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ACTHA NEWS
APR - MAY 2008
Newsletter of the ACT Herpetological Association Inc.

YOUR COMMITTEE

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Public Officer	John Wombey
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	Philip Robertson
Student Representative	Jake McAuliffe

DIARY DATE

The *bi-monthly* meetings of the Association are held on the *third Tuesday of the month* at 7.30pm, Western Districts Rugby Club, Catchpole Street, Macquarie.

UPCOMING MEETING

Tuesday, 15th April 2008

Dr Conrad Hoskin, School of Botany & Zoology, ANU, is our guest speaker this month and he will talk about the reptiles and frogs of QLD (Australia), Madagascar and Cameroon.

His research involves evolution and he studies Queensland frogs and reptiles to see how new species form. In this talk he will briefly show photos of some of the amazing species he has had the privilege to work on and briefly explain the things he's found out in regards to each. Then he will move on to a slide show of frogs and reptiles from his travels in Madagascar and the rainforests of Cameroon. Chameleons, vipers, poisonous frogs, lemurs, Goliath frogs for dinner.... it's all in there.

Not a meeting to miss!

IN THIS ISSUE

ACTHA holds a herp display at a recent Leukemia fund raising event, Hall Showground

Mandy Conway reports on the Hall Showground event, page 2.

Evolution of Geckos in the Pilbara, WA

Mitzy Pepper, School of Botany & Zoology, ANU, gave a wonderful talk and slide show on her Gecko studies at February's meeting. An overview is presented from page 3.

Field trip to Nimmitabel, NSW

Margaret Ning and Geoff Robertson invited ACTHA members to their property at Nimmitabel for a herping weekend, page 7.

Jake with his Carpet Python Poe.

Leukaemia Foundation Charity Day March 08

ACTHA members Jake McAuliffe, Millissa Gillard and Mandy Conway and their reptiles were invited to attend a Leukaemia Foundation Charity Day at the Showground in Hall, a quiet and semi rural suburb of Canberra.

The organisers asked several groups to attend, a Harley Davidson Bike club, the Hall Volunteer fire Brigade, several large trucks and tractors and entertainment for the kids etc, as well as our intrepid herpetologists, whilst organising a yabby race to raise funds for their worthy cause.

The event was a fairly quiet affair, however ACTHA members did manage to convince some rural attendees that snakes and lizards aren't that bad and even venomous snakes are ok if left alone.

Millissa with Freddie Shingleback

Mandy's adorable 3 week old baby Shinglebacks

Australian Geckos:
How the Pilbara can tell us about their evolution

Mitzy Pepper, PhD Candidate
School of Botany and Zoology, ANU

This article by Mandy Conway

Mitzy started her talk by saying it was important for the young people present at this meeting to know that it's never too late to start studying something you're interested in. Mitzy has always been interested in herps, however she studied rocks and landscape ecology in far North-western Australia before moving to biology and genetics at the Phd level.

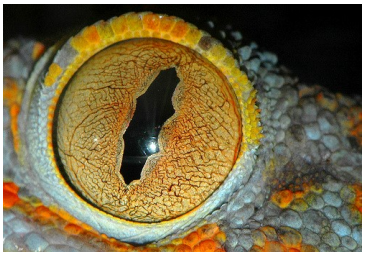
Mitzy's current study in the Pilbara, Western Australia, uses geckos to tell her about evolution, specifically by looking at the way genes evolve and change through time.

Geckos are an old species which started over 20 million years ago and have been out on their own, evolutionary wise, for a long time. They are a spectacular and diverse species, being the second largest family of lizards after skinks and one of the largest vertebrate groups in the world. There are more species of gecko present in Australia than any where else in the world.

Three geckos live in this region: *Diplodactylus vittatus, Gehyra variegata, Heteronotia binoei*. "It's frustrating to live in Canberra as geckos are not easily seen here, despite the fact that they are spread widely over the rest of the continent." Mitzy said.

What makes geckos unique?

- All Australian geckos lay clutches of 2 eggs of either a soft shell that hardens in a few hours to help retain moisture or a parchment type, which is unfortunately more prone to desiccation. (Some species in New Caledonia and New Zealand give birth to live young.)



- Geckos have large unblinking eyes ie fixed upper and lower eyelids which are fused to form a clear spectacle or scale. Pupils are vertical in Australian species.
- They wipe their faces and eyes with their tongues, usually after activities like eating.
- They have fine sensory hairs on their heads which, when wetted, may heighten the sensitivity of those erect hairs.
- Geckos have a unique pad of toes. Primitive species just had a row of scales along their toes however some geckos have evolved highly modified scales forming pads which carry microscopic branching hair-like structures call Setae. These enable the gecko to cling to microscopic irregularities in the surface they wish to climb.
- The foot morphology of geckos is so varied it is often used to identify different species (*see below*).

Pachydactylus = "thick toe"
Stenodactylus = "narrow toe"
Gymnodactylus = "naked toe"
Hemidactylus = "half toe"
Phyllodactylus = "leafy toe"
Lepidodactylus = "scaly toe"
Carphodactylus = "twig toe"
Spaerodactylus = "ball toe"

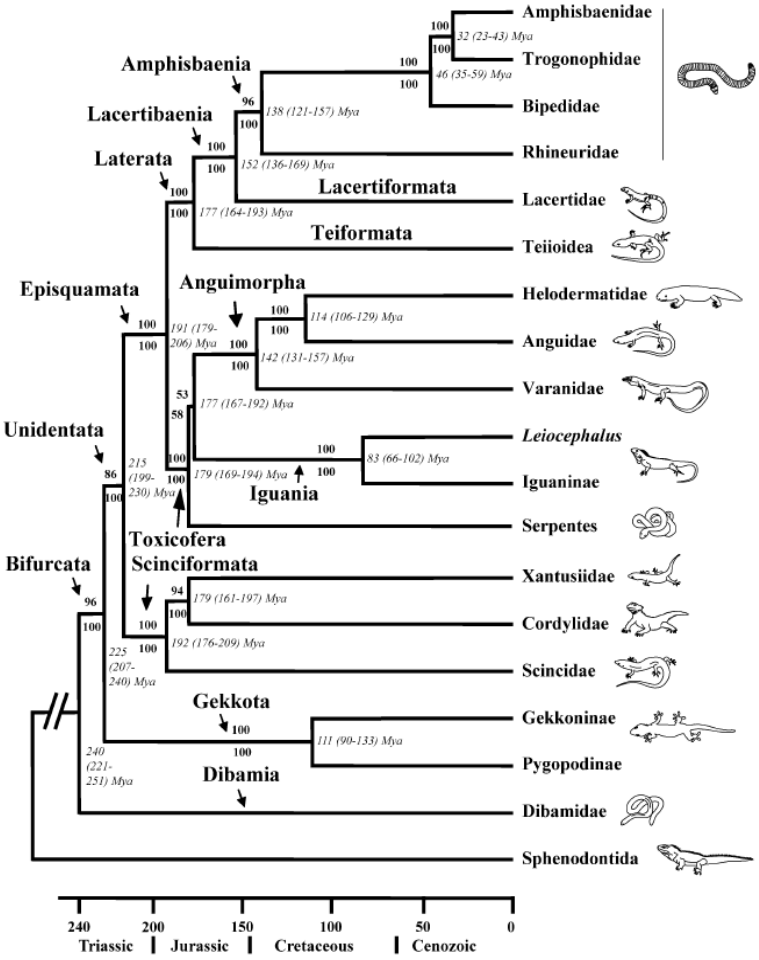
- Geckos have soft velvety skin which is quite thin.
- Most Australian geckos are nocturnal although they sometimes hide under bark on a sunny side of the tree to warm up.
- They are vocal animals who use sounds in distress or aggression towards other geckos or animals.

How do they differ from one another?

The Gekkota family contains geckos and 29 species of Pygopod. The Pygopod, or legless lizard, have completely lost their front limbs and hind limbs have evolved to small flaps. They have thick tongues that lick their eyes and faces and often have obvious ear openings. Their tails are much longer than a snake.

There are 1,110 species in 116 genera of gecko worldwide with 77 in Australia (2004). Advances in molecular techniques has helped identify geckos that look the same but are actually completely different genetically, so actual numbers are hugely underestimated. Mitzy has studied 7 species in detail and found over 35 new species alone.

How have they evolved?



What genera do we have in Australia?

There are four major groups in Australia:

Diplodactylini} (Diplodactylinae)
Carphodactylini}

Gekkoninae

Pygopodinae

DIPLODACTYLINI

Diplodactylus terrestrial geckos, 23+ sp. (*right)*

Rhynchoedura, Beak-faced gecko, 1 sp. (before Mitzy got started with them!) (*left)*

Crenadactylus Clawless gecko, 1 sp. (possibly more). Unique because it doesn't have any claws, and at 30mm snout to vent length is our smallest gecko.

Strophurus, Spiny-tailed Gecko, 16+ sp. Lives in spider burrows and are termite specialists.

CARPHODACTYLINI

A larger and slightly more impressive gecko of which 5 of the 10 genera are found in Australia.

The Leaf-tailed Gecko, *Phyllurus* and *Saltuarius*, is found in Northern NSW and QLD respectively, with one *Phyllurus* living amongst Sydney sandstones. These are big geckos of around 30cm in length with long legs.

Oedura, Velvet Gecko, 13+ sp. Mainly found in rocky cave dwellings, they have big toe pads and are gentle creatures. The stripey/banded juveniles look very different to the adults.

Nephrurus, Knob-tailed Gecko, 9 sp "are scary little dudes which can send most indigenous women running for their lives" Mitzy said. They stand tall and lunge backwards and forwards whilst making a wheezing/ choking sound. A dropped tail makes a high pitched squeaking noise as it bounces around on the ground.

Carphodactylus, Chameleon Gecko, 1 sp.

GEKKONINAE

Seven Genera of Gekkoninae reside in Australia of which 1 is endemic.

Gehyra, Dtellas, 16+ sp. Can often be found behind bark or behind 'onion skin' rock weathering granite. They congregate underneath the peels.

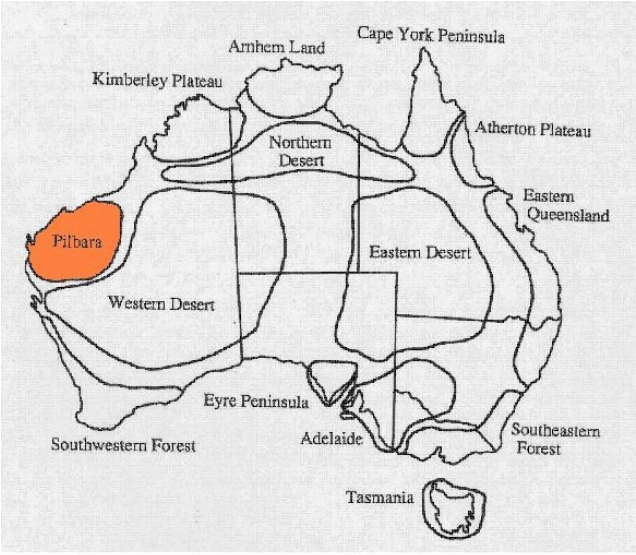
Heteronofia, 3+ sp. Are unusual in that some of the populations are all female, or parthenogetic, essentially making daughter clones of themselves.

Mitzy's PhD work...

Mitzy's PhD work comes under the heading of **Phylogeography**, which seeks to understand processes of speciation and what drives the distribution of biodiversity. Mitzy looks at aspects of the landscape, geology, plants, rivers and the climate and how these things have shaped the evolution of geckos.

The Pilbara

The Pilbara Region in North-western WA covers a 180,000 square kilometer area. Warm waters off the North-west coast ensures this area is vulnerable to cyclones, in fact more than anywhere else in the world. The Pilbara is considered the powerhouse of the mining industry and is the third largest producer of iron ore, behind China and Brazil. This is worth 9 billion dollars to the Australian economy.



People conducting field work in the area often refer to it as an oven: in 1924 Marble Bar (inland) had 160 days of over 38°C in a row, where 45°C in summertime is the norm.

The area has lots of biodiversity and lots of endemic plants and animals, largely because of its unique geology and landform.

The flat landscape is interrupted by what appears as a solid mass but is in fact a weathered pile of rubble. When it's 50°C on the surface, Mitzy wished she'd studied fish so she could spend all her time in the cool waters within the canyons.

The Pilbara makes an excellent study area because it contains so many different landscape areas that may influence the way things evolve. The first real survey across the gambit of flora and fauna in the Pilbara was done in 2005.

"It has been documented that if a species is separated by the formation of a river these populations will evolve separately until they form 2 different species. If they then happen to come into contact with one another they may choose not to breed."

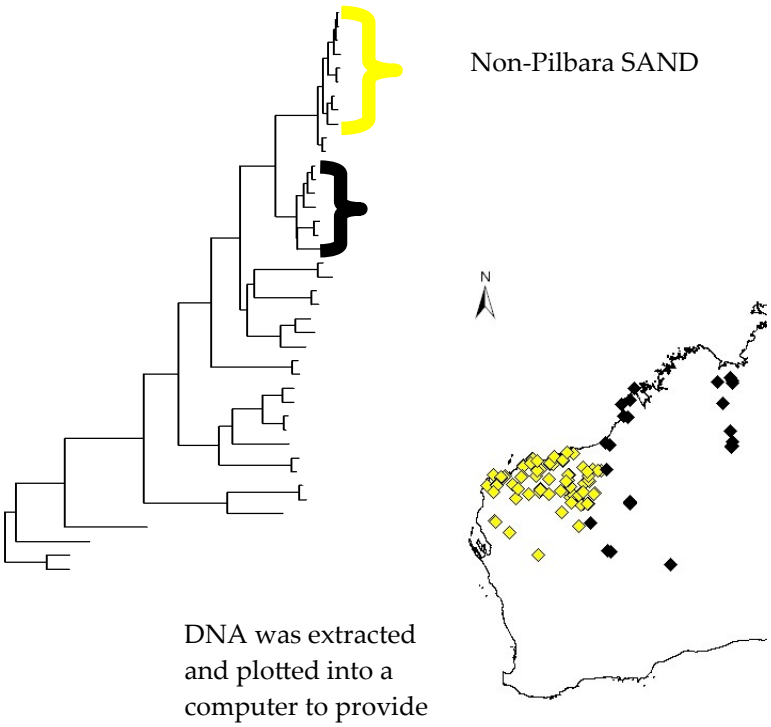
Mitzy's Phd work involves choosing geckos to study, collecting tissue samples from across the species range, looking at the DNA of all the samples to see the distribution of genetic diversity and to try and relate this to changes in the landscape over time.

Choosing geckos to study & collecting tissue samples for DNA

Three sand dwelling geckos and three rock dwelling geckos were chosen for Mitzy's study to determine if geckos living on different substrates evolved in different ways.

Mitzy conducted some field survey work to collect tissue samples however relied on museum specimens to provide the bulk of her samples.

Pilbara ROCKS



DNA was extracted and plotted into a computer to provide a Chromatogram which is painstakingly checked. A Phylogen tree is constructed *(above left)* using another software program to show different genetic variants of a species. Two groups of a species, in this case *D. stenodactylus*, that are closely related are then mapped *(above right)* depending on where they are from.

Relate the DNA to the landscape

There is no physical barrier to the Pilbara area however the map above clearly shows two genetically different species living quite separately, clustered in discrete regions.

The Pilbara geckos live on rocks and the non-Pilbara ones live on sand and hence will probably be described as a new species albeit closely related.

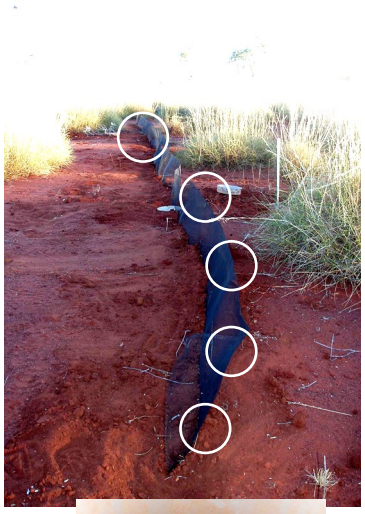
A geology map was sourced at one stage to determine the age of different rock units. "Different genetic groups seem to map really well on those different types of rocks and they cluster in discrete regions eg containing ironstone and granite."

Cryptic speciation is how you would define new species: things that look the same on the outside but are genetically different. Mitzy gave an example of a study of *Rhynchoedure ornata* which revealed not 1 but 5 genetically different species who were individually grouped in separate areas over the Australian continent.

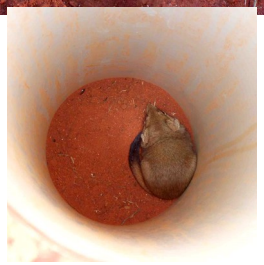
Catching the animals

Pit traps are commonly utilised by many of the agencies asked to determine species presence on mine sites.

Mitzy's group was trying to catch everything from reptiles and invertebrates to mammals and the pit trap was usually used.



Five deep holes are dug in roughly a straight line. A little drift fence that runs along the middle of the trap site is then erected. Animals would then 'hit' the fence, run along it and then hopefully fall into a hole. Sometimes buckets are placed inside the holes to be removed and examined, or a mirror can be handy.



Care was always needed as anything from spiders and centipedes to snakes were caught in these pits. "Pygopods can easily be confused with snakes at the bottom of a dark hole!" Mitzy emphasised!

Another capture method used was to set fire to a **spinifex bush** and wait, and wait, for animals to run out. These grasses would usually contain 20 geckos or Pygopods which were caught by a circle of people.

Termite mounds were examined if tell-tale white droppings from lizards and geckos could be seen. 40-50 geckos from one termite mound was easily achievable.

If all else failed, jumping from a vehicle and running after the reptile could be successful. "Not a recommended approach to catching a large Perentie!" Mitzy added.

Field trip to Nimmitabel, NSW

This article by Mandy Conway, Margaret Ning and Joe McAuliffe

Margaret Ning and Geoff Robertson invited ACTHA members to their property, **Garuwanga**, at Nimmitabel, just south of Cooma, for a herping weekend on the last weekend in March 2008.

They have owned and managed the conservation of the 700 acre property for 15 years. The caravan was replaced with the house just over 10 years ago, adding much comfort for the frequent weekends spent there.

Margaret and Geoff utilise the property as a weekender and keep busy by:

- weeding, both manually and by spraying weeds one by one from the back of a quad bike: thistles, some serrated tussock, the very ugly Lamb's Ear;
- undertaking feral animal control: rabbits, foxes, pigs and cats;
- conducting workshops relating to conservation issues: specifically Friends of Grasslands activities.

Garuwanga recently received Stewardship funding from the local Murrumbidgee Catchment Management Authority. Half of the payment is to be used for biodiversity stewardship and the other half for Indigenous cultural heritage, which helps Margaret and Geoff to continue existing management activities. Margaret and Geoff are also trying to initiate an activity which would encourage an Indigenous 'link with country'.

Arrival

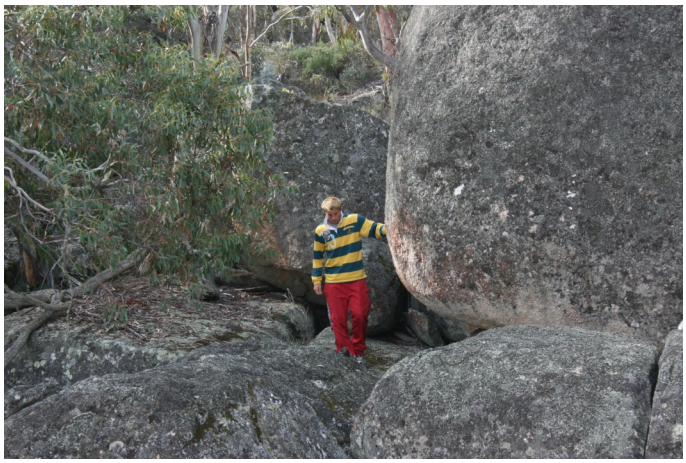
First to arrive Friday lunchtime were Mandy and Michael Conway, with Joe, Jake and Connor McAuliffe arriving with Geoff later that evening. A fine dinner of roo bolognaise was prepared and served by Margaret after which everyone piled into Joe's 4x4 and onto Margaret's quad bike to see if any frogs were calling down at Numerella River and Winifred Creek, both of which traverse the property and have never been waterless.

A single Pobble-bonk or Spotted Grass Frog, *Limnodynastes tasmaniensis,* was heard by eight dedicated herpetologists standing quietly in the dark, staring at a beautiful star filled sky. The Pobble-bonks were a common inhabitant of many of the dams after heavy rainfall.

Upon our return to the house *Litoria verreauxii* and more *Limnodynastes tasmaniensis* were heard calling.

Saturday

Saturday morning dawned cloudy and cold, however the same 8 herpetologists donned their warm clothes, cameras and enthusiasm and trudged off on foot to see if they could uncover the reptile and frog inhabitants.



It wasn't long before Jake *(above)* found the first of many Cunningham Skinks to be seen that day. They were firmly wedged in the crevices of the

rather impressive rocks and boulders. The property is undulating, with outcrops of boulders and eucalypt pockets everywhere. A few small ponds were found in the rocks' shadow and these were filled with many tadpoles.

Quite a few Garden Skinks, *Lampropholis guichenoti* and *L. delicata*, were found in the grassland area surrounding the house.

The only adult frog seen was a *Crinia signifera (below)* which was hiding under a small log. Photos of it were taken with the camera operators

nervously keeping an eye on the Wolf spider sharing its home.

Jake then found what was initially thought to be a pair of Cunningham Skinks within another crevice, however Joe and Geoff spent some time trying to identify the critters with *Eulamprus sp*. a possibility.

Joe and Margaret spent a lot of time identifying the flora of the area, and we learnt to spot many of the weeds being eradicated.

Interlopers

Our hungry group returned to the house for lunch where we were greeted by a friend of Margaret's who had brought a couple of pouch bound Grey Kangaroo joeys with her. That was it, Mandy was in her wildlife caring element and was lost to the herp cause for the rest of the day.

The little female and male joeys were admired by everyone and called "really cute" by several of our tough male herpetologists who espoused "Is it hungry?... I think its having a bad dream because the poor thing is kicking… I think its feeling cold I'd better put it under my jumper…" you get the idea. Grey Kangaroos are to be found throughout this region however the Wallaby population appeared to be in greater numbers, the terrain suiting them perfectly.

Herpetofauna at Garuwanga

Crinia signifera (heard)
Litoria verreauxii (heard)
Limnodynastes dumerilii (heard)
Limnodynastes tasmaniensis (seen)
Lampropholis guichenoti (seen)
Lampropholis delicata (seen)
Lampropholis entrecasteauxii (seen)
Lampropholis duperreyi (seen)
Eulamprus sp. (seen)
Egernia saxatilis ssp intermedia (seen)
Egernia cunninghami (seen)
Physignathus lesueurii ssp howittii (seen)
Hemiergis decresiensis (seen)

March 2008

Off everyone but Mandy set in Joe's vehicle to try and find the hiding herps a few kilometres further down the property.

Lampropholis duperreyi was spotted that afternoon and caused great excitement as it had not been previously seen on the property. *Egernia saxatilis ssp intermedia* was found on a granite outcrop sheltering in the crevices of exfoliating slabs. The other herps found have been noted within the species listed in the above table.

Excitement in the loo

Just before sunset a house guest was discovered trying to hide on the toilet 'room' window sill: a gorgeous little micro bat. Well, looking back at what happened next, was rather amusing to say the least. Imagine 4 adults and 1 child huddled in said room with the door closed. Then imagine one of us carefully draping a large green towel right over the toilet with two large pieces of bark artistically propped against the cistern. Finally imagine a timid bat sitting very still on this artwork whilst $5,000 worth of camera gear took photos, the human adults gently jostling each other for the best angle. The bat must have felt like a movie star! Geoff was standing outside the toilet 'room' reading bat descriptions from a book out loud whilst 5 pairs of eyes tried to determine the bat's identity.

Geoffreyii! and you should have seen Geoff the human prance around with pride at discovering his namesake!!

The bat had launched itself several times trying to escape the attention before being carefully taken outside where it literally flew into the sunset. A magnificent experience for the humans and imagine the bat recounting its adventure to its colleagues. (The child will remain nameless to protect his identity, and he was not injured in the jostling.)

The next morning everyone packed their belongings ready for an early departure, due to other commitments, and the day potentially looked like perfect herping weather. Oh well, there is always next time!

Margaret, Joe and Geoff...

Joe and Geoff taking close-up photos of a garden skink

A pit fire was prepared for the evening BBQ during which everyone excitedly chatted about the day's events. The herp spotting and other activities of the day were great conversation material with the perusal of downloaded photos the flavour of the evening.

Twenty-two reptile and amphibian species have been recorded on the property to date, to which we added *L. duperreyi*, the bat and the Sea Eagle which was spotted by Geoff on Saturday afternoon.

Some Web sites worth looking at:

http://frogs.org.au/

www.aussiereptilekeeper.com

www.mark.org.au

www.canberraexotics.com.au

http://www3.environment.nsw.gov.au/pdfs/hygiene_protocol_snakes.pdf

http://www.cdc.gov/healthypets/animals/reptiles.htm

http://www.tams.act.gov.au/live/environment/native_plants_and_animals/licensing_of_plants_and_animals/reptile_policy

Editor's Note

The Editor takes full responsibility for summaries of presentations by Guest Speakers at ACTHA Meetings, article write-up's and editing of other contributions. The views expressed by contributors and authors are not necessarily those of ACTHA.

Please feel free to contact the Editor with any queries.

Have a very merry Christmas and safe New Year!

See you at Snakes Alive! 2008

ACT Herpetological Association Profile

ACTHA aims to promote the study and conservation of reptiles and amphibians, and to foster a positive community attitude towards this much maligned group of animals. Our members encompass a broad cross-section of the community. Amateur and professional herpetologists are joined by interested members of the public in learning more about our local frogs, snakes, lizards and turtles, as well as other herpetofauna from Australia and around the world.

ACTHA News

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