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ACTHA INC. NEWS DEC 2010 - JAN 2011

*Newsletter of the
ACT Herpetological
Association Inc.*

YOUR COMMITTEE FOR 2010 - 2011

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	Peter Child
	Iris Carter
	Greg Flowers
Student Representatives	Jake McAuliffe
	Angelique Harrison

** Denotes Life Members*

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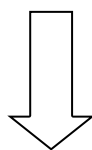


DIARY DATE

The *bi-monthly* meetings of the Association are usually held on the **third Tuesday of the month at 7.30pm**, Southern Cross Club, Catchpole Street, Macquarie, Belconnen.

UPCOMING MEETING

NOTE – CHANGE OF DATE & VENUE



Christmas party for ACTHA members

6.30pm, Tuesday 14th December 2010

Our Christmas party is to be held at the **Australian National Botanic Gardens**, within the **Greenhouse complex**, Frith Rd, O'Connor (access is via Dryandra St).

Our guest will be Dave Hunter, who will give a much anticipated slideshow on some of the herps he crossed paths with around Darwin.

This will be followed by a **BBQ** with a selection of food & drink, where planning for **Snakes Alive! 2011** will be the hot topic of conversation.

The Exhibition is only **4 weeks away** and we really **need more volunteers!**

RSVP to mmconway@hotmail.com.au **by Friday, 10 December 2010**

ACTHA WEBSITE UPDATE

By Angus Kennedy, Webmaster

ACTHA's website has been steadily increasing content since its resurrection in late 2009. In addition to posting regular material such as our Newsletters, we have been able to post some interesting videos submitted by ACTHA members, including a very rare video of brown snake cannibalism and an informative talk on how gecko morphology is shaping modern robot technology.

This good level of content has been reflected in the steadily increasing number of visits to the website. In around 12 months we have had almost 3000 unique visitors (not counting return visits) - that is almost 250 per month! While the majority of visitors are from Australia (67%) it is interesting to see that 17% of visitors are from Japan, closely followed by 12% from the US.

Visitor numbers like this are a real achievement - hopefully there are 3000 people out there who have learnt about, and gained respect for, some amazing reptiles and amphibians!

There are a number of features worth exploring on the site on a regular basis.

The ACTHA forums are a great place to ask questions, post photos of sightings and talk to

others with an interest in herpetology; they are free to use, so give it a go!

There is a live news feed under the 'News' menu that compiles articles from scientific magazines, journals and other sources with a focus on herpetology. Remember to check back as it is updated in real time as news is released.

Almost all of ACTHA's posters and brochures are available under the 'Publications' menu. Why not print them out and put them up at your local school/shop/community hall?

You can find digital copies of Newsletters from the past few years on the website - see those photos in full glorious colour! The 'Burrowing into ACTHA's Past' section of the News will see former Newsletters digitally reproduced over time.

If you have been on a herping trip why not send in your photos to put together in a gallery? Have a look at the other galleries for inspiration.

If you have seen anything interesting you think would be suited to posting on the website, or have any questions, send an email to webmaster@actha.org.au

All members are welcome and encouraged to submit content for the website and get involved on the forums.



THIS BOA CONSTRICTOR HAS NO FATHER

Biology Letters, DOI: 10.1098/rsbl.2010.0793, Image: Warren Booth

She was born in 2009 by parthenogenesis, otherwise known as 'virgin birth'. This makes her one of the first parthenogenetic vertebrate animals who have made it to adulthood.

The mother snake responsible had two litters, one in 2009 and another in 2010, producing a total of 22 offspring. All were female, and all had the same rare "caramel" body colour. Genetic analysis has confirmed that they are not related to any of the males the female had mated with.

In another first, the young snakes have two W chromosomes. Snakes determine their sex differently to humans: males have two Z chromosomes and females have a Z and a W. So in theory, the mother snake's parthenogenetic offspring should have been either ZZ or WW. But WW animals have never been found and have only been produced in the lab with great difficulty.

It's not clear how these WW snakes are able to survive, or indeed why the mother would have produced so many of them. Parthenogenesis is often used as a last-resort technique so that females can reproduce when there are no males around.

So you would expect that the mother would produce some male offspring as well as females.

Long thought to be vanishingly rare, parthenogenesis is becoming more common the more scientists look for it. For instance, in 2003 a Burmese python in an Amsterdam zoo produced embryos parthenogenetically, but they were not allowed to develop so we do not know if they were truly viable.

It's not just snakes.. Earlier this year it was shown that female white-spotted bamboo sharks can produce viable offspring without help from males, and hammerheads can do it too. Many insects also engage in parthenogenesis.



ACTHA PARTICIPATES IN 'K2C BIODIVERSITY & FARMING FAIR'

Bredbo, NSW

By Margaret Ning

On Sunday 10 October '10 we made an early start to what was to be a very long, full day. We headed for Bredbo where the **Kosciuszko to Coast (K2C) Biodiversity & Farming Fair** was to be held from 9am to 4pm.

Two ACTHA members (Greg Cover and I) and a non-ACTHA member manned the ACTHA stall, where we displayed a collection of posters, pamphlets and reference material. We decided our best strategy was to prominently display the seven posters we had of local snakes (one poster) and lizards (six posters) and to engage the fair attendees in discussions of which reptiles they may have had on their properties and 'patches'. We engaged in conversation with local landholders, children and other stall holders. One Council employee wanted to know if he had been giving the right advice re what to do in case of snake bite, so Greg whipped out his compression bandage and gave a demo of the correct procedure.

We also took the opportunity to let people know of our 2011 *Snakes Alive!* Exhibition and mentioned the dates at every opportunity.

The weather was cool but not too off-putting. The estimated number of attendees was close to four hundred and there was a large variety of stalls to choose from, whether food based or information based. There was also a program of talks from nine speakers including the key presenter Sam Archer who explained how he manages his property concurrently for production and environmental outcomes.

Geoff Robertson, *Friends of Grasslands* member, writes about Dave Hunter's talk

Dave Hunter, a threatened species officer with the NSW Department of Environment, Climate Change and water, talked about the threatened frogs and reptiles on the Southern Tablelands. He pointed out that 50% of threatened frog species and 100% of the threatened reptiles primarily occur on private property.



Dave provided wonderful profiles of the characteristics and habitats of each species: Booroolong Frog, Green and Golden Bell Frog, Tablelands Bell Frog, Southern Bell Frog, Grassland Earless Dragon, Stripped Legless Lizard, Pink-tailed Worm-lizard, Little Whip Snake and Rosenberg's Goanna. It was important to have landowners learn about these species. "Having threatened species is compatible with good business and property management planning", he said. He outlined some success stories of community participation in recovery programs aimed at finding populations of these species and improving their habitat. While there were some good news stories, there was concern about the future of the grassland earless dragon whose numbers have greatly declined since the onset of severe drought in 2003.



'Houston, we have a problem!!'

A note from the Editor

The views expressed by contributors and authors and any links to Websites provided in this Newsletter are not necessarily those of ACTHA.





Sophie & Angelique



ACTHA EXHIBITS HERPS AT THE TURNER PRIMARY SCHOOL FETE

By MC, Editor

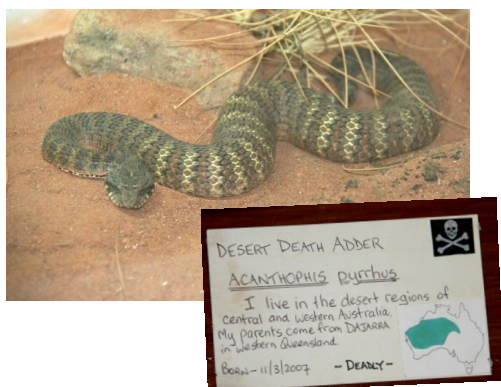
Saturday, 30 September 2010, and several ACTHA members set-up a small but impressive reptile display which included several snakes, lizards and a turtle.

Many Turner Primary School students and their parents looked over the animals and large collection of local reptile and frog posters on display. Questions about animals they may have sighted in their own backyards were ably answered by helpers on the day.

We asked for a gold coin donation from the 372 people who entered the display room and raised \$455.70 for the School in the process. In Geoff's words "Great effort! I questioned a lot of people as they came out and all very impressed!"

We were treated to a mouth-watering selection of home-made curries and liquid refreshments, thanks to the fete organisers.

A big thank you goes to the day's helpers: Angus Kennedy, Joe McAuliffe, Ric Longmore, Mandy Conway, Geoff Robertson, Chris Paice, Angelique Harrison and Sophie Sloane!



"Now's my chance,
they're not looking..."



ACTHA member **Lucinda Royston** sent in some stunning photos of reptiles she encountered on a recent trip to Queensland.

(A selection of others will appear in the next edition & please note: they will appear in full colour on our website, so have a look!)

The Yellow Spotted Monitor, *Varamus panoptes panoptes*, was pictured in Karumba Qld, on a beach walk.



A beautifully coloured Eastern Bearded dragon found on the way from Morven to Mitchell, Qld



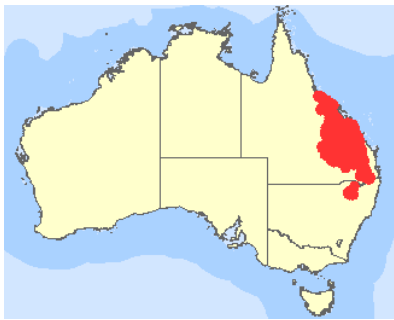
A Stumpy-tailed Lizard on the road between Augathella and Morven, Qld



REPTILES OF THE BRIGALOW BELT AND WHAT THE AUSTRALIAN GOVERNMENT IS DOING TO PROTECT THEM

A summary of Tim McGrath's talk to ACTHA members at the 21 October 2010 Meeting, by Mandy Conway with assistance by Tim.

Tim McGrath works in the Species Information Section for the Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC). He and his colleagues gather species information and develop policy to ensure best practice and consistent decision making is exercised when projects, like mining, could have a significant impact on a threatened species. Tim is also currently undertaking a Masters degree at the University of Canberra on 'The Monaro Tableland's Grassland Earless Dragon'.



The Brigalow Belt bioregion is a large and complex area that covers approximately 36 million hectares, extending from Townsville down to the New England Tablelands around Warwick. It covers about 20% of QLD but only 3.6% of the region is in

identified protected areas eg Blackdown Tablelands and the Carnarvon Range National Park.

The Brigalow Belt of QLD was part of one of the largest land clearing schemes ever undertaken within Australia. The region has been an agricultural and pastoral area since WWII, the

primary pursuit being cattle grazing and cultivation. This has resulted in a diverse and complex region that is highly fragmented and is generally renowned for its fertile clay soils and complex geology.

The bioregion is characterised by *Acacia harpophylla* (Brigalow) but also includes eucalypt forests and woodlands, cypress pine woodlands, native grasslands and semi-evergreen vine thickets (a dry adapted

form of rainforest, relics of a much wetter past). The remnant Brigalow forest has a silvery appearance and is usually 10-15m high, with an understorey of either cypress pine, blackwood or gidgee.

As a result of past land clearing and reduced extent of vegetation in the Brigalow Belt, several of the vegetation communities including Brigalow have been listed under Commonwealth legislation as either endangered or critically endangered ecological communities.

One of the key threats to Brigalow reptiles is habitat clearing and degradation as a result of mining activities as the Brigalow Belt is home to one of Australia's largest coal reserves, the Bowen Basin.

Buffel grass (*Cenchrus ciliaris*) is also an invasive pasture grass that can take over habitats and deter reptiles. In the year 2000, 30 to 50 million hectares was described as being covered by this introduced and invasive grass. The Brigalow reptiles are also at threat from cane toads, feral animals and pastoralism, which involves fire regimes, grazing and weeds.

The Brigalow Belt - a diverse range of species

The Brigalow Belt is a biodiversity hotspot for reptiles and is home to some 148 species. Prior to his current job, Tim spent 5 years working for a private ecological consultancy in remote QLD undertaking vertebrate fauna surveys for environment impact assessment, mainly in relation to large mining projects.

Tim went on to talk about a few of the many reptiles and amphibians he encountered during that time.

Golden-tailed Gecko *Strophurus taenicauda*:

a rare species which lives amongst cypress pine woodlands and Brigalow. This gecko is not listed under the Commonwealth EPBC Act, but is listed in QLD under the Nature Conservation Act. It is able to squirt an irritant fluid when threatened.



Brigalow Scaly-foot *Paradelma orientalis*:

EPBC listed, it occupies a diversity of habitats, particularly lemon-scented gum (*Corymbia citriodora*) forest in sandstone country. This legless lizard utilises woody debris and rocky environments ranging from intact forest and woodlands to cleared, cultivated paddocks and grasslands. It is one of the more common threatened reptiles found during surveys.





Collared Delma *Delma torquata*: EPBC listed, it occupies woodlands and grasslands around Brisbane, Toowoomba and Oakey, living in Moreton Bay Ash communities containing woody debris and abundant

rocks. There is an outlying record of a specimen found in the Blackdown Tablelands, which is a couple of hundred kilometres from its known core distribution. This record's validity is currently being questioned because it wasn't a vouched specimen and no other records exist between the sites.



Dunmall's Snake *Furina dunmali*: EPBC listed and genuinely rare, very little known is known about this snake. Tim spent 5 years doing targeted mining work surveys for this snake and only came across a specimen during the last week he was

there. He found it around midnight in the middle of a drag line operation where there was a lot of pooled water and frogs calling. The snake's diet was previously thought to consist mainly of *Egernia striolata*. It is a thick-set elapid and has a dark chocolatey appearance with a lightly banded nape.



Pale-headed Snake *Hoplocephalus bitorquatus*: listed under the NSW Threatened Species Conservation Act, it

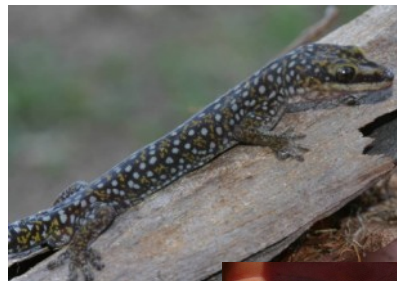
is nocturnal and predominantly lives under peeling tree bark and in tree hollows.



Smaller Brigalow snakes include the **Coral Snake** *Brachyurophis australis* (left) and the **Carpenteria Whipsnake** *Cryptophis boschmai* (bottom left).



Brigalow's geckos and skinks include *Oedura tryoni* (right)



Anomalopus brevicollis (right)



Tim also noted that the Brigalow Belt is home to a variety of small to large burrowing frogs which are often encountered on the roadside after heavy rains. Some of the frogs Tim showed photos of included:

Limnodynastes salmini (right)



Litoria alboguttatus (below)



Cyclorana verrucosa (right)



and *C. brevipes* (below)



Tales from the paddock

Tim shared some interesting stories of his times in the Brigalow Belt. One rather wet day, he and his team were trying to meet strict animal ethic requirements for a survey when in doing so his 4WD got badly bogged on the cracking clays of the Darling Downs. The result? the duo had to pull some nearby gates off a farmer's fence and use them to try and get out!





"It's not just habitat for reptiles, but also terrorists". Tim intrigued members, retelling that whilst doing surveys for Oedura geckos in the sandstone country of



the Callide ranges he found a military box inside a series of caves. It contained guns, camouflage gear, computer disks, chemical formulas and written notes for using the arsenal. Tim reported the finding to the local police and was

asked to lead police officers to the area the next day. He was told to be wary of potential booby-traps on the way: he hadn't really been worried until then! It appears a local 'unstable' resident was the likely suspect. The bloke apparently used to drive around town with a mega phone protesting about John Howard and other issues, which earned him a stint in a cell. The man died 2 years prior so this stash had been hidden for some time.

The EPBC Act: helping to protect the Brigalow Belt's ecology

The Brigalow Belt is a great place for reptiles; however these reptiles must now coexist with mining activities and associated land clearing and habitat degradation. What is the Australian government doing to try and protect threatened reptiles of the Brigalow Belt? The National *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of National Environmental Significance (NES). Eight matters are currently listed: Tim's work area deals with one of these matters 'Threatened Species and Ecological Communities'.

The aim of the National EPBC Act is to regulate actions that will have, or are likely to have, a significant impact on matters of National Environmental Significance. Tim's role in DSEWPac concentrates on the conservation of nine threatened species in the Brigalow Belt region, all listed under the EPBC Act. All bar one of these reptiles is listed in the lowest category of 'vulnerable'. The Retro Slider is listed as endangered (this species was presumed extinct until a recent discovery).

The nine listed species include:

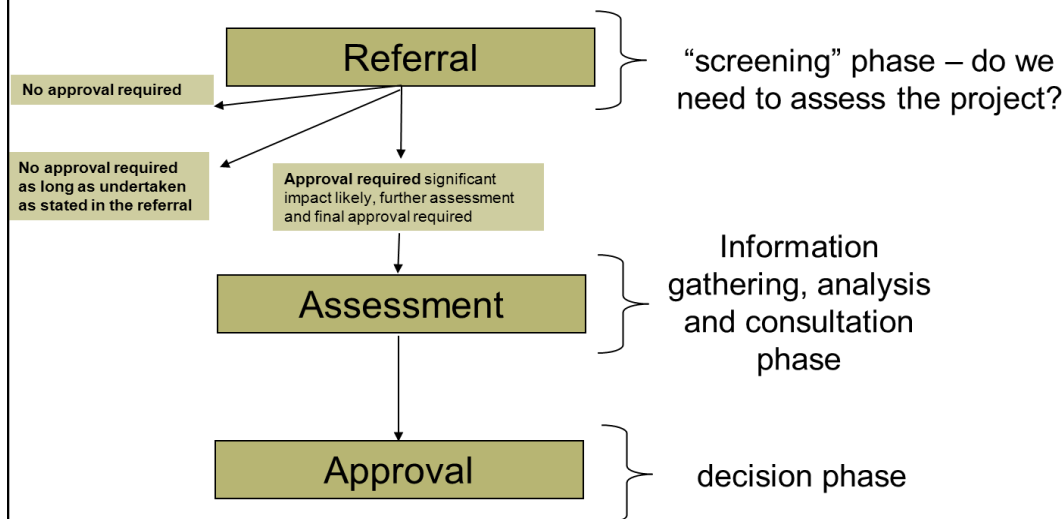
Five-clawed Worm Skink	<i>Anomalopus mackayi</i>
Yakka Skink	<i>Egernia rugosa</i>
Retro Slider	<i>Lerista allanae</i>
Mt Cooper striped Lerista	<i>Lerista vittata</i>
Dunmall's Snake	<i>Furina dunmalli</i>
Strip-tailed Delma	<i>Delma labialis</i>
Collared Delma	<i>Delma torquata</i>
Brigalow Scaly foot	<i>Paradelma orientalis</i>
Ornamental Snake	<i>Denisonia maculata</i>

Under the EPBC Act, 'an action' can include a variety of activities from the installation of a power line to mining. Anybody wanting to go ahead with a proposal must first submit a referral, an online templated form on the Department's website. It contains a variety of questions aiming to gather information on how important an area is, what it is that's being affected and how much habitat is involved. This referral is submitted online to the Department by the person proposing the action. The project is then passed to an assessment officer who has 20 business days to go through all the information and make a decision.

The decision can fall into one of four categories.

1. If an 'action' is deemed to have no significant impact then no approval is required and the project can go ahead.
2. An 'action' is called a 'non-controlled action in a particular manner' when it does not have a significant impact when certain conditions are met. The project gets approval but the project managers have to stick to the methodology they have outlined.
3. If habitat of significance has been identified and it will be cleared or potentially become degraded then the project may be appointed a 'controlled action'. The project then enters a detailed assessment stage with relevant government organisations and experts. This determines possible impact concerns and criteria for the project to proceed. Based on this a recommendation is made to the Federal Minister. The recommendation can have conditions so the project can be approved but it is regulated.
4. The 'action' is clearly unacceptable and cannot proceed.

EPBC Act approval process



General workshop summary

The nine reptiles listed under the EPBC Act benefited from the influx of new information as well as updated distribution mapping. It was also clear that the bioregion required more detailed demographic surveys because most existing

Compliance & enforcement

Substantial penalties may apply to a person who takes an action that is likely to have a significant impact on a matter of NES without approval, including criminal conviction of up to 7 years jail or civil conviction resulting in a fine of up to \$5.5 million (body corporate).

"Anyone who believes that a particular action has the potential to significantly impact on any matter of NES can contact the EPBC Act Compliance Sections of QLD or NSW on 1300 695 110 or at 'compliance@environment.gov.au'"

Measures to prevent grassland destruction in Victoria which impacted on the Striped Legless Lizard and Spiny Rice Flower resulted in large fine proceeds going back into State Government trusts. These were then used for research and land purchases. There are currently a lot of ongoing compliance cases in WA with Black Cockatoo habitat clearing.

Development of guidelines

A guideline for Brigalow reptiles is currently being developed by DSEWPaC. It involves a significant impact policy statement, aimed to provide better guidance for proponents and government assessment and compliance officers who have to make decisions regarding impacts on listed Brigalow reptiles.

Tim's section organises and chairs expert two day **workshops** which include government officers, private consultants and general naturalists/experts. Tim outlined the priorities of the workshops.

- What are the key ecological requirements of the Brigalow reptile species?
- How should you survey for these species?
- What is a significant impact on these species?
- If a significant impact, how do you mitigate impacts on these species?

records did not really indicate the true extent of species' habitat requirements. As a Department, the workshop identified some difficulties in developing a strategic policy because of the ecological differences between species. Several species have really specific habitat requirements, whilst others have a very broad range with only scattered records, and very little is known about some species.



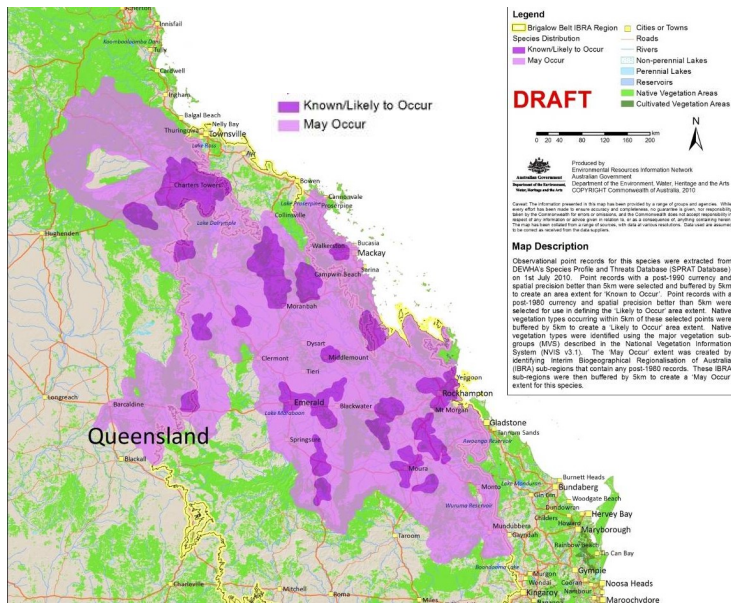
Case study of the Ornamental Snake

Denisonia maculata (above)

Tim presented a case study on how the Department will try to protect this species.

The Ornamental Snake is quite stout and grows to approximately 50cm. The overall body colour is brown, greyish brown or almost black, while the undersides are cream, often with darker streaks or flecks on the outer edges of the belly. The entire head, and at least the fore-body, is very finely peppered with dark brown or black and the lips are distinctly barred. The mid-body scales are smooth and in rows of 17. They bear 6-8 live young.

This snake is regarded as being potentially dangerous and has a very distinctive defence posture: it depresses its body and holds itself in a series of stiff curves, from which it will thrash about and bite savagely if approached. It is also capable of flattening its body when aroused or when squeezing through a narrow space.



Distribution

The Ornamental Snake is endemic to QLD and is restricted to the Dawson and Fitzroy River drainage system, south-west of Rockhampton in central coastal QLD. It is sparsely distributed across its geographic range and is not known to have experienced range declines, although the extent of habitat clearance in the region suggests it is likely to be at risk of extinction.



Ecology

The core habitat appears to be Gilgaied Brigalow woodlands with some records indicating that sandy riparian Coolabah woodlands may be of some importance. Here it shelters under fallen timber and bark, and in deep soil cracks. Their

diet consists of large frogs like *Cyclorana* which emerge after rain. Foraging occurs at night around water.

The experts at the workshop were asked for their advice on the best way to survey for the species. Pitfall trapping was not suggested to be effective due to flooding of pits in the Gilgai environments. The most effective method was to spotlight Brigalow Gilgai under optimal conditions: humid weather, during or after heavy rain, immediately after sunset or within three hours of it, as well as active diurnal searching in the Gilgai habitats lifting wood debris.

A Gilgai...

A Gilgai is a small ephemeral lake formed from a depression in the soil surface. Gilgaies form on clay soils due to the swelling of the clay when wet and subsequent shrinkage upon drying. Each cycle of swelling, shrinkage and cracking becomes more exaggerated and the landscape eventually becomes covered by a repeated pattern of mounds and depressions. Brigalow and gidgee soils, where many *Acacia* species grow, are particularly suited to Gilgai formation.

In short summary, the workshop identified what may constitute significant impacts on the Ornamental Snake.

- The permanent loss or fragmentation of Gilgai gidgee, blackwood and Brigalow communities.
- The alteration of hydrology: damming, creek diversion, drilling which can affect the groundwater systems.
- Compromising the integrity of Gilgai habitat through soil compaction and the introduction of weeds.

Best practice mitigation measures for the species were:

- avoidance principle applies - avoid Gilgai habitat, which can generally be easily seen in the landscape;
- exclusion of cattle from Gilgai depressions, which may include fencing;
- wet season spelling (grazing during dry times ok);
- prevent erosion and sedimentation of Gilgaies;
- establish measures to prevent pollution and eutrophication of Gilgai;
- general environmental management in the event that habitat will be affected e.g. spotter catchers, release protocols in place.

Post workshop

A policy statement is currently being developed. Targeted consultation will take place internally and with experts, and then public comment will be sought. The policy will be put to use by proponents and departmental assessment and compliance officers with the objective of achieving better outcomes for Brigalow reptiles.

Tim finished his presentation by giving a brief overview of the 35 other policy statements which are in various stages of development, some of which are listed below.

Growling Grass Frog *Litoria raniformis*

Green and Golden Bell frog *Litoria aurea*

Wallum Sedge Frog *Litoria olongburensis*

Giant Barred Frog *Mixophyes iteratus*

Striped Legless Lizard *Delma impar*

Southern Cassowary *Casuarius casuarius johnsonii*

Black-throated Finch *Poephila cincta cincta*

Western Ringtail Possum *Pseudocheirus occidentalis*

ACTHA members thanked Tim for a brilliant presentation and wished him and his colleagues well for the conservation efforts they are working on for all the many other species!



THE INTERNATIONAL SCENE

Coral Reef Symposium: turtles & dugongs **8 October 2010, Canberra**

Dr Mariana Fuentes, ARC Centre of Excellence Coral Reef Studies and James Cook University
http://www.coralcoe.org.au/news_stories/turtlerisk.html

The “turtle and dugong capital of the world”, the northern Great Barrier Reef (GBR) and Torres Strait region, faces increased pressure under climate change from human actions such as fishing, hunting, onshore development and pollution.

“Depletion of turtle and dugong numbers increases their vulnerability to other threats and lowers their ability to cope with climate change,” Dr Mariana Fuentes of the ARC Centre of Excellence for Coral Reef Studies and James Cook University will tell the Coral Reef Symposium in Canberra today.

Dr Fuentes says that turtles in particular are vulnerable to the effects of climate change, which include decreases in hatching success, loss of nesting areas and overheated beaches, which will decrease the turtles’ reproductive output and may significantly alter the sex ratio of their offspring.

Dr Fuentes’ research into the green, hawksbill and flatback turtles as well as dugongs in the northern GBR and Torres Strait is seeking to establish priorities for the management of marine megafauna to increase their resilience to climate change.

“Managers face the challenge of addressing the direct effects of climate change, as well as ongoing threats that dugongs and sea turtles face throughout their geographic range,” she explains. “For logistical, financial and political reasons, managers cannot address all threats simultaneously, and so need to prioritise their actions.”

“Of particular concern is the effect of climate change on the gender balance of turtle population, Dr Fuentes says: “The temperature of the beach sand determines the gender of the hatchlings – warmer sand produces more females while cooler sand produces more males.”

“Under current conditions the nesting grounds are already producing more females. With an increasing temperature, these turtles are at risk of stretching out the ratio, though we can’t yet predict exactly when it will cause an unbalanced population.”

“While sea turtles have survived large climatic fluctuations during their evolutionary history, modern rates of climate change are much faster, and are coupled with additional human pressures,” says Dr Fuentes. “We still do not know whether turtles can adapt to modern rates of climate change.”

Dugongs may experience indirect effects of climate change and human activity through impacts on their main food source, seagrass. Seagrass diebacks are linked to lower reproduction, increased mortality and emigration of dugongs.

Dr Fuentes has been working closely with indigenous communities in the Torres Strait region and northern GBR to monitor turtle numbers and condition and to track the movements of dugongs.

She says it will be important to take a range of short and long-term measures to protect turtles and dugongs from climate change, including: reducing the negative stresses that they are currently subject to, actively trying to change the habitat they use (e.g. by shading nests, re-vegetating beaches and replacing lost sand), and protecting areas that seem to offer the best conditions as refuges in the future.

“Turtles and dugongs have numerous roles – apart from their cultural and spiritual significance to the indigenous community, they are important for the tourism industry. Being at the top of the food chain also means that they have high ecological significance.”

“The loss of these species would have a huge impact on the northern Australian marine environment and on indigenous communities”, she warns.

“There are still many uncertainties over how turtles and dugongs will be impacted by climate change. For the time being the best prospects for their survival are to mitigate climate change (by reducing carbon emissions) and to reduce negative pressure on turtles and dugongs from activities such as hunting and coastal development.”

“However, as the impacts of climate change become more extreme, more ‘active’ adaptation strategies may be necessary. The success of each adaptation option will depend on climatic impact and local social, economic and cultural conditions, and therefore needs to be considered on a case by case basis, and at a local scale,” Dr Fuentes explains.



Toiling to save threatened frog

By Erica Rex, published 4 Oct 2010

SEQUOIA AND KINGS CANYON NATIONAL PARKS, California — From the summit of Bishop Pass in the Sierra Nevada, elevation 11,972 feet, all you can see are miles of granite peaks against the sky. There is no traffic and no pollution. The natural world seems pure and unspoiled.

But appearances are deceiving. Over the last decade, disaster has struck in the form of *chytridiomycosis*, or chytrid, a deadly fungal disease that has driven at least 200 of the world's 6,700 amphibian species to extinction. One third of the world's frogs, toads and salamanders are threatened. Forty percent are declining. Chytrid's arrival has laid waste to the indigenous Sierra Nevada yellow-legged frog, *Rana sierrae*.

In Dusy Basin, a remote glacial valley in Sequoia and Kings Canyon National Parks a few miles west of Bishop Pass, Vance Vredenburg, a professor of biology at San Francisco State University, is conducting an experiment he hopes will help preserve what remains of these once abundant creatures. Dr Vredenburg and his colleagues are inoculating chytrid-infected frogs with a bacteria, *Janthinobacterium lividum*, or J. liv, that does not prevent infection with chytrid but can help frogs survive.

Dr Vredenburg, Reid Harris of James Madison University in Harrisonburg, Va., and colleagues found the symbiotic bacteria on several amphibian species. Lab experiments last year showed that J. liv produces a metabolite, violacein, that is toxic to the chytrid fungus. Dr Vredenburg wants to see how effective the treatment will be in the wild.

Even before chytrid arrived, the Sierra frog population had been severely reduced by the California Department of Fish and Game's practice of seeding high-elevation lakes with hatchery-raised fingerling trout for the sport fishing industry.

Chytrid has hastened the destruction.

Dr Vredenburg and colleagues counted 512 populations scattered among the thousands of mountain lakes in the park in 1997. In 2009, 214 of these populations had gone extinct. A further 22 showed evidence of the disease. It is a far cry from the early 1900s, when frogs in the region were so common that lakeside visitors reported trampling them underfoot.

Dr Vredenburg, 41, has been doing frog research in the Sierra since the mid-1990s. He chose frogs as research subjects because he wanted to do "basic science that could be applied toward solving some real-world problems, like the biodiversity crisis. Once your study animals start dying, believe me, you pay attention!" At the time, he said, "I saw many scientists as living and working in a bubble. Besides," he added, "I like catching frogs."

For his Ph.D. at the University of California, Berkeley, under the mentorship of David Wake, Dr Vredenburg measured the effects introduced trout were having on mountain yellow-legged frog populations. The results were clear: They wreaked havoc. Brown and rainbow trout, not native at higher elevations, are voracious consumers of tadpoles. In 2001, as a result of work by Dr Vredenburg and Roland Knapp of the Sierra Nevada Aquatic Research Laboratory, the state fish and game agency and the National Park Service began a gill netting project to remove them. In areas where trout were removed, frogs recovered.

Curtis Milliron, a senior biologist at the fish and game department, pointed out that historically the agency has played a dual, sometimes paradoxical role. "We're both ecological stewards and recreational purveyors," Mr Milliron said. Although his agency is implicated in frog decline, now his charter is to create "a biodiversity management plan where we can maintain frog habitat and implement frog recovery."

Leaders at the National Park Service, too, once felt that "we need to protect the national parks from research scientists," said David Graber, chief scientist for the service's Pacific West region. Scientists' agendas were viewed as being at odds with the service's mandate, which calls for conservation and preservation as well as making parks available for recreation. "Now it's different," Dr Graber said. "Now all we care about are the massive frog die-offs. We're passionate about conservation. We can't wait for 'survival of the fittest.'"

Dr Vredenburg himself was "speechless" when the park service granted permission to carry out the J. liv experiment in Dusy Basin. "Then I had to start planning," he said.

Dr Vredenburg chose Dusy Basin for his experiment because chytrid is just arriving here. Unlike Sixty Lake Basin several miles to the south, where frogs

went extinct within four years of the arrival of chytrid, Dusy Basin still has frogs. Biologists do not know what first brought chytrid to the Sierra. But Dr Vredenburg's research showed that chytrid spreads in a linear wave across the landscape, an infection pattern like that of human epidemics. Infection levels start out light, then increase to very high. Then there is a mass die-off.

In July, Dr Vredenburg and his students captured and tagged 100 frogs, apparently the last remaining here, with transponder tags. They weighed and measured frogs, and they recorded the tag numbers using an electronic reader. The experimental group contained 80 frogs; 20 were designated controls.

Dr Vredenburg and his students placed experimental frogs in plastic containers for an hour long bath in cultured *J. liv* — long enough for *J. liv* to colonize on frogs' skins. They released the frogs into the ponds and streams where they had been captured.

The fieldwork suits Dr Vredenburg, who grew up in Texas and Mexico but looks like a classic blond California surfer. When he was in graduate school, he would often leave Berkeley after work, drive to a 10,000-foot-elevation trailhead, hike 16 miles to a research site carrying 80 pounds of equipment and set up camp before calling it a day.

Before graduate school, Dr Vredenburg spent three years working as a research diver in the Antarctic. He spent a year studying the effects of rampant cattle grazing on native trout in the Golden Trout Wilderness area south of Mount Whitney. He travelled to India to study Buddhism, considering becoming a monk. "I got the acceptance letter from Berkeley in New Delhi," he recalled. "I wasn't sure what I should do. I went to talk to my teacher, who seemed to think I'd already made up my mind."

Early in September, Dr Vredenburg made his last trip of the season to Dusy Basin to see how the frogs were faring. At this elevation, snowfall often starts right after Labor Day, and the lakes start to freeze over. The yellow-legged frogs hibernate beneath the ice for eight months of the year.

Dr Vredenburg spent two days catching frogs, weighing them, checking to see if they were experimental or control animals, and treating them. He found several that had not been tagged.

He found one untagged female in a puddle beside a lake. He held her outstretched in his hand and pointed to her yellow underbelly and the bright yellow-orange of her legs. "I can smell garlic on her," Dr Vredenburg said. "Many frogs species have defensive compounds that smell like garlic." He swabbed her belly, her thighs, her toes and the webbing between her feet. "This gets a layer of skin where I can detect both microbes," he explained. Later in the lab, he would extract DNA from the swab to verify the presence of the protective *J. liv* bacteria.

By Sept. 2, Dr Vredenburg had caught 43 frogs: 33 that had been treated with *J. liv* previously, one control — previously tagged but untreated — and eight brand new, which he treated. Frogs inoculated earlier in the summer were surviving.

Several weeks later, Dr Vredenburg had results from the lab: all the frogs caught in early September were infected with chytrid. The inoculated animals had the lowest levels of infection.

The real test for these frogs, though, is not their current level of infection but whether they survive the winter, and whether the juveniles undergoing metamorphosis from tadpole to frog can withstand the disease.

Dr Vredenburg is hopeful about his experiment, but like many of his colleagues he is not at all optimistic about the future of amphibians.

"There are still places in the world where chytrid hasn't shown up yet," he said, "like Madagascar. But it will. It's just a matter of time."



BURROWING INTO ACTHA'S PAST: 1989

By Mandy Conway

As you can see by the contents list below, the 1989 ACTHA Newsletters exploded in size and content. And not all the articles are mentioned here, I've just plucked out the most interesting titles!

For ease of access by members and archiving, all past ACTHA Newsletters will be digitally reproduced over time and placed on our website. Stay tuned...

February 1989

- Excursion reports: 'Bathurst district to search for the rare earless dragon *Tympanocryptis lineata*' and 'Ginni Flats in Brindabella Range reptiles and amphibians'
- Around town: Burton's Legless Lizard

April 1989

- 'Weird weather has the north's nature on the hop', the platypus frog, SMH article Dec '88
- 'Toadbusters aim to wipe out cane toads within 5 years in Brisbane', SMH article Mar '89

May 1989

- 'Shingle-backs, genetics & conservation', Steve Sarre, advertised speaker at Mtg
- 'Australian Frogs', by Michael J Tyler, book review by Will Osborne
- Fieldtrip to David Carter's study site at Deua, by Jo Vandermark
- 'Turtles & tortoises: telling the difference workshop', Arthur Georges & team, held in April

June 1989

- 'Gharial, *Gavialis gangeticus*, fish eating crocodile' video, David Carter, advertised speaker at Mtg
- 'There's a frog in my stomach' by Michael J Tyler, book review by David Carter
- ACTHA field trips advertised: Rosedale, Ballaba, Deua, Behind the scenes at Australia Museum & Taronga Zoo

July 1989

- 'Crocodiles, fresh and salt water', David Carter, advertised speaker at Mtg
- Historic ACTHA Mtg, 32 members at June AGM for unanimous adoption of a constitution for ACTHA
- 'Man on the rim: the peopling of the Pacific', member Alan Thorne presents an 11 part TV series
- 'Australia's reptiles: a photographic reference to the terrestrial reptiles of Australia', by Stephen K. Wilson & David G. Knowles, book review by Ric Longmore
- '*Hemiergis maccoyi*' article

Aug 1989

- 'Dinosaurs: were they really the ultimate reptile?', Russell Moran, advertised speaker at Mtg
- Notes on breeding *Morelia spilota spilota x variegata*, by Ron Dencio
- Should ACTHA sponsor a reptile at Taronga Park Zoo

- Field trip to Burrawarra Point, South Rosedale, 6-7 August '89, article by Tim Deveson
- Funding for ACTHA Gippsland Water Dragon Project accepted by The Peter Rankin Trust Fund
- Sydney field trip to the Australian Museum, Taronga Zoo & Eric Worrell's Aust. Reptile Park, 7-9 July '89
- 'Crocodile parachutes into a swimming pool and attacks children', UK newspaper article

September 1989

- 'Herpetofauna of Australia's Top End', Dr R. (Hank) Jenkins, advertised speaker for Mtg
- ACTHA has a new letterhead, Gippsland Water Dragon drawing by Frank Knight
- Orroral Valley ACTHA excursion, 27 Aug '89, by Norman Morrison
- '6m, 113kg python caught in Florida'
- ACTHA Committee Mtg: newly constituted ACTHA to join The Australasian Assoc of Herpetological Societies
- 'Frogs: Australian Junior Field Guides', by Eleanor Stodart, book review by Fiona Brand
- Herp Techniques Short Course, NSW TAFE
- Small-eyed Snake *Cryptophis nigrescens* 9 specimens found (6 by ACTHA) in the ACT: an unusual occurrence in this region

October 1989

- 'The Herpetofauna of Australia', Dr Harold Cogger, advertised speaker for Mtg
- 'What is a Dinosaur?' (5 pages), by Russell Moran
- Communal mating of Diamond Pythons, 5 day ACTHA field trip, article by Jo Vandermark
- First World Congress of Herpetology, 11-19 Sept '89, UK, Ric Longmore, David Carter and Arthur Georges
- 'The Bearded Dragon', newspaper article based on interview with Jo Vandermark

November 1989

- 'Snakes of the ACT', Ric Longmore, advertised speaker for Mtg
- Round Hill Nature Reserve, NSW, ACTHA field trip, 21-22 Oct '89, by Norm Morrison
- 'Graeme Gow's Complete Guide to Australian Snakes', book review by Ric Longmore
- ACTHA field trip to Deua to observe goannas
- Fox predation of Canberra turtles
- 'Boy swallows pet slider turtle which is removed alive after 2 days', UK newspaper article
- Four CCAE (UC) students complete undergraduate projects on reptiles

Dec 1989

- 'First International Symposium on Varanids', Bonn West Germany, 20 - 22 Sept 1989, by David Carter
- Frog field excursion on lower slopes of Mount Ainslie, Mon 4 Dec, led by John Wombey, first article by Mandy Conway!



ACTHA trip to Sydney in Nov 2010 to meet with Hal Cogger & Hal Heatwole
Nine ACTHA members made their way to Sydney to meet messers Hal as well as
see reptiles at Darling Harbour and Gosford. A write-up of this amazing
expedition will be included in our next Newsletter. Stay tuned!

ACT HERPETOLOGICAL ASSOCIATION INC. 2010 - 2011 MEMBERSHIP RENEWAL LAST CHANCE!

Membership renewal runs from 1 July 2010 to 30 June 2011 and costs \$10 for all memberships.
Herpetofauna is an additional \$12 for the two issues of December 2010 and June 2011.

Check your membership status at our December Christmas party.

Please make your cheque out to ACTHA Inc., fill in your details below and send it to
ACTHA Membership Officer, PO Box 160, Jamison ACT 2614.

Surname:

Given name(s):

Address:

State/Territory:

Postcode:

Telephone (h):

Telephone (w):

Email:

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

St George Bank, BSB 112-908, A/c 040003311

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

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

Christmas party for ACTHA members

6.30pm, Tuesday 14th December 2010

Our Christmas party is to be held at the **Australian National Botanic Gardens**,
within the **Greenhouse complex**, Frith Rd, O'Connor (access is via Dryandra St).

Our guest will be Dave Hunter, who will give a much anticipated slideshow
on some of the herps he crossed paths with around Darwin.

This will be followed by a **BBQ** with a selection of food & drink, where planning
for ***Snakes Alive! 2011*** will be the hot topic of conversation.

The Exhibition is only **4 weeks away** and we really **need more volunteers!**

RSVP to mmconway@hotmail.com.au *by Friday, 10 December 2010*



ACTHA News

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