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ACTHA Inc. News

June - July '18

Newsletter of the
ACT Herpetological
Association Inc.

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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)

Meeting held

Tuesday, 19 June 2018

Meet a reptile keeper:

Skott Williamson from the Canberra Reptile Zoo will be discussing some of the ups and downs of owning pythons with a particular focus on *Morelia* and *Aspidites*.

Our Guest Speaker:

Ben Scheele, ANU, will follow and give a talk which will focus on current research efforts to understand whether environmental conditions and the presence and abundance of reservoir hosts influences the ability of Northern Corroboree Frog populations to persist in the wild at sites where chytrid fungus is present.

Your Committee for 2017 - 2018

President	Scott Keogh
Vice President	Ric Longmore*
Secretary	Dennis Dyer
Treasurer	Margaret Ning
Newsletter Editor	Mandy Conway
Webmaster	Angus Kennedy
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Committee Members	Jason Spurr Iris Carter Greg Flowers Roy Chamberlain Peter Child
Student Representatives	Vacant

* Denotes Life Members



Turtle Research in the Northern Territory – Looking for an adventure?

RESEARCH PROJECT: The project is looking into developing genetic resources to help combat wildlife trafficking of vulnerable and endangered freshwater turtles throughout the Northern Territory and New Guinea.

RESEARCH ACTIVITIES: Travelling to and throughout the coastal catchments of the NT. Catching turtles from a boat with cast-nets and dip-nets, also using baits. Snorkelling and hand-capturing turtles will be employed in some National Parks. Taking genetic samples and voucher photos of all freshwater turtles captured. The turtles are released back into the water, minus a small skin biopsy. The research will be conducted in the East Alligator, South Alligator, Daly, FitzMaurice and Victoria drainages, and at times involves working with National Park Rangers and Traditional Owners.

WHAT TO EXPECT: Physical work in hot/tropical temperatures, in many places swimming is prohibited due to the presence of saltwater crocodiles (we'll only be snorkelling in places where salties are removed). Camping in National Parks and reserves, caravan parks and on cattle stations in tents.

OPTION #1: THE ENTIRE TRIP: Drive to NT. Elsey National Park, Nitmiluk National Park, Flora River Nature Reserve, Kakadu National Park, Warddeken Indigenous Protected Area, Litchfield National Park. Wombungi Station, Gregory National Park, Victoria River Downs Station. Drive back to Canberra. Approx. 10th July to 23rd September.

OPTION #2: PART OF THE TRIP: Drive to NT. Elsey National Park, Nitmiluk National Park, Flora River Nature Reserve, Kakadu National Park, Warddeken Indigenous Protected Area. Dropped off at Darwin Airport. Approx. 10th July to 25th August.

SELECTION CRITERIA: volunteers must: *i)* hold a current manual car licence, *ii)* be capable of working in hot/tropical environments + enthusiastic about physical work outdoors, some of which is heavy lifting and hiking, *iii)* be a proficient swimmer and have snorkelling experience including diving, *iv)* be proactive in the field, takes the initiative to get the job done and *v)* has a keen interest in research.

Food, accommodation and flights (if required) all paid for.

Contact: Matt on Matthew.Young@canberra.edu.au if you're interested. Please provide a CV detailing field experience, also a short statement/sentence addressing each selection criteria.



ACTHA meeting held Tuesday, 17 April 2018

Meet a reptile!

A new initiative by your ACTHA Committee sees us inviting a member to bring their pet reptile to a meeting so that other members can view and ask questions they may have about keeping different species of reptiles as pets, with an emphasis on correct handling and husbandry requirements.

We would particularly like to encourage new members and our younger members to come along to 'Meet a reptile!' which will start before the main speaker.

This Ed. brought along a baby and adult shingleback lizard to show the difference between a wide age gap.

"I have had this old male shingleback for around 5 years. He has a calm and sweet nature, even more so than most of the others I have owned as pets over the years.

"He came to me from someone whose dog had attacked their pet. The dog had chewed over most of the shingleback's body, damaging most of the scales. The deeper bite marks were on the top of the lizard's head and on either side of the lower jaw.

"It took many months of cleansing and applying a soothing moisturiser (in this case Paw-Paw cream to encourage healing) and feeding soft foods until the jaw had regained strength.

"There are permanent scars: most of the scales on the shingleback's back are raised and pitted. The skin has healed but grown back a white colour on top of the head and around the lower jaw. There are large lumps on the lower jaw's sides which are getting slowly bigger from the inside - the vet and I think that when the tissue was damaged it started a process of over-active tissue growth. The shingleback is relatively old so we closely observe him and will probably have to put him to sleep when he can no longer eat or swallow, hopefully not for a few years though!"

"And here is the baby shingleback, now 5 weeks old. It has nearly doubled in size since birth.

"The heavily pregnant mother (*right*) was caught in a wire fence on a property, stuck just in front of her back legs.

"Over the next 4 or 5 days she ate well and seemed comfortable, but then she looked like she was in labour for nearly 3 days. Time to seek veterinary help.

"Three babies were born, with assistance, just before mum sadly passed away. The baby I'm holding is fairly black and looked to be the healthiest with the most body mass. It's two siblings were long and thin and a pale grey colour.



Above: they took a very long time to eat their yolk sacs.

"I thought all would be well however the two pale babies sadly died over the next week.

"I was devastated, however there is one shingleback that looks set to return to the paddock next Spring. At the moment the old male and baby are inseparable; sleeping, eating and walking around together. Who said they were solitary creatures?!"

Actually, Jake added that when he goes bush he frequently comes across groups of shinglebacks.





Above: the sweet natured male keeping a close eye on surviving baby!

Liam's show & tell summary by Dennis Dyer...

ACTHA member Liam kindly brought two of his pythons to show and tell.

The first one that he displayed was an Albino Carpet Python which was approximately 2m in length. Its distinctive albino appearance masks its underlying carpet pattern making it a very attractive animal.

Liam explained that it is about 5 years old and was given to him just before last Christmas due to its owner becoming uncomfortable with handling it. Its previous owner reported that it had the habit of striking her whilst she was handling it, often some time after being taken from its enclosure. Liam related that he had not experienced this since he acquired it. It seems to settle once taken from its enclosure although, having been advised, he is nevertheless careful when handling it. It currently feeds on rabbits.

Jake kindly handled it (below left) whilst Liam (below right) displayed the next python, an approximately 3 year old Black-headed Python.



(Meet a reptile! cont'd,...)

This python is about 1.5 to 2m long and is also being fed rabbits. It is housed in an enclosure with a sand base. Liam explained that although this species occurs in such an environment, this specimen was initially uncomfortable on a sand base having been kept on newspaper before, but is now 'quite at home' on it.

This was acquired from a person who was also unable to care for it. It was quite active during Liam's talk, appearing to be both inquisitive and aware of the environment. Liam also related how, unlike all the other pythons in which he comes into contact, this one enthusiastically eats even when it is shedding!

The audience showed their appreciation to Mandy and Liam for bringing their reptiles to the meeting and to Jake for his handling display of the Albino Python.

Our Guest Speaker:

Duminda Dissanayake, PhD Candidate, Institute for Applied Ecology, University of Canberra

Herpetofauna of Sri Lanka

followed by a talk about Duminda's PhD on

'Skink Sex: Sex reversal and determination in the skink

Bassiana duperryi

Duminda started his presentation by giving a slide show of some of Sri Lanka's beautiful herpetofauna before launching into his talk which outlined his work on 'Skink Sex: Sex reversal and determination in *Bassiana duperryi*, a species found locally.

Duminda is a zoologist and a conservation biologist from Sri Lanka. His research has focused on ecology, behavioural biology and spatial distribution of reptiles and amphibians in his country of birth.

"The most exciting and rewarding herpetological research I have done in my career was my Master of Philosophy degree on the systematics, ecology, haematology, in vivo toxicity of venomous snakes in Sri Lanka."

Duminda is currently a PhD student at Prof. Arthur Georges lab, at the University of Canberra. He will use a multidisciplinary approach to investigate how environmental temperature and evolutionary processes converge to influence the dynamics of sex determination mechanisms and sex chromosome evolution in reptiles



Above: Duminda during his venomous snake research in Sri Lanka

Scope of current research

Biological mechanisms leading to the generation of males and females are extremely plastic. Higher vertebrates show divergent strategies to complete their genetic control of sex. The biological process of sex determination, particularly in mammals, birds, amphibians and fish has been studied extensively. Until recently, sex-determining mechanisms were largely unknown in reptiles, but sex chromosomes have now been discovered in many reptiles which in contrast have an astonishing array of mechanisms for determining offspring sex, including environmental sex determination. Hence, this provides a fertile field for studies of the interactions of genes and environment to determine sex and the consequences of such interactions for ecology and evolution.

Recent studies in Arthur Georges laboratory, on *Pogona vitticeps* have revealed a phenomenal relationship between sex reversal by temperature and rapid evolutionary transitions among genetic and environmental sex determination.



(Sex reversal and determination, cont'd...)

The skink *Bassiana duperreyi*, has a mechanism of sex determination similar to that of humans, that is XX/XY. However, according to records, low temperatures reverse female to male. The sex reversal by temperature occurs in both species in the laboratory and in the wild. But high temperatures reverse dragon embryos and low temperatures reverse skink embryos. This suggests that different mechanisms are involved in sex reversal and the evolution of these mechanisms was independent.

"The focus of my research project is to examine the genes and chromosomes involved in low temperature sex reversal, and the evolutionary and ecological insights to sex determination by studying *Bassiana duperreyi*."

The species studied here, *Bassiana duperreyi* is found in the ACT region and along the southeast of Australia, and are considered to be of considerable importance scientifically because of the work undertaken on its ecology and field biology. "This study will build on this foundation to provide us with an understanding on the effects of global warming on the local populations of this species and would provide us with the ability to predict the future effects. Having a prior idea on the effects of global warming on the local populations of these species would allow us to better understand the impact of climate on reptiles in general, and inform measures to initiate conservation and recovery plans to reduce the risk of extinction."

Biodiversity conservation

Global warming has major impacts on several aspects of the biology and ecology of many reptile species on earth which in some cases has led to population declines or serious other threats. Until now, however, such impacts have not been reviewed for reptiles, despite the fact that these species are often at the cutting edge of conservation priorities and educational level. Changing temperature is increasingly being considered as a one of major threats for reptiles, especially for species with temperature-dependent sex determination.

A field-based project which will work on a cline from the Australian Alps to Melbourne.

Left: The skink *Bassiana duperreyi*



Above and below, Duminda in the field, and collecting morphometric data.



Below, winter field work monitoring soil temperature.



Below, the Brindabella Mountain Range.



The Australian & International Scene

Why blue-tongues have blue tongues

iview.abc.net.au/programs/abc-news-nsw/NU1801H137S00

Gemma Veness interviews Martin Whiting about why bluetongue skinks have blue tongues. The interview is about research published by the Lizard Lab on deimatic displays in blue-tongue skinks that shows that blueys have UV (ultra-violet) tongues that likely startle predators. This work was published in the journal 'Behavioural Ecology and Sociobiology'. A very good interview!

Zoos Victoria release eggs to help Corroboree frogs leap out of extinction

By Joe Hinchliffe, The Sydney Morning Herald, 30 April 2018

Until recent decades, there were hundreds of thousands of southern Corroboree frogs clambering around snow gum trees and wallowing in the frigid waters of the Australian Alps.

Now, less than 50 of the vividly-coloured, poisonous little frogs are left in the wild.

But those numbers are set to swell this week with the release of about 1000 captive-bred southern Corroboree frog eggs into Kosciuszko National Park.

Zoos Victoria herpetofauna expert Deon Gilbert delivered the eggs from Melbourne – where they were bred – to Australia's highest mountain, the only place in the world which they call home.

Mr Gilbert said the frogs went swiftly from 'very common' to critically endangered after their population was decimated by the arrival of amphibian chytrid fungus to the high country, which probably occurred during the 1970s.

The fungus infects the amphibians with *Chytridiomycosis* disease to which the frogs are particularly susceptible. "It's difficult to give precise numbers but we're talking many hundreds of thousands, potentially more," he guessed of the number of frogs before the arrival of the fungus.

"[But] we started seeing population declines in '80s and then they dropped out really quickly

over the preceding decades to the point where there are now virtually no frogs left in wild."

During the 1990s herpetologists recognised the population crash and began collecting frog eggs for captive breeding programs at Taronga Zoo and Zoos Victoria.

Mr Gilbert said enough genetic diversity had been captured to ensure a viable population at the zoos, which had slowly been built-up to the point that the species will survive in captivity and was now producing thousands of eggs every year.

In 2011, Zoos Victoria began releasing some of those eggs into the wild. They have done so once a year, every year since, just before the tadpoles hatch from their eggs in autumn.

As a result of the programs, Mr Gilbert said he now had high hopes the species would once again have a stable wild population.

"The southern Corroboree frog program is right up there amongst conservation stories," he said. "Without it, the frogs would almost certainly be extinct."

It is hoped that by releasing frog eggs back into the wild the species will eventually build a genetic resistance to the fungus, but Mr Gilbert said that such a natural immune response would not emerge overnight.

"It takes many years, potentially decades to be able build up large, healthy populations."

The thousand or so little eggs released this week will hatch in disease-free "semi-wild" enclosures in the national park.

World's oldest lizard fossil forces rethink of reptile family tree

By Nicola Davis, The Guardian, 31 May 2018

The international study of the *Megachirella wachtlen* fossil allowed the authors to re-write the history of all fossil and living lizards and snakes.

The fossilised remains of a small lizard discovered in rock from the Italian Alps has shaken up the evolutionary family tree of reptiles and shed new light on the survivors of the most devastating mass extinction the world ever faced, researchers say.



Above: the *Megachirella wachtleri* fossil.
Image; MUSE - Science Museum, Trento, Italy

Thought to have lived in the triassic period, about 240 million years ago, the creature, known as *Megachirella wachtleri*, has been unveiled as the oldest known member of a group of reptiles known as squamates – which includes lizards, snakes and peculiar legless creatures known as worm lizards.

Researchers say the finding not only sheds light on what the last common ancestor of such creatures would likely have looked like, but reveals that squamates probably appeared far earlier than previously thought, and survived one of the planet's greatest catastrophes.

"All lizards and snakes are descendants from *Megachirella* or a *Megachirella*-like lizard," said Dr Massimo Bernardi, co-author of the study from the University of Bristol, adding that *Megachirella* would probably have measured about 25-30cm from its nose to the tip of its tail.

Writing in the journal *Nature*, an international team of researchers describe how they reanalysed the 240m year old fossil of the creature which was first discovered in rock from the Dolomites in the early 2000s by an amateur collector.

Using an x-ray technique known as CT-scanning, the team were able to examine in 3D previously hidden features of the fossil. In addition, they spent about 400 days visiting and examining some 150 specimens of ancient lizard-like creatures held in collections around the world, and analysed both skeletal and molecular data – including DNA – from living squamates.

The results reveal that *Megachirella* is a squamate, pushing back the earliest known member of the group by 75m years and backing

up some previous molecular studies that had proposed squamates existed in the triassic. A further result of the new family tree, the team say, is that it settles a long-standing debate, revealing that geckoes evolved earlier than iguanas.

And there's more.

Combining both the

molecular data and observations of skeletal features, the team were able to estimate when the earliest squamates appeared, revealing they probably originated just before the "Great Dying" – a catastrophic mass extinction event 252m years ago when more than 90% of marine creatures and 70% of land vertebrates died. That, Bernardi said, overturns current theories that they arose after the disaster, and reveals that many different species appeared in the wake of the catastrophe due to factors such as a lack of competitors. "It is like the other side of extinctions," he said. "Squamates, for example, were actually there before the extinction, they went through [it] in some way, and they took the opportunities that opened up just after the extinction," he said.

Bernardi says *Megachirella* probably lived along shorelines and that the specimen found in the Dolomites met with a watery end amid a thunderstorm. "At that time geological reconstructions show us very clearly that the Dolomites were a series of islands with rich vegetation and fine sand beaches, and probably *Megachirella* was walking along one of those beaches," he said. "[We think] it was taken by the thunderstorm because in the very same [rock] layers you see a lot of plants and debris and things that were coming from land into the sea.

David Martill, professor of palaeobiology at the University of Portsmouth who was not involved in the study, said the revelation that squamates arose before the Great Dying casts the creatures in a new light. "This means squamates are real survivors," he said. "The Permo-Triassic extinction event was a dangerous time to be alive. Not much escaped its deadly touch."

Dugong and sea turtle poo sheds new light on the Great Barrier Reef's seagrass meadows

Authors: Samantha J Tol, Alana Grech, Paul York, Rob Coles (James Cook University), this article appeared in The Conversation, 25 May 2018

Just like birds and mammals carrying seeds through a rainforest, green sea turtles and dugong spread the seeds of seagrass plants as they feed. Our team at James Cook University's TropWATER Centre has uncovered a unique relationship in the seagrass meadows of the Great Barrier Reef.

We followed feeding sea turtle and dugong, collecting samples of their floating faecal matter. Samantha then had the unenviable job of sifting through hundreds of smelly samples to find any seagrass seeds. These seeds range in size from a few centimetres to a few millimetres, and therefore can require the assistance of a microscope to be found. Once any seeds were found, they were stained with a chemical dye (Tetrazolium) to see if they were still viable (capable of growing).



Above: PhD candidate Samantha Tol holding dugong poo collected from Cleveland Bay in Townsville. Image: TropWATER, JCU

Why is this important for turtles and dugong?

Green sea turtles and dugong are iconic animals on the reef, and seagrass is their food. Dugong can eat as much as 35 kilograms of wet seagrass a day, while sea turtles can eat up to 2.5% of their body weight per day. Without productive seagrass meadows, they would not survive.

This relationship was highlighted in 2010-11 when heavy flooding and the impact of tropical cyclone Yasi led to drastic seagrass declines in

north Queensland. In the year following this seagrass decline there was a spike in the number of starving and stranded sea turtles and dugong along the entire Queensland coast.

The seagrass team at James Cook University has been mapping, monitoring and researching the health of the Great Barrier Reef seagrasses for more than 30 years. While coral reefs are more attractive for tourists, the Great Barrier Reef World Heritage Area actually contains a greater area of seagrass than coral, encompassing around 20% of the world's seagrass species. Seagrass ecosystems also maintain vibrant marine life, with many fish, crustaceans, sea stars, sea cucumbers, urchins and many more marine animals calling these meadows their home.

These underwater flowering plants are a vital component of the reef ecosystem. Seagrasses stabilise the sediment, sequester large amounts of carbon from the atmosphere and filter the water before it reaches the coral reefs. Further, the seagrass meadows in the Great Barrier Reef support one of the largest populations of sea turtles and dugong in the world.

"Seagrass meadows are more connected than we thought"

Samantha's research was worth the effort. There were seeds of at least three seagrass species in the poo of both sea turtles and dugong. And lots of them – as many as two seeds per gram of poo. About one in ten were viable, meaning they could grow into new plants.

Based on estimates of the number of animals in the coastal waters, the time it takes for food to pass through their gut, and movement data collected from animals fitted with satellite tags, there are potentially as many as 500,000 viable seeds on the move each day in the Great Barrier Reef. These seeds can be transported distances of up to 650km in total.

Below: Green Island seagrass meadow exposed at low tide. Image: TropWATER, JCU



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

This means turtles and dugong are connecting distant seagrass meadows by transporting seeds. Those seeds improve the genetic diversity of the meadows and may help meadows recover when they are damaged or lost after cyclones. These animals help to protect and nurture their own food supply, and in doing so make the reef ecosystem around them more resilient.

Understanding recovery after climate events

Seagrass meadows have been under stress in recent years. A series of floods and cyclones has left meadows in poor condition, and recovery has been patchy and site-dependent.

This research shows that these ecosystems have pathways for recovery. Provided we take care with the environment, seagrasses may yet recover without direct human intervention.

This work emphasises how much we still have to learn about how the reef systems interconnect and work together – and how much we need to protect every part of our marvellous and amazing reef environment.

Native geckos with GPS backpacks and fluoro tattoos thriving against the odds on Queensland cattle station

By Joanna Khan for Off Track, ABC News Science, 21 May 2018



Above: A gecko wearing a little GPS transmitter will send regular signals back to the scientist tracking its movements. Image: Eric Nordberg

A tiny lizard scurries around the trunk of a dead ironbark. Every few seconds it freezes, blinks, then sets off again, winding its way further up the tree.

But there's something unnatural about this lizard.

If you look closely you'll see that strapped around its middle, disrupting its otherwise flat and streamlined body, is a small backpack.

The lizard is a native house gecko, *Gehyra dubia* (not to be confused with the **Asian house gecko**), about eight centimetres long, and it has been fitted with a GPS transmitter so scientists can monitor its movements.

The GPS backpack isn't the only accessory this gecko is sporting — it also has tattoos.

Ecologist Eric Nordberg from James Cook University has spent many nights chasing and tattooing these creatures in the name of science.

Every gecko he's caught has been tagged with a fluorescent, elastomer tattoo — comprised of a unique combination of colours and lines — so each individual can be identified when it is recaptured.



Above: Dr Eric Nordberg gives each gecko a unique tattoo. Image: Stephen Zozaya

The native house gecko is one of three gecko species Dr Nordberg is studying, to see how they interact with the Brahman cattle typical of many stations in the north Queensland region.

He's using these tattooed, backpack-toting critters to find out how the cattle change the environment.

Wambiana station, where the research is taking place, is a three-hour drive from Townsville, roughly 50 kilometres south of Charters Towers.

Most of the landscape is characterised by sparse eucalyptus woodlands, dotted with dead trees, termite mounds, and tall spear grass.

But there are also small pockets of different habitat — microclimates. Places where spiky pandanus palms loom over thick grasses, and a lagoon, where grassy banks lined with river gums play host to a cacophony of frogs and insects in the evening.

Here, kookaburras, kangaroos and geckos cross paths with cattle, and graziers mingle with scientists.

Cattle on trial

Like most graziers in the region, Wambiana's managers Michelle and Michael Lyons run Brahman cattle on the 57,000-acre property.

Over 20 years ago, the state department of agriculture leased land from the Lyons to find out what the best grazing practices were for the drought-stricken area.



Above: Braham cattle are a hardier choice for farmers in Northern Queensland. Image: Charlie McKillop

Ms Lyons says they've never had any hesitation about letting researchers onto the property — they welcome it, and acknowledge the value these long-term studies have added to the grazing community.

"We got involved to look at the impacts on biodiversity in those different cattle-grazing treatments," he says.

"One of the main patterns that we kept finding was that a lot of the arboreal (tree-dwelling) lizards were doing really well in the heavily grazed areas — and one of those was the native house gecko."

"I wanted to find out what was allowing the native house gecko to thrive in an area that's pretty harsh, where a lot of other species decline," he says.

Doing it tough ... but thriving

At first, it's difficult to see how the slow, plodding Brahman could influence what's going on in the trees.

"The cattle don't chew on the trees, so something that lives up in the branches may not necessarily have the direct or immediate impact from cattle because their primary habitat doesn't really change," Dr Nordberg said.

But the cattle do have an impact

"Here the trees aren't that close together, so to get from one tree to the next, the arboreal geckos still have to come down to the ground and go through that habitat where the cattle are," he said.

Long-term changes to the environment from cattle grazing have serious consequences for the geckos and the trees where they live.

"Exposed ground soil leads to erosion and run off, and over a long run you might find that tree health declines in areas that are heavily grazed."

Fortunately, the geckos' super-stylish backpacks and one-of-a-kind tattoos have helped reveal something unexpected about the cattle conundrum.

The smallest of the three species of gecko Dr Nordberg studied appear to be utterly unperturbed by the cattle.

"We found higher numbers of the native house gecko in the heavily grazed sites, compared to the moderately grazed sites," Dr Nordberg says.

So why has the native house gecko increased in numbers, where other geckos — tree and ground-dwelling — have declined?

Has the decline of other species in areas of heavy grazing relieved the intense pressure of competition on those that remained?

Or are the native house geckos driven to these less-desirable areas because they've been out-competed for the nicer spots?

Smooth competitor

The largest of the three species is the northern velvet gecko (*Oedura castelnaui*), and it's also the most striking to look at.

It has dark, bulging eyes, and a wide mouth that shapes itself into a smile. And because the velvet gecko is bigger, you can get a good look at its specialised toepads — flattened and sticky, so it can climb to its heart's content.

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

With black, yellow and greyish stripes running across its body, the northern velvet gecko appears a class above the native house gecko — in size and style.



Above: This beautiful velvet gecko still has its original tail full of fat stores.

Image: Joanna Khan.

As they are bigger than the native house gecko, the velvet geckos also tend to throw their weight around.

"The northern velvet gecko does bully the other ones and takes all the nice hiding and hunting spots," Dr Nordberg says.

"Whenever we found sites with both gecko species, the velvet geckos ended up taking all the good spots, and the native house geckos would scatter."

When the cattle are invited into their habitat, Dr Nordberg has found the northern velvet gecko doesn't disappear — but they also don't increase in numbers like the native house gecko.

"As long as there were dead trees, and big trees with hollows or loose, peeling bark you could still find them in the heavily grazed regions," he says.

Spiny survivors

Suffering the worst from the cattle onslaught has been the Eastern Spiny-tailed Gecko (*Strophurus williamsi*) — and that's because it doesn't like to get too high in the trees, which provide protection from the Brahmans' feet.

"The eastern spiny-tailed gecko is a shrub specialist," Dr Nordberg says.

"It lives off the ground but not very high, and they don't do well in the heavily grazed paddocks compared to the truly arboreal ones."

The eastern spiny-tailed gecko has declined where the grazing is heavy.

But fortunately, because they prefer different habitat to the other species, they don't have to worry about competition in the lightly grazed areas.

An unexpected partnership

We're often quick to associate farming and agriculture with negative environmental impacts, but it's not always that simple — as Dr Nordberg's study of the three gecko species has shown.

The Wambiana grazing trial and accompanying ecological research has been an example of industry and conservation science working together, Dr Nordberg says.

"It doesn't necessarily have to be this binary response where what's good for the industry is bad for wildlife conservation and vice versa," he says.



Above: A drift fence, like this one being set up by Dr Eric Nordberg, is another way to catch small reptiles. Image: Joanna Khan

Not only has the industry benefited from the grazing trial, Ms Lyons says they've also seen a side to science they might not have expected.

"We want researchers and students to understand that people in grazing care for the environment and are willing to look at ways to minimise the disruption to nature, and that there's a lot of good stuff happening that you didn't know about," Ms Lyons says.

