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ACTHA Inc. News

Oct - Nov '17

*Newsletter of the
ACT Herpetological
Association Inc.*

Your Committee for 2016 - 2017

President	Scott Keogh
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	Iris Carter
	Greg Flowers
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	Peter Child
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	<i>* Denotes Life Members</i>

Annual General Meeting

Notice is hereby given of the 2017 AGM of the **ACT Herpetological Association Inc.** to be held at the Belconnen Soccer Club, Cnr Belconnen Way & Springvale Dr, Hawker, in conjunction with our meeting on **Tuesday, 17 October 2017**, at 7.30pm.
All members welcome!

Agenda

Nominations are called for President, Vice-President, Secretary, Treasurer, Newsletter Editor, Webmaster, Public Officer, Excursion Officer, Conservation Officer and Committee members. Nominations may be sent to ACTHA by email info@actha.org.au or post to PO Box 160 Jamison ACT 2614.
If there are no nominations for a position, nominations will be accepted at the meeting.

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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

Tuesday, 17 October 2017

The **AGM**, whilst very important to our Organisation, will be relatively short.

'Is your pet reptile OK?'

Mandy Conway will give a talk on simple ways you can tell when your pet reptile might be uncomfortable, unwell or have a more serious problem. 'Denise', a 1.5m Diamond x Jungle Python, will be there to help with a demonstration.

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

Dr Murray Evans, Senior Ecologist, Conservation Research, EPSD, is our main guest speaker at this month's meeting where he will provide an overview of the Corroboree Frog captive breeding and release program at Tidbinbilla, and present the results of recent broad-scale surveys to find populations in the ACT. He will also present the results of the program to release captive-bred frogs to the wild, which has occurred since 2011 to Namadgi National Park.

'Walk the Border' for the Conservation Council-ACT Region

This fundraising walk, which commenced on 7 October 2017, will complete a full circuit of the ACT's border over 21 days. The 306km walk crosses ancient pathways and defines the Australian Capital Territory. Funds raised will go to the Conservation Council-ACT Region. The walk offers a rare opportunity to raise community awareness about the breadth of the ACT's ecosystems and the many cultural aspects associated with the landscape.

Please follow this link to register to become a Border Walker or to sponsor a walker.

<https://conservationcouncil.org.au/civicrm/?page=CiviCRM&q=civicrm/event/info&reset=1&id=85>

The end of the walk will be celebrated at Spring Mingle on Friday 27 October, at the Renewables Innovation Hub, Moore St Turner, commencing at 6pm. The announcement of the 2017 Environment Awards will also take place then. There will be a bar, music, entertainment, a silent auction and lovely food! Entry by donation.



2017 Reptile Caring Course with Special Guest:

Dr Shane Simpson BVSc(Hons), GCM(VP), CMAVA



When: Saturday 28th October 9:30-4pm

Where: Jerrabomberra Community Centre

How much: \$35

The Details:

This will be a great course for current carers and reptile enthusiasts. New carers are of course welcome also and will gain much from this.

Dr. Simpson has over 20 years of veterinary experience, with more than half of that specializing in reptiles. He presents regularly at wildlife conferences and for caring groups.

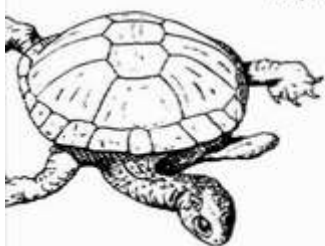
The course will cover our local lizards and turtles – identification, how to care for them properly, feeding and housing, euthanasia, reptile biology, wound care and shell repair (new techniques).
(This course does NOT cover snakes)

Tea and Coffee with a few snacks will be provided with a break for Bring/buy your own lunch

If you would like to attend: Please email reptiles@wildcare.com.au

Payments can be made to Wildcare – BSB: 062-593 Acct: 28026717
or via paypal to

Please use your name and "reptiles" as the identifier
Payment can also be made on the day if need be



Turtle sightings needed By Bruno Ferronato

So we can better understand turtle distribution in the Upper Murrumbidgee catchment and beyond!

Waterwatch is looking for turtle sightings throughout Canberra and region including Yass, Queanbeyan, Cooma and even as far as Adaminaby, Jindabyne and the alpine areas beyond.

The more common species in the region is the Eastern long-necked turtle (*Chelodina longicollis*), which inhabits rivers, urban wetlands and farm ponds. It is usually found on 'walkabout' during Spring and Summer, especially after rain. This behaviour is not only related to reproduction, as they are also in search of different wetlands to take advantage of food abundance, as they had been in dormancy during Winter. So you are probably going to encounter males, females and juveniles on the move. Our Eastern long-necked Turtles are also affectionately called 'Stinkers', as they tend to release a smelling fluid if they feel threatened.

Another species is the Murray River turtle (*Emydura macquarii*), which is a short-necked turtle and are mainly found in rivers. Different from the Eastern long-necked turtle, Murray River turtles do not 'walkabout', so they can mainly be seen along the river channels.

The idea of increasing the number of turtle sightings is to better understand the distribution of both species throughout the ACT region and beyond, and to help to mitigate the impacts of urbanisation, such as road mortalities. Please help us with any turtle sightings this year (live or dead), you can upload your records and photos in two websites (whichever you'd prefer):

Canberra Nature Map (<http://canberra.naturemap.org/>) or Turtle Sat (<https://www.turtlesat.org.au>), or email your sightings to waterwatch@ginninderralandcare.org.au

In addition, if you find any turtle injured, you can contact ACT Wildlife (<http://actwildlife.net/>) in the ACT, Wildcare (6299 1966) in the Queanbeyan Region or LAOKO (6456 1313) south of Bredbo.

Thanks.



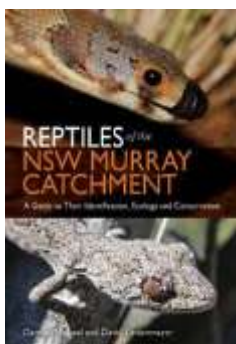
Eastern long-necked turtle



Murray River turtle

Reptiles of the NSW Murray Catchment

A Guide to Their Identification, Ecology and Conservation



Damian Michael, David Lindemayer
Paperback, April 2010,
CSIRO Publishing,
ISBN: 9780643098213, 248pp

This is an easy to use field guide for identifying the 80 reptile species currently known to occur in the Murray catchment area of New South Wales.

Illustrated with high quality colour photographs, the book describes the key distinguishing features of each reptile and includes details on habitats and conservation status. Uniquely, it has a detailed chapter on how to conserve reptiles and manage key habitats, providing landholders and natural resource agencies with the knowledge to help conserve reptiles in agricultural farming landscapes. The up-to-date distribution maps are based on 10 years of extensive surveys and research on reptiles in the Murray catchment. The final chapter includes a section on similar looking species to further enable readers to accurately and quickly identify difficult species.

Discover the hype - New geckos in the north

This summary by Mandy Conway

*At our ACTHA meeting of 15 August 2017 our guest speaker, **Dr Rebecca Laver**, talked about recent surveys of the northern Australian Monsoonal Tropics (AMT) which are revealing many new species and higher than expected levels of biodiversity, particularly herpetofauna. Rebecca introduced some newly described geckos, a few exciting diversity 'hotspots' within the Kimberley and discussed the complexities of 'cryptic species' discovery.*



Dr Rebecca Laver (*left*) has recently completed her PhD through the School of BioSciences, University of Melbourne, and Museum Victoria, studying diversity patterns of geckos from the Kimberley region of the Australian Monsoonal Tropics.

She is currently working on various research projects with collaborators at ANU's Division of Ecology & Evolution, Research School of Biology, and is particularly interested in species formation, distributional patterns of diversity and why particular regions accumulate higher diversity than others.

Where, what, why and how



The AMT region, spanning northern Australia's Cape York Peninsula, the Top End and the Kimberley, is a vast and relatively undisturbed tropical

savannah which has long been known to host high biodiversity. It remains relatively understudied due to the remoteness of many areas which are difficult to get to. Early studies indicate key biodiversity hotspots within three major areas – The Kimberley, Arnhem Land and Cape York.

The Kimberley is a complex environment which encompasses tropical savannahs, woodlands, spinifex grasslands and lots of rocks! The area is

strongly characterised by its monsoonal climate: distinct wet and dry seasons, with very strong rainfall and aridity gradients along the Kimberley's west coast (where there is three times more rainfall each year compared with the south-east of the Kimberley). A little known fact about the Kimberley is that it has over 2600 islands.

"Herps in general are a great group of animals to study as they can be fairly abundant and reasonably easy to collect. Geckos in particular tend not to travel great distances which means there is a tendency for populations to develop strong structure and differentiate over small geographic scales," Rebecca said. "Geckos also have a surprisingly wide variety of ecologies: crawling around on the ground, living in the desert on sand dunes, climbing trees or living amongst spinifex grasses, whilst others are intimately tied to rocky landscapes. I am particularly interested in these rock specialists."

Rebecca has undertaken many trips into the field to date, spending four or five weeks at a time travelling in a 'troopy' and camping. The areas she visits are often extremely isolated from people and buildings.

"It is often difficult to get to these isolated areas so collaborating with other groups is extremely important, particularly when obtaining permits and funding. I have had the opportunity to work with people from several different museums, universities, conservation organisations and also traditional land owner groups, including rangers who manage their own land. When working with so many other people you try to make the best use of your time. You help out a lot of people who are surveying different animal groups who in turn assist you."

As for the work itself? There are different shifts: the day shift, below.



*NB: All the images in this article are courtesy of the following people (unless specifically annotated):
Rebecca Laver, Pascal Title, Catherine Noble, Gaye Bourke*

(Discover the hype - New geckos in the north, cont'd,...)

"Day shifts/surveys include setting up a variety of traps, such as pitfall and funnel traps, to catch herps during the day. We rake spinifex grass and leaf-litter, flip rocks, visit tips and flip tin on Stations to uncover critters hiding from the heat of the day. We also make use of the light to pick good rock piles and mountain ranges to survey at night, noting their GPS localities, before setting up camp and waiting for night fall."



"Night shifts are when we go out hunting, my favourite part of the survey. Because many geckos climb, a lot of them don't get caught in the traps we have set out during the day, but at night everything comes alive and spotlighting to detect eye-shine is very successful. We try to photograph animals at night because colours and patterns are often brighter and more distinctive than during the day, which is a better time to 'process' them."

A huge variety of **monitors** and **dragon lizards** were found, all different shapes and sizes, often seen sunbaking during the day.



"Loads of different **skinks** were uncovered, the *Cryptos* are fun because they chase laser pointers, making it easier to catch them."

Snakes – the first time Rebecca handled a venomous snake! which was a Brown Tree Snake, *Boiga irregularis*.

"I admit I'm often nervous about snakes in the field, unlike my supervisor who is always excited about the potential for seeing death adders or taipans. I am often relieved that the snakes will be the ones to get out of the way if they sense you're coming."

"I came across many **frogs** and didn't necessarily have to search hard for some. I was taught at the start of my PhD how to catch herps by practising to chase splendid tree frogs, which we found on a huge mountain of granite boulders."

"We also saw many 'specy' **bird** species, identified by our 'bird watcher' travelling companions. Small **mammals** and sometimes even **invertebrates** were also surveyed."

Geckos

Rebecca's favourite group! Her images represent just a small sample of some of the many geckos which call this region home. "Two of my all-time favourite species are the Northern Knob-tail Gecko, *Nephurus sheai*, and the Northern Spiny-tailed Gecko, *Strophurus ciliaris*. Note the little guy playing peek-a-boo (right): we sometimes find large groups inhabiting termite mounds, collecting the insects that live within."

Sometimes you get to rest. "When not working we focus on catching up with sleep and eating to keep up energy levels. We're always excited about visiting Stations, usually a 20+km drive from the highway, that advertise fresh scones & cold beer. Because it's so hot we also get to swim in some spectacular locations, often waterfalls or pools which we have completely to ourselves."



Above: a blindsnake





Above: images courtesy of Rebecca Laver, Catherine Noble and Gaye Bourke.

(Discover the hype - New geckos in the north, cont'd,...)

Processing specimens and data

After all the specimens have been collected they are processed. The data recorded includes where the specimens were found, many body measurements, key features and genetic samples (easily done when a gecko drops its tail).

Lots of photos are taken, "which sometimes requires wranglers for elaborate photo shoots!" Rebecca added. The few animals that are collected for museums are prepared as voucher specimens: things like toe pads are laid out very carefully so that accurate measurements can be

taken once back at the museum. Each specimen is given a belt with an ID number to match it back to its data and tissue samples.

Back to work!

"Put on the white coat, get into the lab, extract DNA from the tissues and then sequence and

compare all the genetics. Using these sequences I create trees which tell me how things relate to each other, either within or between species. Once I have the data I can estimate the ages of when species have split or how long ago things became different. Then I map out all my data points for where all my species are in the landscape. Having done all this I can potentially identify what could be a new species. The next step involves comparing patterns across landscapes and groups to try and infer how things became different, including possible environment history throughout the region; this can cover millions of years."

Who's who of who's new?

Rebecca explained how she did an intense literature review of material from her collaborators, particularly data which was gathered at roughly the same time as her PhD work.

New AMT herps (non gecko)

2014

Uperoleia stridera,
Ratcheting Toadlet
from the northern
deserts region along
the bottom of AMT
(right).



Varanus sparnus,

Dampier Peninsula Monitor from the far southwest of the Kimberley.

2015

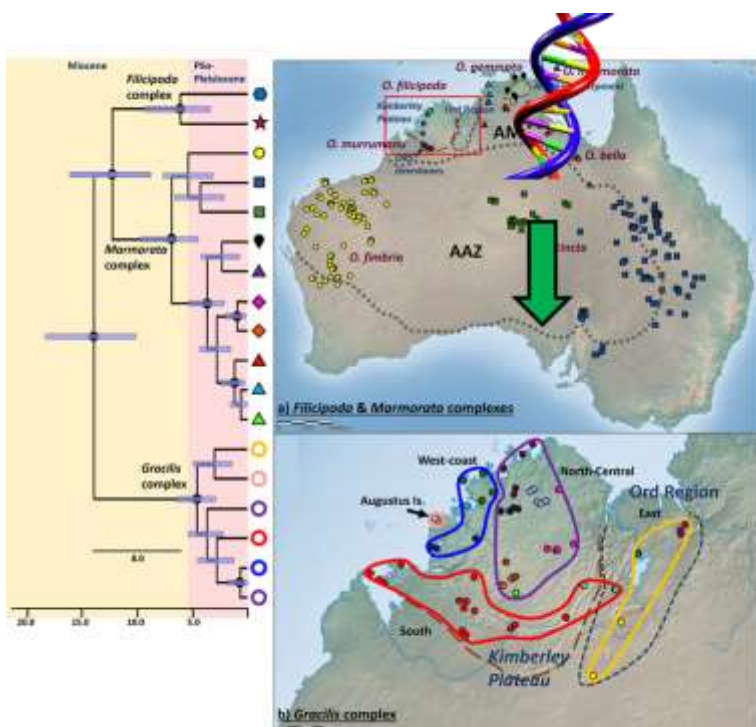
Acanthophis
cryptamydros,
Kimberley Death
Adder which was
distinguished from
the NT species
(right).



2016

Anilius zonula, West Kimberley Blindsnake from only a couple of islands off the Kimberley coast.

Eseya flaviventralis,
Yellow-bellied
Snapping Turtle from
the Top End Arnhem
Land area (right).



(Discover the hype - New geckos in the north, cont'd,...)

2017

Ctenotus rhabdotus, Kimberley Lined Ctenotus (comb-eared skinks) from the south Kimberley, described just this month!

New AMT geckos

2014



Diplodactylus barraganae,
Gulf Fat-tailed Gecko from
the Gulf region of the NT
and Qld (left).

Diplodactylus custos,

Kimberley Fat-tailed Gecko from the Kimberley.
Oedura murrumanu, Limestone Range Velvet Gecko
from a small area of limestone ranges at the
south Kimberley border.

Strophurus horneri, Arnhem Phasmid Gecko from
the Arnhem Plateau. A very small gecko that
lives amongst spinifex and resembles stick
insects (hence 'phasmid' gecko).

2016

Gehyra einasleighensis, Einasleigh Rock Dtella from
the Gulf.

Gehyra girloorloo, Kimberley Karst Gecko from the
same limestone range as the velvet gecko.

Oedura bella, Gulf Marbled Velvet Gecko.

"Over the last few years we're finding a number
of new species in particular areas (e.g. the Gulf
region and southern Kimberley limestones)."

'Easy' species

"At the start of my PhD I was told about this
Fringe-toed Velvet Gecko (*below*) known only
from the Mitchell Plateau in the Kimberley,
along the north-west coast. But news came



along that it had been seen at a site down the
very south of the Kimberley; we were pretty
excited about this because it would have been a
huge range extension for this species."

"We searched for days but found nothing. Upon
return my supervisor checked coordinates with
the original finders. A little later he did a return
trip and found a scrappy pile of rocks about
2km down the road from the site we had been
looking at. Bingo! As soon as you saw it you
knew it was completely different and a new
species. It's becoming a rare occurrence to find
things so distinct. More often now we are
discovering cryptic species that are hidden
within what we would otherwise think are a
single widespread species."

'Cryptic' species

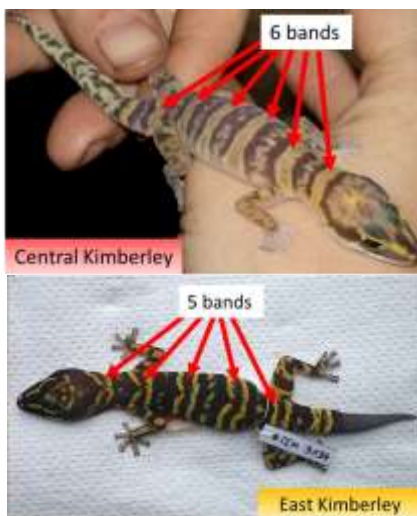
"To understand how cryptic species might arise,
imagine a series of mountains, at the top of
which live geckos which can easily move
between each mountain. Then a period of
environmental change occurs, i.e. Australia had
the traditional warm wet climate before the
deserts formed. The geckos like the wetter
mountain tops, not the drier conditions. A
barrier eventually forms between the
mountains, which can be described as a desert
ocean, prohibiting the geckos' movement
between the mountains. The habitat on the
mountain tops remain the same which means
the geckos keep the same body-form, but
isolation over time causes genetic differences.
Just because we can't see that they are different
doesn't mean that they aren't: by developing
different climatic tolerances, for example if one
mountain is in a slightly hotter region, they can
effectively become new species."



(Discover the hype - New geckos in the north, cont'd,...)

Rebecca worked on three main gecko groups for her PhD. She was told they contained 2-4 different species however it turned out that she most likely had cryptic species complexes. "The genetic divergences I am getting between the lineages were equal to or greater than those between currently recognised and described species. In some cases the splits would date an estimated 8–10mya. Even if it's not easy for us to see differences or it's challenging to find them, the genetics tells us that the species are different."

The Gracile Velvet Gecko, *Oedura gracilis*:



"I have one gecko group in the Central Kimberley and a distinct lineage from the Mitchell Plateau. I would argue that they look different, having slightly different patterns and banding. For example, the Central Kimberley lineage has 6 bands between the 'collar' and the 'belt' whilst the East Kimberley lineage has only 5 bands."

What's hot in this hotspot?

"The Kimberley as a whole is recognised as a biodiversity hotspot in the AMT. But given the huge environmental variation within the Kimberley we might predict that there are further hotspots at a much finer geographical scale."

Comparative phylogeography

"Once all the diversity patterns have been collected they are put down together for comparison to try and determine what features

are common across different groups. A common theme that was picked up in the north-west zone around the Mitchell Plateau was a really high concentration of unique and divergent lineages with short geographic ranges. Many groups have divergent lineages on small islands, which date up to 8mya, even though most of these islands are only 8 thousand years old and really close to the mainland."

Refugia

"When all the AMT data sets are combined we are able to create maps that highlight areas of highly concentrated and unique old divergent lineages with short geographic ranges." The maps are developed by people in the lab but heavily driven by data Rebecca collected. Locations that are deemed special are referred to as refugia and often represent unique environments when compared to the surrounding environments, which have an enhanced ability to protect against unfavourable environmental change.

Summary

"The Kimberley and AMT are amazing places to work and represent one of the final frontiers for new biodiversity and species discovery. The environment is highly variable, contains an incredible amount of cryptic diversity and there remains a lot yet to be described. By comparing diversity patterns you start to be able to detect refugial regions, and you can use these patterns to infer where things may have dried out in the past and split species up, and where things have come back into contact when conditions are more favourable. This work is now actively feeding into conservation practices."



The Australian & International Scene

Turtle triage gets shell-shocked reptiles back on their feet after storms

By Charmaine Kane and Damien Larkins,
ABC Gold Coast, 19 April 2017



Above: Putting the turtle shells back together has been like a jigsaw puzzle for staff at Currumbin Wildlife Hospital.
Image Supplied: Currumbin Wildlife Hospital.

About 30 freshwater turtles injured in wild weather during March '17 are on the slow road to recovery on the Gold Coast.

The turtles were washed out of rivers and streams and hit by cars or attacked by dogs during storms in the wake of ex-Cyclone Debbie.

Freshwater turtles are common in Queensland waterways, with about 14 species across the state. Currumbin Wildlife Sanctuary senior vet Michael Pyne said the injured turtles were pushed from their homes by raging torrents at the height of the floods.

"The turtles get washed up onto the shore and they start wandering around," he said.

"They don't know where they are and sadly, they get hit by cars and almost all of [the injuries] are as a result of that."

Staff at the hospital have wired the injured turtles' shells with adhesives to hold them in place while they knit back together.

Dr Pyne said a turtle's shell was living tissue, which would heal in time.

"It's a real jigsaw to put the shells back together but in almost all the cases, that shell has protected the internal organs," he said.

"They really are tough little critters," he said. Slow and steady is the pace as it could be six months before the turtles fully recover from their injuries. They will then be released back into the wild once the cooler winter months pass.



Above: It will take months for some of the injured turtles to fully recover but staff are up to the challenge.
Image Supplied: Currumbin Wildlife Hospital.

Guam's forests are being slowly killed off - by a snake

By Elizabeth Wandrag (University of Canberra) and
Haldre Rogers, *The Conversation*, 31 August 2017

Can a snake bring down a forest? If we're talking about the Pacific island of Guam, the answer may well be yes.

Our research adds to mounting evidence that the killing of many of the island's bird species by an invasive species of snake is having severe knock-on effects for Guam's trees, which rely on the birds to spread their seeds.

Invasive predators are known to wreak havoc on native animal populations, but our study shows how the knock-on effects can be bad news for native forests too.

Globally, invasive predators have been implicated in the extinction of 142 bird, mammal and reptile species, with a further 596 species classed as vulnerable, endangered or critically endangered. But the indirect effects of these extinctions on entire ecosystems such as forests are much harder to study.



Image: The brown tree snake has caused a cascade of problems. Image: Isaac Chellma.

The brown tree snake was accidentally introduced to Guam in the mid-1940s and rapidly spread across the island. At the same time, bird populations on Guam mysteriously began to decline. For years, no one knew why. In 1987 US ecologist Julie Savidge provided conclusive evidence that the two were linked: the brown tree snake was eating the island's birds. Today, 10 of Guam's 12 original forest bird species have been lost. The remaining two are considered functionally extinct.

But the ecological damage doesn't stop there. The loss of native bird species has triggered some unexpected changes in Guam's forests. Both the establishment of new trees and the diversity of those trees is falling. These changes show how an invasive predator can indirectly yet significantly alter an entire ecosystem.

Birds and trees

Birds are very important to trees. In the tropics, up to 90% of tree species rely on animals, often birds, to spread their seeds. Birds eat fruit from the trees and then defecate the undigested seeds far away from the parent tree's canopy, where there are fewer predators and pathogens that specialise on that species, where competition for light, water and nutrients is less intense, and where seeds can take advantage of promising new real estate when old trees die.

Without birds, roughly 95% of seeds of two common tree species on Guam (*Psychotria mariana* and *Premna serratifolia*) land directly beneath their parent tree. Compare that with the nearby islands of Saipan, Tinian and Rota – none of which have brown tree snakes – where less than 40% of seeds land near their parent tree. On Saipan, seeds that escape their parent tree are five times more likely to survive.

What's more, passing through the gut of an animal can actually increase the likelihood that a seed will germinate. On Guam, seeds that had been eaten by birds were two to four times more likely to germinate than those that hadn't. Overall, for the roughly 70% of tree species on Guam that rely on birds to spread their seeds, research suggests that the bird deaths caused by

the brown tree snake have reduced the establishment of new tree seedlings by 61-92%, depending on the species.

Forests' future threatened

These numbers suggest that many tree species in Guam are under serious threat, which in turn threatens the species diversity of the island's forests.

Our new research, published in Proceedings of the National Academy of Sciences, examined the number of seedling species growing in treefall gaps on Guam compared with Saipan and Rota, which still have their birds.

Treefall gaps appear when an adult tree dies, opening up the canopy and increasing the light that reaches the forest floor. Many species rely on this increased light for germination and early growth, so these gaps are hotspots for new seedlings.

We found that Saipan and Rota had roughly double the number of species of seedlings growing in these gaps, compared with Guam. What's more, seedling species on Guam tended to be clumped together, as you might expect if more than 90% of seeds are falling beneath their parent trees.

We also found that birds are important in moving the seeds of certain types of species to gaps. In forests, "pioneer species" are those that rapidly colonise gaps, exploiting the increased light to grow fast and reproduce young. Crucially, we found pioneer species in all gaps on islands with birds, but in very few gaps on Guam, where these species could be at risk of being lost entirely.

Invasive predators are a reality for many ecosystems, particularly on islands, and the situation on Guam is particularly extreme. Perhaps nowhere else in the world has experienced such dramatic losses of native fauna as a result of invasion.

While these direct impacts of invasion are astounding, the indirect impacts cascading through the ecosystem are just starting to unfold, and may prove to be similarly catastrophic.

ACTHA 2017 - 2018 Membership Renewal Last Chance!

\$20 family/individual m'ship **\$10** university student m'ship [**\$15** 'Herpetofauna']

Membership year runs from 1 July 2017 to 30 June 2018.

Direct debit to: ACTHA BSB 112-908, A/c 486822880

OR by cheque to ACTHA, PO BOX 160, Jamison Centre, ACT 2614.

Most importantly, please don't forget to note your name so I can identify it on the bank statement. Queries: margaretning1@gmail.com.

(The Australian & International Scene, cont'd,...)

Meet frog recording pioneer Murray Littlejohn: a man who heard music in amphibious murmurs

By Ann Jones, ABC News, 30 Aug 2017

Below: Murray Littlejohn is known in some circles as the grandfather of frog recordings.



One evening in 1953, in a room at the University of Western Australia, Murray Littlejohn heard the words that would inform the path of his career.

"These noises that the frogs are making — we think they're quite

important," Bert Main, a legendary naturalist and academic from the university, said to him. It was just a kernel of an idea: perhaps frog calls had meaning.

But that was all it took to set Associate Prof Littlejohn on a path to becoming the "doyen of Australian evolutionary biology" and the "grandfather of frog recordings".

Finding a method

Sitting in his retirement home in 2017, Prof Littlejohn explains the first hurdle he and his mentor needed to overcome was finding a way to properly document the frog calls.

Prof Main was able to arrange with the ABC an outside broadcasting unit — which in 1953 was a huge van — to travel out under his direction to a place where the frogs were calling and make a recording there.

But the human ear wasn't enough. The scientists needed a way to measure the sounds — so they called in another favour.

"Another contact at the CSIR [now CSIRO] — a man called [Roy] Muncey, who was in building acoustics, took some of this recording and processed it through a cathode-ray oscilloscope," Prof Littlejohn says.

Their contact then described how they could take measurements from what scientists now call the waveform of a frog call.

The oscilloscope had a small screen, however there was no way to record the squiggly line it produced.



Above: The ABC outside broadcasting unit took Murray Littlejohn and Bert Main out to make their first recordings in 1954. Image: ABC Archives.

So a continuous recording camera was lined up to the oscilloscope to film it, and then the 35 millimetre strip of film was processed.

Only after all of that could the sounds be measured in a scientific way, with the oscilloscope showing the volume and frequency of vibrations sent out by an individual frog.

"We knew then, when my work started in 1954, that we had a method that could be used," Prof Littlejohn says.

However, they needed their own more portable recorder.

Luckily, one of Prof Littlejohn's friends was interested in movie photography, and had read a magazine article on building your own sound recording device.

So Prof Littlejohn employed a local dentist with a precision machining hobby to build the recorder from the schematics in the article.

It was based off a gramophone mechanism, and recorded onto tape. The mechanism was weighed down by lead weights so that it spun at the correct speed — and in the end, the whole thing weighed about 17 kilograms.

Below: Early recording efforts required a lot of preparation and equipment. Image: supplied by Murray Littlejohn.



It was portable in the sense that it wasn't powered by mains power," Prof Littlejohn says. The recorder was loaded into a car, and the young Prof Littlejohn travelled out into the cold evenings of south-west Western Australia with Prof Main as his supervisor.

The starting point of Australian bio-acoustic studies

Below: A cathode-ray oscilloscope was used to take measurements from the waveform of their recordings. Image: supplied by Murray Littlejohn.



On these trips, the operator of the heavy recorder stayed in the car and Prof Littlejohn went out with a microphone attached to a 50-metre cord in search of calling frogs.

His very first recording was of a Western Australia moaning frog.

Prof Littlejohn and his colleagues were able to use these recordings, and the oscilloscope, to show each species of frog had a call that was absolutely measurable and was of scientific use.

Some of Prof Littlejohn and Prof Main's early recordings of the *Heleioporus* complex of frogs, from the southern part of Western Australia, were used to classify new species, including the whooping frog and the hooting frog.

This was one of the starting points of Australian bio-acoustic studies.

"Some people were working [on this] in other countries in different ways — perhaps studying bird calls for example," he says.

"We didn't know much about that, because the publications were very scarce, and the tyranny of distance operated."

But after reading a press clipping about Texan frogs singing with an accent, Prof Littlejohn

became acquainted with a "kindred spirit" in the United States — Prof Frank Blair.

He then spent time studying the frogs of the US, hoping to bring more cryptic species into the taxonomic light with the aid of recording technology.

Returning to Australia

Prof Littlejohn returned to Australia in the 1960s to take up a post at the University of Melbourne, where he would remain for the rest of his career, recording the frogs of Victoria.

His late wife Patsy, an accomplished scientist in her own right, often acted as an operator for the largely after-hours pursuit of frog recording.

As his career progressed, Prof Littlejohn updated his recording apparatus, moving from various reel-to-reel recorders on to tapes, mini discs and then eventually to digital.

At the same time, his studies became more and more complex, looking into the zones of contact between species that are very similar and the hybridisation that occurs between them.

Focusing on a smaller number of species, including the Victorian Smooth Froglet (*Geocrinia victoriana*), this modern-day Dr Doolittle even sought to understand, in part at least, what frogs were trying to say.

Sometimes called the Eastern Smooth Froglet, the male Victorian Smooth Froglet likes to position himself in a tuft of grass and call out for love.

Below: Recordings of the Victorian smooth froglet's bi-phasic call were used to find out which part females were attracted to. Image: Supplied by Murray Littlejohn.



"The call has two distinct parts to it," Prof Littlejohn says. "We thought that's interesting ... it's got a bi-phasic call and it's quite well marked in its two parts. Why would it be doing that?"

"So in the pre-digital days, we took a recording and snipped it up and we put the 'wark' and made a loop of that. And the 'pip pip pip pips' and made a loop of that.

The team then set up two loud speakers in the field and played the 'wark' from one speaker, and the 'pip pip pips' from the other.

"We released a female of the same species to see which way she would go, and she was attracted to the 'pip pip pip' part of it, not the 'wark' part of it," Prof Littlejohn says.

The scientists then tested this on a male frog. They found the 'pips' in the call excited the male, which increased its own "pipping rate" in response. And in response to the "warks", the frog would stop calling and "answer back" with more "warks".

"So we determined in that way that this first part of the signal had a territorial function directed at other males," Prof Littlejohn says. You could say that one part of the call says, "I'm a male, come and get me" to females, and the other says "I'm a male, come at me bro" to other males.

Prof Littlejohn worked in the field recording and analysing frog choruses right up until the year 2003 and has been honoured in Australia and internationally for his work — he even has two species of Australian amphibians named after him.

But perhaps the most charming part of his legacy is the glorious recordings of Australian frogs from those cold nights in south-west WA at Sheepwash Creek in 1954.

Now, retired and aged 85, listening back to calls on his computer from his retirement home, he smiles.

"It's frog music, isn't it?" he says.

How Slovenia is helping its 'baby dragons'

By Robin McKie, *theguardian*, 27 August 2017

Postojna Cave in Slovenia is one of Europe's longest cave networks and one of the world's most spectacular subterranean tourist sites. Hundreds of thousands of visitors come here every year to gaze at its wonders: its huge stalactites and stalagmites, its curtains of coloured rock and bridges that have been carved out of the local limestone by the river Pivka over millions of years.

Given such glories, it is not surprising that few tourists take note of the two concrete huts draped with black polythene that have been erected in a shadowy alcove in one obscure part of the 24km-long labyrinth. But the huts contain wonders of their own. In racks of trays of water, scientists have placed specimens of one of the world's strangest creatures: the blind aquatic salamander *Proteus anguinus* – or olm, as it is known locally. It constitutes a project that could have profound implications for the future of these remarkable creatures.

"We now have 21 baby olms flourishing in our trays," said Primož Gnezda, a biologist working in Postojna Cave. "For the first time we have witnessed the hatching of *proteus* larvae – and, after one year, they are all healthy. And that gives us hope we can save our olms for the future."

Olms spend their lives in total darkness in the Postojna cavern complex. They can grow to up to a foot in length, making them the world's largest cave-dwelling animals and they can live up to a century, though they usually breed only once every six or seven years. The creatures can detect the bioelectric fields of other organisms – helping them hunt in the dark for their main prey, the cave shrimp. And experiments have suggested that they use the Earth's magnetic field to orient themselves. In addition, they possess photosensitive skin: if you shine a torch on the tail of an olm, it will swim away from you.

That extraordinary set of attributes has brought olms considerable renown among animal lovers, not least David Attenborough who has included them in his list of endangered animals he would most like to save from extinction. They are, he says, "one of the ultimate specialists" in the natural world. They have adapted to living in total darkness by losing their sight and can survive for up to 10 years without food. "The olm lives life in the slow lane which seems to be its secret for living a long life... and perhaps that is a lesson for us all," says Attenborough.

Given their remote, stygian home, it might be expected that olms would be relatively new to the world of science but their existence has been known about for centuries. That's because their habitat – the subterranean pools and rivers of the great karst outcrops of Slovenia and the north Adriatic coast – occasionally becomes flooded during rainstorms and when that happens the olms get flushed out into the open. In medieval times, the appearance of these writhing, white, eyeless creatures in the midst of severe storms caused some alarm. Locals believed they were the spawn of a mythical beast, most likely a dragon. So they become known as baby dragons – and the name has stuck, not least on the mugs and fridge magnets on sale in the tourist shops. In fact, with their clammy white skin and tiny legs, olms look more like miniature versions of Gollum than baby Smaug.

Below: An olm on the cave bed; they can live up to 100 years. Image: Alamy



Slovenia is extremely proud of its remarkable little blind salamander which featured on the country's pre-Euro coins. But the creature faces problems. For a start there is the threat of pollution to its waters from surrounding factories and towns - many of which are outside Slovenia. It has also suffered from the attentions of collectors. As a result *Proteus anguinus* is now rated as vulnerable by the International Union for Nature Conservancy.

That explains the particular joy that met the news that young baby dragons had been bred and were now being carefully nurtured in that dark subterranean hut. It was the first time olms had been persuaded to breed in a scientifically controlled environment within Postojna Cave. "In the cave, in nature, olms hatch all the time," said Saso Weltdt, another cave biologist, "but nobody has ever seen that happen or seen a hatchling younger than about two years – until now."

The discovery that a mother olm had started to lay eggs was made in January last year by cave guide Juan Pablo Maschio. He reported having seen one attached to the wall of the aquarium in the cave that allows tourists to see living examples of Postojna's distinctive salamanders. Biologists who rushed to the tank found the mother fighting to fend off other olms. Three years earlier, in 2013, another captive olm had laid eggs but none hatched and many were eaten by the other olms in her tank. This time the Postojna team were able to move the other olms out of the tank and allow their "dragon mum" to go on to lay her eggs. On 30 May, four months after the first egg was laid, the first baby dragon was born. In the end, a total of 21 larvae were hatched. "It was just fantastic. We all had tears in our eyes," said Katja Dolenc Batagelj, head of the Postojna Cave laboratory.

At present, all 21 baby dragons are thriving and have grown from 2 to 7cm over the past year, and studies of the creatures continue. Last year, Lilijana Mali, of the University of Ljubljana – working with Stanley Sessions of Hartwick College, New York, and others – discovered that olms have evolved a unique genetic feature in which a piece of Y-chromosome (in most creatures present only in males) has become attached to an X-chromosome. Such a translocation can mix up sex determination and

cause gender ambiguity, even in humans. This translocation may have arisen to conserve genes that are useful in the olms' lightless, low-food environments. However, it may also pose reproductive problems for the species.

"The establishment of our breeding colony in Postojna gives us a chance to carry out more research and see what has been the impact on the genes of *Proteus anguinus* in evolving in this strange environment," says Mali.

The story underlines the importance of the Postojna team's success in establishing a breeding colony. "There may be thousands of our baby dragons in the caves but equally there is a constant danger of pollution," says Batagelj. "Only a slight change to the water here might have a devastating effect so this colony is a lifeline."

Curious Kids: What happens if a venomous snake bites another snake of the same species?

This is an article from Curious Kids, 'The Conversation', by Jamie Seymour 18 Sept 2017

"If a lethally poisonous snake bites another lethally poisonous snake of the same species does the bitten snake suffer healthwise or die?", Ella, age 10, Wagga.

Hi Ella,

That's a great question.

If a venomous snake is bitten by another venomous snake of the same species, (for example during a fight or mating), then it will not be affected.

However, if a snake is bitten by a venomous snake of another species, it probably *will* be affected.

This is probably because snakes have evolved to be immune to venom from their own species, because bites from mates or rivals of the same species probably happen fairly often.

But a snake being regularly bitten by another snake from a different species? It's unlikely that would happen very often, so snakes haven't really had a chance to develop immunity to venom from other species.

Snakes can break down venom in the stomach

Many people believe that snakes are immune to their own venom so that they don't get harmed

when eating an animal it has just injected full of venom.

But in fact, they don't need to be immune.

Scientists have found that special digestive chemicals in the stomachs of most vertebrates (animals with backbones) break down snake venom very quickly. So the snake's stomach can quickly deal with the venom in the animal it just ate before it has a chance to harm the snake.

People that have snakes as pets often see this. If one venomous snake bites a mouse and injects venom into it, for example, you can then feed that same dead mouse to another snake. The second snake won't die.

The difference between venom and poison

By the way, scientists usually use the word 'venomous' rather than 'poisonous' when they're talking about snakes. Many people often mix those words up. Poisons need to be ingested or swallowed to be dangerous, while venoms need to be injected via a bite or a sting. Some snakes can inject their toxins into their prey, which makes them venomous. However, there seem to be a couple of snake species that eat frogs and can store the toxins from the frogs in their body. This makes them poisonous if the snake's body is eaten. Over time, many other animals will have learned that it is not safe to eat those snakes, so this trick helps keep them safe.

New Purple Pig-nose Frog found in remote mountains

By Jason Bittel, National Geographic, 24 August 2017

Below: The newly discovered Bhupathy's purple frog spends nearly its entire adult life underground—but its tadpoles spend four months suctioned to cliffs behind waterfalls.

Image: Jegath Janani



Scientists have discovered a new and unusual species of frog in the Western Ghats mountain range in India. The frog has shiny, purple skin, a light blue ring around its eyes, and a pointy pig-nose.

The scientists have called the new species Bhupathy's purple frog (*Nasikabatrachus bhupathi*), in honor of their colleague,

Dr. Subramaniam Bhupathy, a respected herpetologist who lost his life in the Western Ghats in 2014.

While the new amphibians may appear odd, each quirk of the purple frog's anatomy is the result of countless years of evolution. Small eyes, a long snout, and short limbs equipped with hardened 'spades'—each enables the frog to spend almost its entire life below ground.

In fact, the amphibians don't even surface to eat. Instead, the Indian purple frogs use a long, fluted tongue to slurp up ants and termites underground, says Elizabeth Prendini, a herpetologist at the American Museum of Natural History and coauthor of a paper describing the species in the newest issue of the journal *Alytes*.

Bhupathy's purple frog is closely related to another purple frog (*N. sahyadrensis*) found in the region in 2003. Together, the two make up the only known members of their family. The find comes as part of an effort sponsored by the Indian government to sample the DNA of every frog and toad species in the nation. "This frog lineage is very ancient, and has a very low diversity, so this finding is very special and unusual," says Prendini.

Emergent multisystemic *Enterococcus* infection threatens endangered Christmas Island reptile populations

By Dr Wendy Townsend, Chief Veterinary Officer | Parks and Conservation, ACT Government

The images below are pictures of an emerging disease of captive and free living reptiles on Christmas Island. The bacterium responsible is thought to be a novel *Enterococcus*. Members of this genus are widespread due to their ability to survive in a range of environmental conditions and adapt to situations that are considered extremely hostile for other bacterial species. Some can cause disease in both humans and animals and these bacteria are also known to have multidrug resistance.

Given that one of the reptiles affected by this disease was the Asian house gecko, which is widely distributed across Australia, I thought that this information would be of interest to members of your herpetological society. To date the disease has not been reported on the Australian mainland, but I have distributed this information to our conservation officers so we can keep a watchful eye for potential incursions in the ACT.

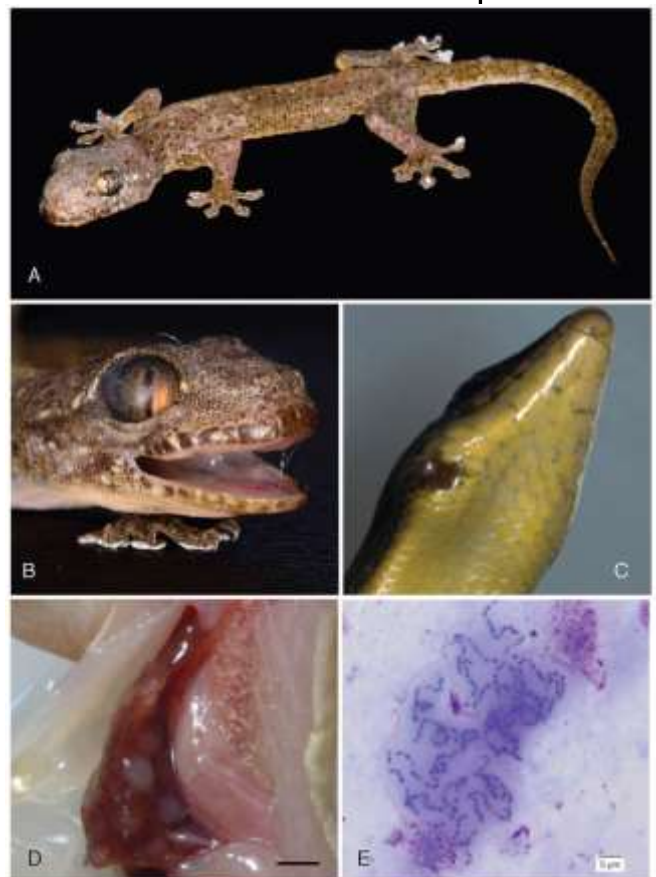
The full paper by Rose et al describing this condition can be found via the link below.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181240>

Gross and cytological findings

Gross and cytological findings in Christmas Island reptiles infected with the *Enterococcus* species bacterium included emaciation, subcutaneous nodules along the face and tail, and sub-spectacular fluid accumulation (A), sub-spectacular fluid build-up, gingival swelling and subcutaneous nodules along the face of an Asian house gecko (B), a focal skin ulcer in a blue-tailed skink (C), multiple raised white foci throughout the hepatic parenchyma of an Asian house gecko, bar 5 mm (D), and chains of cocci with a mucinous matrix aspirated from the sub-spectacular fluid of a Lister's gecko, Romanowsky stain (E).

[<https://doi.org/10.1371/journal.pone.0181240.g002>]





Pic 2



Pic 1



Pic 3

Reptile Hotel: by Matthew Higgins, via email

Pic 1 "... a blue-tongue emerged from under the greenhouse slab. Probably the same one we saw coming and going there last summer, now making its first appearance of this season with the warming weather. The pale colour is of note; maybe exposure to sunlight darkens skin colour? You can see how it is flattening itself for maximum solar exposure. The delights of life in the Bush Capital..."

Pic 2 "Word must have got around the lizard fraternity that we are a soft touch for backyard accommodation. Not only have we been putting up Brinda Blue-tongue for the last year or so, but now Sam Shingleback has moved in, and what's more they seem to tolerate each other. This image shows them basking within a metre of each other, either side of the concrete pavers. On top of that, Brinda has now brought home a mate 'You want to share a slab with me, concrete that is?'"

Pic 3 "Further developments to our garden resident blue-tongues, Brinda and Bella, they have now mated. Fascinating to watch this behaviour by wild reptiles in our own backyard. We see from the literature that this species can have over a dozen live young, after a gestation period of three to five months. So the next little while will be most interesting...(as if it wasn't interesting enough already!). Meanwhile, Sam Shingleback makes occasional appearances too - will he/she find a mate? Await the nest thrilling instalment from 'Adventures in Amorous Ainslie, Reptile Style'."



By Daniele Senior via ACTHA's website

"Thought you might be interested in this tiger snake which has taken up residence on our verandah. Every day since the 23rd of September it has climbed up the wisteria in the morning (to the consternation of the little birds) and warms itself on the beams where it stays all day. We live close to Lake George just off the Federal Highway."

Three Eastern Brown snakes fight at Tidbinbilla Nature Reserve in Canberra

By Han Nguyen, *The Canberra Times*, 2 October 2017
[NB content edited]

A group of hikers have stumbled across a rare sight of three eastern brown snakes romping in the grass at Tidbinbilla Nature Reserve in Canberra.

William Chancellor and friends were walking along the trail when they spotted the snakes.

"We weren't really sure what was happening, whether they were fighting or mating."

"As we watched, another one came out of the scrub towards the two snakes that were entangled and then it sort of joined in as well and they sort of started spinning around, nipping at each other."

He said one of the snakes left and the other two continued for about 10 minutes.

Mr Chancellor, who has walked the trail many times before, said when they returned to the spot after their hike two hours later, the two snakes were resting near a log.

The sighting comes as Canberra enters the beginning of snake season.



Image: William Chancellor

Christmas party for ACTHA members

from 6pm, Friday 15 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 *by Friday 8 December 2017*

Of course we shall take the opportunity to discuss Snakes Alive! 2017; who can volunteer, who can provide animals and most importantly who can show off our beautiful animals to people attending the week-long event!

*[*The third Tues of the month was a tad too close to Christmas Day.]*

Notice is hereby given of the 2017 **AGM** of the **ACT Herpetological Association Inc.** to be held at the Belconnen Soccer Club, Cnr Belconnen Way & Springvale Dr, Hawker, in conjunction with our meeting on **Tuesday, 17 October 2017**, at 7.30pm.



ACTHA News
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