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ACTHA Inc. News

June - July '15

*Newsletter of the
ACT Herpetological
Association Inc.*

**ACT Herpetological Association Inc.
2015 - 2016 Membership Renewal Now Due**

Please see below & back page!

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, 16 June 2015

Canberra artist and ACTHA member Steven Holland will speak about his PhD research which was recently completed at the ANU School of Art bronze foundry. Steven has spent the last four years looking for connections between elapid snakes from the districts around Canberra and bronze as a material and a process. Members of ACTHA were able to help Steven realise his project, come and hear how his project went!

Our Main Guest Speaker will be Murray Evans who will give an update on the ACT Northern Corroboree Frog breeding and release program.

Since establishing the captive population of northern corroboree frogs in 2003 at Tidbinbilla, staff have waited many years to reach a major milestone for the project – having young captive-bred frogs surviving in the wild to reach breeding age – no mean feat with Chytrid fungus in the environment.

Your Committee for 2014 - 2015

| | |
|-------------------------|-----------------------|
| President | Dennis Dyer |
| Vice President | Ric Longmore |
| Secretary | Vacant |
| Treasurer | Margaret Ning |
| Newsletter Editor | Mandy Conway |
| Webmaster | Angus Kennedy |
| Public Officer | John Wombey * |
| Excursion Officer | Ric Longmore * |
| Conservation Officer | Joe McAuliffe |
| Committee Members | Iris Carter |
| | Greg Flowers |
| | Jason Spurr |
| | Peter Child |
| | Nicole Hansen |
| Student Representatives | Vacant |

** Denotes Life Members*

In this issue

FROGWATCH News, page 2 & 3.

Ecology of the Eastern Long-necked Turtle along a natural urban gradient, ACT: Bruno Ferronato, UC, was our guest speaker at the April '15 meeting and a summary of his presentation starts on page 4.

**The Australian & International Scene:
50-million-year-old turtle fossils discovered in
central QLD oil shale mine**, page 8.

What did the first snake look like? page 8.

Snake swallows BBQ tongs, page 9.

**The race to protect frogs from a deadly pathogen
gets a much needed boost**, page 10.

Pics: Red-bellied Black Snake eats a frog, page 12.

**Volunteers needed for herp survey by PhD student
around Young NSW**, page 13.

ALL ACTHA MEMBERS PLEASE NOTE! ACTHA has a new bank account

A member's unfortunate experience when they tried to renew their membership on-line has ended with a **\$14 bank fee**.

The \$10 Membership Renewal was sent to our old account, which was **CLOSED** in April 2015.

ACTHA's new bank account details are:

St George Bank, **BSB 112-908**
A/c 486822880

Safer still, follow this link to renew details:
<http://www.actha.org.au/renew-membership.html>

FROGWATCH news

*This update by Anke Maria,
FROGWATCH ACT and Region, phone 62783308*

Changes in the FROGWATCH citizen science program

In order to focus as much on the Science as we do on the Citizen we are planning to implement the following changes:

1. Reducing the number of FROGWATCH sites from 500 to 100-150 and regarding all remaining sites as key sites.

WHY? – So that all FROGWATCH sites get monitored every year, which will make our data set more consistent and easier to analyse, e.g. doing a comparison between years. Since 2002 the number of FROGWATCH sites has steadily increased, with many sites only visited once or twice. This inconsistency creates a lot of “data noise” and makes analysing the data set very difficult. Having less sites, which get visited every year, makes the data set more manageable and the coordination of monitoring much easier.

In practise this means we will: **keep** most FROGWATCH sites with ongoing and consistent monitoring records; **delete** all private property sites with patchy, irregular records and all public sites that have been monitored only once or twice; **establish** new FROGWATCH sites in strategically important areas, such as different altitudes or in areas with proposed or recent development.

2. Introducing a monthly monitoring approach, similar to the Waterwatch monitoring, to supplement the FROGWATCH Census activities.

WHY? –

A) Many Frogwatchers have noticed an earlier onset of breeding activities over the past 10 years and have pointed out that many more frogs were calling in the lead up to Census week than during the actual event.

B) Several frog species in the ACT do breed during winter or in summer and have so far not been included in our frog monitoring efforts.

C) Warmer temperatures allow species which have previously not been recorded in the ACT, to extend their distribution range into the Capital Region.

To document these **effects of climate change** we desperately need to monitor the shift in breeding season, include observations on winter and summer breeders, to gain knowledge on their potential behavioural changes, and closely monitor species advancing their distribution range into the ACT.

3. Establishing a range of **FROGWATCH action teams** (weather, breeding onset, new species, habitat assessment) for specific tasks.

WHY?

Action team weather - Some species can only be found under very specific conditions, which not always arise during Census week. To capture the distribution of these frogs we need volunteers to monitor designated areas after an email alert e.g. monitoring after heavy rain to capture burrowing frogs.

Action team breeding onset – we need fairly intensive monitoring over the lead up and during spring at a range of different habitats at different altitudes to investigate behavioural shifts triggered by climate change in our local frogs.

Action team new species - This group will spring into action to monitor designated spots for "new arrivals" at regular intervals.

Action team habitat assessment - One of our future focus will be the interaction between habitat value and frog occurrence/abundance. To streamline collected data on habitat attributes I need a group of volunteers to help me evaluate ALL Frogwatch sites each year in spring. This may seem a huge task but with 6 teams of 2 it should all be done within a day.

In summary this means that the FROGWATCH Program is extending from a once-off fun citizen science activity to a more ongoing and question driven commitment to our local environment. Streamlining the program will not only enable us to find answers to questions regarding habitat quality, species distribution, climate change and other important topics, it will also make us more consistent, relevant and applied and therefore ensure that the program will keep going well beyond my retirement (in 22 years!).

As all this can only be done with your help, please spread the word! Join our action team email list and/or adopt a FROGWATCH site for monthly monitoring!!

Just in!

More FROGWATCH News

*This update by Anke Maria,
FROGWATCH ACT and Region, phone 62783308*

New funding situation

Frogwatch is getting back on the funding track!! We were actually an item in the latest ACT budget speech (Chris Bourke). *"One of the great local programs, the ACT and Region Frogwatch has been doing great work monitoring and restoring frog habitats throughout Canberra. Their Tadpole kits for school kids engage a new generation in caring for the environment while learning valuable scientific lessons....Given the great community engagement of Frogwatch and their contribution to our environment's biodiversity, I am pleased to say the ACT government will be able to step in with funding to support their great work."*

The very appreciated **financial support from the ACT Government** (ACT Conservation, Research and Planning) over the next 3 years will see the annual Frogwatch Census into 2017.

In addition to that, Frogwatch has just received the "THUMBS UP" for our **Climate Change Project** - kindly funded by the Climate Change Policy in the Environment and Planning Directorate. The project is about monitoring designated sites across the ACT weekly, to investigate for changes in breeding behaviour. A very exciting and applied project!

Both funds will sustain the Frogwatch monitoring activities. We are still seeking funds for the educational components of Frogwatch – and for the day-to-day running of the program – so keep your fingers crossed!

Climate Change Project - we need volunteers NOW for helping with weekly monitoring of sites in Weston Creek, Duffy, Mulligans Flat and Dunlop

Below is a list of involved sites - 5 discreet groups, all linked to historic data about frog calling behaviour in the ACT. We need volunteers for three of the clusters.

Can you help out? Occasional monitoring, adopting a site/cluster for a month, 2 month or the entire period –**just let me know how you want to contribute asap.**

Need to be partnered up? Let me know and I might be able to help!

Time is prime real estate in this project, We will organise a get together with a bit of strategic planning and some more information on the project aim in a few weeks.

CLUSTER 1: West Belconnen

DGP001 Dunlop Grassland , accessible from Shakespeare Drive, Fraser, -35.185, 149.0332

FRA200 Grassland off Edlington St, Fraser, -35.18735, 149.04338912

FRA201 Adjacent to CSIRO land in cow paddock, Fraser. 300mNW of FRA200, -35.1874771092, 149.0400978847

CLUSTER 2: Weston Creek

DUF100 southern dam on Narrabundah Hill, -35.34371, 149.02301

DUF200 northern dam on Narrabundah Hill, -35.344363, 149.022882

COO100 Cooleman Ridge N-dam off Karthner Street, -35.350089, 149.02255

CLUSTER 3: Mulligans Flat

4 ponds, bike riding will speed up visiting the 4 sites!

CLUSTER 4: Mt Majura (partly booked till October, but free for additional monitoring)

FMC220 Mt Majura Dam, lower, via Jukes St, -35.2412, 149.1688

FMC200 Mt Majura Dam, bottom, via McKenzie St, -35.251, 149.1745

FMC210 Mt Majura Nature Reserve, top dam, via McKenzie St, (uphill from FMC200), -35.2506, 149.1769

CLUSTER 5: Weston Park

- done by Will Osborne

And really cool: we have a volunteer in Captains Flat, and the Bush Heritage team from Scottsdale joining in and monitoring their sites. This will be great to get some understanding of what is going on in the areas surrounding the ACT.



Ecology of the Eastern Long-necked Turtle (*Chelodina longicollis*) along a natural-urban gradient, ACT

Bruno Ferronato, PhD Candidate, IEA, UC, was our guest speaker at the 21 April '15 ACTHA meeting. This summary by Mandy Conway

Introduction

Urbanisation is one of the leading causes of biodiversity loss and extinction and a reduction in species richness and an increase in the abundance of tolerant species can be seen. There are many challenges for wildlife: roads, habitat loss, pollution and interaction with exotic species just to name a few. Over the next decades we will see an increase in human population and urbanisation, especially in developing countries. Study of the ecology of susceptible species, particularly those that are affected by urban stressors, will become more and more important.

"To our knowledge, this is the first study to look in detail at how conservation fences impact non-target, native reptile populations," Bruno said. "Shingleback lizards, eastern long-necked turtles, bearded dragon lizards and eastern brown snakes were among the species adversely impacted by the conservation fence at Mulligan's Flat. Overheating, attacks by predators outside the fence, vehicle collisions on the nearby road and entanglement were the main causes of death in turtles, the most affected species by the fence."

Study species: The Eastern Long-necked Turtle, *Chelodina longicollis*

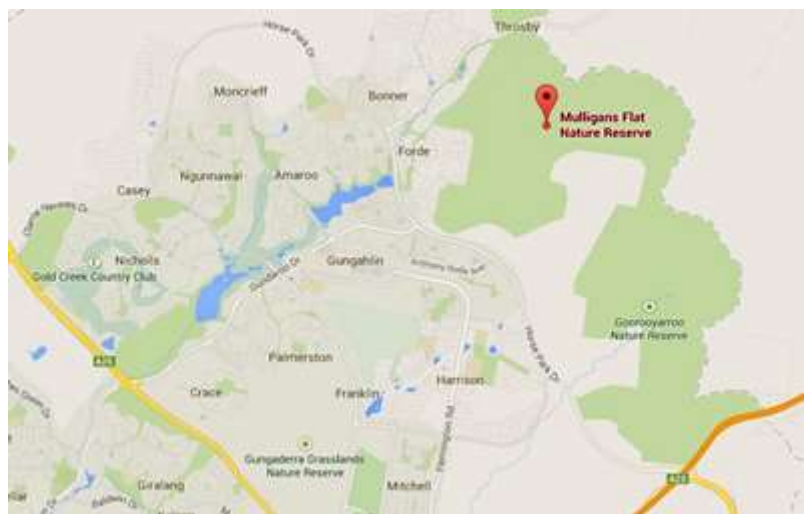
"This species has a wide distribution throughout Eastern Australia, and is a generalist carnivore. They are most commonly seen in spring and summer, especially during rain. It is an interesting species to study because of a number of adaptations and behaviours," Bruno said.

"The long-necked turtle has a slow rate of desiccation as well as a great ability for overland movements, with migrations of 5km and terrestrial aestivation of up to

480 days recorded. This kind of behaviour is essential for population regulation."

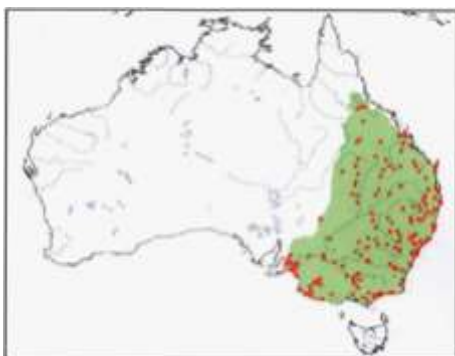
Bruno described turtle movement dynamics during wet and dry cycles during El Nino and La Nina and gave an example of a study in Jervis Bay where animals at a long term study site were found to have moved to a large body of water when most of the ephemeral ponds were dry. The huge concentration of turtles here did not breed or grow, although once the drought finished they moved off again towards the now full ephemeral ponds and returned to natural behaviours.

Study site: Mulligans Flat, Gungahlin



"My main study site was at Mulligans flat, however I also trapped turtles at Yerrabi Ponds, Gungahlin Ponds and a couple of smaller ponds."

By way of background, during 2006-2007, when the area was in drought, another student did some studies comparing populations in the suburbs to those in nature reserves. Contrasting differences were found, mainly that turtles in the suburbs were more abundant, grew faster, moved larger distances and didn't enter terrestrial aestivation because water was available all year around. However in the nature reserves the ponds dried up, the animals aestivated on land and/or they moved to urban ponds. Both groups were found to have similar survivorship even though turtles in the suburbs moved more. Questions arose as to whether the turtles used culverts or under-passages to move around.



“Now we are interested in seeing what happens when the conditions change: we know from the previous study what happens in drought, but what happens in wet conditions? What would be the dynamics in rain? What would be the mechanisms involved in the population’s response?”

Changes in the study site since the first study (2006 – 2007)

There have been a lot of changes with this site:

- The human population has increased by 79% and the traffic volume by 76% [Amaroo, Bonner, Forde, Gungahlin, Ngannawal];
- Due to La Nina, rainfall increased and wetlands remain flooded;
- All the ponds were full of water during this more recent study, as opposed to dry in the previous study;
- Another change was the establishment of a predator proof fence in Mulligans Flat in 2009.

Aims of this Study (2011 – 2014):

‘To evaluate behavioural and population responses brought about by increasing urbanisation and rainfall.’

Spatial ecology, or movement and survivorship of females

Bruno collected sample numbers from each site, in this case 20 females from the nature reserve and likewise from the suburbs, and attached radio transmitters to each animal. The turtles were tracked each week for 16 months to determine their location and if they were alive or dead. This enabled Bruno to compare the movements.

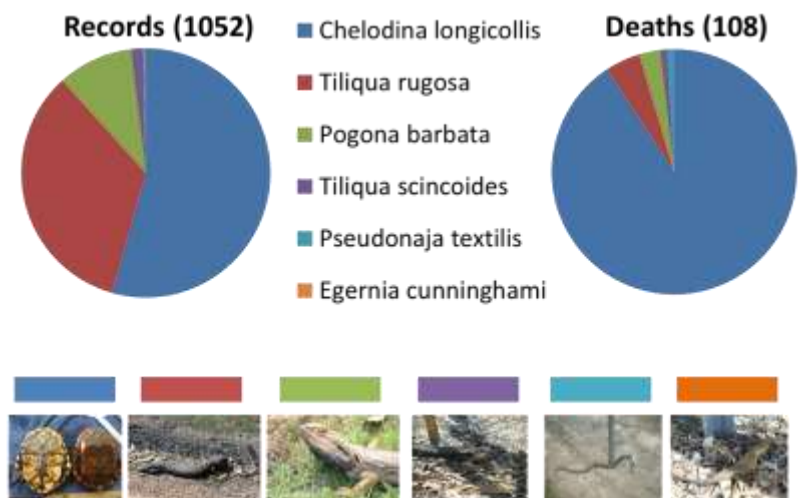
Turtles in both the nature reserve and suburbs moved in the same manner in their home range and no animals were seen in terrestrial aestivation. There were differences, however, in survivorship. No tagged turtles died within the Reserve, however nine died in the suburbs. Bruno described movement metrics vs traffic volume: within the suburbs, ponds showed a similar traffic volume, but it was observed that turtles living in smaller size ponds changed wetlands at a higher rate than turtles from larger ponds, then turtles inhabiting small and isolated ponds have a higher chance of being hit by cars in the city.

Effects of pest fencing on endemic reptiles

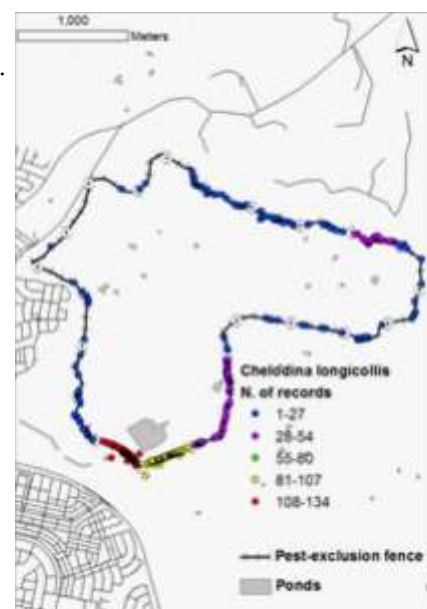
During the same 16 months, twice per week, Bruno drove along the inside of the pest exclusion fence in Mulligans Flat in search of other species. Any reptiles seen were recorded by their species and GPS location, their location inside or outside the fence, and also if the animals were alive or dead.

Over half of the records (1052) were turtles, with the majority of the deaths along the 11.5kms fence line (108) being turtles. The number of turtles moving about in search of other ponds was quite clear. Some of the tagged turtles kept trying to find a way around the fence, which was interfering with their migratory route. Mark and recapture turtles (71) were shown to try again and again to move past the fence: 68% tried twice, 27% tried three times, 4% tried four times and one turtle was recorded as trying five times.

(Ed. Images below are very clear on ACTHA Website version :)



Spatial hotspots gathered from GPS data can be seen in this figure at right. “The number of turtles recorded coming from the suburbs trying to reach the large pond located within the pest-proof fence is quite clear. With a stimulus to move, more animals were seen along the fence during rainfall and mild temperatures.



Once conditions changed to hot the mortalities occurred. What is the magnitude of deaths within this population? As we were trapping animals we could estimate the size of the population within the fenced area at 641 individuals. Movement of 21% with a 3% mortality is quite high for a long-lived animal."

Population dynamics and reproduction in wet years; Capture, Mark and Recapture (CMR)

Turtles were captured, marked and then recaptured to study population dynamics.



Turtles were trapped and their shells were marked with notches for individual identification.



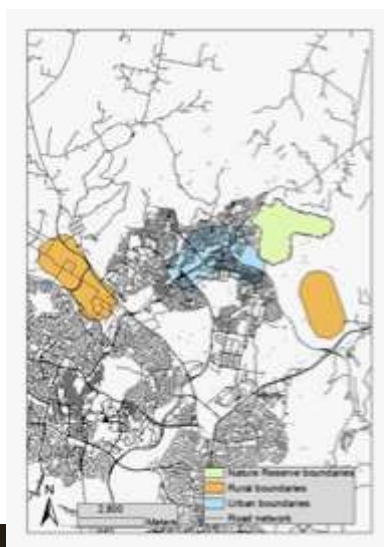
Once recaptured they could be re-measured to determine growth, the females were x-rayed to see if they were gravid, the number of eggs present if so, and when she might be likely to lay them.

Turtles were trapped at three sites: within Mulligan's Flat Nature Reserve boundaries, urban boundaries, and rural sites (Yerrabi Ponds and CSIRO Ginninderra Experiment Station).

Each site had a similar breeding season, with eggs usually laid during October and November. During the three years of the study, the three sites had similar percentages of gravid females. It was thought previously that turtles in the suburbs may have had double clutches, or more eggs, but the present study confirmed that both populations breed in a similar way.

Long-term movements (recaptures)

In the previous study (2006 – 2007), conducted during drought, turtles were marked at the three sites. In this study (2011–2014) animals were recaptured in the same population and some were recaptured within other localities.



| 2006-2007 | 2011-2014 |
|----------------|---------------------------|
| Reserve (n=32) | 25% suburbs |
| Suburbs (n=28) | 10% reserve 14 % rural |
| Rural (n=17) | all rural |

Above: Of the 32 turtles recaptured from the previous study (marked in the reserve) 25% were found in the suburbs, having moved before the fence was built. Of the 28 turtles marked in the suburbs, 10% were found in the reserve and 14% in a rural area, having travelled a distance of up to 6kms over the entire landscape. Were the turtles only moving down the drainage lines? "Unlikely," Bruno said, "because they were moving in both directions." All the turtles recaptured at the rural site (17) originated within that site.

Population sizes and sex ratios were similar. There were some differences in sizes, with juveniles of 6 – 7cms seen, an indication that breeding was occurring at all sites. CMR showed that there was a similar survivorship of animals at all three sites.



Above: Pest fencing at Mulligan's Flat Nature Reserve, showing drainage lines.



Nesting biology – hatchling over-wintering in the nest?

Where were the turtles predominantly nesting? and could the hatchlings over-winter in the nest if conditions were not optimal?



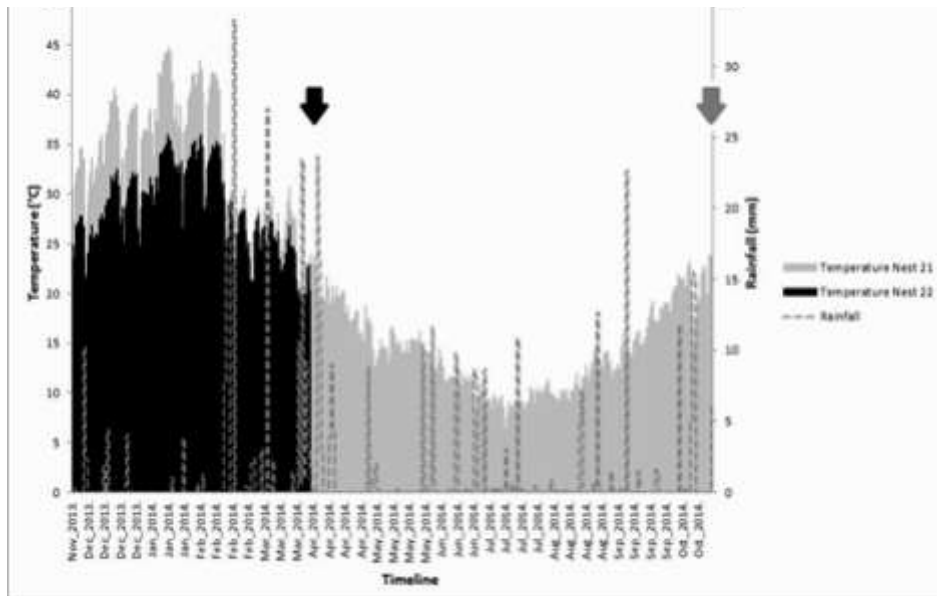
A long-necked turtle's normal incubation period is four months, from November to December. Previous studies have shown that the young emerge in autumn, March/April. During Bruno's study, young didn't emerge from all the nests. In July of his study's first year, he carefully excavated two nests and found little turtles alive but in torpor. They finally emerged in spring, between September and November during rainy days. It took

almost a year from the time they were laid in the nest to when they left, 284 – 356 days.

Dichotomous overwintering strategy (Chart below)

This occurred in the last year of Bruno's study. One nest emerged in March, whilst another would do so in October. Emergence is probably related to the temperature or humidity inside the nest and this is the first time this has been recorded for long-necked turtles.

Dichotomous over-wintering is common in North American turtles (*Emydidae*) because of the snow-laden long winter.



The message for managers and urban planners: Connectivity of water bodies allows long distance movements

It is better to have larger ponds which are connected, with drainage, rather than isolated small ponds for reptiles such as the long-necked turtle to survive amidst urban environments. Connectivity of water bodies allows for long distance movements of the species.

Mitigations – fence / population regulation

Where potential disruptions to movements cannot be avoided, mitigation to facilitate movements and avoid mortality could be applied at targeted times and location. This could include: manually assisting animals across the fence (perhaps using volunteers) as well as conducting a poison bait program for foxes at hot spots to avoid mortalities; regularly mowing the vegetation close to the fence and covering puddles with gravel to increase driver visibility and reduce the chances of vehicular mortality; building aquatic under-passages or size-specific mesh along animal hotspots that facilitate non-target animals movements while excluding pests.



Future directions

The present findings show that eastern long-necked turtles seem to be resilient to urbanisation, but a follow up in this population would be interesting in a few years. "It would be good for another student to do a further study in 10 years, monitoring the marked population inside the fenced area. Further investigation of

hatchlings over-wintering in the nest would also be good, particularly to ascertain how wide spread this is and what environmental cues influence this behaviour, temperature? moisture?



The Australian & International Scene

50-million-year-old turtle fossils discovered in central Queensland oil shale mine

By Chrissy Arthur, ABC News, 20 May 2015



Above: The large turtle plates were discovered about 15m below ground level in the oil shale mine site.

Image: Australian Age of Dinosaurs

Well-preserved turtle fossils dating back about 50 million years have been discovered in an oil shale mine near Gladstone in central Queensland.

A crew from the Australian Age of Dinosaurs (AAoD) at Winton, north-west of Longreach, has been digging at the Gladstone site, looking for fossils to display at its natural history museum.

AAoD executive chairman David Elliott said they had worked in an open pit and uncovered plenty of bones and fossils for preparation.

"There is a deposit in the vicinity of the oil shale, that is the remains of a big old lake, like a big lake system," he said. "The lakes have dried up obviously over a number of years so there are all these crocodiles and turtles and that sort of stuff that was around, and you are looking at around 50 million years' old. We were hoping for a lot more crocodiles than we're finding, but we have found this massive bed of turtles."

"They are beautifully preserved and we are just getting these big slabs of rock with all these bones exposed over the top."

Mr Elliott said although the turtles were not new to science, they were still important discoveries. "The exciting thing about this

deposit is that is an age that is reasonably rare in Australia, particularly in eastern Australia," he said. "But around 50 million years' old is an age - it is only really around 15 million years after the dinosaurs died out, so it is a long, long time ago and it is a time period in Australia that not a lot is known about."

Mr Elliott said the fossils that were discovered were about 15 metres below ground level. "We are getting pieces up to four or five inches across, they are huge big plates," he said. "We are getting some small pieces too, but the couple we are working on at the moment, they are quite massive. They were big turtles, they would have been probably a good half a metre across or better."

Mr Elliott said the aim was to collect a range of fossils for display at Winton, and the organisation had been collecting items from across the country over the last few years.

"The aim is to build the exhibition specimens for the Australian Age of Dinosaurs Museum of Natural History," he said.

What did the first snakes look like?

ScienceDaily, BioMed Central, 19 May 2015

The original snake ancestor was a nocturnal, stealth-hunting predator that had tiny hindlimbs with ankles and toes, according to research published in the open access journal *BMC Evolutionary Biology*.

The study, led by Yale University, USA, analysed fossils, genes, and anatomy from 73 snake and lizard species, and suggests that snakes first evolved on land, not in the sea, which contributes to a longstanding debate. They most likely originated in the warm, forested ecosystems of the Southern Hemisphere around 128 million years ago.

Snakes show incredible diversity, with over 3,400 living species found in a wide range of habitats, such as land, water and in trees. But little is known about where and when they evolved, and how their original ancestor looked and behaved.

Lead author Allison Hsiang said: "While snake origins have been debated for a long time, this is the first time these hypotheses have been tested thoroughly using cutting-edge methods.

By analysing the genes, fossils and anatomy of 73 different snake and lizard species, both living and extinct, we've managed to generate the first comprehensive reconstruction of what the ancestral snake was like."

By identifying similarities and differences between species, the team constructed a large family tree and illustrated the major characteristics that have played out throughout snake evolutionary history.

Their results suggest that snakes originated on land, rather than in water, during the middle Early Cretaceous period (around 128.5 million years ago), and most likely came from the ancient supercontinent of Laurasia. This period coincides with the rapid appearance of many species of mammals and birds on Earth.

The ancestral snake likely possessed a pair of tiny hindlimbs, and targeted soft-bodied vertebrate and invertebrate prey that were relatively large in size compared to prey targeted by lizards at the time. While the snake was not limited to eating very small animals, it had not yet developed the ability to manipulate prey much larger than itself by using constriction as a form of attack, as seen in modern Boa constrictors.

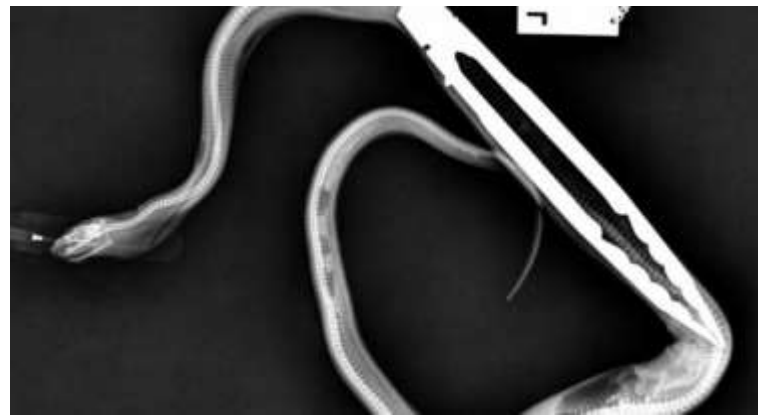
While many ancestral reptiles were most active during the daytime (diurnal), the ancestral snake is thought to have been nocturnal. Diurnal habits later returned around 50-45 million years ago with the appearance of Colubroidea -- the family of snakes that now make up over 85% of living snake species. As colder night time temperatures may have limited nocturnal activity, the researchers say that the success of Colubroidea may have been facilitated by the return of these diurnal habits.

The results suggest that the success of snakes in occupying a range of habitats over their evolutionary history is partly due to their skills as 'dispersers'. Snakes are estimated to be able to travel ranges up to 110,000 square kilometres, around 4.5 times larger than lizards. They are also able to inhabit environments that traditionally hinder the dispersal of terrestrial animals, having invaded aquatic habitats multiple times in their evolutionary history.

Here's how a python swallowed a pair of BBQ tongs – and how doctors removed them

By Katie Silver, *Science Alert*, 16 May 2015

A pet python has undergone surgery in Adelaide, South Australia to remove the pair of BBQ tongs that were lodged inside him. The snake - a two-year-old Woma python (*Aspidites ramsayi*) called Winston - was being fed a rat by his owner using the metal tongs. He latched on and refused to let go. "I tried to prise him off the tongs but we didn't have any hope of that at all," his owner, Aaron Rouse, told 891 ABC Adelaide.



He left the python to play with them, returning later to find Winston had gobbled them up. "'I was dumfounded."

Woma pythons are native to southwest Queensland, central and Western Australia, and this one was presented in a box to veterinary surgeon, Oliver Funnell, at the Companion Animal Health Centre at the University of Adelaide, after a very uncomfortable meal. Initially, Funnell thought they were dealing with a small pair of forceps or tweezers. "I asked Aaron if he was sure that the snake had swallowed the tongs," he told ScienceAlert. From Aaron's reaction I could tell that I was about to see something unusual."

Funnell says the skin and muscles were so tightly constricted around the tongs that you could make out its structure. "Through the skin you could feel the bumps on the end of the tongs and at the other end the relatively square hinge could be seen obviously protruding through abdominal wound," he said. "These

tongs have a small clip that can be moved up and down to lock them and this could be easily identified."

Snakes can swallow very large prey items because of their flexible lower jaws. In most animals, the lower jaw is fused but snakes have an elastic ligament which allows the mouth to stretch open very wide, says Funnell. The snake will then engulf the prey or in this case the tongs using what has been called the 'pterygoid walk', where the teeth are ratcheted over the prey as it is pushed into the snakes gastrointestinal tract."

Funnell says that Winston grabbed the rat and tongs and quickly wrapped himself around them: "These animals even when small can be very strong."

Operating on Winston proved to be an exercise fraught with a number of challenges. The first was anaesthetising him, as snakes are cold-blooded, which makes their drug metabolism slower. To combat this, the team used two anaesthetics, allowing them to pass a catheter into Winston's trachea so he could breathe and be anaesthetised throughout the operation.

"Although some of the general principles apply when surgery is performed on a snake, there are some important differences," says Funnell. "One of these is that because a snake's ribs extend from most of the animal's vertebrae (rather than having a distinct rib-cage), the location of the incision is important. The incision should ideally be made below the ribs so that they do not need to be cut... (and) between the scales and not through them," he said.

The team made an educated guesstimate that the tongs were lodged in the oesophagus and stomach, but they couldn't be sure. They cut open the snake at the larger end of the tongs so they could pull them out. "Skin closure is slightly different from mammals as the scaled skin tends to roll under," says Funnell.

After four weeks Winston's stitches will be removed, but so far things are looking good. "At the follow up appointment, the snake was acting normally and had been seen drinking," said Funnell. He'll eat again in two to four weeks, and Funnell and Rouse are hoping he'll keep tongs out of his diet from now on.

The race to protect frogs from a deadly pathogen gets a much needed boost

By Lindsay Renick Mayer, Smithsonian.com, 8 April 2015

A new amphibian lab in Panama will help researchers to return charismatic golden frogs to the wild.



Above: The Panamanian golden frog has become the flagship species for amphibian conservation around the world. Image courtesy of Brian Gratwicke, Smithsonian Conservation Biology Institute.

"One of the coolest features of the once-abundant Panamanian golden frogs is their wave," says Tulane University professor Cori Richards-Zawacki. "It's a behaviour that makes them seem almost human. Sitting on the edge of a riverbank these gold and black beauties catch the attention of the opposite sex by raising one arm in a circular motion, and waving at one another."

"My favourite memory was going to the river and eating a sandwich with these frogs," she says. "They're the cutest little frogs and they'd sit there, and wave and call. I'd watch them try to jump to a log, and they'd make it halfway there, and wind up in the water, scrambling back to shore. They were so much fun."

Scientists studying golden frogs today aren't as fortunate. The last time anyone reported seeing a Panamanian golden frog in the wild was in 2009, after a deadly fungal disease called *chytridiomycosis* (or chytrid) swept through the Neotropics, wiping out entire amphibian species in its wake.

The devastating pathogen is still in the environment today. And a group of unwaveringly optimistic and impassioned scientists have launched a full-scale

investigation into the myriad options for a defence, from the search for a protective shield of bacteria to the quest to understand the genes that could be responsible for resistance—anything that could give golden frogs a leg up. Much of this work is underway in the United States, but a new amphibian lab opens today at the Smithsonian Tropical Research Institute in Panama that will provide researchers coming at this crisis from different angles better access to captive animals and their native habitat.

One of the researchers working feverishly to protect golden frogs is biologist Matt Becker, who got into the golden frog game after the species had gone extinct in its native habitat, so his work has been limited to small groups of golden frogs that come from the 2,000 individuals held in captivity today—a result of happy foresight when scientists collected golden frogs while they were still in the wild and learned to effectively breed them.

Every species—including humans—have beneficial bacteria, or probiotics, on their skin that can protect them from pathogens. This bacteria varies by species and even individuals, and scientists are still not sure what factors determine which bacterial communities individuals wind up with. Becker, however, is on a mission to find the probiotics that will act as an invisible cloak of protection against chytrid for Panamanian golden frogs. If scientists can take that kind of beneficial bacteria from an amphibian species that doesn't die from chytrid and put it on the golden frog as a shield of sorts, the hypothesis goes, the golden frog might be able to clear an infection. "The whole point of the research is to figure out how to get these guys back out in the wild," says Becker, who is a researcher at the Smithsonian Conservation Biology Institute. "Golden frogs are such a cool species to work with, but these aren't the circumstances you want to be working with them in. We're more than likely responsible for the spread of chytrid, so I feel like we have an obligation to figure out what we can do about it."

Researchers believe that the original carrier of chytrid was the African Clawed Frog, which was used until the 1970s as an indicator of human pregnancy—if a frog laid eggs after a

woman's urine was injected into it, the woman was pregnant. African Clawed Frogs didn't die of chytrid; and once released into the wild as carriers, they likely spread it.

Becker's probiotics work is one possible approach among many that could give golden frogs what they need to survive in the wild. Some researchers are looking at how the genes of individual frogs or the genes of chytrid itself impact whether a frog can successfully fight off the pathogen. Others are trying to innovate through the development of immunizations that could protect frogs. Others still are trying to figure out how to alter amphibian habitat so that the environment warms up slightly—heat, it seems, helps frogs fight the pathogen.

Nature itself seems to be lending an unexpected helpful hand. Richards-Zawacki and fellow researcher Jamie Voyles found a few individual variable harlequin frogs, the sister species to the Panamanian golden frog, living in the wild in places where chytrid is still present. Most recently they discovered a seemingly viable population of about 40 frogs at one site—many of which are infected with chytrid, but not dying as a result. While the pair hasn't yet found golden frogs in the wild, they aim to understand why a population of the golden frog's sister species seems to be rebounding, even thriving in every phase of life at this particular site.

"In all likelihood it's going to be a combination of lots of different angles that result in a workable solution," says Lisa Belden, Associate Professor of Biological Sciences at Virginia Tech and Becker's PhD advisor. "It's not just going to be probiotics and it's not just going to be habitat manipulation. And if we can come up with some possible strategies for golden frogs, it could potentially lead the way for other species."

The new state-of-the-art \$1.2 million amphibian lab at the Gamboa field station, run by the will help bring together these efforts, facilitating scientists from different disciplines and giving them access to seven Panamanian species considered priority rescue species. For the past five years, the Panama Amphibian Rescue and Conservation Project's team of Panamanian researchers and conservation biologists have

been caretakers to a population of priority amphibian species, all kept in tanks in used shipping containers. Their new lab will have space for five full-time staff members and two visiting researchers, and will include amphibian "rescue pods" for the project's frogs, many of which are the last individuals of their kind. The pods, constructed from recycled shipping containers, are retrofitted with customized terrariums, or mini-ecosystems, for each frog species.

"Having an in-country facility will open up the doors to many future research projects and to simplify some of the research steps," says Brian Gratwicke, amphibian conservation biologist for the Smithsonian Conservation Biology Institute and international coordinator for the rescue project. "We're at a turning point right now and this new facility empowers us to really start the exciting business of figuring out how to get the frogs back into the wild."

Even if scientists had a silver bullet cure to chytrid today, it would be another four or five years before golden frogs could go back into the wild even as part of a controlled experiment, Gratwicke says. But Gratwicke, says he has no doubt that it is going to happen, that the alternative—that golden frogs don't return to the wild and chytrid continues to spread—isn't an option. Like Becker, Richards-Zawacki and countless other amphibian researchers, the return of Panamanian golden frogs is Gratwicke's primary motive.

"I've never seen golden frogs out in the wild," Gratwicke says. "It gives you a little thrill when you actually see an animal for the first time in its native habitat. You feel just a little jolt. Some people get the thrill of that from money or winning Olympic races or whatever else motivates humans. But that feeling of joy—the joy of seeing a living creature for the first time in its natural habitat—that's what really motivates me."

Red-bellied Black Snake makes a meal of a frog

These amazing photos were taken by ACTHA member Maryke Booth's friend, John Karas, last November '14. The 'incident' happened near a pond and dam wall at Tidbinbilla Nature Reserve.



Ed.

Do you have any great herp pictures you would like to share with your fellow members? Please send them along to mandycnwy@gmail.com and don't forget to include a few sentences telling us where and when they were taken :)



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CONSERVATION
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PhD project: Movement of herpetofauna through fragmented agricultural landscapes

To maintain biodiversity in agricultural landscapes, millions of dollars are expended annually on habitat restoration and corridor establishment. However, the effectiveness of these expensive conservation actions hinges on unconfirmed assumptions about how animals move through these landscapes. With growing pressure to increase agricultural production, it is a national priority to discover the connectivity and habitat needs of fauna in these complex and changing human-natural systems. Preliminary fieldwork has been completed for this project thus far, and our next step will be understanding species specific responses.

Movement behavior and survivorship of the Tree Dtella (*Gehyra variegata*; a highly territorial and patch-dependant gecko) would be examined, using transects extending from a remnant patch into four contrasting matrix treatments (planted native vegetation, woody mulch, pasture, cropped), using radio-tracking, fluorescent powder tracking and mortality trials. By understanding how matrix structure and quality affects movement, our findings would inform land-use planning and restoration management that help maintain an ecologically sustainable agricultural sector while reducing isolation of preferred habitats.

Methods used: Trapping, spotlighting, radio-tracking (night work), fluorescent powder tracking (latter part of the study), camera work (predator detection)

What's required: hard (but rewarding!) work, good fitness levels - lots of walking outdoors on moderate terrain, long nights and some day work, getting dirty and handling a broad range of animals. Experience handling reptiles is an advantage but not a requirement. It does get very hot, particularly in the western locations!

Provided: All food (three meals a day, and some snacks) and basic accommodation is covered (ranging from shearer's hut to camping), in return for dedicated support in the field. Training in a variety of wildlife survey methods incl. animal handling, direct tracking. Fantastic opportunity to interact with likeminded people, and see the wonderful agricultural belt, national parks, state forests and crown lands.

What's not provided: Transport to the locations unless arranged prior (once on site, then transport is provided). Extra/special snacks. There will be spare time between field work to explore the local area! Spending money - there are little towns/shops around the locations.

Location: sites are located near Ardlethan, Grenfell and Young, NSW. Locations vary depending on your available dates.

An exciting collaboration between the ANU Fenner School of Environment and Society, ARC Centre of Excellence for Environmental Decisions & National Environment Research Program, & the Central Tablelands Local Land Services!

DATES

Surveys start from late September to the end of November 2015. Then from early January to mid March 2016. Dates are subject to change and weather dependant.

One week commitment required. Preference would be given for those that can commit 2-3 weeks.

For further information contact:

Nicole Hansen

Please forward a summary of your skills relevant to the project, availabilities (eg how many weeks available in each month) as well as a CV (no more than 2 pages) to nicole.hansen@anu.edu.au or for enquiries call 0407 727 076

ACT Herpetological Association Inc. 2015 - 2016 Membership Renewal Now Due

Membership renewal runs from 1 July 2015 to 30 June 2016 and costs **\$10** for a single or family membership. 'Herpetofauna' is an additional **\$12**.

Payment at our August meeting would be appreciated.

OR Please use the forms on our website **www.actha.org.au** to renew:

<http://www.actha.org.au/renew-membership.html>

OR you could make a direct Deposit to ACTHA's bank account:

St George Bank, BSB 112-908, A/c 486822880 (**Note - new account number**)

(PLEASE! Don't forget to note your name so we can identify whose payment it is on our Bank Statement.)

Know someone who would like to join ACTHA?

Then please direct them to our Website: <http://www.actha.org.au/join-actha.html>

Queries? please call Margaret on 02 6241 4065 (h)



FOR SALE: Glass tank enclosure in good condition, suitable for water dragons, frogs, etc. In good clean waterproof condition. Includes universal rock background as shown, not the cheaper foam. Selling as have upgraded for my frogs. Photos below show it cleaned as is now, also how it was set up with habitat. Is at Albury, NSW. Asking \$100 or near offer. For further info, please contact Julianne mobile 0409 782 842, email julianne1234@bigpond.com

Canberra & Districts Aquarium Society

CDAS, our partners from *Snakes Alive!*, have invited ACTHA members to attend the Society's 'splash and treasure' small market day on the **25th July at the Harmonie German Club,** Narrabundah. 11am - 3pm. Entry is \$2.

A great array of all things fish and aquarium will be available to see and also purchase!

The latest Issue of Herpetofauna has arrived and there are some copies left, only \$12 each

Issue June - December 2013, Volume 43

Please contact Margaret on 02 6241 4065 if you would like a copy.



ACTHA News
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