

# NATURE TERRITORY

August 2010

Newsletter of the Northern Territory Field Naturalists Club Inc.

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Club web-site: <http://ntfieldnaturalists.org.au/>

**Meetings** are generally held on the second Wednesday of every month, commencing at 7:45 PM, in Blue 1.14 (Business Faculty Building) on the Casuarina Campus of Charles Darwin University.

**Subscriptions** are on a financial-year basis and are: Families/Institutional - \$30; Singles - \$25; Concessions - \$15. Discounts are available for new members – please contact us.

Life away from water isn't easy for frogs because they lose water easily through their skin.

However, "tree-frogs" such as this Wotjulum Frog (*Litoria wotjulumensis*) have been remarkably successful in doing just that in northern Australia.

Recently-published research by Club member Chris Tracy and others exploring the consequences for tolerance of dry conditions of different skin permeability at a range of temperatures is summarised on page 9.

Photo: Chris Tracy.



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**Disclaimer:** The views expressed in *Nature Territory* are not necessarily those of the NT Field Naturalists Club Inc. or members of its Committee.

## Club activities

**August meeting.** Wednesday August 11, 7:45 PM. Blue 1.14 (Business Bldg.), CDU.

### Jon Clark

**"Bornean Birds, primates and more from the coast to the 4000m peak of Mt. Kinabalu"**



Jon took this photo of the rare Bornean Blue Flycatcher – anticipate a feast of wonderful photos at the August meeting.

Asia on your doorstep is one perk of living in Darwin, and Borneo has to be one of the crown jewels. Along the banks of lowland rivers such as the Kinabatangan you can find the endangered Orangutan and the unique, endemic Proboscis Monkeys with a nose that can cover 25% of a dominant male's face. In the hills it is a bug lovers paradise, with the loud chorus from cicadas, a multitude of colourful butterflies and large rhinoceros beetles to name a few. While ascending the steep trail of Mt. Kinabalu, pitcher plants and orchids are a highlight. In addition, you can find many of the 51 endemic birds that are part of the 664 species that can be found on the island. The small islands off the coast are a major breeding area for Hawksbill and Green sea turtles. All of this diversity can be found in the state of Sabah which is part of Malaysian Borneo we were amazed at how much one could experience in just two short weeks. The only unpleasantness to be found in Borneo is the fast conversion of native vegetation such as peatlands and

rainforest to palm oil plantations. Armed with only a camera, we managed to capture a small part of what this wonderful island has to offer!



### **August field trip. Camp-out, Pine Creek, 14–15 August.**

Locations to be visited include Umbrawarra Gorge, Copperfield Dam, Pine Creek Cemetery and Sewage Ponds. Avifauna aficionados may get to see Hooded Parrots, Gouldian Finches, Black-fronted Dotterels and Whistling-ducks. For the entomology enthusiasts there are likely to be Common Crow butterflies aggregating in the gorge and brightly-coloured orange and black Torpedo Grasshoppers may be sighted at some point during the weekend. Meet opposite Mayse's Café (40 Moule Street) at 11:30AM on Saturday 14 August for an early lunch. At 12:30PM we will head to Umbrawarra Gorge for the afternoon. The Gorge is about 40 minutes drive along a reasonable gravel road. There is some rock art at the Gorge.

Early (about 7:30AM) on the Sunday (15 August) we will visit Copperfield Dam, which is about 10 minutes from the centre of town. This will be followed by a trip to the cemetery and sewage ponds later in the morning. Both of the latter locations are less than five minutes drive from town.

The trip will officially end by lunchtime on the Sunday but people may wish to take the scenic route home via Robin Falls or some other destination.

Accommodation in Pine Creek includes a hotel-motel and a caravan park. Please make your own arrangements for accommodation. If anybody wishes to car pool, please contact Fiona Douglas, phone 8985 4179 or email [fiona.douglas@octa4.net.au](mailto:fiona.douglas@octa4.net.au).



**September meeting** Wed. 8 Sept.. Judit Szabo: *Neomapas Aves: Surveying birds in Venezuela.*

This is also our Annual General Meeting; see notice on page 3.

**October meeting** Wednesday 13 October. Emma Francis: *Mangrove snakes.*

**November meeting** Wednesday 10 November. Azlan: *Mangrove birds.*

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## Top End Native Plant Society activities

**August 19 meeting.** David Griffiths: *Boabs of the Botanic Garden.*

**September 16 meeting.** Garry Cook: *Thorned Acacias and ancient herbivores.*

General meetings are held on the 3<sup>rd</sup> Thursday of the month at the Marrara Christian College, corner Amy Johnson Ave. and McMillans Road, and commence at 7:30 PM (speaker at 8 PM).

# Club notices

**Welcome to new members: Peter Kyne & Micha Jackson; Glen Sperring.**

**Thank you:** The previous issue was proof-read by **Christine Maas** and collated and mailed by **Fiona Douglas**. It was printed by **Fiona Douglas** and **Don Franklin** using equipment kindly made available by the electoral office of **Michael Gunner MP** and the **School for Environmental Research** at Charles Darwin University.

## Notice of Annual General Meeting

The Annual General Meeting of The NT Field Naturalists Club Inc. will be held at 7.45pm on Wed. September 8 in Room Blue 1.14, Casuarina Campus of Charles Darwin University. Issues to be considered include:

- the audited accounts for 2009-10. Audited accounts will be available from Fiona Douglas (8985 4179 or [fiona.douglas@octa4.net.au](mailto:fiona.douglas@octa4.net.au)) from 23<sup>th</sup> August, and will be included in the September newsletter.
- election of Office Bearers and Management Committee for 2009-2010. A nomination form will be included in the September newsletter.

Our President and Membership Officer will not be available for these positions next year, so we're keen to identify new blood for the Committee. Furthermore, your Newsletter Editor will likely be unavailable for 3-6 months next year, so the Committee is looking for a temporary or permanent replacement. If you are interested in participating in the Committee's activities in any capacity, please contact the President or another Committee member.

**Newsletter contributions welcome:** Sightings, reports, travelogues, reviews, photographs, sketches, news, comments, opinions, theories ..... , anything relevant to natural history. Please forward material to Don at [eucalypt@octa4.net.au](mailto:eucalypt@octa4.net.au) or the Club's postal address, or contact him on 8948 1293.

Deadline for the September newsletter: Friday August 20.

## Annual subscriptions overdue

We thank the very many people who have renewed their membership. If you have not, and do not renew shortly, this will be the last newsletter you receive. If you have not yet renewed, and you receive your newsletter by:

- email – the newsletter email will have been accompanied by a notice to this effect;
- snail mail – your membership expiry date on the address page will be 30/06/2010.

**Need a Club membership form?** Go to: <http://sites.google.com/site/ntfieldnaturalists/downloads>.

**Club library:** The Club's journal and book collection is available to members. Lists of holdings can be found on our web-site: <http://sites.google.com/site/ntfieldnaturalists/library>. The library is housed in two sections:

**Books, reports and CDs:** at the medical clinic of Dr. Lyn Reid in the Rapid Creek Business Village. This can be accessed directly between 9 AM and 2:30 PM Tuesday to Thursday, and 4-6 PM on Tuesday, or indirectly by phoning Lyn at work on 8985 3250.

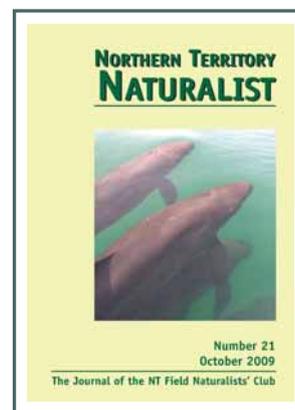
**Journals:** in the office of Don Franklin at CDU Casuarina (Red 1.2.34). These can be accessed directly during working hours, or by ringing Don on 8946 6976 (w) or 8948 1293 (h).

**Northern Territory Naturalist:** The Editorial Committee of the Club's journal, the *Northern Territory Naturalist*, is now calling for manuscripts for issue no. 23. The journal publishes works concerning any aspect of the natural history and ecology of the Northern Territory or adjacent northern Australia. and may include Research Papers (Articles or Short Notes), Reviews, Species Profiles and Book Reviews.

The *Northern Territory Naturalist* is a registered, peer-reviewed journal (ISSN 0155-4093) and is recognised as a Category C publication by the Australian Research Council ([http://www.arc.gov.au/era/era\\_journal\\_list.htm](http://www.arc.gov.au/era/era_journal_list.htm)). Author instructions may be downloaded from our web-site: <http://sites.google.com/site/ntfieldnaturalists/journal>.

If possible, manuscripts should be submitted in digital form by email to [michael.braby@nt.gov.au](mailto:michael.braby@nt.gov.au). Editors of the journal are Dr Lynda Prior, Dr Michael Braby and Dr Chris Tracy.

The journal page of the web-site also has an order form for back issues of the *Northern Territory Naturalist*, which are available individually or as a set (some are out of print and available as photocopies only).



# Black Butcherbird depredating nestlings of Broad-billed Flycatcher

**Richard Noske**

The breeding success of birds in mangals (mangroves) around Darwin is low, primarily due to predation of eggs and young, although flooding by high tides is another cause. In studies at Ludmilla Creek and Nightcliff, about 70% of nests of Gerygones of two species, and 60% of nests of Lemon-bellied Flycatcher, lost eggs or young to nest predators. A study of artificial nests also suggested that the level of nest predation in mangals was higher than that in savanna woodland, monsoon rainforest and riparian habitat (Noske *et al.* 2008). Discovering an empty nest is therefore a common occurrence in studies of mangal-dwelling birds, but sadly, the culprits are very rarely known. Many hundreds of hours of video footage, and many days of infra-red and motion-sensor camera photographs have failed to capture them in the act except for one Yellow Oriole investigating the contents of an artificial nest. But this all changed at 09:30 hrs on 23 June 2010, when I witnessed an entire nest predation event.



These Broad-billed Flycatcher chicks are at least 5 days older than those that were predated by the Black Butcherbird. Photo: Richard Noske.

I had been monitoring nests of Broad-billed Flycatchers in the Nightcliff mangal over the previous 2 months, and of four nests (belonging to four separate pairs), only one was left, the other three presumably depredated by something. Fiona Douglas and I looked at this remaining nest 8 days before, when the parents had been sitting, presumably on eggs. On the morning in question I was expecting that this nest would be empty, too. I was wrong, but what happened over the next 10 minutes changed that. Having seen no life at the nest, I was drawn to the buzzing calls of an adult about 30 m away.

The parents were both dive-bombing a solitary Black Butcherbird, which was slowly heading in the direction of the nest. The butcherbird had been banded by the Nightcliff banding group just over a year before, and was a common sight on my "rounds" of the mangal. Whether it knew the nest's location or was being "guided" by the intensity of the

parents' harassment, I have no idea. But there was no mistaking its intentions as when it was about 10 m from the nest it flew straight to it, and within 30 seconds plucked a baby (with pin-feathers) from the nest, flew a few metres to a perch, where it bashed the hapless chick 3-4 times, before first attempting to swallow it. Two more attempts and down it went. That done, the butcherbird flew right back to the nest, plucked the other chick out, and flew off with it across the reef, with one parent in hot pursuit. The whole predation event was over within 5 minutes.

The male soon returned to the nest tree, but the female was nowhere to be seen. He foraged around there for 10 minutes or so, perching high where he could probably see the empty nest, but eventually he moved on. I've no idea whether they felt any grief, but I certainly did. I had contemplated stopping the butcherbird from taking the 2<sup>nd</sup> chick, but realised that once I was gone, it would almost certainly return to claim its dessert. Its chipped upper mandible (noted when Fiona, Ian Hance and I caught it last year) was obviously little handicap; and I regularly see it in the mangal, pursuing other sorts of prey. I suspect the 2 chicks would've sated it for longer than the average large insect or crustacean.

In the thousands of hours I have spent in that mangal, and thousands in other mangals, and thousands of hours spent by my colleagues and students in mangals, I and my colleagues have only witnessed Black Butcherbirds attacking a nest once each (3 separate events), but the details of the event were never seen. So I feel extremely privileged to have witnessed this event, especially given that I had not visited the nest for 8 days, and had I arrived 10 minutes later or earlier I may have been blissfully aware of what had happened or was about to unfold.

And finally we have concrete evidence of Black Butcherbirds causing the complete loss of a brood of a mangal-specialised passerine.

**Reference** Noske RA, Fischer S, Brook BW. 2008. Artificial nest predation rates vary among habitats in the Australian monsoon tropics. *Ecological Research* 23: 519-527.

Nest predator: the Black Butcherbird.  
Photo: Trevor Collins.



# Cane Toads from *Recent Literature*, page 11

## Biology & ecology of Cane Toads

It is now well-established that Cane Toads at the invasion front have evolved to be better invaders; or perhaps, to put it another way, those behind the invasion front evolve a different set of traits better suited to survival and reproduction of individuals in an established population. Two recent papers shed further light on the subject. Llewelyn *et al.* (2010) found that Cane Toads from the invasion front don't move any faster than those away from the front – but they have three times the endurance. And (even) under controlled, experimental conditions, Phillips (2009) found that toad tadpoles and juveniles from the invasion front grow 30% faster than those from elsewhere.

Cane Toad populations are often infected by the lungworm (a nematode, *Rhabdias pseudosphaerocephala*). “Infected toads exhibited reduced survival and growth rates, impaired locomotor performance (both speed and endurance), and reduced prey intake” (Kelehear *et al.* 2009). However, Cane Toads at the invasion front enjoy a “honeymoon” as the lungworms catch up with the Toads one to three years after the Cane Toad population is established (Phillips *et al.* 2010b).

Female Cane Toads beware! Male Toads may call to attract them, but once in range .... females do have some capacity to enforce their choice of mates – by inflating themselves, they have a much improved chance of shedding a male who's attention is unwanted (Bruning *et al.* 2010).

## Impact and response

Add the Northern Blue-tongue Lizard (*Tiliqua scincoides intermedia*) to the list of casualties. Price-Rees *et al.* (2010) monitored numbers of this skink using night-time surveys along roads in the Fogg Dam area before after the arrival of Cane Toads. Numbers declined when the Toads arrived and subsequently disappeared altogether, none being detected in surveys over 20 months. Furthermore, “in the laboratory, foraging responses of bluetongues were as intense to cane-toad scent as to the scent of native frogs, and many of the lizards we tested attempted to consume toads, and were poisoned as a result.”

In laboratory trials, tadpoles of all 15 frog species tested died when they consumed the eggs of Cane Toads (Crossland & Shine 2010). However, there was marked variation among species in mortality rates, from 0 – 70%, depending on the willingness of the tadpoles to consume the toad eggs. The presence of an alternative food source often also made a difference: “Tadpole mortality was decreased by the presence of an alternative food source in four species, increased in two species, and not affected in seven species.” In three of four species tested for differences between “small (early-stage) and large (late-stage) tadpoles, both mean survival rates and the effects of alternative food on survival shifted with tadpole body size.”



Much like other Top End frogs, Dahl's Aquatic Frog is vulnerable to Cane Toad toxin. Populations persist by avoiding eating (young) toads. Photo: Chris Tracy.

Popular reports have suggested that adult Dahl's Aquatic-frog (*Litoria dahlui*) differ from other native frogs in being able to consume Cane Toad tadpoles without harm, and even that the frog offers potential to control Toads. However, this report has not stood up to the scrutiny of rigorous testing (Shine *et al.* 2009). In contrast, it appears likely that the Sooty Grunter, a fish, can consume adult Cane Toads without serious consequences (Davis & Perna 2009), though rigorous testing remains to be undertaken. More evidence has emerged that, in the presence of Cane Toads, it doesn't pay to have a big mouth – and that natural selection for being small-mouthed – and “toad-shy” – may be an adaptive response that will enable the survival of some species that are otherwise vulnerable to the toxin in ingested Cane Toads. Studying the Death Adder (*Acanthophis praelongus*), Phillips *et al.* (2010a) found that “during laboratory trials and field radiotracking, toads killed 48% of the adders we studied. Long-term monitoring of the population also suggests a massive decline (>89%) in recent years concurrent with the arrival of toads. Variation in snake physiology (resistance to toad toxin) had little bearing on snake survival in the field. [However] .... smaller snakes with relatively small heads, and snakes that were unwilling to attack toads in the laboratory, had much higher survival rates in the field.” A somewhat similar trend is evident in the Marbled Frog (*Limnodynastes convexiusculus*) (Greenlees *et al.* 2010). When metamorphs (between the tadpole and adult stage) of the species “first encounter invasive cane toads ....., they try to eat the toxic invader and, if they are able to do so, are likely to die from poisoning. .... small metamorphs cannot ingest a toad and thus survive long enough to disperse away from the natal pond (and thus from potentially deadly toads)”.

# Captive breeding of native species

## Reporting on Greg Miles' talk at the July club meeting

Ian Hance

Greg needs no introduction to Field Nats members and attracted an audience of over 50 members and visitors. He spoke passionately about his dream of securing native wildlife from extinction through captive breeding programs.

Greg stated that there needs to be a national campaign to review approaches to and laws about wildlife protection, as legislation both state and federally is clearly failing and is outdated given the increase in knowledge and data that is now available. The laws governing the possession of native species were drafted in the late 1960s and early 1970s. Given that the current rate of extinctions worldwide according to Dr. Richard Kingston is 1,000 to 10,000 times greater than at any time since the time of the dinosaurs, there is an urgent need for new strategies, of which captive breeding is one. There is resistance by government bodies to captive breeding programs.

Greg stated that the Federal Government needs to admit that there are other people who now know how to look after biodiversity, knowledge that didn't exist when the original laws were drafted.

In the national parks (our reservoirs for native wildlife), the current policies are failing because of the vested interest in making them more aesthetically more appealing to the general population rather than looking after the native animals they contain. Greg quoted Kakadu as an example with an annual budget of \$18 million yet according to John Woinarski's study there has been an 80% decline in wildlife since management began. Greg showed a map of endemism for the N.T. which clearly showed the greatest concentration of wildlife species to be in Kakadu and Western Arnhem land region. He also showed a map of areas burnt in one year and noted the extent of damaging hot fires late in the dry season although there seems to be no certain "smoking gun" or single cause for the rapid decline of so many species.

One solution to securing species is to make wildlife a viable commercial concern – give them a market value to be sold on as pets or to collectors. Greg feels that this would work on species that are easy to look after, leaving the more difficult to captive breeding programs in zoos or to experienced carers.

This idea in no way suggests that species once so secured should be reintroduced into their natural environment. This would be self-defeating whilst the current threats to the environment (threats exist in every ecosystem in Australia) remain unresolved.

A worrying example of an approaching threat is the spread of the Cane Toad into Western Australia. Greg thinks that now is the time to take species obviously under threat out of the environment before the Cane Toad arrives.

Greg contrasted the success story of the Rough-scaled Python of the Kimberley with the apparent inaction to secure the Oenpelli Python of the Kakadu escarpment in "The Tale of Two Pythons". After many applications to the WA Government, John White was finally allowed to start a captive breeding program of the Rough-scaled Python from specimens taken from the wild. He very quickly bred up 1,000 young from the 3 or 4 original pythons. Now there are far more pythons in captivity than in the wild, which is very timely considering the expected arrival of the Cane Toad and the anticipated decline of the python.



A local in need of a captive breeding program? Oenpelli Python (*Morelia oenpelliensis*). Photo: Greg Miles.

But the Oenpelli Python has no similar breeding program as taking animals out of national parks such as Kakadu is not permitted by either the NT or Federal Government.

Other success stories demonstrated were: the commercialization of the Wollemi Pine of the Blue Mountains National Park, captive breeding of the Corroboree Frog, and the current breeding program for the Tasmanian Devil at Barrington Tops and other facilities. Presumably the plan is to reintroduce the Devils back into Tasmania after the disease is either eradicated or the affected population becomes extinct.

After Greg's talk, a lively discussion ensued on related problems such as other NT species under threat, threats to the environment such as Gamba Grass, Salvinia and Mimosa, the difficulty in managing fire regimes, problems dealing with accidental release into new environments, keeping gene pools viable, and the apparent obsession of some collectors to hybridize species. Major question would be: what is a safe breeding program? who would be licensed to do this? how to involve indigenous communities in making commercial ventures with wildlife.

Greg left us with this to ponder "the final question we should be asking is: is extinction better than captivity?" Many thanks to Greg for a very enjoyable and thought-provoking talk.

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# Fish, turtles and water-plants

## Reporting on the August excursion

Fiona Douglas; photos by Sherry Prince

After a bit of confusion for some about the numbering system along Mahaffey Road, a good crowd met Greg Miles at Dave Wilson's place to hear about Dave's native fish and water-plant breeding venture. Dave's enthusiasm was evident and stories of his manoeuvring through bureaucratic mazes demonstrated his persistence and determination. Apparently traditional owners of locations whence Dave sourced his fish are very supportive of what he is doing, but other authorities have been less so. Traditional owners benefit from his endeavours, with Dave paying them 10% of the receipts from his fish sales at the end of each year.

An impressive series of tanks houses Dave's collections. Water is heated in the Dry by being circulated through black poly pipe laid out in the sun, and is kept clean by use of vegetation, snails and fish. Vegetation in tanks absorbs nitrogen, other undesirable nutrients and pollutants such as heavy metals. Snails and some species of fish keep down algae and unwanted vegetation. Dave showed us several different colours of Rainbow Fish, which may or may not be separate species, as well as Gudgeon, Archer Fish and others. Tanks contain various combinations of species and sizes of fish; breeding fish is no problem to Dave and he has not had to collect more fish from the wild because of death of stock.

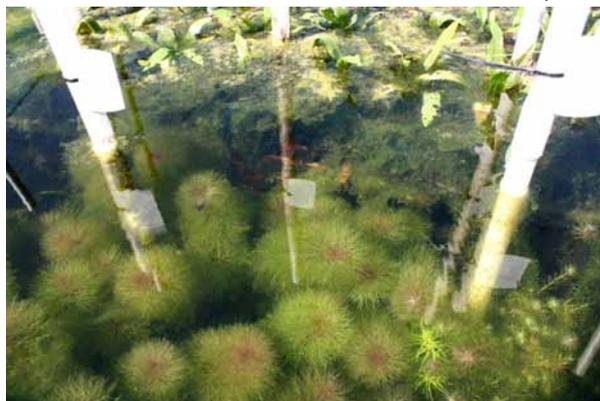
Several of us took home a sample from the extensive range of aquatic plants also growing in the ponds; these showed great variety of size and shape of frond and, in some cases, colour as well. Fertiliser is able to be delivered most effectively, right to the root system of plants, via vertical black poly pipes seated into the base of each plant pot, thus minimising waste from dilution by the tank water.

As we went back to the vehicles we were introduced to one of the frogs Dave also breeds – a large fit-looking specimen of the Kimberley species *Litoria splendida*, green with pale yellow spots all over the back and with yellow/orange backs to the inner thighs. Frogs are fed with insects caught in a light trap over a funnel, with a pipe attached, that allows the trapped insects to fall down to a feeding area within the cage.



Above: Dave Wilson (yellow shirt) explaining some of the finer points of curating fish and water plants.

Below: Dave's water plants



The Magnificent Tree-frog (*Litoria splendida*).

Having been introduced to this sustainable, commercial enterprise involving native fish, frogs and water plants, we then formed a long convoy and followed Greg to his home a few minutes away. Set in a mixed woodland, in which Greg practices his own fire regime, Greg's house has an unusual "swimming pool" out the back – a breeding area for Pig-nosed Turtles. These turtles, found only in a few river systems in the Top End of the NT, the Kimberley, Indonesia and southern New Guinea, form a monotypic genus. They are highly threatened outside Australia because of illegal capture for an international market. Wild populations are probably secure within Australia

but, Greg argued, permitting captive breeding and then export of young turtles would enable the international trade to continue while reducing the pressure on wild populations. Greg considers that he has largely filled the Australian demand now, but he is currently not permitted to export any animals.

The turtle enclosure is surrounded by a secure, roofed shadecloth structure and includes an entertainment area. The turtle pool is shaped like an asymmetrical H, with the top of one upright transferred to be tacked on sideways to the top of the other. The shorter side is densely vegetated with a huge variety of aquatic and water-edge plants used for keeping the water clean. Only a very small water pump is needed, and the water is heated in the Dry season by

being circulated through a long serpentine of black poly pipe laid out behind the enclosure. Widths of shade cloth draped over the sides and into the pool sustain colonies of various bacteria that help to keep the water in good condition. Plants and turtles flourish, the water is very clean and gravid females appreciate the warmed water, often congregating under the inlet for hours at a time. Female Pig-nosed Turtles in the wild show the same behaviour, in the Dry season congregating in parts of the Daly River where thermal springs are found.



Greg's turtle pond.



Pig-nosed Turtle (*Carettochelys insculpta*).

The longer arm of the H is the adult turtle pool with a north-facing, carefully-constructed beach for egg-laying in the additional bay at one end. Females spend some time inspecting beaches before laying begins. Each female lays two clutches of about 10 eggs in a year, but only in alternate years. Laying is not synchronised, with some laying each year. Incubation lasts around 2-3 months, depending on temperature and environmental water. It seems likely that, in the wild, a good fall of rain, or stream rise, triggers the explosive release of young turtles

from the eggs, presumably to optimise survival as turtles are aquatic on hatching and for the rest of their lives. Greg collects eggs and incubates them before selling young turtles as soon as possible. Gender depends on incubation temperature and Greg tries to breed males for sale. Greg reckons to bring to sale about 17 young turtles from every 20 eggs. Any young turtles he keeps are safe in the densely-vegetated area of the pool, which provides cover and which is separated from the main pool by a vertical mesh barrier in the crosspiece of the H, to prevent adult turtles from entering the 'nursery'. This is required because adults will eat the young ones if not separated from them. Young turtles are rather delicate during their first year, before their immune systems seem to mature. Growth of young slows if their container is small, making them a good animal to keep even if large tanks are not available. They are long-lived and don't breed until they are 16 years old.

Adult turtles have a staple diet of bread (must be fresh!), Good-O dog rings, and softish dried dates that are imported from New South Wales. The turtles are, Greg says, more like mammals than herps as they need daily feeding. Occasional addition of roo meat (or other smelly meat) and living water plants supplement the basic diet. Young turtles are very playful, but when they are adults the females are dominant, the males bearing a number of scars to prove it. The bite from a turtle is very powerful and we were shown a piece of hard plastic that had an even mouth-sized piece bitten out of it. These turtles are unique in several ways: they have a soft living skin over their shell, which means they bleed if they crawl over rocks; they retract their necks rather than move them to the side like the other freshwater turtles; and their eggs are spherical and hard-shelled (other Australian freshwater turtles lay oval eggs and sea turtles eggs although also round, are soft-shelled). According to Greg, these turtles are also very stupid! We didn't all agree – the pickiness in food suggests a degree of learning at least! Greg is obviously very fond of them and we could see that they do indeed have some charisma.

We give Greg and Dave our most sincere thanks for the time and effort they put in to show us around and talk about what they do. We wish them continued good health for their stock and good luck with their enterprises.



### **Nesting behaviour of Pig-nosed Turtles** (from *Recent Literature*, page 11)

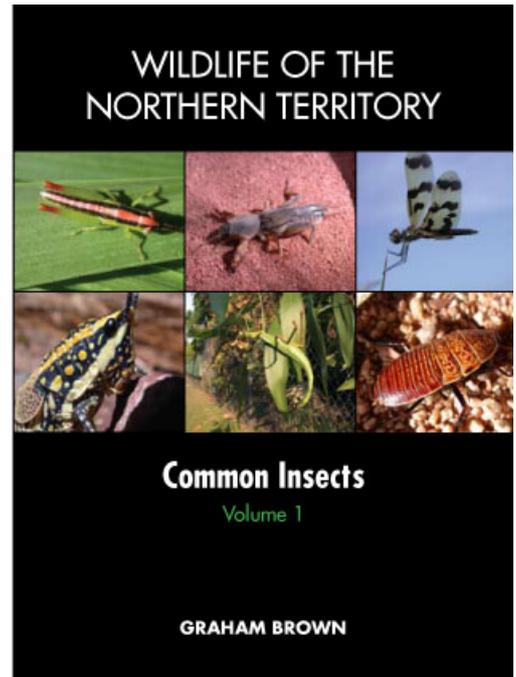
The Pig-nosed Turtle (*Carettochelys insculpta*) is a large freshwater turtle that lays its eggs on sandy riverside beaches and banks. Its nesting behaviour is reported by Doody *et al.* (2009) from a study along the Daly River near Ooloo Crossing. Females came ashore to lay in the evening when it is dark and on average 6 times at 1–2 beaches over 2 nights. They spend an average of 27 minutes on the beach. Females swim up and down the river in groups of 2 to 8 prior to nesting, and up to 4 nest on a beach on the same night. However, they are known to “argue” over nest sites, which contributes to the abandonment of some “test holes”.

# New booklet: common insects of the Northern Territory

Brown G. 2010. *Wildlife of the Northern Territory. Volume 1. Common Insects*. Graham Brown: Darwin.

60 pages, 15 x 11 cm, full colour. Available for about \$17- from good bookshops including the Museum and CDU bookshop, and for \$15- from the author.

Club member Graham Brown has produced this booklet as a complement to his far more extensive CD *Northern Territory Insects*. It is intended as a pocket guide for visitors and should also be most useful to primary and secondary school students and field naturalists with a spark of interest but limited knowledge of entomology in general, or of particular insect groups. Following seven pages of introductory notes, the more prominent insect groups including dragonflies, cockroaches, mantises, grasshoppers, bugs, antlions and more are each treated over two or more pages. There is a brief, non-technical description of each group and notes on biology and other matters of general interest. Each group is illustrated by a series of photos of select, mostly common species. At the end, two pages are devoted to other “creepy-crawly” groups such as spiders, scorpions and millipedes that might be confused with insects, and one page to *Further Readings* (this could have been usefully expanded).



I've added this to my field kit. The lay-out is simple and clear throughout and this is a great way to start on local entomology. Photo quality is good to excellent, though older users such as myself may struggle with the detail of small photos – an inevitable compromise in a pocket guide.



## From *Recent Literature*, page 11

**Frogs surviving without moisture** How long can a frog survive in dry air such as might be experienced by a frog in Darwin in June without a source of moisture? It depends, according to Tracy *et al.* (2010), upon the size of the frog and the permeability of its skin, as well as on temperature and evaporative wind. The answer, for an adult Green Tree-frog (*Litoria caerulea*) weighing about 40 g is estimated from a detailed model to be about 24 hours at day-time temperatures with a light breeze but as much as 6 weeks at night-time temperatures. No wonder they mostly hide away in sheltered places during the day (could be something to do with predators as well). For a 9 g juvenile of the same species, the equivalent times are 3 hours and 2.5 days respectively.

The challenge is a (proverbial) evolutionary double-edged sword for frogs. Losing moisture is a way of keeping cool much like sweating, but a permeable skin also limits their ability to maintain internal body temperature because of continuous evaporative cooling. On the other hand, having a less permeable skin makes it more difficult to absorb moisture when moisture is scarce – such as by absorbing overnight dew. The latter may be why, Tracy *et al.* suggest, frogs in seasonally dry environments tend to be large. They also provide evidence that frogs with a greater capacity to resist drying out tend strongly to be tree-dwellers. Adults of ground-dwelling species that form cocoons as drought refuges are also highly resistant to drying out, but only within their cocoon.

**Non-native geckos** The Asian House Gecko (*Hemidactylus frenatus*) is more widespread in the Northern Territory than is generally understood, according to McKay *et al.* (2009). The authors collated records from the Northern Territory Vertebrate Fauna Atlas and field surveys. Though records are most dense in the north-western Top End, the species has also been recorded at a few location in Arnhem Land, on a number of islands (the Tiwis, Croker, Marchinbar and Groote Eylandt), and at scattered locations inland all the way south to Ti-tree. Although most records are from buildings and in nearby bush, the species has been recorded up to 1 km from any artificial structures or any road or track at three locations, two near Darwin and one in Kakadu, all in moist forests.

Prior to 2005, the Mourning Gecko (*Lepidodactylus lugubris*) had been recorded in the Northern Territory only in the Wessel Islands off the coast of Arnhem Land. McKay & Horner (2007), however, reported 7 records of the species on the NT mainland, all from one house in Rapid Creek in 2005 and 2006. The species can be confused with the Asian House Gecko, from which it can be distinguished by the relatively broad tail with a fringe of tiny spines and sometimes held coiled to one side, and small black spots or transverse zigzags on the back. The authors note that the species can reproduce parthogenetically (i.e in the absence of males). They suggest that the species was introduced accidentally to Rapid Creek, perhaps as a single female, and that further introductions are quite likely. Its natural range includes Indonesia. Check your resident geckos!

# Interesting bird sightings

26 June to 25 July 2010

Compiled by Ian Hance

Sightings are as reported (unvetted, unconfirmed) and have been mostly compiled from the e-mail digest of the NT birder website (<http://groups.yahoo.com/group/ntbirds>) moderated by Niven McCrie.

Species	Date	Location	Observer/s	Nos./comments
<b>Waterbirds &amp; seabirds</b>				
Wilson's Storm-Petrel	11/07	Groote Eylandt	Braden McDonald	1
Pied Cormorant	23/07	Leaning Tree Lagoon	Bas Hensen <i>et al.</i>	1
White-browed Crane	18/07	McMinns Lagoon	Peter Kyne & Micha Jackson	1
<b>Birds of prey</b>				
Eastern Osprey	17/07	Channel 9 tower, Darwin	Sheryl & Arthur Keates	adult feeding chick
Square-tailed Kite	17/07	CDU Casuarina	Ian Hance	1
Collared Sparrowhawk	20/07	CDU Casuarina	Jessie & Jo	1
Spotted Harrier	21/07	Adelaide River floodplain	Bas Hensen	1
Black Falcon	21/07	Marrakai Track	Bas Hensen	1
Rufous Owl	17/07	Humpty Doo	Darryel Binns	1
Barking Owl	6/06	Harrison Dam	Darryel Binns <i>et al.</i>	7
Grass Owl	6/06	Anzac H'way near Fogg Dam	Darryel Binns <i>et al.</i>	1
<b>Other non-passerines</b>				
Banded Fruit-Dove	c. 18/07	Ferny Creek, Kakadu	Clive Garland	3
Tawny Frogmouth	14/07	Rapid Creek	Bas Hensen	2
?Chestnut-backed Button-quail	21/07	Marrakai	Bas Hensen	covey, ID not 100%
Varied Lorikeet	27/06	CDU	Don Franklin	c. 12
Channel-billed Cuckoo	26/06	Adelaide R. Bridge	Matt & Cathy Gilfedder	1
<b>Passerines</b>				
Grey Fantail	27/06	Palmerston Sewage Ponds	Matt & Cathy Gilfedder <i>et al.</i>	1
Gouldian Finch	21/07	Margaret River, Marrakai	Bas Hensen	5 juvs. Other sightings, Bird Billabong
Yellow-rumped Mannikin	9/07	Darwin Hospital	Darryel Binns <i>et al.</i>	1

## From Recent Literature, page 11

**Goannas** It pays goannas to live in and near water. Smith & Griffiths (2009) – James Smith, former editor of *Nature Territory* – found that, unlike their terrestrial counterparts, Mertens Water Monitors (*Varanus mertensi*) at Manton Dam and Mangrove Monitors (*V. indicus*) on the Adelaide River were active throughout the year. Mangrove Monitors also had much smaller home ranges than terrestrial monitors (0.3 – 12 ha, but mostly less than 5 ha), but home ranges in Mertens Water Monitor were larger and varied greatly (1 – 22 ha). Larger Mangrove Monitors had slightly larger home ranges than smaller ones. Daily distances travelled also varied greatly between the two species, being generally less than 200 m in Mangrove Monitors and generally from 1 – 3 km in Mertens Water Monitor.

Mertens Water Monitors are long-lived; too long-lived for even a 2.5 year study to shed much light on the topic (Smith *et al.* 2010).

**Crocodiles passing time** Most animals with backbones have a pineal gland that secretes melatonin, but crocodiles lack this feature. Melatonin is secreted rhythmically in response to light and temperature and is important in helping animals identify and respond to the seasons, for example, so that they come into mating condition in synchrony with potential mates. Firth *et al.* (2010) tested wild and captive Freshwater Crocodiles (*Crocodylus johnstoni*) for evidence of a melatonin rhythm, with mixed results but sufficient to suggest that crocodiles must have a yet-to-be identified melatonin-secreting organ or tissue.

**Arafura File-snake** The Arafura File-snake (*Acrochordus arafurae*) is aquatic and feeds exclusively on fish. In a study conducted in a billabong on a tributary of the Adelaide River in Djukbinj National Park, Ujvari *et al.* (2010) documented a population crash driven by two years (early 2002 and 2003) of poor rains late in the wet season that reduced fish populations. Small fish were more affected than larger species. Prior to and after the first adverse year, the billabong population of file-snakes remained stable at about 1,600 individuals, but after the second adverse year crashed to about 250, showing partial recovery two years later. However, in both adverse years, file-snakes were unusually low in body weight corrected for body length. There was much variation between demographic sections of the file-snake population in how they coped. Female Arafura File-snakes are much larger than males. The most adversely affected groups were large males and medium-sized females. The authors attribute the survival of large females to the persistence of large fish through the study period, and the survival of small file-snakes to their lower energy requirements.

# Recent literature about Top End natural history

Back listings and summaries may be viewed at <http://www.cdu.edu.au/ser/profiles/ecologyintopend.htm>.

## REPTILES & AMPHIBIANS

Compiled by Don Franklin

### Not so technical

Hodgson R. 2009. Digesting crocs' secrets – from the inside out. *Origins* 1: 14-15.

### Lizards

- Couper PJ, Amey AP. 2009. *Lerista karlschmidti* (Marx and Hosmer, 1959) (Sauria: Scincidae): re-examination of the type series, reassignment of a paratype and distribution notes. *Zootaxa* 2312: 39-48. [Lesser Robust Fine-lined Slider]
- Donnellan SC, Couper PJ, Saint KM, Wheaton L. 2009. Systematics of the *Carlia* 'fusca' complex (Reptilia: Scincidae) from northern Australia. *Zootaxa* 2227: 1-31. [four-fingered skinks]
- McKay JL, Horner P. 2007. First records of the Mourning Gecko *Lepidodactylus lugubris* (Dumeril and Bibron, 1836) from the Northern Territory mainland. *Herpetofauna* 37: 75-80.
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- Smith JG, Griffiths AD. 2009. Determinants of home range and activity in two semi-aquatic lizards. *Journal of Zoology* 279: 349-357. [Mangrove Monitor, Merten's Water Monitor]
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### Cane Toads

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- Hagman M, Shine R. 2009b. Species-specific communication systems in an introduced toad compared with native frogs in Australia. *Aquatic Conservation-Marine and Freshwater Ecosystems* 19: 724-728.
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- Llewelyn J, Phillips BL, Alford RA, Schwarzkopf L, Shine R. 2010. Locomotor performance in an invasive species: cane toads from the invasion front have greater endurance, but not speed, compared to conspecifics from a long-colonised area. *Oecologia* 162: 343-348.
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- Phillips BL, Greenlees MJ, Brown GP, Shine R. 2010a. Predator behaviour and morphology mediates the impact of an invasive species: cane toads and death adders in Australia. *Animal Conservation* 13: 53-59.
- Phillips BL, Kelehear C, Pizzatto L, Brown GP, Barton D, Shine R. 2010b. Parasites and pathogens lag behind their host during periods of host range advance. *Ecology* 91: 872-881.
- Price-Rees SJ, Brown GP, Shine R. 2010. Predation on toxic cane toads (*Bufo marinus*) may imperil bluetongue lizards (*Tiliqua scincoides intermedia*, Scincidae) in tropical Australia. *Wildlife Research* 37: 166-173.
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### Frogs, turtles, crocodiles

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