



SEGments

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Scientific Expedition Group Inc.

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Cover Photo: Chris Wright crossing Arcoona Creek in the Vulkathunha – Gammon Ranges National Park in October 2016

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 of Environment Water and Natural Resources 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 annual mallee-fowl monitoring over a weekend in the Murraylands.

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Chairman's Report 2016

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Thank you from the Editors

We would like to thank the many contributors to SEGments for their interesting, informative and well-written articles. As Editors we occasionally receive complimentary comments about the quality of the Journal, and we are grateful to you as contributors for your willingness to spend time writing for SEGments and for your patience as we edit articles to produce each edition.

Alun Thomas
Helen Johnson

Since last year's AGM we have experienced some environmental extremes: flooding rain and fire. A fire in the Gammon Ranges came very close to our recording devices and our surveys both at Minnowarra and Witchelina were affected by rain. Many people have worked hard to make our program of events run smoothly.

The SEG committee meets regularly and work effectively and efficiently to organise the various activities. Thanks are due to:

President, Richard Willing; Hon Secretary, Sarah Telfer; Hon Treasurer, Graeme Oats; Administrative Officer, Alun Thomas; and Andrew Barr, Helen Johnson, Greg Johnston, John Love, Duncan Mackenzie, Stuart Pillman, Trent Porter, Jill Tugwell and Chris Wright.

I would also like to thank the Telfer's for organising the venue: centrally located and well appointed.

Witchelina (12th – 23rd September): The wet weather made this a difficult time for our volunteers. Some tracks were impassable and cool conditions meant that the numbers of animals captured in traps were low. Despite these difficulties our people worked well and have added significantly to the data available to the managers of the property Nature Foundation SA. Thanks are due to all particularly Darren Niejalke, the scientific leader.

The Vulkathunha – Gammon Ranges Scientific Project: A fire in the Gammon Ranges came very close to destroying some of monitoring equipment vital to the Vulkathunha – Gammon Ranges Scientific Project. The data though keeps coming in due to our small and hardy team led by Chris Wright.

Minnawarra biodiversity survey. Here again the weather proved a trial for the researchers but they continue to turn up interesting information about our local fauna. It is particularly pleasing to see the records of bandicoots in the area. Well done to Richard Willing and Janet Furler for running this project and being so hospitable to the workers.

Malleefowl monitoring. The short trips to the mallee for these counts of mallee fowl nests are some of the most accessible forays for our members. Stuart Pillman has again ably organised these events. SEG's monitoring patch is Bakara Conservation Park and the adjacent farm, until recently owned by Henry Short. Our grateful thanks to Henry for being such a generous host and supporter. The new owner is interested to keep the project going.

SEGments. Alun Thomas and Helen Johnson continue to produce high quality publications with fascinating accounts of our work and reports from scientists. Members must be particularly impressed by the excellent photographs in each issue.

Bob Sharrad

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SURVEY METHODS FOR MEASURING BIODIVERSITY AT WITCHELINA, 2016

Courtney Glover

During a very wet month over the period 12th to 23rd September a series of surveys were conducted at Witchelina in order to record the biodiversity of the property. Due to its size, the landscape and habitat varies greatly throughout the property, with the northern portion where this survey took place being dominated by low chenopod shrub lands, large dry creek beds lined with river red gums, and the rocky slopes of the Willouran Ranges.

Although numerous biological surveys have been undertaken at Witchelina since 2010, there is still little known about its faunal and floral diversity. This expedition worked to survey previously established vegetation sites, as well as establishing new biological surveying sites in order to record the abundance and distribution of animals and plants in the area. This data can then be compared to any previous data for the area. Unfortunately, due to the high amount of rainfall and the stormy weather present during this survey, the number of sites that could be visited was limited. It was proposed that 14 sites would be surveyed for vertebral and invertebral species abundance, but only 8 were completed. There was some more luck with the plant surveys, with 14 in total being completed, but there were 10 more sites that were either inaccessible or couldn't be found.

In order to better understand the biological diversity of Witchelina, multiple surveying methods were carried out. These surveys were distributed across a large area in an attempt to broaden our knowledge of the area. The surveys undertaken recorded the abundance of mammal, reptile, invertebrate, bird, and plant species using the methods explained below.

VERTEBRATE SURVEYING (Mammals and Reptiles):

In order to understand the mammal and reptile species abundance of a specific area, there are various survey methods. Not all sites could be accessed due to adverse weather conditions, but at each of the sites we could access, we undertook pitfall trapping, Elliot trapping, cage trapping, and funnel trapping, as well as actively searching and recording any opportunistic sightings. Darren Niejalke, an environmental scientist with over 20 years of field experience, was the Scientific Leader and was also in charge of the mammal survey. Kelly-Jo Kovak, an environmental scientist who has had 18 years experience in the mining industry and arid South Australia, mainly in flora and fauna, was in charge of the reptile surveys. The vertebrate surveying techniques are explained in more depth below:

Pitfall Traps:

At each site a small 60 metre long fly-wire fence was erected. At 10 metre intervals along this fence a macro-pit (like a

bucket without a bottom, but with wire over the bottom) was dug into the ground; the opening sitting flush with ground level. In total 6 macro-pits were placed in the ground, each with the fence running centrally over their opening. Metal pins were inserted along the pit line in order to make sure the fence remained in an upright position. Placed in each macro-pit was an empty toilet roll or piece of plastic tubing, so that any animal that fell into the trap had a place to hide to feel protected. Some leaves and small twigs were also placed in the macro-pits.

Each pit line was checked once in the morning and once in the afternoon for 4 days, before being packed up.

Over the surveying period a number of animals were collected in the pits, including a Stripe-faced Dunnart (*Sminthopsis macroura*), Fat-tailed Dunnart (*Sminthopsis crassicaudata*), and House Mice (*Mus musculus*). Some invertebrates were also found in these pits which will be mentioned later.

Elliot Traps:

A semi-circle of 15 Elliot traps ran parallel to and approximately 10 metres away from the pit line at each site. Each Elliot trap was placed roughly 10 metres apart, all within similar vegetation. A small ball of peanut butter and rolled oats was used as bait in each trap. The traps were placed under bushes in order to limit their exposure to direct sunlight, and these bushes were all marked with bright flagging tape. No animals were caught in the Elliot traps on this trip.

Cage Traps:

Two large cage traps were also placed along the pit line, one on each end. In each trap a ball of peanut butter and oats was placed as bait. These traps are again placed under a bush if possible, with a piece of sacking draped over them to limit exposure to direct sunlight. A rock was also placed on top of each trap to prevent disturbance from birds or foxes. On this trip no animals were found in the cage traps.

Funnel Traps:

Also placed along the pit line were 2 funnel traps. These were placed in the middle of the line, flush with the fence. The funnel traps are designed to catch larger vertebrates that may be too large to fall into the pits, but many smaller vertebrates and invertebrates also manage to get into them. A couple of small rocks were placed on top of these traps in order to keep them grounded, but also to limit disruption from any animal hoping to eat a creature which may be trapped inside. On this trip, only a variety of invertebrates were caught in the funnel traps, including a large centipede.



Large centipede found in a funnel trap

Active Searching:

For at least one hour over the four days each site was actively searched. This included lifting rocks and logs, raking leaf litter, etc. This was done mostly to record any reptiles and frogs that may have been present, but any other animals that were found were also recorded. Tracks, scats, burrows and bones were also noted down on a data sheet. It was mostly skinks (including Shingleback Skinks, *Tiliqua rugosa*) that were found through these searches.



Shingleback skink found during an active search

Opportunistic Sightings:

As expeditioners were travelling from site to site, around the campsite, or elsewhere at Witchelina, any animals they found were photographed, GPS'd, and recorded. This allowed for a broader range of data to be collected, especially for animals that may not be recorded at the sites. Some examples of the animals recorded through opportunistic sightings included:

Euros (*Macropus robustus*), Red Kangaroos (*Macropus rufus*), European Rabbits (*Orytolagus cuniculus*), and Bearded and Painted Dragons (*Pogona vitticeps* and *Ctenophorus pictus*), and an echidna (*Tachyglossus aculeatus*).

Justification/ Potential Improvements:

Although some of the trapping methods did not yield extensive data, a large number of species were still recorded. These methods were ethical, however, with little harm being inflicted on any of the animals caught. I learned on this trip that the number of individuals captured depends greatly on the surrounding habitat, where the traps are placed, and the type and density of animals in the area. The data from this survey may have been hit and miss, but it was a repeatable, reliable method of identifying animals that may be quite hard to identify otherwise.

BIRDS

Brian Blaylock is a former secretary for Birds SA and has performed bird surveys for the Department of Environment, Water and Natural Resources (DEWNR) for 5 years. He was in charge of the bird surveys on this trip, with a method which proved to be quite effective for understanding the species abundance of birds in a given area.

Once a survey site had been chosen and the starting point identified, the survey began. A rough circle was walked approximately 100m out from a central point, with all birds either seen or heard within one hour recorded on a data sheet. The area which I surveyed with Brian was a wide plateau covered in sparse saltbush, with only one tree as far as the eye could see. During this survey the species of birds recorded included zebra finches (*Taeniopygia guttata*), a group of white-winged fairy wrens (*Malurus leucopterus*), some Black-face woodswallows (*Artamus cinereus*), and a nankeen kestrel (*Falco cenchroides*).

This survey was repeated once in the morning and once in the afternoon for each site, enabling the recording of any birds that may only be present at certain times of the day. This helped in gaining a greater understanding of the abundance of bird species for a particular area.

Any opportunistic sightings were also recorded to increase the potential data collected. These included any birds seen while travelling throughout Witchelina, with each sighting being marked with a GPS reading so that it could be found again if needs be. Some of the birds observed through these opportunistic sightings included Yellow-throated Miners (*Manorina flavigula*), Wedge-tailed Eagles (*Aquila audax*), Emus (*Dromaius novaehollandiae*), and a Cinnamon Quail-thrush (*Cinlosoma cinnamomeum*). Some active nests were also found, including those of a Tawny Frogmouth (*Podargus*

strigoides), a Barn Owl (*Tyto alba*), and a Black-breasted Buzzard (*Hamirostra melanosternon*).

Justification/ Potential Improvements:

The method advised by Birds SA for surveying the bird species of an area involve walking in a circle 80m out from a central point for 20 minutes. According to Brian Blaylock this is an inconclusive method of identifying the birds within a given area, as 20 minutes is not enough time to gather a reasonable sample of the species diversity. As time progresses, the number of different species identified will increase exponentially, before plateauing off until no new species or individuals will be seen as they have all already been recorded. Brian has incorporated this into his surveys, determining a set length of time that he feels will give enough time to identify the greatest number of species or individuals for a certain site. On this survey it meant walking around the site for 1 hour, while on other sites this time frame may vary. I believe this is an effective method of understanding the bird species present at a site, because species density does change from site to site and this needs to be taken into account.

A limitation for all birding though, is spotting or hearing the individuals. Even though a bird may not be seen or heard while a survey is underway, it does not mean that there are no birds present. This is also why Brian's method is effective, because the longer the time spent in an area, the greater the likelihood that observers will have enough time to see birds that are in the area. Because the time spent at each site is recorded, this method is repeatable and yields reliable results for the bird species in a given area.

INVERTEBRATES

In charge of the invertebrate surveys were Nick Birks and Annette Vincent. Nick Birks has had a life-long interest in invertebrates, mostly trapdoor spiders, and has volunteered at the SA Museum for nearly ten years sorting and identifying spiders. Annette Vincent has a Bachelor of Biological Sciences, and throughout her career has worked extensively with



Vial of ethanol with invertebrates collected from macropits

insects, more specifically focussing on ants. Although surveying ants may sound like tedious work, they are ideal for monitoring environmental change (Andersen & Majer, 2004).

In order to survey the abundance of ants and other invertebrates, micro-pits were established. The micro-pits had a similar set up to the macro-pit lines for the vertebrates, except there were no fences, and the pits were much smaller (30-40ml vials) and were filled with 100% ethanol. This pit line consists of 6 vials placed at 10 metre intervals in a line parallel to the main vertebral pit line. The micro-pits were generally placed 2 metres away from the macro-pit line to avoid people trampling on them. At each pit a stick was also hammered in the ground with some flagging tape tied to the top in order to find them more easily. These micro-pits were left out for 4 nights, and were topped up with ethanol as necessary.

Additionally a glass jar filled with 100% ethanol was kept at the beginning of the macro-pit line in order to collect any invertebrates found in the pits.

Justification/ Potential Improvements:

This method of surveying invertebrates does not yield a conclusive result for the potential species found in a given area, as only the ground dwelling bugs will be caught and recorded. This means any invertebrates that are found on trees or that spend most of their time flying will have a much lower chance of being caught in the traps. Another limitation is if any invertebrates fall into the macro-pits and there is an insectivorous animal such as a dunnart or a dragon. To prevent this, toilet rolls and leaf litter are placed in these pits to provide shelter and an escape for the insects.

Although this method can be easily repeated, there are some potential improvements which will enable a broader range of invertebrates to be recorded. This includes hanging a sticky insect trap, the merits of which are discussed in a paper by Taylor (Taylor, 1962). Unfortunately, these traps are only effective at catching invertebrates at wind speeds of 1-16km/hr, which would not have been useful at Witchelina where the wind speeds often far exceeded this range.

More research needs to be done into understanding various methods of surveying invertebrates which are reliable, repeatable, and suitable for the weather conditions at Witchelina.

VEGETATION

To measure the vegetation at Witchelina, multiple methods were put in place. These surveys were run by Justin Jay and Margie Barnett. Justin Jay has worked as a rangeland officer for DEWNR for many years, travelling the state assessing the floral diversity in pastoral leases. Margie Barnett has a Bachelor of Science specialising in Botany and holds a keen

interest in native flora, working extensively with Trees for Life and native nurseries throughout South Australia.

The sites surveyed on this trip were initially chosen in 1999 by the Pastoral Board as representative of the property. These sites were chosen as they are near a water source (either natural or man-made) which meant heavy grazing was incurred in these areas. According to Justin, the land can be heavily disturbed for up to 1.5km away from the water source. Since 1999 surveys were thought to have generally been undertaken once every four years, but it became apparent that not all sites have been surveyed regularly, because there were some tracks to sites found to be completely overgrown. The property has now been de-stocked for the past four years and significant change could be expected

Heavy rains in arid environments such as Witchelina bring on rapid growth in many native annual plants, which survive long enough to reproduce before dying. As this vegetation is not a constant in these areas and therefore not a reliable measure of the area's health and biodiversity, this survey mainly focussed on perennial, long lived vegetation.

Jessup Transects

To measure the perennials, the Jessup Method was used. As this method can be repeated year after year at the same location, it is a good measure of density change for perennial species. In order to keep the area to be surveyed constant, permanent transects had been established at each vegetation site. A transect consisted of two poles spaced 100m apart, with one of the poles being used as a photo-point, allowing a surveyor to look back on previous photo images of the location and monitor changes. On each survey a tape measure was placed between the two poles so that each 10m increment could be identified. A two metre long rod was then held out on the left hand side of the line made by the tape. Every perennial that fell under the rod was identified and recorded on a Jessup Transect Data Sheet, along with a description of the plant's age (adult/juvenile).

The person holding the rod slowly walked from 0-100m, stopping at each 10m mark so that the observers had time to record any plants present. Once the rod holder made it to the end of the 100m length, they turned around and completed the other side of tape. If there was any doubt as to what a plant species was, a specimen was collected and taken back to camp for identification. If the base of the plant was within the transect, it was counted. If only the foliage penetrated the transect, the plant was not included. Chenopod shrubs often grow in clumps, and therefore care was taken to distinguish between individual plants. If there were multiple root stocks within 30cm of each other, it was counted as one plant, but if there was a larger space than this between them, they were classified as separate clumps.

Any perennial that was found to be shorter than 10cm in height or width and lacked a woody stem was classified as a juvenile. If the plant was heavily grazed, however, which resulted in a small height, it was still classified as an adult, but a comment was made on the record sheet. If a plant was dead or completely lacked foliage, it was not recorded, although a note of it was made.

Photo-points

As was previously mentioned, photo-points were incorporated into each survey site. These photo-points have been used since 1999. This enables an observer to look at any changes in the site over time.

Active Searching

Active searching was also undertaken at each vegetation site. This was done within approximately 400m² of the Jessup transect and all plant species were recorded, including annuals. This was extremely time consuming and consisted of walking up and down or in circles trying to identify any plants species that had not previously been recorded. As we were not counting each individual, but rather identifying the species present, it was not too arduous.

Justification/ Potential Improvements:

Jessup Transects, photo-points, and active searching are extremely efficient methods of surveying the floral diversity of a site. Although it was slow and tedious work, it ensured that the density and change of abundance in perennials was measured, while also documenting any annuals present at the site. Thankfully, there have been a series of good years bringing with them plenty of rain, resulting in many annual plants which broke up the otherwise sparse landscape.

Because the transect lines are permanent, and surveys are repeatable, vegetation data can be compared over time.

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WHAT WE DID ON OUR HOLIDAY

Garry Trethewey

Between Witchelina, the Gammons and Arkaroola, Michelle and Garry Trethewey had some jolly good adventures!

Witchelina

We missed the first week of the Witchelina trip, arriving late Friday 16/9/16. I'm sure there will be other reports about Witchelina, so I'll only mention a few things, mainly the extra-curricular activities.

Graham Medlin from the South Australian Museum has turned us on to sub-fossils; old bones that are not yet fossils, but 100 or 1000 years old. Michelle took a few minutes off from a picnic, poked her head into a bit of a cave and found some amberat. No, not Amber Rats – amberat is stuff that is the dried urine solids of Stick-nest Rats, plus pollen, hair, dust and other indications of the past. Very exciting. Duly GPS'ed, photoed, notebooked, and discussed.

Later we took the opportunity to check out a likely looking cave that I'd noticed on a previous goat-shooting trip, but hadn't had time to investigate. After lying down in, and scrabbling around in, and digging and sieving damp goat shit for a couple of hours, we had accumulated a small handful of fairly broken and degraded tiny little jaw bones and the odd detached teeth. Graham has identified the previous owners of these bones, and it turns out some are of animals that have been extinct for well over 100 years. Again, very exciting. See separate article by Graham Medlin in this edition of SEGments. I'm newly interested in geology, so I was constantly stopping to look at rock formations, wonder about minerals, and collect samples. Some very interesting stuff - a fist sized calcite crystal, whole hillsides of shining white quartz looking like snow, and areas of tillite (glacial detritus).

V-GRaSP

We'd planned on doing our usual photopoints in the Gammons, only about two hours drive from Witchelina, after the Witchelina trip finished. So on Friday 23/9/16, the shorter than usual trip allowed a more relaxed coffee stop at Copley than usual. Copley caravan park has sold the bakery/general store part of the business to Peter and Mary-Lee, while Shirl and Dave will continue to run the caravan park. (After five years of Dave asking customers how to work the coffee machine, something had to change). The new bakery owners plan increased and more consistent services, including evening meals.

We checked in at Operation Flinders' headquarters, Owieandana, because we traverse their property. Brief chat, nothing untoward, we went on to Bob's Camp. Plenty of signs of the recent rain – odd track washouts, a bit of mud, plants greening up. From Bob's Camp, near Arcoona Creek, an

unaccustomed roar of fast water.

Anticipation rewarded, but with ambivalence. We'd always wanted to see the creek running, but somehow hadn't expected to get wet. It was running well over the tops of our boots. Hmm, a New Zealand walk, wet feet all the way. The small pool holding the stream gauge had disappeared under the larger pool up & down the creek, which in turn had disappeared under a tranquil 100 metre long pool we'd never seen before.



Another wet crossing of Arcoona Creek

The seeps, spoken of at length in previous reports for the paucity and inaccessibility of the water, were running a foot deep. Lake Willing (usually a short dry mud flat) was full. Our route was often impeded by rushing water or deep mud. Wild Ass Waterhole, usually a two metre deep dry rockhole below an outcrop, was now almost up to the level of its inflow.

A short while later, a different kind of excitement was provided. We heard the loud roaring sound that usually accompanies bees swarming. Normally bees swarming are pretty safe to walk through, as they have nothing to protect, and are busy looking for a new home. But this lot was behaving unusually, with many feeding on flowers. They were soon chasing and stinging us. We ran back the way we'd come, slapping and squashing bees in our hair & clothing, until we seemed clear, and then took time to get out a pocket knife to remove stings (so much for keeping finger nails short). The swarm didn't seem to be moving, so we looked at the wind direction and our options for bypassing them. Up the hill it was to be. But first we lit a fire and smoked ourselves, and prepared some burning and smoking sticks to take with us.

Thinking about it, I hypothesize that the bees had swarmed some time ago, not found a new home, and so were becoming cold and hungry and grumpy. When I was a bee-keeper 40 years ago I never saw that, but I suppose well-bred bees kept in luxury will be more placid than these feral ones. Checking



Lower Vandenberg campsite

Because of the recent rain, we anticipated a bit of trouble crossing Arkaroola Creek at Stubbs Waterhole, so we were surprised to see the creek and waterhole bone-dry.

But as we drove up the track 300 metres up the creek to our photopoint, we heard the roar of water. Huh? Investigating, we found lots of it, flowing fast, rushing and splashing down waterfalls and channels. Puzzled, we followed the flow back downstream, toward the crossing, initially only just keeping up with the speed of the water, but soon overtaking it as it appeared to slow down. Turned out it was soaking into the gravel between the rocks, and filling the pools, and the actual front was only advancing a couple of centimetres a minute.

Later Marg Sprigg gave us an account of the water's progress down the creek that September. It crossed the road near Bolla Bollana Smelter late on the 19th. The Ridgetop Track crossing, 18km downstream, was flowing deep and fast on the 21st and the tour was cancelled that day. It reached Stubbs Waterhole, another 13km downstream late on the 25th, and didn't reach Tillite Gorge, 5km further, at all.

I wonder a few things.

1) Given:-

--Arkaroola Village, only 6 km west, got 90mm rain the month before, in a generally good (ie wet) year. -- Arkaroola Creek's top catchment is in the Gammons. It is only 5km from Arcoona Creek, which was running a banker.

--All the local side creeks had flowed.

--A PhD project at Paralana Spring was interrupted by the creek flowing over the spring.

But although Stubbs Waterhole is within and at the bottom of this area, it was dry. Why?

2) It had taken six days for the water to get 30km down the creek. As we'd observed, the substantial flow a few hundred metres upstream was reduced to a slow trickle by the water being diverted into the gravel bed and filling dry pools. So perhaps this was the case all the way upstream. I'm conceptualizing the creek bed being a giant sponge, slowly absorbing flow, rather than a rocky bottomed 'pipe' that would simply carry water.

3) "Creeks never run their whole length at once." -anon, but a nice example.

On Monday we went home to do days & days of documentation, that really should have been done at the time. As always.

If anybody wants, they can get photos, a Google Earth .kml of Arkaroola creek flows, rainfall records, or any other details from garrytre@bigpond.com

later, Dr Google says that while smoking a going colony pacifies them, smoking a swarm can make them more grumpy. Whatever the pros and cons of the learning experience, we lived, suffering nothing more than a few cosmetic imperfections for the next week.

We couldn't get to the old Vandenberg cache safely, with a deep gutter under it and a slippery cliff to traverse, so our photos lack the marker pole. Lower Vandenberg, a well used camp site, was a shallow pond, warming in the sun and growing algae and succulent shoots. Upper Vandenberg looked like it wouldn't take much to create the same effect, but we camped under a tree a couple of inches above the flow path and all was well. Except for the mozzies. Bigger than those at Witchelina, and more able to puncture clothing, so while faces and arms were protected by repellent, covered areas suffered.

Next day, up the hill with little rain and not too cold; -quite pleasant. Mainly rock, but the 'bare patch' - gibber over clay - was sticky and deep, and the burned *Melaleuca uncinata* site was running with an inch of water.

A couple of hundred metres from North Tusk we came across just another small dragon, but Mark Hutchinson says people think *Ctenophorus decresii* are becoming rare in the North Flinders, so I record them when I see them. I'm always surprised at that: things I wouldn't have thought were significant turn out to be.

At the Plateau Pluvio we were pretty listless with the thought of the mozzies overnight, so we decided to pack up and go that day. Sudden rejuvenation: out easily past a sad little bee swarm (the main body had left) and off to Arkaroola for another adventure!

Arkaroola

At Arkaroola on Sunday 25/9/16 we whizzed around and did the photopoints from the SEG Arkaroola 2009 & 2011 bio surveys, as we tend to do most Octobers. So there's an ongoing series, which Marg & Doug Sprigg appreciate.





Approaching storm at Witchelina—Photo Annette Vincent



Graeme Oats and Kathleen Cunningham at a freshly worked malleefowl mound in Bakara Conservation Park—Photo Alun Thomas



Ruby Kovac baiting an Elliot trap at Witchelina



Chris Wright, Graham Blair, John Love and Ray Hickman at the Upper Vandenberg campsite



Restoring the longdrop at Minnowarra

Photo Janet Furler

R IN PICTURES



Annette Vincent and Sam Kovac at Witchelina
Photo Kelli-Jo Kovac



Trish Williams calibrating Plateau rain gauge.
(Anzac Weekend)



Inspecting the impact of the Plateau fire (Anzac Weekend)

ANALYSIS OF SMALL BONES FROM AN OLD OWL ROOST ON WITCHELINA

Graham Medlin

During September 2016 the Scientific Expedition Group (SEG) carried out a biological survey (BS 1028) of the northern and north-eastern sections of Witchelina Nature Reserve. In addition to the normal opportunistic searching, pitfalling, cage traps and spotlighting at night, some cave sites were searched for signs of stick-nest rat nests and middens and bones from old owl roosts.

Garry and Michelle Trethewey located a cave with preserved amberat (solidified stick-nest rat urine) and another cave with small bones from an old owl roost. The locations are shown below.

Coordinates of stick-nest rat midden: Easting 221835, Northing 6681610. Map Zone 54.

Lat. -29° 57' 53.6" S, Long. 138° 07' 3.1" E. Datum: WGS84.

Date recorded: 19-09-2016.

Coordinates of the old owl roost site: 30 m S of Easting 211882, Northing 6684052. Map Zone 54. Lat. -29° 56' 26.1" S, Long. 138° 00' 54.6" E. Datum: WGS84.

Collector: Garry Trethewey. Date of collection: 20-09-2016.

The following small mammals were recorded from the old owl roost, including three species now extinct in Australia.

1. Lesser Stick-nest Rat (*Leporillus apicalis*). [Diagnostic material: 1 left dentary.] **EXTINCT**
2. Greater Stick-nest Rat (*Leporillus conditor*). [Diagnostic material: 1 left dentary.]
3. Probably the Spinifex Hopping-mouse, (*Notomys alexis*) (rather than the Dusky Hopping-mouse *Notomys fuscus*). [Diagnostic material: 3 right maxillae, 2 right dentaries.]
4. Long-tailed Hopping-mouse (*Notomys longicaudatus*). [Diagnostic material: 1 left maxilla, 2 left dentaries.] **EXTINCT**
5. Western Barred Bandicoot (*Perameles bougainville*). [Diagnostic material: distal fragment of 1 right dentary.]

6. Probably the Plains Mouse (*Pseudomys australis*). [Diagnostic material: 1 right maxilla, 1 left dentary.] This species has already been recorded for Witchelina.
7. Gould's mouse (*Pseudomys gouldii*). [Diagnostic material: 3 left and 4 right maxillae, 6 left and 3 right dentaries.] **EXTINCT**
8. Either Bolam's Mouse (*Pseudomys bolami*) or the Sandy Inland Mouse (*Pseudomys hermannsburgensis*). Skulls of these two species are very similar and without the diagnostic M¹ (missing in this case) they cannot be separated. [Diagnostic material: 1 right maxilla with M¹ missing, 1 left and 1 right dentary.]
9. Long-haired Rat (*Rattus villosissimus*). [Diagnostic material: 4 left and 2 right maxillae, 3 left and 3 right dentaries.] This species has already been recorded for Witchelina.
10. Either the Fat-tailed Dunnart (*Sminthopsis crassicaudata*) or the Stripe-faced Dunnart (*Sminthopsis macroura*). [Diagnostic material: 2 left dentaries without teeth.] Unable to identify to species because the diagnostic teeth were missing. Both species have already been recorded for Witchelina.
11. Rabbit (*Oryctolagus cuniculus*) [Diagnostic material: Single upper incisor only.]
12. Large dragon lizard not identified to species. [Diagnostic material: 1 left maxilla, 1 right dentary and frontal bone from the skull.]
13. Small skink not identified to species. [Diagnostic material: 1 left maxilla, 1 right dentary.]

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Amberat found by Michelle Trethewey at Witchelina

IT TAKES A VILLAGE...

Kelli-Jo Kovac

Recently I had the privilege of taking part in the SEG expedition to Witchelina Station. My involvement was as the Reptile Science Leader, however as an added bonus I was able to bring along my husband Dave and three kids, Jack (7), Sam (6) and Ruby (3). We are currently travelling Australia in a caravan (which includes home-schooling the children) so this was an opportunity too good to refuse.

It has been some time since I have participated in a biological survey so it was fantastic to be back in the field, and be able to involve my whole family in the experience. However, the highlight for me was seeing my kids benefit from the experience



Jack Kovac working on a pitfall line at Witchelina watched by his Dad, Dave.

The first few days were spent setting up sites, which saw the kids spend hours in the field with Nick "Spiderman" Birks and Annette "Ant" Vincent. Both of them were so patient and the kids learnt all about spiders, ants and other invertebrates – including the best ways to catch them and put them into a specimen jar, how to install and top up micro-pits and even how to mount insects for display.

Later days were spent checking traps and doing active searches at survey sites. They learnt how to set and check Elliot Traps, how to check funnel and pitfall traps, how to properly handle animals and how to search habitats for critters. They learnt about the habits and behaviours of the many animals that we did capture. Above all, I saw their confidence grow in so many areas. On one particular day, the kids turned up a Spiny-tailed Skink. Jack was regaling us with the story later on "and you should have seen Sam, he was so brave, he just leapt in and grabbed the skink. I was so proud!".

The debrief meetings after dinner also became an attraction for the kids. A few days into the trip, Nick encouraged Sam to

do a show and tell of a spider that they had uncovered during the day. When it was his turn Sam stood up and shared his spider with the group – he was so proud. So were Dave and I. I thanked Nick later on for his encouragement and his response really made an impact on me "I normally give talks to 80 year olds, and I look at them all and think "where are your grandchildren?" so this is great". By the time our last night rolled around all three kids stood up and gave a talk on something that had been captured during the day.

Life around the camp was also great exposure for all of the kids. The arrangement of the teams and the fact that everyone helps out with different roles was great for them to see. They got to watch their Dad (who we often call 'Doing Stuff Dave') helping out and fixing things around the camp. This included repairs to door handles among other things, but the most notable effort included helping to unblock the septic system that wasn't able to cope with the daily ablutions of 40 odd people. Dave jumped on the loader and helped the station manager remedy the situation and soon enough the problem was resolved. They could see how everyone was involved and even asked if they could be in the camp team for a day. While this didn't eventuate the boys lined up at various stages in the kitchen to help out with preparing meals.

Participating in the expedition was an amazing opportunity for my kids to interact with nature. Growing up with an ecologist parent, they have seen and experienced many things that most kids wouldn't have had the opportunity to do. The expedition however, bought so many things together on many levels. It certainly is an unrivalled experience for children of all ages to experience true science for an extended period; one which I would recommend for all children.

The skills that the kids picked up during the trip have continued to show up during our travels. For weeks afterwards they wanted to jar up every invertebrate they came across and send it to Nick or Annette! Ruby is super keen to pick up and touch any animal or invertebrate that she can find. Sam and Jack are determined to overturn every rock to see what might be living under it. Jack has also continued to finger stitch (thanks Christine!) and he has since taught his brother how to do it – they have spent many hours in the car turning out metres of finger stitching.

I would like to sincerely thank everyone for the opportunity to be involved and for being so welcoming to our family. They say it takes a village to raise a child and I saw first hand during the trip just what that means. Dave and I both delighted in watching the kids develop friendships with participants from all walks of life and across multiple generations. They were welcomed unconditionally and created bonds which they continue to refer to. The patience and friendship shown to our kids was truly humbling and something that we will never forget.

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JARRYD HOLMES—MY STORY (AND SOME OF MY WITCHELINA PHOTOGRAPHS)

Hi all,

I have been asked to tell you all a little bit about myself and my lifelong passion for the environment. From a very young age, I have been fascinated by the environment and all of its inhabitants. Growing up, I was always nagging Grandpa to take me bush-walking or snorkelling. Even when we couldn't go out into the world exploring, I would head out into the backyard and search for reptiles and invertebrates.

Whenever I was asked what I wanted as a birthday or Christmas gift, it was usually something animal related. For my 12th birthday, I received my first field guide, *The Slater Field Guide of Birds*. When I was 13, I was given an aviary and this was when I first started keeping and breeding birds. I started with Budgies and Cockatiels. My love for birds grew and so did my bird collection. I converted our old chook house into an aviary and started keeping Australian Finches along with Doves and Neophemas. I also joined the Adelaide Zebra Finch Society and the Adelaide Aviculture Society.

Eventually I started working in a family friend's bird shop every Saturday. Working in the shop, I was hand rearing birds, cleaning, feeding and watering cages and serving customers. I was being paid in a pair of birds or a bag of seed each week. I then developed my menagerie and started keeping a few exotic breeds such as Green Cheeked Conures, Plumhead Parrots and Kakarikis.

While all this was happening I was still in the process of graduating Primary School. On completion of Primary School, I



Gidgee skink

applied to get into Urrbrae Agricultural High School, my dream school. However I didn't get accepted so I then went to Underdale High School. In year 8 at Underdale, I was diagnosed with epilepsy and I slipped into a depression.

I was asked to see the school counsellor and she asked me what they could do to help. I told her about a wildlife rescue facility called Minton Farm that I wanted to volunteer at. They offered to send me there to volunteer twice a week to help care for the animals they housed. Working at Minton Farm, I met some amazing people and had some amazing experiences. I think cuddling a Wedge-Tailed Eagle was my most memorable experience.

It was during my time at Minton Farm that I decided to apply for Urrbrae again. This time, with some help from my new



Red-backed Kingfisher



White-winged Fairy Wren



Thick-tailed gecko

friends at Minton, I was accepted. I started at Urrbrae Agricultural High School in year 10. It was such an amazing school to attend; I learnt so much and made some great friends.

In year 12 I got an email from Bev Langley from Minton Farm about a scientific expedition to the Nullarbor. I jumped at the opportunity and this is how I became involved with SEG. On this trip, I met so many interesting and amazing people, who were interested in all the same things as me. I travelled up with Ric Williams; he took me under his wing and looked after me for the two weeks. He is a very interesting man who I love to chat with.

On this trip, we had two campsites. Our first campsite was just past the Nullarbor Roadhouse. The second camp was back on the other side of the Roadhouse along the dog fence. At both sites we saw and caught some amazing fauna and flora. Some highlights of that trip would be seeing Dingoes in the wild,

getting up close to some amazing wildlife and getting to know some inspirational people.

After this trip, I set myself a new life goal to eventually work in the field of conservation or ecology. After that I went back finished school and while I was searching for a job, I kept various animals including lots of native and exotic species of fish, several scorpions, giant burrowing cockroaches, giant millipedes and a tarantula. I also started keeping reptiles such as Spotted Python, Ridge-tailed Monitor, Central Bearded Dragons, Shinglebacks, Eastern Blue Tongued Lizards and Cunningham Skinks. I eventually got a job working with Australia Post sorting parcels. It is not my desired career, however it supports me until I can find employment in my preferred field.

Last year I went on another trip with SEG to SA Nature Foundations Property at Witchelina. This was another amazing experience where I built upon my knowledge of native species of both fauna and flora. I worked with some more fabulous people who taught me a lot and made me feel at home.

In September this year, I returned to Witchelina with the SEG group to continue our work from last year, completing bio-surveys of the local area. I love working with SEG and getting to spend my time doing the things I am passionate about. It is a wonderful feeling, being surrounded by others who share the same passions and enthusiasm that I do when it comes to conservation. I hope to one day be able to turn my passion into a career, but until that day I will continue making time to spend in nature and chase my dream.

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Wedge-tailed Eagle

MINNAWARRA SPRING SURVEY 2016

Janet Furler

Our Spring survey was held, but was not as straightforward as some. We were due to start on the Wednesday but became aware of a serious weather system on the way. A few troops were rallied and the Wednesday setup became a Monday setup, with all sites open and 4 having an afternoon round. Tuesday provided the standard morning and afternoon rounds. Wednesday dawned fine and still, with one query as to why we were closing sites as we checked them, and was the forecast wrong? By lunch time the clouds were looming and the wind was rising. By mid afternoon the power was out – across the state.

Having battened down hatches and burned a lot of firewood for 2 days we ventured out on Friday morning to assess the damage. Four sites were accessible in the morning by cautious driving and walking, Elliotts and cages only, as the pits were all water logged, so they got an afternoon check. Sites 7 and 8, way south, were opened on Friday afternoon with the tractor on standby if needed. Site 4, below the house, was not opened again as walking down and back took too long with the other walking to sites. Site 1 had only the cage traps

opened as they could be checked by one person on motor-bike.

So, with business resumed to an extent on Friday, Saturday yielded 2 rounds to 6 sites – not too bad considering. We were all set to carry on at least to the Monday holiday, possibly the Tuesday for packup day, but once again the weather called the shots. More rain was due on the Monday so all sites were packed up on Sunday, the official finishing day.

In summary, we got the required 4 night of monitoring from 6 of 8 sites, 3 nights from 1 site and 2 nights from 1 site, for the Elliotts and cages. Five of the pitfall lines were opened at the beginning, with 3 sites flooded from below with high ground-water levels. None were reopened. Given we mostly catch skinks and they were all in hiding it was not a big loss of data. The reopening of the cages at Site 1 was for bandicoots, and was successful, with a recapture of our third bandicoot, a feisty young boy. A good result, considering the weather.

I would like to send a big thanks to Kalki and Alex who turned up early and stayed for the duration. David and Graeme also rallied early on to get us started. We also had a good turnout on the weekend.



Male bandicoot caught in a cage trap at Site 1

MINNAWARRA BIODIVERSITY SURVEYS 2017

Autumn Survey Wed 19th to Sun 23rd April 2017
Spring Survey Sat 30th September to Wed 4th October 2017

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
Richard Willing on 0408 807 517

Results

The big excitement was a young adult bandicoot at Site 1, where we've caught the others. It indicates that we have a resident population, not just passers-through.

We caught 74 individuals, all mammals, a total of 142 times. 48 were new and got chipped, 26 were from previous surveys.

This is lower than last spring (100 mammals), which could well be explained by the weather, the break in the middle of the survey and 15% less opening time for traps. We still had our range of bushrats (*Rattus fuscipes*, 44), swamp rats (*Rattus lutreolus*, 15) and *Antechinus (A flavipes*, 14), with our females carrying a good number of babies.

Also

Not surprisingly there were large trees blown over, including this pine across the road by the main gate.

And the longdrop, which had turned into a shortdrop, has been rejuvenated and recommissioned. Sarah did get rescued before the shelter was replaced.



Contact: thefurlers@gmail.com



The wet conditions necessitated roadside processing

Visit SEG's website: <http://www.communitywebs.org/ScientificExpeditionGroup>



YOUNG ONES WORKING AT WITCHELINA



Jack and Ruby erecting a pitline fence assisted by Helen



Ruby checking a pitline with Kelli-Jo and Nick



Sam at Show and Tell



Ruby at Show and Tell with Kelli-Jo and Sam

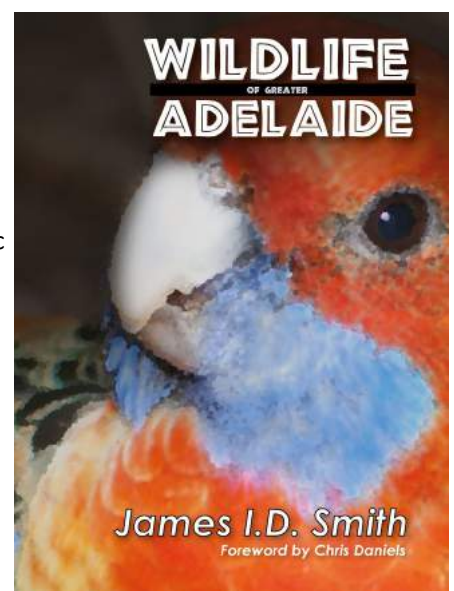
WILDLIFE OF GREATER ADELAIDE

JAMES I D SMITH

A collaboration between the Barbara Hardy Institute at UniSA and the South Australian Museum and sponsored by organisations including Nature Foundation SA and Scientific Expedition Group, this is a must for anyone interested in identifying and learning more about the fascinating wildlife in and around our city.

Written by James Smith from the SA Museum and with a foreword by Professor Chris Daniels, the *Wildlife of Greater Adelaide* was launched at the SA Museum in October. SEG members are able to purchase this wonderful book for a special price of \$55 (RRP \$69.95).

To obtain your copy please contact Graeme Oats on 8278 3179.



SCIENTIFIC EXPEDITION GROUP INC.
APPLICATION FOR MEMBERSHIP AND MEMBERSHIP
RENEWAL for 2016 —17

Membership is open to any persons, family or organisation interested in the following aims:

- * The promotion and running of expeditions of a scientific, cultural and adventurous nature.
- * The furthering of knowledge, understanding and appreciation of the natural environment.
- * Promotion of the values and philosophy of wilderness.
- * Enabling people to learn the skills required for planning and running expeditions, and to develop sound field techniques

SUBSCRIPTION RATES

Adult member -----	\$30.00
Concession cards/ student -----	\$20.00
Family membership -----	\$40.00
Corporate membership -----	\$40.00

Name

Address

.....

Telephone (H) (W)

E-mail

Details of scientific, cultural, and adventuring or other relevant skill or interests you may be prepared to share with the group:

.....

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ELECTRONIC PAYMENT

If you have access to the internet, payment can be made using SEG's bank account at Bank of South Australia, details as follows:

Acc Name – Scientific Expedition Group Inc.

BSB - 105-086

Acc No. 330629440

Please use your last name if possible to identify your payment **AND** also advise us by email that you have made a payment to our bank account.

Email address – gdoats@bigpond.net.au

PLEASE NOTIFY ANY CHANGE OF POSTAL ADDRESS

Or send a cheque made out to Scientific Expedition Group Inc. with a photocopy of this page to:

The Secretary
Scientific Expedition Group Inc.
P.O. Box 501
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Wedge-tail Eagle chick on nest at Witchelina. Photograph Jarryd Holmes