of Corroboree frog

The **Northern Corroboree Frog**, *Pseudophryne pengilleyi* is found in the Brindabella Ranges in the ACT and adjacent Bogong Mountains and Fiery Ranges in NSW. They occur as three main populations that are genetically distinct from one another. They include those in the high altitude areas of the Brindabellas, which are split into two genetic groups, and the low altitude sp. around Mt Coree, NSW. The species of interest here in the ACT are those found at higher elevations, up around Mt Ginini.



The **Southern Corroboree Frog**, *Pseudophryne corroboree*, occurs in Kosciuszko National Park at a higher elevation of between 1300 and 1760m.

*In the early 1980s in the ACT there were once several thousand Northern Corroboree frogs in the Brindabella/ Bimberi Ranges. Recent monitoring [2017] suggests there are now less than 10 breeding pairs left from these wild populations.*

Surveys for the Northern Corroboree Frog have been undertaken for many years, usually by lines of people walking across the large bogs and calling out to them using the 'hey frog!', otherwise known as the shout response technique, or by simply making a loud noise which the frogs readily responded to. The frogs could be found around many of the ephemeral pools.



In the 1960s and 70s these frogs were common animals and bushwalkers often saw them in the moss when putting their gas stoves down. When the stove heated up the frogs could be seen walking out from beneath trying to avoid the heat. They were thought to be the most abundant vertebrates in the bog system at that time.

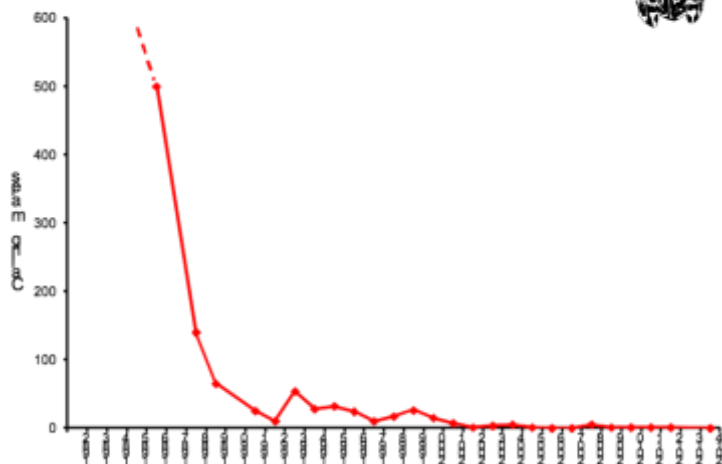
In the late 70s and early 80s people started saying they weren't seeing as many as they used to. There was some evidence to suggest the species was in decline.

When Will Osborne went out to survey the frogs at Ginini Flats in 1986 the frog was relatively abundant. The survey form had a number of boxes to choose from to indicate calling males. A box marked 500+ was ticked if it was determined there were 500 or more calls. By 1992 (six years later) the Northern Corroboree Frog had almost disappeared from Namadgi National Park.

Southern Corroboree frogs in NSW were undergoing similar population crashes. The reason for these crashes was a mystery, but ozone depletion (high UV) or severe drought were initially thought to be the reasons.



## Northern Corroboree Frog – Ginini Flats, ACT



The graph above shows data for the Ginini Flats site, though this trend mirrors the decline across all Corroboree frog sites in the Brindabellas.

### The African Clawed Frog, a disease vector

The African Clawed Frog, 12cm in length and weighing around 200g, was used as a pregnancy test kit for humans from the 1930s to the 1950s, becoming the equivalent of the 'lab rat' and exported throughout the world. They weren't just

continuously exported out of Africa, the frogs would have been imported into many countries and bred there. Unfortunately, accidental contact with a research facility's native species and/or subsequent escapes into the wild would have

enabled the chytrid fungus to spread through wild native populations, which had no immunity. No one at the time realised that the African Clawed Frog carried the fungus which could easily spread amongst other species, whilst suffering no ill effects from the pathogen itself.

*Who thought of injecting an African Clawed Frog to determine pregnancy, the ACTHA audience asked?*

Murray explained he could see how the idea came about. People would have been experimenting with all sorts of reproductive hormones across a wide taxa of mammals; a mouse, an elephant, and every mammal in-between. So when scientists came across this theory they started to look at amphibians. By placing the same hormones into an amphibian scientists learnt that the same processes could be

driven. So someone would have thought that alright, some hormones are expressed through urine so what happens if we inject female hormones that cause ovulation into a frog? would it trigger the same response? Who would have thought that a frog would become a testing unit for pregnancy!

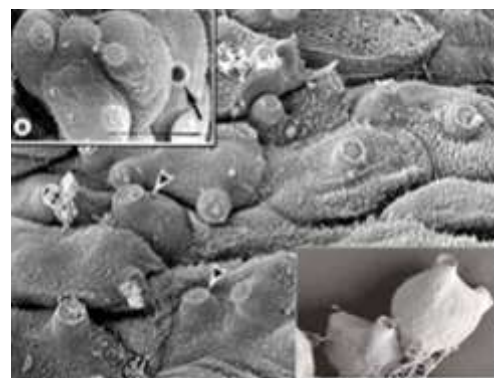
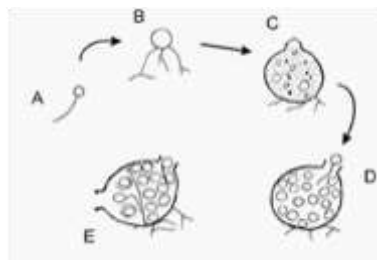
The spread of Chytridiomycosis from this 'lab rat' was eventually identified as the cause of amphibian die-offs in Australia in 1998 and is the first emerging disease shown to cause the decline or extinction of many hundreds of species worldwide not otherwise threatened. It is alluded that scientists and conservationists were literally running ahead of this wave of extinction and scooping up frogs, placing them into shipping containers which have been turned into breeding facilities.

"In a similar way, back in 2003, eggs of the Corroboree frog were gathered while nests and eggs were still to be found. The population had hit rock bottom, it was not recovering, and if we had not done that we would not have frogs now." Murray said.

### Chytrid Fungus, *Batrachochytrium dendrobatidis*

Chytrid fungus starts life as a waterborne spore, which lands on skin that has keratin. The spores set down roots, which grow into a capsule that then produces thousands more of these spores. The image at right shows what it looks like on a frog's skin.

A frog's egg is free of chytrid because the keratin cells have not yet developed, hence the eggs can be brought into the laboratory chytrid free. However the tadpoles have a little keratin present in their mouth scales, and this is where the first free-swimming chytrid spores attach themselves. "And the tadpole can do alright with that, but as soon as it metamorphoses and the rest of its body turns into keratin skin, chytrid fungus spreads all over it. The frog usually dies post metamorphosis of systemic issues such as liver and heart failure" Murray said.



Most tadpoles take a matter of weeks to go through the metamorphose stage but Corroboree tadpoles take months. So in some years, when there is drought, the ephemeral pools dry up and the tadpoles die. Chytrid and the odd dry year make life very difficult for the Corroboree frog.



#### **A native species unaffected by chytrid**

The frog pictured here is the Common Eastern Froglet, *Crinia signifera*, and we call it 'the Typhoid Mary of the chytrid fungus world'.

Why is the story of Typhoid Mary relevant? Mary Mallon was a 'healthy carrier' of typhoid fever in the United States. She was employed by many families over the years as a cook, and investigations into her employment history showed that typhoid bacillus outbreaks had followed Mary from job to job. Health professionals at the time didn't know typhoid could be carried by someone that showed no symptoms at all but could infect people.

The Common Eastern Froglet carries chytrid fungus in the same way; the froglet is not affected but passes the fungus on to anything it bumps into in a pool. There are a number of frogs that are resistant to chytrid however there is a whole suite of frogs that are not. The Common Eastern Froglet is a habitat generalist which occurs from behind the sand dunes of the East Coast of Australia, right up to the top of Kosciusko. It is one of the main vectors of this disease and removing this reservoir host is nigh impossible. 'Nothing that has been introduced into Australia and established itself in the environment has ever been eliminated.'

The behaviour of a frog species also plays a part in survivorship. Some frogs, like green tree frogs, like to bask in the sun for short periods during the day. Chytrid fungus doesn't like warmer temperatures, it dies at 30°C, which is why the first dramatic declines occurred in high altitude frog colonies, affecting the Corroboree frog



Above: Chytrid Fungus sweeps through the world's native amphibians.

and the Southern Gastric Brooding Frog, amongst others.

#### **Establishing the breeding facility at Tidbinbilla**

"The frogs needed to be placed in a secure environment and we followed efforts being undertaken by NSW Parks & Conservation after the Southern Corroboree Frog started to crash a few years earlier. In 2002 we established a facility at Tidbinbilla Nature Reserve to house a captive 'insurance' colony of the Northern Corroboree Frog. This is not technically saving the frog, it simply gives us options for the future. The facility comprises of refrigerated shipping containers placed on concrete slabs, which enables the frogs to be kept in the cool, moist conditions found in their natural habitat."



#### **Disaster**

"We got the shipping containers at the end of 2002, we were all ready to collect eggs, and then the unthinkable happened. The January 2003 bushfires came through. This was a really horrible time. I got a call back from the rangers up there, who said the bogs had survived but everything else had burnt. Then, a few days later on Sunday the 18th of January, the fire storm went through and reburnt the area and this time the bogs. A classic extinction scenario. We thought well that's it, we've lost the Corroboree frogs. I thought we would only be reading about them in text books."

On average, 70 to 90% of these pristine and fragile sphagnum moss ecosystems burnt.

#### **But some areas had survived!**

Corroboree frogs lay their eggs, around 25 per year, out of water, terrestrially, near the edge of pools.







The tadpoles develop inside these eggs and then wait for the water levels to rise. Once the eggs are swamped the tadpoles, now at an advanced stage, wriggle into the water. "What's amazing is that you open up a nest and there are these massive eggs, in a clump about the size of a golf ball. The female is much smaller, and lays about a third of her body weight in eggs as a concentrated jelly. Then, over the course of perhaps a few days, the eggs absorb water from their environment, usually in Spring when the snow melts, swelling to many times their size."

"Once we were given access, we collected some 300 eggs from those few remaining nests amongst wet tussocks in the Mt Ginini area, although only about one-third of eggs were taken to minimise further impact on a population that could hopefully continue when the sphagnum bogs recovered. These eggs established the captive population at Tidbinbilla. Each year we returned to collect more eggs until 2007, when no more nests could be found. Luckily we had that window of opportunity where we could get up there and collect enough eggs for a broad genetic base. You can't expect a species to survive from only six animals. Then came the huge job of working out how to hatch and raise them, not having done this before."

The first successful captive breeding of a Corroboree frog occurred at Tidbinbilla, in 2008, when those first eggs had developed into mature frogs of breeding

age (at 5 years). Ecologists had managed to re-created the right conditions to stimulate breeding. The climactic conditions were exaggerated, the



Above: Wild collected eggs being prepared for hatching at Tidbinbilla.

frogs placed in a chiller at 4°C to replicate winter and then the temperature raised before they were placed in furnished terrariums with plenty of food, namely crickets.

### Breeding northern Corroboree frogs

The eggs are placed on floating trays, poking roughly half out of the water - they could drown if placed fully into water. Once the tadpoles hatch they wriggle down through the mesh. Murray commented that they pretty much look like the non-descript tadpole of *Crinia signifera*, which is very annoying when you are trying to find them in the field!

The tadpoles are raised in small containers (A), before being moved into terrariums, (B).



A



B



"Corroboree frogs in the wild can live for nine years." Murray said.

"We still have frogs, wild founders, which are breeding and were collected in 2003."

There are currently around 1000

Corroboree frogs in the captive population from eggs collected in 2003 and 2004.

A captive-bred Northern Corroboree Frog (below). The ACT species, which comes from a higher altitude, tends to be greener, having genetic differences to its close cousin (below right).



Below: Ginini Flats in 2007, recovery post-fires.







"The genetic viability of this captive colony is vitally important. The ACT Government has enlisted the help of a prominent captive husbandry geneticist from San Diego Zoo, Dr Caroline Lees, who was able to offer further advice.

The frogs have since been divided into different groups and a 'maximum avoidance of interbreeding' strategy is being applied, which follows frogs through generations and involves sexes being swapped around. Amongst these different 'genetic blocks' are females that haven't yet laid their eggs despite the end of the breeding season arriving. (The females will reabsorb their eggs if they don't lay them which results in health issues.) Hence they are removed from their tank with the incumbent males, and placed into another tank with different males which can initiate egg laying in the majority of cases. The University of Wollongong is investigating ways to get females to lay their eggs with hormone use and the ACT will be trialling this approach in the future to try and keep these females healthy.



*Left: All of the frogs in the colony and the frogs released to the wild have had their belly patterns photographed and entered into a database. This enables individual identification; belly patterns are much like a fingerprint.*

In 2011 the first captive-bred Northern Corroboree frogs were released back to the wild; 2,000 frogs have been released at Namadgi National Park to date.

This year, 2017, some of the frogs that had been released have returned to breed. Murray found a male on a nest whom had been released 3 years earlier. "Only 9 males were heard calling, with presumably 9 females in the vicinity, add a few extras that didn't call and we probably have 20-30 frogs in the wild from 2,000 released animals."

"The good news is we know we can put frogs out there and that some can survive 3 years with chytrid in the environment and go on to successfully breed. If we brought those eggs back into captivity might they be more resistant to chytrid? Also, that's a lot of work to get 20 frogs to survive from 2,000 captive bred animals after a few years. Is this approach going to work?" Murray indicated that we have to at least try

for the next few years, finding a better way to utilise the excess progeny will also be investigated.

#### **What's next?**

"There are two ways we think we can get the Corroboree frog over chytrid fungus: facilities such as the University of Wollongong will continue lab based work to determine the mechanisms of chytrid, and the second approach is to re-establish breeding aggregations and allow development of natural resistance to chytrid."

To this end, excess progeny from Tidbinbilla will be released into the environment as one-year-olds, who are old enough to be robust and which gives them 3 years to develop natural instincts before breeding age. Allowing them to remain in zoo-like conditions for 3-4 years won't allow the frogs to develop natural behaviours.

Outdoor ring tanks appear to have promise for a longer term solution to breeding the frogs economically and were trialled in 2015/16. The tanks



are designed to enclose Corroboree frogs in a natural habitat whilst excluding other chytrid carrying frogs.

If one of these enclosures becomes contaminated, by a Peron's Tree Frog for example, then it is cleaned out, sterilised and the process is started again. These ring tanks were installed at Tidbinbilla, with mesh tops to prevent other frog species entering. Pools are included so that eggs can be put in there to allow tadpoles to metamorphose. The one year old frogs will then be collected and dispersed into the wild. A challenge has been to provide uncontaminated water, particularly bore water.

Murray also mentioned that NSW is changing their legislation for keeping reptiles and amphibians, adding many species which can be kept on licence, one of which was the Corroboree frog. The question is that if the Corroboree frog cannot survive in the wild then could it be kept as a hobbyist species which has been sourced from breeders. A big concern here is that if these animals are bred and then 'released' into the wild will they transmit diseases or run the risk of becoming genetically altered frogs.



## The Australian & International Scene

**From ACTHA member Mark Robertson:**

This unwanted visitor (*right*) was spotted in my backyard on a Sunday afternoon, whilst my son was studying.

The red box is about 34cm wide, so the **brown snake** is perhaps 1.2m long.

"When I work out the back I tend to have a bit of a look around first, conscious that I might find one, especially with the bird life and young lizards that seem plentiful. Our neighbour has an old Labrador and they worry about it and snakes, the woman thought putting in the colourbond fence would stop them..."



**From Janelle who posted these 3 images on the Canberra Nature Map on-line repository:**

Eastern Long-neck Turtle spotted at Bywong, NSW laying her eggs. "We have been observing many turtles nest building and laying eggs on our property in Bywong. Several nests have been raided by foxes, hence we have now fox-proofed this one.



*Above:* laying her eggs

*Left:* covering them up

*Below:* nothing to see here!



**From Matthew Higgins: (*below*)**

brown snake in Fryers Range State Forest, near Castlemaine Victoria in October '17.



**AND,** shingleback lizards mating in Matthew's garden!





## **Slater's skink makes remarkable comeback after species thought extinct**

By Claire Campbell, ABC News Canberra,  
11 April '17



Above: Slater's skink. Image: Claire Treilibs.

Indigenous rangers and scientists rediscovered 11 populations of the species, which is native to central Australia, near Alice Springs, NT.

Claire Treilibs has just completed the most intensive study of the relatively-unknown species as part of her PhD, and will lead a forum in Alice Springs on how best to protect the species, which once flourished in the Finke and MacDonnell ranges.

"People were looking far and wide for it since the late 1990s and eventually some populations kept turning up and more targeted searches were undertaken since 2004 onwards," Dr Treilibs said.

They dig multi-entrance burrows in half-moon shaped tunnels underneath shrubs and mounds."

Dr Treilibs said the populations ranged in size from 50 skinks to a few hundred but were still very much under threat.

"These guys are particularly special because they are quite unique in the areas that they inhabit — they're very much restricted to the flood plains and riverine environment," she said.

"And unfortunately these environments are being overrun by things like buffel grass and buffel grass interacts quite significantly with fire.

"And those two things combined are changing the entire structure and composition of these ecosystems."

## **New skink management plan in the works**

The Slater's skink is one of the threatened lizard species in the Northern Territory with landholders and rangers working to create a management plan.

Jen Kreusser from 'Territory Natural Resource Management' said the plan to protect the species needed updating.

"It'll be interesting to see what does come out of it because the current recovery plan is a little bit beyond its expiry date," she said.

"We hope that it will reinvigorate and standardise some of the methods used and techniques and it's an opportunity for people to collaborate and share some of the latest works.

"At the Alice Springs Desert Park there's a captive population there that is getting to [be] ... a larger population and there's going to be some conversations around what some options might be, considering the Slater's skink is still listed as a threatened species."

The forum will also discuss whether building exclusion fences or managing grazing pressure could help protect the Slater's skink from feral animals.

## **The global distribution of tetrapods reveals a need for targeted reptile conservation**

Uri Roll, Anat Feldman, Maria Novosolov et al,  
*nature ecology & evolution*, 9 October 2017

For full article please see: <https://www.nature.com/articles/s41559-017-0332-2>

The distributions of amphibians, birds and mammals have underpinned global and local conservation priorities, and have been fundamental to our understanding of the determinants of global biodiversity. In contrast, the global distributions of reptiles, representing a third of terrestrial vertebrate diversity, have been unavailable. This prevented the incorporation of reptiles into conservation planning and biased our understanding of the underlying processes governing global vertebrate biodiversity. Here, we present and analyse the global distribution of 10,064 reptile species (99% of extant terrestrial species). We show that

richness patterns of the other three tetrapod classes are good spatial surrogates for species richness of all reptiles combined and of snakes, but characterize diversity patterns of lizards and turtles poorly. Hotspots of total and endemic lizard richness overlap very little with those of other taxa. Moreover, existing protected areas, sites of biodiversity significance and global conservation schemes represent birds and mammals better than reptiles. We show that additional conservation actions are needed to effectively protect reptiles, particularly lizards and turtles. Adding reptile knowledge to a global complementarity conservation priority scheme identifies many locations that consequently become important. Notably, investing resources in some of the world's arid, grassland and savannah habitats might be necessary to represent all terrestrial vertebrates efficiently.

### **Urgent rescue mission to save Australia's frogs using smartphone app**

*By Julie Power, The Sydney Morning Herald, 10 November '17*

Like the stars of stage, screen and *Sesame Street*, the 25-year-old green tree frog called Godzilla was immediately ready for his croak up.

When Godzilla saw an iPhone at the Australian Museum this week, the male frog hugged it. It

was an appropriate response given that a new smart phone app called FrogID is being described as an "urgent rescue mission" to save frogs that are vulnerable or endangered.

It's part of a national citizen science initiative to count Australia's frogs, which is being launched by the Australian Museum on Friday.

The app developed by IBM works a bit like the music identification and

discovery app Shazam by recording male frog's chirps, barks and croaks. After downloading the app and turning on the location to aid identification, all users have to do is hit record when they think they hear a male frog calling out to attract the females of its species.

The museum's frog expert Jodi Rowley said frogs were often hard to identify by sight: some species look so similar that she sometimes has to inspect the front legs to find small differences. Like humans, each frog has its own "voice", and a larger frog will sound deeper than a younger, smaller frog.

Of the 240 native Australian species, four frogs are already extinct, five are critically endangered, 14 are endangered and 10 are vulnerable, said Dr Rowley, the curator of amphibian and reptile conservation biology.



*Above: A Pobblebonk Frog. Image: Nicholas Moir*

"Frogs are an incredibly threatened group of animals," she said. "Globally it is 42 per cent of all species [that are threatened], which is faster than birds and mammals. And one of the major obstacles in preserving frogs is a lack of knowledge."

In Australia, an estimated 20 species of frogs have yet to be named or identified. There may even be cases where what is thought to be one species could actually be three. "That has huge conservation implications," she said.

Frogs are bio-indicators, and, like the canaries in the coal mine, they are often the first to perish when the quality of water deteriorates or from changes in their habitat.

Kathy Potter of the Frog and Toad Study Group lives with Godzilla and about 40 other frogs, which the educational group has saved or rescued.



Godzilla, the green tree frog.

Image: Nick Moir.



"It is nice to see people doing things with frogs," she said of the new FrogID app. "It's usually pretty lonely out there."

Frogs were easier to find than most people thought, she said, adding they were everywhere.

"You don't have to go out into the wilderness and be the next David Attenborough ... you can go to your local oval at night, you find them in drains, you find them in gutters, any parkland with waters, a good thing to do with friends."

Dr Rowley is hoping citizen scientists may also find some frogs that have gone missing, such as the peppered tree frog, which was last seen in 1970s in NSW's Northern Tablelands and may be threatened with extinction.

"It is a little bit of a needle in a haystack because it is about two centimetres in body length [and lives in deep gorges]," she said.

"This is one species where it would be amazing if somebody out there recorded its call," said Dr Rowley who has been looking for it.

Download info is available at [FrogID.net.au](http://FrogID.net.au)



# SNAKES ALIVE!

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**PARTNERS**



# Christmas party for ACTHA members

from 6pm, Friday 15th December 2017

to be held at **Canberra Reptile Zoo**, O'Hanlon Place, Gold Creek, Nicholls.

A selection of food & drink will be available for all financial members.

(Margaret will have her receipt book for *last minute membership subscriptions, \$20pa*)

RSVP to [margaretning1@gmail.com](mailto:margaretning1@gmail.com) by **Monday, 11 December 2016** pls

*Of course we shall take the opportunity to discuss Snakes Alive! 2018; who can volunteer, who can provide animals and most importantly who can show off our beautiful animals to people attending the week-long event!*



ACTHA News

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