



SEGments



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The Scientific Expedition Group is a not-for-profit organisation which began in 1984. SEG undertakes several expeditions each year to record scientific information on wildlife and the environment in many parts of South Australia.

A major expedition to conduct a biodiversity survey occurs each year over two weeks. Scientific experts lead volunteers in surveying mammals, reptiles, invertebrates, vegetation, birds and physical geography. The data collected on each survey are archived with the relevant State scientific institutions to ensure they are available to anyone interested in our State's environment.

In addition to the major expedition, a number of trips for the Vulkathunha-Gammon Ranges Scientific Project are organised annually. A long term study of rainfall on the ranges and of water flow in arid-zone creeks is undertaken. All data are supplied to the Department for Environment and Water and to the Bureau of Meteorology and are available for analysis.

SEG conducts four-day biodiversity surveys at eight different sites each autumn and spring in the Heritage Area of scrub on "Minnawarra" farm near Myponga. Data collected are entered into the Biological Data Base of SA. SEG also conducts mallee-fowl monitoring in the Murraylands.

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Cover Photo: Fossilised bones collected at

Waralamanko. Photo: Piers Brissenden

Rear Cover Photo: Setting out for fossil searching on

the gravel, beds at Waralamanko. Photo: Piers

Brissenden



SEGments



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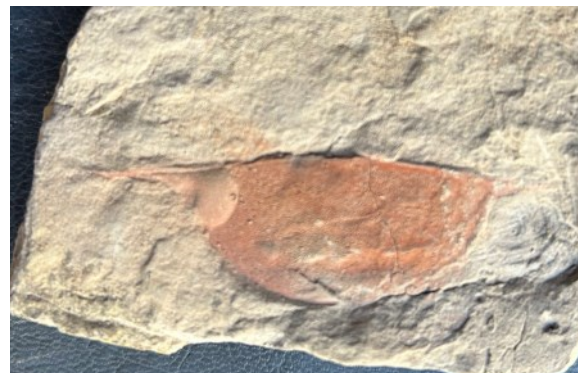
There is no doubt that the Nilpena region is of global significance and, as has recently been announced, is now part of the Nilpena Ediacara National Park.

A number of years ago, again with the Waterhouse Club, we were able to collect, for the South Australian Museum, fossils from the Emu Bay area on Kangaroo Island. These are trilobite fossils from the Cambrian period. It was amazing to me that we were able to take a piece of rock from a hill face, split it with a chisel and reveal a fossil that had not seen the light of day for over 500 million years. One such lump of rock is shown in the photo below. In this photo with one hammer on chisel blow 8 or 9



trilobite fossils, *Estaingia bilobata* as orange shapes are revealed.

While we were digging away the scientists were watching over us and the good ones were taken for the museum. We could keep the broken and "ordinary" ones. One *Isoxys* specimen I unearthed was apparently so good that it was taken even before I had a good chance to look at it. Another *Isoxys* specimen was not considered as good and I kept as shown in the photo below. (See details of this trip in SEGments volume 33 No.2



Many of us have also seen fossils of sea creatures in the limestone cliffs of the River Murray, amongst many other places, from the Tertiary period about 20 million years ago.

Alun Thomas
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EDITORIAL

Fossils searching for fossils.

This was the comment made (by someone in SEG, I should say) when SEG was invited to assist Flinders Uni personnel to collect fossils in the Cooper Creek area. Mind you, for the six SEG members who went on the collecting trip our average age was well north of sixty while the average age of the 5 Flinders personnel was well south of thirty. That being said us oldies were usually ready to go out for a day's searching at a nominated time and well before the youngies. As you will read in the first article on this copy of SEGments the collecting trip was very successful and Aaron, the leader, was pleased with the assistance from SEG.

This collecting trip reminded me of a number I have been on fossil trips either with the Waterhouse Club at the South Australian Museum or with SEG.

At Nilpena last year, with the Waterhouse Club, we saw fossils from Pre-Cambrian Ediacran geological period and had a chance to a bit of fossicking at a region well away from the main fossil areas. One of the ones we saw is shown on the photo. This shows a *Dickinsonia* fossil.





THE GREAT FOSSIL HUNT 2023

Alun Thomas and Piers Brissenden

An assemblage of fish fossils found on the first day of searching.

At the talk at the SEG AGM last year the speaker Rod Wells mentioned that there was a proposed fossil collection trip to the north of South Australia to be held in 2023. Subsequently between 17 and 26 June this year SEG members assisted Flinders University Palaeontology Department scientists in a fossil search in the Cooper Creek Basin on Etadunna Station due east of Kati Thanda-Lake Eyre in northern South Australia.

The fossil hunt was led by Dr Aaron Camens, Lecturer in Palaeontology, Ecology and Evolution, College of Science and Engineering, Flinders University. Other Flinders University personnel were Dr Diana Fusco, Tim Niederer, Jacob van Zoelen (Jake) and Luke Westerveld. The SEG personnel were Stuart Pillman, Jill Tugwell, Trent Porter, Raylene Klinger, Piers Brissenden and Alun Thomas.

BACKGROUND

The fossils the palaeontologists were interested in related to the Pleistocene era which is the geological period that lasted from around 2.58 million to 11,700 years ago, however, we were searching for specimens about 50 to 150 thousand years old. At that time the area which is now the Cooper Creek was more temperate than now and there were rivers flowing across it which are now termed palaeo-channels. When mammals, reptiles, amphibians, fish, and birds died some of their bodies ended up in these streams and their bones deposited in gravel beds at the bottom of these streams. Subsequent climatic changes caused these streams to dry up and be covered by clay and sand where the bones fossilized.

Nearer the present time the Cooper Creek flowed across the land and cut across some of these palaeo-channels. Subsequent surface erosion of these gravel beds has exposed

the bones. Sometimes the gravel beds present as piles of gravel held together by sand and clay. Further surface erosion particularly by flood events in the Cooper Creek have spread some of the gravel and bone fragments across substantially horizontal dry river beds. Nearly all the bone fragments located were damaged or broken presumably because they had been tumbled along a river bed before being buried. Some are so damaged that that could not be used to identify the animal from which they came.

Pleistocene fossils were first found in the Cooper Basin in the late 1800's and in 1903 an exploration party led by J W Gregory made a substantial collection of fossils from the area. Subsequently a number of collecting trips have been undertaken to the Cooper Basin and as mentioned above regular flood events expose new beds. A substantial flood event on the Cooper Creek in 2022 provided a good opportunity for location of fossils this year.

THE EXPEDITION

The collecting expedition was planned for June 17 to 30, 2023 but owing to the forecast of heavy rain in the area from 27 June which would likely have made leaving the collection area difficult we cut the trip short and headed back on 26 June 2023. The expedition consisted of two Flinders University vehicles and three SEG vehicles. One SEG vehicle and one Flinders University vehicle were towing trailers.

DAILY DIARY

All parties drove to Marree on Saturday 17 June and stayed overnight there, and we met everyone at the Marree Hotel for dinner that night.

On the Sunday morning the group did final refuelling and headed up the Birdsville Track as far as Etadunna Station,

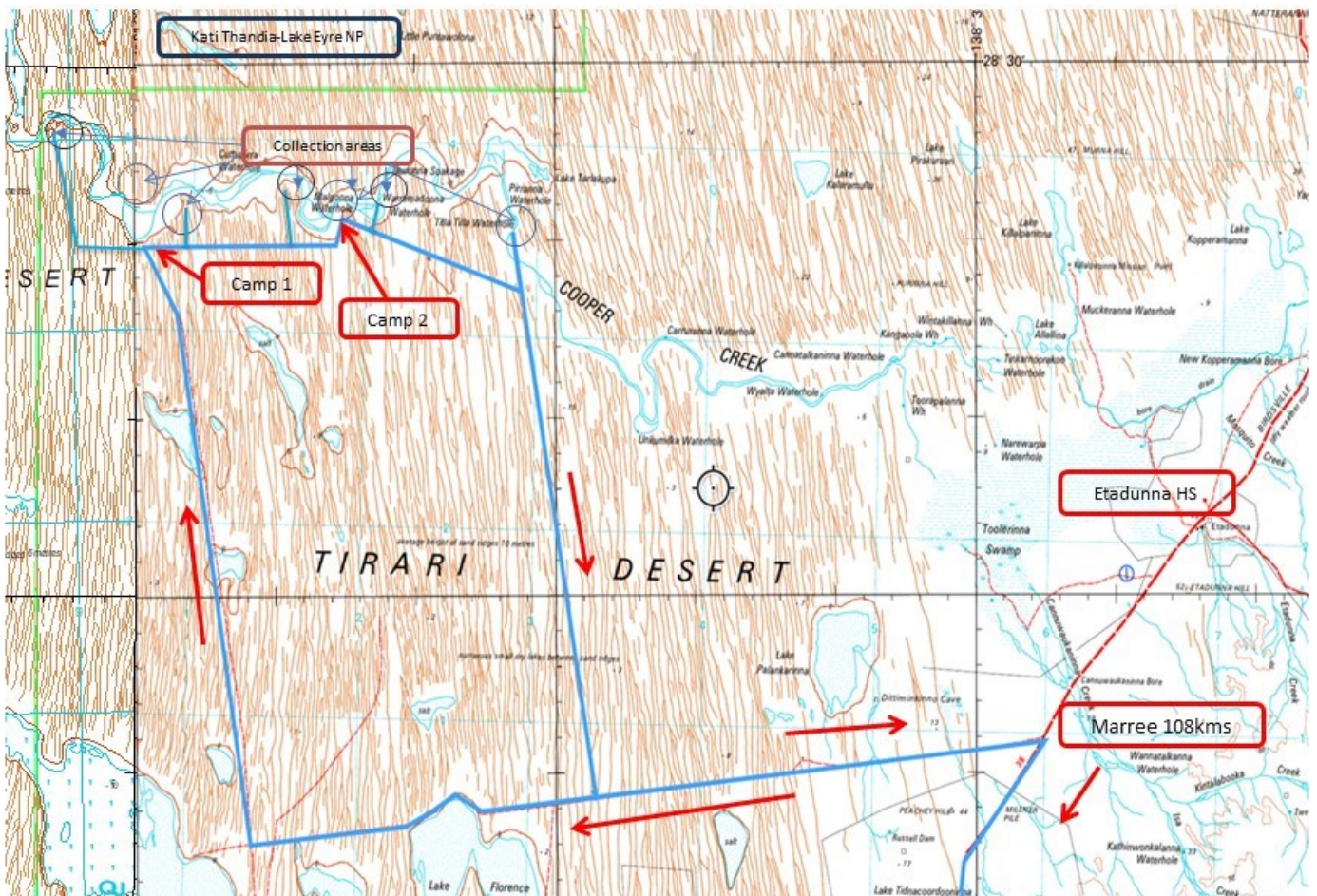


A general view of threv region from Maree up to Lake Eyre. The fossil search are was just to the south of the Kati Thanda Lake Eyre National Park

about 100 km north. From there we headed west on a well-maintained station track about 45 km.

On the way west we came across the skeleton of a camel which Aaron had seen as a recently shot animal 10 years earlier while on an earlier expedition to the area. This time he collected some of the long bones of the camel as a good example of the weathering in the far north over a known period of time. He intended these to be good teaching resources.

We then headed north towards the Cooper Creek about 30 km but soon a track was no longer present, and the expedition vehicles were making their own tracks. We were traversing the Tirari Desert which is vegetated sand dune country with dune ridges extending substantially north-south with swales between them of about 50 to 500 m wide. The dunes ranged from about 5 m high to about 15 metres high. About 50 to 60 years ago a seismic survey line had been bulldozed approximately north-south in a straight line regardless of dunes and swales but it crossed a number of dunes. We were attempting to follow this seismic survey line. With growth in vegetation in the intervening years it was difficult to follow the line most of the way and particularly where it crossed dunes. The vehicles towing the trailers got bogged several times crossing dunes. It took about three hours



A more detailed map of the Tirari Desert with the Cooper Creek crossing it. Lake Kununka to which we had intended to go in the second week of the fossil hunt is just off the centre of the top of the map. While we were driving across the Tirari Desert we were surprised to see how accurate the lines of dunes actually were. In places we could count the number of dunes we had to cross from the map to get to a selected location.



Crossing the dunes

to travel the 25 km and we didn't get to our first campsite on the banks of the Cooper Creek until 5:00pm.

The campsite, referred to prosaically as Camp 1, was in a very pleasant swale right next to the dry bed of the Cooper Creek. This was our campsite for the next four nights. It was a cold first night down to 0°C.

On the Monday we drove about 8 km north-west to a portion of the Cooper Creek called Waralamanko Waterhole. This took over an hour over the dunes and across the swales. At this site there were a number of gravel beds for us to search. Aaron instructed us about the things we were looking for and the techniques to use. Essentially, we were doing pattern searches across and back on the gravel beds. To ensure that search effort was not wasted Aaron suggested that we keep our eyes on footprints on the gravel beds to ensure we weren't doubling up on search effort. We were also told to not collect white bones as they would be modern non-fossilised bones. Fossil bones are generally brown through to purple in colour.

As if to illustrate how easy it was to find fossils Aaron bent over and immediately found two fossilised crocodile teeth. It took us somewhat longer to get our eyes in but soon



Aaron searching on the gravel flats at Waralamanko

we were finding numbers of fish vertebrae, fin spikes and gill plates, kangaroo tail vertebrae, tortoise carapace fragments, crocodile teeth and parts of the long bones of larger mammals. It was particularly interesting to note that the fish bones which in life would have been white or translucent when fossilised became red.

To ensure that the pattern search was carried out regularly and without missing bits I devised the process of leaving my backpack at the beginning of each crossing of a gravel bed, so I had something to aim for when I turned at the other side of the bed. The backpack could then be moved to the next crossing start.

We searched four areas in the Waralamanko region over the day and were back at the vehicles by 4:00pm for the hour-long drive back to camp.

On Tuesday we went back to the Waralamanko region but went upstream rather than downstream which we had done the day before. Here the gravel was in piles rather than gravel beds and we found more larger pieces of fossil from a



The team searching gravel flats in the Waralamanko region

wide range of species. We were requested to not collect any more fish fossils as we had got so many the day before.

Back in camp in the late afternoon we were visited by a large male camel which by its rumblings seemed to be in an aggressive mood. It hung around camp until after dark when Stuart attempted to scare it away by shining a strong flashlight towards it. This was only partially successful, and we were encouraged not to venture too far from camp overnight. In the morning there were camel footprints quite close to camp but luckily the camel had departed.

It rained lightly overnight on Tuesday night but only enough to firm the sand to make it easier driving on the next day.

On Wednesday we drove eastwards about 7km to other search sites referred to as Sites 072 and 072A. It was proposed to move camp further eastwards on the Thursday so that part of the travel eastwards on Wednesday was to select a



Travelling across the expanse of the Tirari Desert

path across the dunes which would be suitable for towing the trailers next day.

Sites 072 and 072A were not prolific and we moved about 1 km further east after lunch to Sites 073 and 073A. Here we found a number of larger *Diprotodon* bones including vertebrae and teeth. Back at camp it started raining lightly by about 7 pm and continued on and off all night.

We packed up Camp 1 on the Thursday morning and headed about 10 km as the crow flies but actually driving about 14 km over dunes and swales to a new campsite called Malkuni Waterhole (also referred to on maps as Malgoona or Malkoona). This again was on the banks of the Cooper Creek but further upstream. It was sheltered by large coolabah trees. We set up camp and spent the afternoon searching in gravel beds adjacent to the camp in the afternoon.

On the Friday after another cold night, we searched walking from the Malkuni camp east along the Cooper Creek in the morning and west in the afternoon. In these regions we found many larger pieces of diprotodon. Tim found a nearly complete atlas bone of a diprotodon buried almost completely in sand and gravel. He and Jake spent over an hour carefully revealing the extent of the bone with the thought that it might need reinforcing before it was extracted. In the end it was removed but came out in three pieces.

The weather was fine and sunny all day, but Friday night was again very cold. In the morning it was -1°C in camp. Overnight we could hear dingos calling long distances away and some much closer. There were dingo footprints across the vehicle track where we had driven into camp. Piers also heard cat calls that night and found cat footprints around his tent in the morning.



A typical gravel bed or bank in which fossils could be found



Tim and Jake carefully extracting the atlas bone of a diprotodon at Cooper 3 site



Lunch under a shady coolabah tree on the banks of the Cooper Creek near the Katapiri Waterhole

Saturday was another fine sunny day. It was proposed to move camp further eastwards on the Monday so that part of the travel eastwards on Saturday was to select a path across the dunes which would be suitable for towing the trailers. A first stop was about 6 km east to a search site referred to as Cooper 3. This turned out to be a very sparse site and we headed east and after a few more kilometres got onto a substantially east-west seismic survey which had been used as a station track and was passable as a road.

In about 10 km we came to a north south track and headed north to a crossing place of the Cooper Creek and north of the creek we branched off to a search site known as Tilla Tilla Waterhole. This site had extensive gravel banks which we searched but few fossils were found. This waterhole is believed to be one of Gregory's campsites 120 years ago. A previous Flinders University expedition found a clay pipe in this area. A large number of fossils are believed to have been taken out then.

After lunch we headed back to Malkuni camp. The plan was that Aaron and Luke would drive back to Marree on the Sunday morning to purchase more fuel before we headed further north to Lake Kununka to our final search area. They

were also to meet SEG members Andrew and Sarah Telfer who were joining us for the second week of the field trip and to escort them back to the camp site.

Plans were thrown into disarray late on Saturday when we received a text message from Andrew over Piers' Zoleo satellite communications asking whether we had seen the weather forecast which was predicting up to 10 mm of rain around Marree on Monday and up to 30 mm on Tuesday. If these rains occurred, the Birdsville Track would be closed for quite some time, and we would not be able to safely get back to Marree. The rain in Marree was not forecast until after 12:30 pm on Monday. A quick change in plans was made. We would search an area to the west of Malkuni called Katipiri Waterhole on Sunday morning and then get back to camp to pack up as much as possible ready for a very early start to aim to get to Marree by midday on Monday.

Sunday morning dawned fine and sunny, but it was very cold getting down to -2.4°C in camp at 6:30 am.

After breakfast we headed off to several regions near Katapiri which is about 5 km west of the Malkuni campsite. After searching with not a lot of luck the SEG team chose to



Sorting the finds in the evening



A huge flock of corellas were seen at Katipiri Waterhole. All the waterholes we saw were as brackish as seawater.



A set of molars of an extinct kangaroo



Pieces of vertebra of a diprotodon



A molar of a diprotodon



Crocodile teeth found at Site 072A



Kangaroo teeth fossil in situ



Diprotodon bones

have lunch under a shady coolibah tree. Almost immediately Stuart found a number of fossil fragments where we were sitting. There was a surprising number for such a small area. When Aaron inspected Stuart's find he informed him that on a previous collecting trip a Flinders University party had camped under that tree and the fossils Stuart found were ones that had been found elsewhere and discarded as being non-

diagnostic and therefore not worth keeping. On looking at these fossils Aaron did find one *Diprotodon* Incisor which should not have been discarded earlier.

This site had extensive gravel banks which we searched but few fossils were found. Despite the lack of fossils, a large waterhole proved an interesting diversion for

the group who enjoyed watching a large noisy flock of little corellas flying from tree to tree around the saline pool. Whilst not over-abundant, birdlife was ever present during the trip with sightings of zebra finch, black-faced wood swallow, Australian raven, emu, brown falcon, wedge tailed eagle, mistletoe bird and blue bonnet parrot to name a few.

On Monday final packing was done and we were on the track not long after 7:30 am. There were no further holdups and we'd travelled some 70 km through Etadunna Station back to the Birdsville Track by about 10:30 am. Some time was spent pumping up all the tyres back to road pressures and we reached Marree by 12:30 pm as planned. Most of us went straight on to Farina for lunch and then headed on to Quorn for the night. Piers and I travelled on and reached Adelaide not long after 8:00 pm.

We were fortunate that there were no serious incidents on the trip other than having to go home four days early. It was lucky to come home when we did. A week later the Birdsville Track was still closed. We did not have any punctures or mechanical problems which was surprising considering the long distance and the type of terrain we travelled off road.

We give particular thanks to Trent who towed a trailer loaded with over 400 litres of water to ensure we would not run dry. The trailer also carried diesel fuel and firewood. It is no easy feat to tow a heavily loaded trailer across sand dunes. Unfortunately on the final drive down the Birdsville Track a stone was thrown up from the road and broke Trent's rear windscreen.

COLLECTION RESULTS

There will be a huge job to clean, sort out and identify the very large number of fossils collected in the trip but there

were several finds which it seemed to be of great interest to the scientists. These included in no particular order:

- A sliver of enamel from a tooth from an extinct omnivorous kangaroo called *Propleopsus oscillans*. Apparently, the pattern of grooves on the tooth was sufficient to positively identify the animal from which it came. This was only the second definite occurrence of this animal from the region.
- The upper joint of a humerus of a very large extinct *Diprotodon*. Other significant *Diprotodon* bones such as vertebrae and other joints were also located.
- The front end of a lower jaw of a crocodile and a number of teeth.
- Teeth from a wide range of extinct kangaroos.
- Bones of flamingoes no longer existing in Australia as well as many other bird bones.

References

Tedford, R.H. and Wells, R.T. 1990 3 31: Pleistocene Deposits and Fossil Vertebrates from the "Dead Heart of Australia". *Mem. Qd Mus.* 28(1): 263-284. Brisbane. ISSN 0079-8835.

R. H. Tedford, R. T. Wells And S. F. Barghoorn. Tirari Formation And Contained Faunas, Pliocene Of The Lake Eyre Basin, South Australia. *The Beagle, Records of the Northern Territory Museum of Arts and Sciences*, 1992 9(1): 173- 194

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Double Rainbow at Camp 1

Minnawarra Biodiversity Project Autumn 2023

Janet Furler

The latest Minnawarra Autumn survey was successfully completed between Monday the 24th and Saturday 29th April 2023, with significant amendments to the original plan. Due to heavy rain forecast on the Thursday we opened the Elliott traps on Monday instead of the planned Tuesday, to give some leeway if needed. Most of the pit lines were opened on the Tuesday. We closed the traps on the afternoon round on Wednesday, had 14mm of rain, almost all overnight, and opened them again the next morning. Apart from the rainy Wednesday night the weather was better than expected, with maximum temperatures between 23 and 25, and nocturnal drifting down from 17 to 12, with 7 on the last night.

Over the 6 days we had 30 volunteers participating, 20 adults and 10 children. They took part in 119 rounds, making 357 total volunteer hours during the survey.

219 individuals were caught 323 times. Of the 191 native mammals 31 were recaptures from previous surveys, 128 were microchipped and 30 male *Antechinus flavipes* were ear punched. 2 Western Grey kangaroos (*Macropus fuliginosus*) and one echidna (*Tachyglossus aculeatus*) were observed. While we see a lot of kangaroos while travelling around during the surveys, they aren't often at the sites. And echidnas trundling past are an occasional delight. 3 *Crinea signifera* and 6 *Lampropholis guichenoti* were caught. We didn't catch the Red Bellied Black Snake (*Pseudechis porphyriacus*), but stood and admired it for some time.

Last autumn we caught 159 native mammals, and the 20% increase in numbers was noticeable.

Site 7, on the edge of a southern swamp, was the most active this time, with 38 new captures and 4 recaptures from previous surveys. We got 11 swamp rats (*R. lutreolus*), 11 bush rats (*R. fuscipes*), 17 *Antechinus* (*Antechinus flavipes*), 2 black rats (*R. rattus*) and one house mouse (*Mus musculus*). One each of the swamp rat and *Antechinus* and two bush rats were recaptures. Other sites ranged from 35 individuals to 16 indi-

viduals at Site 9, which is the highest, driest site and usually has fewer than 10 individuals caught. For maybe the third time in 20 years we caught a swamp rat (*R. lutreolus*) at Site 9. The wet summer with no long heatwaves seems to have suited the animals.

The bird survey, conducted at the beginning of April, included sighting of a Bassian thrush (*Zoothera lunulata hal-maturina*) at Site 7. These birds have been seen infrequently on the property over the past few decades, but not during a survey, so adding to the list of endangered birds here.

thefurlers@gmail.com



Richard Willing and Anthea Habel recording catches

MINNAWARRA BIODIVERSITY SURVEY SPRING 2023

Saturday 7th October to Wednesday October 11th

(note that this is not the October Long Weekend because of the full moon on the Friday before the long weekend)

Come for half a day, one day or several days.

Minnawarra is situated on the southern Fleurieu Peninsula

For further information and registration forms, contact:

Janet Furler on 0419 842 667 or thefurlers@gmail.com



POSTSCRIPT: THE GREAT FOSSIL HUNT 2023

Alun Thomas

Returning from the field trip to Cooper Creek was not the end of the story for the fossils we collected in June (See the article “The Great Fossil Hunt earlier in this issue). Several SEG members have assisted Flinders University Palaeontology Department staff and students to clean and preserve the fossils we brought back from the fossil hunt. Those who assisted from SEG were Jill Tugwell, Piers Brissenden, Trent Porter and Alun Thomas.

While still in the field Aaron and Diana had done a initial sort of the fossils into animal type (birds, fish, mammals, reptiles and amphibians) and site as well as specially packaging special and fragile fossils.

Preservation involves several crucial steps. First the pieces of bone have to be washed to remove sand and clay which is adhering to them. Where there are hollow bones sand and clay is removed as much as possible from the hollows without damaging the bone. Essentially the fossils we located have been in brine as the Cooper Creek is very salty in the region we were collecting from. The salt must be removed from the bones to prevent possible cracking later as the salt can absorb water and cause expansion in cracks in the fossils and breakage.

After careful washing the bones were laid out on newspaper to give an initial drying and then loaded into trays, separated in layers on the trays by paper towels and placed into a low temperature drying oven for up to a week to thoroughly dry them.

Particularly with larger mammal bones the fossils are very fragile and either before washing or after drying the fossils are impregnated with a strengthening material. The material used at Flinders is Paraloid. This is a soluble acrylic resin suspended in acetone. To ensure that the resin is carried deep into the pores in the fossil bones first a small patch is wet with acetone and while still wet the resin solution is painted on and carried into the pores before the resin sets. It is quite a painstaking process to preserve larger bones. In some circumstances it is necessary to apply Paraloid to fossils in the field even before they are taken out of the ground.

After thorough drying the various sets of fossils are carefully labelled and stored away for later detailed identification.

It was fascinating working in the wet preparation lab as while we were working on the fossils we collected there were others working on a near complete skeleton of a giant wombat from Wellington Cave in NSW and several bones of a diprotodon, including a femur about 74 cm long from Lake Callabonna.



Cleaning and removing of salt from fossils collected on the Great Fossil Hunt in the Flinders University Palaeontology Department wet preparation lab. From left Alun Thomas, Tim Niederer, Frazer Brown and Jill Tugwell.



Fossils washed and laid out on newspaper for initial drying.

WITCHELINA FAUNA SURVEY 2023

RAW DATA OF SPECIMENS COLLECTED AND SORTED BY SITE NUMBER

Site	Date	Time	Scientific Name	Common Name
Christine.01	20.04.23	AM	<i>Ctenotus saxatilis</i>	Stony-soil Ctenotus
Opp	16.04.23	AM	<i>Litoria rubella</i>	Desert Tree Frog
WIT002	20.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT002	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT002	20.04.23	AM	<i>Planigale tenuirostris</i>	Narrow-nosed Planigale
WIT003	16.04.23	PM	<i>Ctenophorus nuchalis</i>	Central Netted Dragon
WIT003	20.04.23	PM	<i>Ctenophorus nuchalis</i>	Central Netted Dragon
WIT003	18.04.23	AM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT003	18.04.23	PM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
WIT003	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT003	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT003	19.04.23	AM	<i>Neobatrachus sudellae</i>	Sudell's Frog
WIT003	19.04.23	AM	<i>Pseudonaja modesta</i>	Five-ringed Snake
WIT003	18.04.23	PM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT003	20.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT003	18.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT004	16.04.23	PM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT004	18.04.23	AM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT004	19.04.23	PM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
WIT004	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT004	16.04.23	PM	<i>Ctenotus taeniatus</i>	Eyrean Ctenotus
WIT004	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT004	20.04.23	AM	<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko
WIT004	19.04.23	AM	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
WIT004	16.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT004	18.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT006	16.04.23	PM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT006	19.04.23	AM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT006	16.04.23	PM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
WIT006	19.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT006	20.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT006	20.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT006	18.04.23	AM	<i>Suta suta</i>	Curl Snake
WIT006	20.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT006	19.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT006	19.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT006	18.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT006	16.04.23	PM	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon

Site	Date	Time	Scientific Name	Common Name
WIT009	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT009	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT009	18.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT009	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT009	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT009	18.04.23	AM	<i>Morethia boulengeri</i>	Common Snake-eye
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	18.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT009	17.04.23	AM	<i>Neobatrachus sudellae</i>	Sudell's Frog
WIT009	19.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT009	20.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT010	20.04.23	PM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT010	20.04.23	PM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT010	20.04.23	PM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
WIT010	18.04.23	AM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
WIT010	19.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT010	21.04.23	AM	<i>Menetia greyii</i>	Dwarf Skink
WIT010	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT010	18.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT010	18.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT010	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT010	17.04.23	AM	<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko
WIT010	18.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT010	20.04.23	AM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT011	20.04.23	PM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
WIT011	21.04.23	AM	<i>Ctenotus regius</i>	Eastern Desert Ctenotus

Site	Date	Time	Scientific Name	Common Name
WIT011	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	19.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	21.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT011	17.04.23	AM	<i>Menetia greyii</i>	Dwarf Skink
WIT011	19.04.23	AM	<i>Menetia greyii</i>	Dwarf Skink
WIT011	20.04.23	PM	<i>Menetia greyii</i>	Dwarf Skink
WIT011	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT011	17.04.23	AM	<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko
WIT011	21.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT011	17.04.23	AM	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon
WIT011	17.04.23	PM	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon
WIT011	18.04.23	PM	<i>Menetia greyii</i>	Dwarf Skink
WIT015	20.04.23	PM	<i>Ctenophorus vadrappa</i>	Red-barred Dragon
WIT015	18.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	AM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	18.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	17.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	20.04.23	PM	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
WIT015	20.04.23	PM	<i>Lucasium stenodactylum</i>	Crowned Gecko
WIT015	18.04.23	AM	<i>Morethia boulengeri</i>	Common Snake-eye
WIT015	19.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT015	20.04.23	AM	<i>Mus musculus</i>	House Mouse
WIT015	20.04.23	AM	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
WIT015	19.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT015	20.04.23	AM	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
WIT015	18.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT015	18.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT015	18.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT015	20.04.23	PM	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
WIT015	17.04.23	PM	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon
WIT016	18.04.23	AM	<i>Ctenotus olympicus</i>	Saltbush Ctenotus

BAKARA CONSERVATION PARK

Craig Gillespie

Bakara Conservation Park is in the Riverland and Murraylands National Parks and Wildlife Region on the Stott Highway between Swan Reach and Loxton.

The park was first proclaimed in 1986 and is named after the Hundred of Bakara in which it is located. Initially, the park consisted only of around 1000 ha but was doubled in size in 2009 when the land parcel adjoining to the north was added, bringing the frontage of the park up to the highway. The entire park consists of mallee scrub but the ecosystem is far from uniform throughout. Bakara CP sits within the Holder Land System which consists of undulating plains with low dunefields, occasional solution depressions and minor areas of moderate dunes. The low dunefields consist predominantly of east-west parallel dunes whereas the moderate (taller dunes) tend to be parabolic in shape. In Bakara, the southern land parcel which is the original extent of the park is dominated by these moderately high irregular shaped dunes. The soil here is very thick, soft, loamy, calcareous sand. This is very poor quality soil for cropping and prone to significant erosion if cleared of native vegetation. This is probably why this part of the park contains some very old growth mallee, most of which has likely never been mechanically cleared. This parcel also contains one of these occasional solution depressions or soaks which is surrounded by some very large, thick-stemmed old-growth mallees. Evidently, this area has been historically accessed by graziers to water stock and is adjoined by one of the few areas in this parcel that has obviously been chained at some point. By contrast, the northern parcel is dominated by shallow calcareous loams with outcropping calcrete and low dunes. Here the dunes are generally linear and parallel. I have heard a local farmer who grew up in the area recount his memory of that block having been chained and the trees pushed up into windrows and burnt allowing the land to be

grazed by livestock. The mallee in the north of the park is therefore predominantly considerably younger but seems to have recovered well, probably reflecting a relatively short grazing history.

The shallow calcareous loams support a woodland commonly of *Eucalyptus gracillis* and *E. socialis* with a very open chenopod understorey. This system is found on low-lying plains including the inter-dunal swales. The low dunes rise into a mixture of *E. socialis* and some *E. leptophylla* over a mixed shrub understorey and often quite continuous ground layer of *Triodia irritans*. Here, the *Triodia* covers the peaks of the dunes. Meanwhile, the taller dunes tend to have this latter vegetation assemblage on their flanks with the *Triodia* thinning out towards the crests which instead support quite a diverse and patchily dense mid-storey of shrubs including *Leptospermum coreacium* and several *Acacia* species with an overstorey of *E. socialis*, *E. leptophylla* and *E. incrassata*. Some large sand dunes of this type also exist on the very northern boundary of the park but the vegetation here is somewhat degraded by comparison to that of the southern parcel.

Bakara is a relatively seldom visited park by the public probably due to its small size and out-of-the way location by comparison to some of the region's larger reserves. However it has always been a popular destination for birders and keen naturalists. The rich avifauna includes many sought-after species including the iconic Malleefowl. The Red-lored Whistler was recorded there in 2017 which was the first record of that species in the entire Holder landscape since the turn of the century. The park is also a stronghold for populations of several other bird species that show locally to State level declining trajectories. Birds that are typical of and locally dependent upon that patchily dense shrubby mallee system on deep sand are well represented in Bakara. These include the Shy Heathwren, Purple-gaped Honeyeater and Southern Scrub-robin. These birds were once found more



SEG members walking between malleefowl mounds at the annual Mound survey. Photo Alun Thomas



Shy Heathwren. Photo Tom Hunt



Malleefowl. Photo Tom Hunt

widely in the Northern Murray Mallee where the taller parabolic sand dunes lie in an arc between Stockyard Plains near the north of the landscape, south through Bakara and Mantung and curving east towards Caliph and Cobra Bore. Their distribution in this landscape has contracted back from these extremes to the Bakara and Mantung area since records have been reliably collected over the last 50-60 years. Thankfully, the area surrounding the park includes an extensive complex of properties that have Native Vegetation Heritage Agreements, some of which are among the earliest agreements in the state. Many of the owners of these properties formed an alliance known as the Mantung-Maggea Land Management Group around the time that the park was proclaimed. This group has been actively involved in managing their own Heritage Agreements as well as the Bakara CP for conservation outcomes ever since. Their work has included fox and rabbit control and importantly an extensive revegetation program aimed at restoring the deep sand habitat that these declining birds use. Much of this revegetation and other management activities was undertaken on a nearby property which was later (2014) proclaimed the Mantung Conservation Park. The persistence of these bird species in the area is no doubt due in large part to the existence of these parks, the Heritage Agreements and the work of the local landholders.

The earliest South Australian nest-mound monitoring records in the National Malleefowl Monitoring database are also from Bakara CP in 1989. Monitoring has continued there annually since then and much of this work has involved the Scientific Expedition Group. Site S07 in Bakara CP has remained throughout that time one of the state's most productive breeding sites. The recent exhaustive ground-search within in and around the monitoring site for nest mounds turned up several previously un-recorded mounds suggesting that recent breeding activity may have even been underestimated to some degree. Malleefowl are prolific in the area and the number of active nest mounds each breeding season on local private properties is something of a bragging-point among the farmers and other landholders.

In 2016, the Malleefowl mound monitoring site in Bakara became the first in the Murraylands to be incorporated into

the national scale Adaptive Management Predator Experiment with the installation of eight continuously active wildlife surveillance cameras. The purpose of this experiment is to better understand the relationship between predator activity (foxes, cats, goannas etc), predator control effort (mainly fox-baiting) and Malleefowl breeding effort (as measured by the mound monitoring). Multiple sites in similar habitat but with varying intensities of predator control are compared. Currently, the Murraylands and Riverland Landscape Board manages five other sites in addition to the Bakara site in Peebinga, Karte and Danggali Conservation Parks, Calperum Station and Gluepot Reserve. The SEG has also been heavily involved in the servicing of these surveillance cameras which is greatly appreciated by the Landscape Board and very important work. To date, the AMPE has demonstrated within our region that Malleefowl seem to be able to coexist with foxes at a variety of activity levels across the region with little relationship to the level of predator control. At a recent National Malleefowl community of management practice meeting, the National Recovery Group presented similar findings at the national scale with some impact of baiting on



SEG members Helen Owens and Bruce Gotch servicing one of the active wildlife surveillance cameras in Bakara CP. Photo Alun Thomas

foxes evident but scarce evidence that this flows on to affect Malleefowl breeding effort. The experiment continues to be rolled out nationally and we intend to continue our participation in the MR landscape indefinitely.

In addition to the information on predators, these cameras capture large amounts of other useful data. By comparing this data to that from other cameras focussed on Malleefowl mounds in the same habitats, a recent published study demonstrated greater diversity of avian and reptilian visitors to mounds than to non-mound sites. This, along with another study into soil nutrient and micro-organismal properties begins to build evidence for Malleefowl as important ecosystem engineers.

The cameras also capture continuous records that provide an activity index for large herbivores, particularly



Southern Scrub-robin. Photo Tom Hunt



Purple-gaped Honeyeater. Photo Tom Hunt

rabbits, hares, feral goats and kangaroos. All of these are believed to impact Malleefowl and other mallee birds both directly through competition for food and indirectly through degradation of habitat. This data therefore helps the Landscape Board to better understand the efficacy of our management of these herbivores. In the case of Bakara, the cameras provided the first record of a feral goat in the park in 2018. This was soon followed by a community effort to detect and control feral goats in the area. The last goat detected on the cameras was in November 2021 but we are watching!

Thanks to the work of the Scientific Expedition Group, Bakara Conservation Park continues to be an important and valuable biodiversity and scientific asset. The relationship between SEG, National Parks and Wildlife and the Murraylands and Riverland Landscape Board is highly valued by us and we look forward to it continuing and developing into the future. For any questions or comments regarding the work of the MRLB in Bakara CP or elsewhere, please contact the author, Craig Gillespie, Senior Ecologist, MRLB.

Craig.Gillespie@sa.gov.au



An active Malleefowl mound on Bakara Conservation Park. Photo Alun Thomas

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