

June 2024

Alice Springs Field Naturalists Club Newsletter



A fossil impression of *Arumberia banksii* in Arumbera sandstone, found during a field trip to the Arumbera Range on Saturday 11th May. Thanks to Lee Ryall for this magnificent photo. See p. 8 for a trip report.

Meetings are held on the second Wednesday of the month (except December and January) at 7:00pm at the Olive Pink Botanic Garden.

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The next newsletter will be published on 1 July 2024. We appreciate all contributions, articles, and photos both local and from elsewhere. Please have them to Lisa McLean lisamclean@outlook.com by **20 June 2024**.

ALICE SPRINGS FIELD NATURALISTS CLUB

Wednesday 12th June – 7.00pm. *Pitchi Richi historic records and survey results*. Marg Friedel, Alex Nelson & Jessie Longmuir. Saturday 22nd or Sunday 23rd June – Arltunga. Leader Neil Woolcock. Specific date and arrangements to come.

AUSTRALIAN PLANTS SOCIETY – ALICE SPRINGS

apsalicesprings@yahoo.com.au

Wednesday 5th June —7.00pm. *Conservation, temple plants and agriculture projects in Japan*. Peter Nagle will provide an overview of his recent visits to Japan where he was involved with conservation and community projects.

Sunday 16th June – Redbank Waterhole, Owen Springs Station. Leader Dorothy Latimer. Details to come.

Alice Springs Field Naturalists Club

committee Members		
Marg Friedel	0417 849 743	
to be appointed		
Lisa McLean	0412 642 987	
Neil Woolcock	0428 521 598	
Jill Brew	0437 223 203	
<u>s</u> rt	0434 495 903 0427 177 450 0418 477 450 0438 388 012	
	Marg Friedel to be appointed Lisa McLean Neil Woolcock Jill Brew	

Other Club Responsibilities:

Newsletter – Lisa McLean Facebook Organiser – Meg Mooney moon3@iinet.net.au Website controller – position vacant

Positions Vacant

The Club is looking to appoint a Vice-President. If you would like to contribute your time and join the enthusiastic group who keep things rolling, please get in touch with Marg Friedel.

Thank you

Thanks to all contributors this month: Alex Nelson, Lee Ryall, Lisa McLean, Colin Leel, Marg Friedel.

Welcome new members

Welcome to the following new member who has recently joined the Alice Springs Field Naturalists Club.

Floyd Howard

Be sure to give Floyd a warm welcome at an upcoming event, field trip or speaker night.

Opportunity to join the Alcoota Fossil Dig in July this year



Alcoota Kolopsis (Kolopsis torus) is a diprotodontoid marsupial from the Miocene. Picture: Australian Museum. This year MAGNT have opened our Alcoota Field Program in July to paying volunteers for the first time. There are 3 out of 6 spots still available to experience 6 days of central Australian desert camping, excavating late Miocene fossils, contributing to fauna surveys and broader MAGNT palaeontology program, visiting Engawala Art Centre and more. It's \$2200 Alice Springs return. (still the cheapest fossil dig in Oz).

For more information see https://www.magnt.net.au/megafauna-central and click on the booking link to pay a deposit. You bring yourself and your sleeping gear, including tent. We cater and do everything else.

The site is a true gem of a location and many of you may have visited already. With 33 species found so far, and some exciting things on

the cards this year, it's worth every cent and more. If you know someone who might be interested, please pass it on! It's for 18 years and over.

Please contact Kirsti Abbott who is happy to answer any questions. Get in touch via phone 0466 726 525.

Glenn Edwards – *Reflections on feral animal management in Central Australia over 30 years*

Alice Springs Field Naturalist Speaker Night Lisa McLean

Reflections on feral animal management in Central Australia over 30 years

Glenn Edwards, Department of Environment, Parks and Water Security





NT- 80,000 camels removed, high natural mortality due to dry conditions, 78% reduction in western deserts, 96% reduction in Simpson



Glenn Edwards spoke to another 'standing room only' Field Nat's speaker night on Wednesday 8th May, demonstrating I think, the care and concern we have for the country we live on and environment we live in. Coming to Alice Springs for an initial 3 month period, 30 years' later Glenn is clearly well versed in, and committed to, humane methods of feral animal management, using research, data, feedback and continuous improvement at all times. This was a data rich presentation, delivered with humour, a deep knowledge, and compassion for the environment. This overview of the presentation cannot provide all the information Glenn gave us on the night, so please enjoy this brief summary and some of the presentation slides. Thanks to Glenn for generously sharing them.

Firstly, Glenn spoke of large herbivores such as camels, horses and donkeys; small herbivores such as rabbits; and carnivores such cats and the red fox. He said that for him, camels were the most interesting and he provided a brief background to their history in Australia and to early aerial surveys that contributed to the understanding of distribution of camels. These animals are very mobile and can move over large areas such as the Simpson Desert. With the camel population doubling every 8-10 years, serious camel management began in the early 2000s, with the overall goal to reduce the camels' impact on the environment. In particular, in times of drought, there are lots of camel deaths which is not very pleasant.

In all cases of feral animal management, the optimal method of management is based around whether options can be used on a broadscale; are they targeted for that animal; are they humane; and, are they available. New ways of doing business informed the management of feral camels. After decades of research, collaboration, consultation and monitoring for effectiveness, aerial culling using professional shooters was shown to be the most effective and humane way of reducing camel density. Contraception, helicopter mustering, fencing and trucking them away were options which just didn't work economically or at scale.

Next Glenn spokes of horses, prompting some emotion from the audience. He reminded us that horses are also feral, in particular across the top end of the NT, with the current population around 265,000. The negative impacts of feral horses is similar to camels – erosion gullies, scalding, degradation of vegetation and wetlands, and distressingly – collisions with vehicles. Also as with camels, feral horses die *en masse* during drought. It's particularly important to be ethical and humane when dealing with feral horses, Glenn reminded us, because of the strong relationships humans have with horses.

Reflections – Horses

- West Macs program very effective in reducing population
- Regular follow-up has been good
- No recent estimate of population density in region. Is it below threshold?
- No asset monitoring
- Need to be squeaky clean when aerial shooting horses
- A lot of reactive horse management in Aboriginal communities when it gets dry

Donkeys



Negative impacts - Donkeys



- Erosion gullies
- Scalding
- Degradation of vegetation and wetlands
- Pasture depletion, competition with stock

Some facts - Rabbits

- Introduced 1859 in Victoria
- Spread quickly
- Historically considered worst vert. pest
- Myxomatosis introduced early 1950s
- Resistance built up rapidly but new strains were introduced





Regarding the third of the large herbivore, Glenn told us that donkeys arrived during the early stages of European settlement, with current numbers reaching 100,000. In particular, areas east of Tennant Creek and west of Katherine see large number of donkeys, and their negative impact on the environment is similar to camels and horses. Donkeys are culled during horse culling with management based, as always, on the options followed for optimal methods of management. Over time there has been much speculation on the use of donkey parts in Chinese Medicine and possibilities of commercialising them either as an export or industry – however, there are no arrangements in place and extraction of the donkeys on a large commercial scale is difficult.

Moving on to smaller feral animals, Glenn spoke next of rabbits, foxes, and cats. Introduced in 1859 into Victoria, rabbits spread quickly (staying out of the tropics) and are historically considered the worst vertebrate pest. Rabbits' negative impacts on the environment include vegetation degradation, erosion, competition for food with stock and native animals and, where there are rabbits, you'll find another feral vertebrate, the fox. While Myxomatosis was successfully introduced in the 1950s, rabbits quickly built up a resistance and new strains of biocide and pathogens (including Rabbit Haemorrhagic Disease [RHD] are now in place and found to be the most effective management method. Interestingly, Glenn noted that Myxo is more effective/active in summer; RHD active in winter.

Where there are rabbits, there are foxes. Introduced in the 1860s, exact numbers of foxes are difficult to determine. They negatively impact native fauna, and locally of course we know of the fox impact on bilbies and rock wallabies. Management is complex, with options such as trapping, or exclusion through barriers, also impacting dingoes, creating a dilemma. The optimum option is biocide which ticks all the boxes, although delivery can be challenging. A targeted fox bait delivery device developed in the mid-2000s and refined through trials over the following 20 years has ensured that these are triggered by foxes and not dingoes. These devices are continuing to be improved and are now being used at Watarrka.

There are also 'inland islands' / fenced refuges at Lander River, Watarrka, Uluru-Kata Tjuta National Park and Newhaven which have a place in fox management, but the goal of management, as Glenn explained, should be to address threats to key assets across the broader landscape.

Last but definitely not least, Glenn spoke of the feral cat – which can be found right across Australia. Cats arrived with the First Fleet, and their spread continues to be facilitated by humans, but it was only in the late 1980s that the impacts of cats was first flagged. Until 15 years ago, there was no management strategy at all and the number of feral cats remains difficult to determine. Despite popular belief, there are no tiger sized feral cats! Feral cats have massive impacts on native fauna

Alice Springs Field Naturalists Club

Some facts – Red fox

- Introduced 1860s in Victoria
- Fox spread facilitated by rabbits
- Broadly overlap with rabbits but......
- How many foxes?



Fox bait delivery device





- Developed 2002-2006
- Trialled at Owen Springs (2006) and Tanami (2006-8)
- Demonstrated proof of concept- excludes dingoes but allows fox to take bait

Reflections – Feral cats

- Cats are live prey specialists
- Cat baiting still experimental
- Very high bait application rates
- Baits kill dingoes
- Need to improve target specificity of baits
- Barkly dynamics



- 7. Flexible management approach
- * Strike while the iron is hot
- * Use local knowledge and science
- Continuous improvement
- Beware of compensatory effects eg. immigration
- Adapt to changing landholder views





and carry toxoplasmosis. Using the same feral animal management underlying checklist of options, feral cat management is challenging, with biocide – delivered through various means – as the most likely 'best' option. Cats wont usually eat dead bait, as they are live prey specialists. That a patented biocide is *Curiosity*, certainly tickled the funny bone of some in the room. This method of control however is still experimental as we have seen at Newhaven in the protection of the Rock Rat (*Zyzomys pedunculatus*), and again our dingo friends can be impacted by this baiting regime.

Referring to the dingo, members of the audience were keen to hear of their role in feral animal management. As a keystone predator they regulate macropods, possibly deer and pigs, but can and do co-exist with cats and foxes. Glenn discussed key things to consider across the field of feral animal management:

- 1. Resourcing landscape scale management needs to be ongoing and isn't cheap!
- 2. Consultation needs to be extensive before any management takes place, and on-going.
- Respect for values landholder values should be key to decisions on the how and where management can be applied.
- Planning / strategy set goals, focus on reducing impacts on key assets, and note that population reduction in itself is not useful unless the relationship between density/damage is known.
- Monitoring monitor impact; density [number removed]; animal welfare. Evaluate / Review / Improve all through the process.
- Animal welfare is paramount be guided by rigorous procedures, use experienced operators, and monitor compliance. The social licence to operate depends on it.
- Flexibility use local knowledge and science, continuous improvement, adapt to changing views.
- 8. Follow up populations will recover if not managed, a landholder responsibility.
- Role of commercial use / hunting can help if integrated into a program to reduce numbers; ensure this is humane.
- Evidence based decision making in all cases, management is informed by evidence and rigorous data.

And finally, Glenn presented a list of future challenges and directions which revolve around long term management, funding, expertise, constant development of tools and realisation that the promise of some big ideas – for example CRISPR, a gene editing tool – may never be realised.

Overall, a fascinating presentation which never lost the audience's attention and gave us all some new knowledge about how feral animals are managed in the Territory and beyond.

Alice Springs Field Naturalists Club

Snails of Pitchi Richi

Looking down among the gastropods

Alex Nelson



Sinumelon sp. [Marg F notes: Could these be S. bednalli – Bednall's dwarfmelon, a threatened species? See https://nt.gov.au/__data/assets/pdf_file/0020/206516/bednalls-dwarfmelon.pdf. Feedback welcome!]

These snails predominate at Pitchi Richi, especially in the vicinity of my cottage. These photos were taken during the big rain event in late March. The snails emerge from the ground during significant rainfall events, especially at night but also during daylight when overcast.

They have been identified as genus (don't know the species), typically associated with spinifex grassland communities. At Pitchi Richi, they have obviously adapted to buffel grass as a substitute shelter for aestivation during dry periods. I understand they normally feed on detritus and fungi rather than green foliage, so they have no direct impact on the buffel grass. I have occasionally uncovered dormant snails in the root balls of buffel grass clumps.

Pitchi Richi is the only place I've noticed this association between *Sinumelon* and buffel grass. In a situation where buffel is so completely dominant, there is a major decline in prevalence and diversity of other plant and animal species, but the accumulation of buffel leaf litter in deep shade provides a bonanza for fungal organisms - it's a whole different ecology that's little studied (if at all) - anyway, that's the new niche these snails appear to be able to use to advantage.

Empty snail shells are scattered across the whole site, indicating they are commonplace; however, I suspect their numbers have taken a severe hit from the wildfire four months ago. Interestingly, the snails are numerous in the vicinity of my cottage despite the removal of mature buffel grass - it appears there is sufficient diverse plant cover and leaf litter enabling their survival. It's possible the snails have taken advantage of dense couch grass patches too but I can't be sure of that.

I noticed during the rain last month that the snails frequently blundered into puddles. They quite happily pushed through shallow water where they could see above the surface but were disoriented when completely immersed. However, they didn't drown - if I removed them from the water, or when the water soaked away, the snails recovered immediately without apparent ill effects.



Snail crawling through a puddle – and immersed, not drowning



Beautiful snail trails across the damp sand

Enigmatic Ediacaran fossils of the Arumbera sandstone

Field trip 11 March 2024, led by Peter McDonald. Report by Marg Friedel



Figure 1. Glaessner and Walter's reconstruction of the appearance of Arumberia banksii during life. Each cup is 5-20 cm high. Only selected longitudinal ribs are shown.



Fossil Arumberia banksii was first described by Glaessner and Walter almost 50 years ago, after an intriguing find during geological mapping in the Amadeus Basin west of Alice Springs. Geologist Mr J. Banks found a displaced block of Arumbera sandstone near Laura Creek, 22 km WSW of Alice Springs, in October 1966, which was covered with peculiar grooves radiating from several centres. Later, Walter examined the area we visited on May 11 in the Arumbera Range and found more examples. Glaessner and Walter concluded that these organisms were Precambrian, meaning that they predated 'metazoans', which have bodies composed of cells differentiated into tissues and organs and usually a digestive cavity. They named the species Arumberia after the Arumbera sandstone, and banksii in honour of Mr Banks, who first found the fossil.

They provided an illustration showing the cup-shaped form the organism had when it was alive, describing "hollow compressible ribbed bodies composed originally of flexible tissue" (Figure 1). Adam Yates, MAGNT Senior Curator of Earth Sciences at Megafauna

Figure 2. Adam's sketch of Arumberia banksii: cup-like body (left); vertical section (centre); horizontal section (right).

Central, provided a more detailed illustration (Figure 2), showing first the cup-shaped body (left) then, second (centre, in vertical section), how the base was probably buried in the silty substrate and explaining that the cup may have been at least partially filled with sand as ballast with perhaps only the upper rim showing. Thirdly (right, in horizontal section), showing that there were bigger folds or ribs, with smaller folds between, giving an appearance of 'quilting' in cross section. This organism 'fed' by passive absorption of nutrients, rather than by active feeding as a metazoan would have done.

Glaessner and Walter explained that "the soft-bodied organisms were preserved on a silty substratum [MF: which later became mudstone] when the next sand wave passed over and eventually covered them. The parallelism of the ribbing indicates the direction of the sand-laden current which knocked the cups down, partly filling them near their margins and finally flattening them under the weight of newly deposited sand." As Adam told us, the fossils are impressions on what had once been the underside of the sandstone. The organism had been anchored in what became the mudstone underneath, but the mudstone had subsequently eroded away.

Why enigmatic? Glaessner and Walter found evidence that the organisms lived in an environment with intermittent very energetic water movement and intermittent but probably rapid sand deposition, most likely a shallow sub-tidal marine environment. The enigma, according to Mapstone and McIlroy, is why and how soft-bodied organisms were preserved in relatively coarse-grained sediments under high-energy conditions?



During the Ediacaran period (575 -542 million years ago), prior to the Cambrian period and the development of the metazoa, microbial mats of cyanobacteria and filamentous algae formed on undisturbed surfaces, in which our Arumberia banksii was embedded. Following a storm event, when existing organisms were buried in sand, a new mat may have bound the sediment surfaces overlying the dead organisms, protecting them and creating an anaerobic ('without oxygen') environment. In this environment pyrite, an iron sulphide, formed via microbial processes in a matter of weeks and created a veneer over the dead organisms, helping to preserve them. Much later, the pyrite was oxidised away, leaving the red sandstone and the fossil impressions.

The impression left in the Arumbera sandstone by fossilised Arumberia banksii. Photo: Lee Ryall.

Ediacaran fossils have been found in over 30 localities on five continents, including the Flinders Ranges in South Australia (the origin of the name Ediacaran), Newfoundland, northern Russia and southern Namibia. There has been lively debate about whether some of the fossils, including *Arumberia banksii*, are fossils or the result of non-biological activity, but we were readily persuaded by Adam's and Peter's explanations that we were indeed looking at fossil *A. banksii*, or rather impressions of it.

Many thanks to Peter and Adam for a fascinating and informative field trip.



Adam explaining the formation of the Arumbera Range fossils to some of the group. Photo: Lee Ryall.

References

Glaessner, M.F. and Walter, M.R. (1975) New Precambrian fossils from the Arumbera Sandstone, Northern Territory, Australia. *Alcheringa*, **1**, 59-69.

Liu, A.G. (2017) Framboidal pyrite shroud confirms the 'death mask' model for moldic preservation of Ediacaran soft-bodied organisms—a reply. *Palaios* **32**,197-198.

Mapstone, N.B. and McIlroy, D. (2006) Ediacaran fossil preservation: Taphonomy and diagenesis of a discoid biota from the Amadeus Basin, central Australia. *Precambrian Research* **149**, 126–148.

Spiders of Alice Springs

Colin Leel



Trichonephila edulis

You don't have to go very far to see spiders in Alice Springs, although sometimes they can be very small or well camouflaged. They inhabit our homes, our gardens, parks, reserves, and bushland.

From spiders that spin large webs (*Trichonephila edulis*), Australian Huntsmans (family *Sparassidae*), the cute little Jumping Spiders (family *Salticidae*), the Elegant Water Spiders (*Dolomedes facetus*) that skim across ponds and swimming pools, Hackled Orbweavers (family *Uloboridae*), and the striking Red-headed Mouse Spider (*Missulena occatoria*), just a selection of some of the interesting spiders to be found here in Central Australia.

Of course some may have an aversion to spiders, so check out the blog post **A tangled web**... <u>https://ausemade.com.au/blog/a-tangled-web/</u>



Australian Huntsman (family Sparassidae)



Elegant Water Spiders (Dolomedes facetus



Red-headed Mouse Spider (Missulena occatoria)



Hackled Orbweavers (family Uloboridae)