

SEGments



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SEGments



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Contents

Volume 26 Number 2, September 2010.

	Page
Editorial	1
Presidents Report	2
Chairman's Report 2010	3
Bimbowrie Expedition 2010	5
Bimbowrie Reconnaissance 2010	9
Minnawarra Report	11
Mallel Fowl Monitoring	13
VGRASP	14

Editorial: feral Animals

What does “going feral” mean to you? In the Australian lexicon it means going wild, out of control.... Going bush...

Australia has a poor track record with regards to the introduction of feral animal species into the environment. Probably the most well known and even infamous examples are the European rabbit and the Cane toad. The management of these invasive species is usually carried out by concerned people, landowners, conservation groups and government.

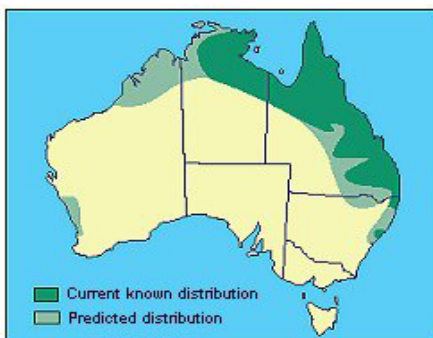
The control of the European rabbits in Australia has had an interesting history. The use of Myxomatosis in the 60's and recently the Calicivirus represent examples of the measures undertaken to reduce the impact of the rabbits on our environment. Unfortunately some rabbits are immune to these controls and we have to start over again.



The introduction of Cane toads into Australia was in itself an early attempt at biological control that went horribly wrong. In trying to reduce the impact of beetles attacking sugar cane fields in parts of Queensland, the government introduced large numbers of Cane toads from Hawaii. In 1935 when the cane toad was first released

its eventual impact on the local environment was not anticipated. So far most attempts to control the cane toad have failed except for the occasional golf club party.

There has been reports that predators have been dying due to these poisonous toads. According to Shine (2009) there is no change in the ecology. Another researcher, Alford (2008) states that there isn't enough evidence to be that optimistic. This writer thinks that the jury is still out as more data needs to be collected about the complex ecological relationships of this feral animal.



But there have been some successes as well. The prickly pear cactus was finally controlled by cactoblastis caterpillars (*Cactoblastis*

cactorum) and is still regarded as the world's most spectacular example of successful weed biological control.

The work of the Science Expedition Group, with Department of Environment and Natural Resources (DENR) attempts to monitor native and feral animals in South Australia. Our expedition this year to Bimbowrie will provide some base line data about animal populations. Hopefully government recommendations will be developed to manage feral animal populations in this area.

The first article by Robert Brandle is very important for the 2010 Bimbowrie biological survey, as it deals with the new site sampling protocol methodology that SEG will undertake.

Trent Porter also adds very good details about the Reconnaissance trip that was undertaken for our up and coming 2010 expedition to Bimbowrie in October.

The Minnowarra project is in it's tenth year and is going strong as Janet Furler reports on the Autumn survey.

The yearly Mallefowl survey at The Bakara Conservation Park is scheduled from October 30/31, 2010. Contact Bruce Gotch if you would like to participate.

Chris Wright has written an interesting article about the 20 year monitoring of rain fall in the VGRASP project and how the technology has changed over the time.

Annette Vincent, the SEG expert on ants, features on the cover with an image from her Arkaroola 2011 calendar after winning a prize at the Waterhouse Exhibition. (see Page 4)

References

1. Shine, R., et al (2009) Locomotor performance in an invasive species: cane toads from the invasion front have greater endurance, but not speed, compared to conspecifics from a long-colonised area. *The Quarterly Review of Biology*, DOI:10.1086/655116.
2. Alford, R., et al (2008) Impact of the invasive cane toad (*Bufo marinus*) on an Australian frog (*Opisthodon ornatus*) depends on minor variation in reproductive timing. *Oecologia*. 01/10/2008; DOI: 10.1007/s00442-008-1167-y

Predicted Cane toad distribution from, WA Dept. website

Editor Email: Andrew.Barr@unisa.edu.au



President's report

Richard Willing

The Patron of SEG, His Excellency Rear Admiral Kevin Scarce AC CSC RANR, Governor of South Australia, presented awards to several supporters at the Annual General Meeting on 3rd September 2010. This follows the presentation of the Order of Australia Medal to SEG member **Chris Wright OAM** earlier in the year for his service to SEG and the community.

Four members received Life Membership:

Alun Thomas was a foundation member of SEG when it started in 1984, and has supported SEG over this time, being Editor of SEGments for 5 years, and Chairman for the last 7 years.

Duncan MacKenzie OAM has lent his biological training and scientific skills to various SEG activities over many years, being a committee member, and involved in several annual expeditions, the Fleurieu Roadside Biodiversity surveys, and the Minnowarra Biodiversity Project.

Janet Furler has been an enthusiastic SEG supporter and has used her biological training and scientific skills in her involvement in the Fleurieu Roadside Biodiversity surveys, the Minnowarra Biodiversity Project, several annual expeditions, and as a former committee member.

Graham Blair has been involved in the continuous support of the Vulkathunha-Gammon Ranges Scientific Project (V-Grasp), giving his support and expertise to the efficient functioning of the equipment during the two decades of the project.

Six members received the President's Award for Outstanding Service to SEG:

Phil and Janet Davill, and **David Kemp** have all been strong supporters of the V-Grasp over twenty years, involving many hours of making equipment work, and climbing to the plateau in all weathers to install and service it.

Jill Tugwell and her family have been staunch supporters of the Minnowarra Biodiversity Project since it started, spending countless hours setting and cleaning traps, and processing the captures. She has also been involved in several annual expeditions.

Loraine Jansen and **John Morley** have been the team involved in mammal and reptile trapping at many annual expeditions and Minnowarra surveys. Loraine's expertise and John's "grunt", as well as his ability to provide a truck for transport have made them valuable members of many survey teams.

SEG offers its congratulations to all those receiving awards, and thanks them for their considerable contributions. As a volunteer, non-profit organization, these awards give some indication of SEG's high standing in the community, in that it receives the support of such outstanding people.



His Excellency Kevin Scarce and Alun Thomas



His Excellency Kevin Scarce and Duncan MacKenzie

SEG's AGM report 2010

Alun Thomas



The Scientific Expedition Group is in its 26th year and it has been another busy year for SEG.

GRaSP has continued its work, the Minnawarra Biodiversity Project has continued, the Mallee fowl project has become a fixed part of our calendar and we are in the final stages of planning for our major expedition this year to Bimbowrie.

GRaSP

Chris and his team have continued to develop the Gammon Ranges rainfall project with more electronics and remote communications. He has been ably assisted by Michelle and Garry Trethewey and many others. There will be a full report on GRaSP presented by Chris Wright. For those members who have not heard, Chris Wright was awarded an Order of Australia in the recent Australia Day honours list for his work on the GRaSP Project.

Minnawarra Biodiversity Project

The autumn survey of the Minnawarra Biodiversity Project has been carried out and the spring survey will be in a few weeks. There will be a report on Minnawarra Project presented by Janet Furler.

Major Expedition 2010

The major expedition will be in a few weeks to Bimbowrie in the far north east of the state. Bimbowrie was a former pastoral property recently purchased by the government. Of particular interest is that this survey will be using new pitfall techniques which are particularly adapted for arid areas. A small group did a reconnaissance several weeks ago and they reported that there have been recent rains so we can expect a lot of vegetation and lots of animals.

Michelle Trethewey has agreed to be Camp Leader, a strong scientific team has been organised and as usual Trent Porter is quartermaster and chief organiser. They are doing a magnificent job. Once again we have applied for and been awarded sponsorship for students by the Nature Foundation so that we are able to subsidise five students to the sum of \$500 each. We are very grateful to the Nature Foundation for the continued support.

Mallee Fowl Monitoring

After our first malleefowl monitoring project two years ago we carried out a second one was undertaken in November last year but very hot weather meant that it was somewhat abbreviated. We monitored two sites, Bakara Conservation Park and the property of one of our members, Henry Short. Bakara is located 32 km East of Swan Reach on the Swan Reach to Loxton Road. A further monitoring will be done later this year and hopefully there will be more favourable weather. If you have not yet indicated your interest in this survey and you would like to be involved please register with Bruce Gotch.

Arkaroola

Following the successful but very dry expedition to Arkaroola last year there have been significant rains and an opportunity has presented itself for a biodiversity survey on Mawson Plateau. A small party will be going there next week to attempt to do a reconnaissance and decide if a larger expedition is possible.

SEGments

Andrew Barr and Conrad Denyer have produced this year's editions of SEGments until recently when Conrad resigned. We are very grateful for the assistance Conrad provided to the group. Andrew will continue as Editor.

Website

Michelle Trethewey has managed the website and has done a great job keeping the various screens up to date. We are due to have a re-write of the website by a student from the University of South Australia but this has been delayed. We should have the new website by the end of the year. I encourage members to visit the site regularly to keep an eye on what is going on.

Committee

In my seventh year as Chairman there has been a number of changes to the committee.

1. Michelle Trethewey has become Vice-Chairman and has ably filled-in in my absence.
2. Gina Breen has taken on the enormous work of Secretary and done a very good job. She has fortunately re-nominated for the position.
3. Graeme Oats has been our indefatigable Treasurer and has changed the form of his monthly reports to allow us to understand our current financial position. Graeme will present his annual financial report next.
4. John Love has been a one member committee revising our various application and notification forms used for GRaSP and the major expeditions and these are now all consistent. Thank you for that work John.
4. Trent Porter has managed our equipment and storage.
5. Stuart Pillman has joined the committee this year and has provided valuable insights into the Department of Environment and Heritage.
6. Last, but by no means least, Richard Willing, as President, has provided a steady hand as well as a place for our monthly committee meetings. Thank you Richard.

Equipment

SEG has continued to accumulate equipment needed for our expeditions so that we are less reliant on borrowing equipment from members or hiring it. Most recently we have purchased two trailers. The first will be a cage trailer for carrying gear and the big ice box and the other is a closed in trailer which will be our food trailer.

SEG is now also the proud possessor of a harp trap for catching bats. This will be used as part of the Minnowarra Project as well as on the major expeditions.

To at least partially fund these purchases and also to pay for running costs for expeditions SEG has applied for and been awarded a number of grants for community projects. In the last year a total of nearly \$15,000 has been obtained from various grants. Thank you to those members of the committee who have worked hard locating and applying for these grants.

Summary

The future for SEG looks very bright with a number of new avenues opening up for further adventurous expeditions. We will try to decide the site for next year's major expedition before the end of this year to give plenty of time to plan it. The pleasant problem we have is that our reputation as a biodiversity survey team is that we are somewhat in demand and have more requests for us to carry out surveys than there are years to do them. There is no doubt that SEG continues in good hands.

Contact: Alun Thomas

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Annette Vincent at the National Archives of Australia in Canberra, at the Waterhouse exhibition with her 3rd prize winning entry '*Arkaroola in Pen and Ink*'

Editor's Note:

Contact Annette Vincent for details about her Arkaroola 2011 Calendar .

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Figure 1: Bimbowrie Cheopod Scrubland (photo by R. Klinger)

Bimbowrie Conservation Reserve is being rehabilitating from the impacts of 130 years of commercial livestock grazing. Many of the original vegetation communities have been significantly altered or degraded by sheep grazing, particularly in the plains and valleys. For the latter parts of the 20th century (~30 yrs) the hills have been under pressure from periodic high goat populations. Since its acquisition by the SA Government as a conservation reserve sheep have been removed and goat numbers are kept low through an ongoing control program. To help determine the effectiveness of the rehabilitation of Bimbowrie the Science Resource Centre (SRC) has developed a monitoring program that aims to measure the recovery of many of the dominant vegetation communities across the property. On the plains and valleys these utilize many of the sites established by the Pastoral Program to assess livestock grazing levels, whilst in the hills novel methods have been established to assess the effectiveness of goat control (McDonald 2010).

During 2005 baseline flora (Kenny 2005) and fauna (EBS 2005) surveys were done to describe the types of vegetation communities present and the plants and animals that inhabit them. These sites provide a useful baseline for future long-

term whole-of-property comparisons. To date there has been no assessment of the impacts of the grazing history on the ground dwelling fauna of Bimbowrie, or monitoring of their response to the recovery of vegetation communities.

To make a monitoring program practical from a resources point of view only one plant community and associated fauna has been targeted. Chenopod low shrublands are abundant and typical for the region. On Bimbowrie they are now represented by a range of impact states that are currently being monitored for vegetation recovery. The community that best fitted these criteria was the Low Bluebush *Maireana astrotricha* and Bladder Saltbush *Atriplex vesicaria* low chenopod shrublands and their various degraded states.

Methodology: Site Sampling Protocols:

Sampling will be conducted in two phases – 5 sites with 4 patches each in week 1 (=20 trap arrays) and the remaining 5 sites with 4 patches in week 2 (total 40 arrays). The sampling period during October will overlap with goat control operations (Sporting Shooters) for the first week 11th-16th October.

For this reason the order of site sampling will be fixed as outlined in Table 1 in the Sample dates column.

Mammal and Reptiles

The proposed method differs from standard biological survey methodology to more efficiently use the number of pit traps available (192) and allow for replication which is necessary to obtain statistically defensible results. There will be 1 sampling array for each patch which are mostly separated by more than 500m. The proposed trap design will be to use a three pronged star arrangement (Figure 2) which has been shown to be marginally more efficient in arid areas than a straight row of pits (Read 2002). To enhance trapping effort for species less likely to enter a pit trap 15 Elliott traps and 3 funnel traps are proposed in the arrangement indicated in Figure 1. These will be referred to as arrays for the remainder of this document. The Elliott traps should be set 5m out from the nearest pits with the outer arm traps being 10m further along from the next nearest trap. All be covered with an Elliott protector (example in picture on next page). Some ant powder should be put at either end of the trap protector during the initial setup.

The centre of each array is marked with a star dropper, the centre pit in the array being 1m from the dropper. All

pits will have been installed and a metal lid screwed on with Philips Head screws (screw drivers will be required to remove them). The trenches should also have been dug prior to the survey with the outer pits at 10m on the three arms of the array. The drift fence should be set for a further 5m past the pits. Always start installing drift fence from the centre pit and make sure that the fence is pinned in to slightly overhang the centre pit by ~20mm. 15 Elliott traps and covers should be set 5m out from the pit spokes and separated by 10m each. To assist the removal and placement of Elliott traps under the customized covers (Figure 3) make a shallow depression on the ground, the width of the trap, with mattock or boot. Elliott traps should only be baited and opened in the late afternoon (with oats and peanut paste). Therefore baits need to be removed and traps closed each morning. The 3 Funnel traps should be set half way between the centre and radial pits, with one trap placed in each wedge of the array (These should be covered with a hessian bag).

All animals will need to be marked to distinguish new animals from recaptures so that an accurate index of animals visiting that site can be determined. All new captures will have to be bagged and brought back to camp for processing. Marked animals can be recorded and released – provided that the species can be correctly identified. If in doubt bring to camp for processing. Mammals in Elliotts

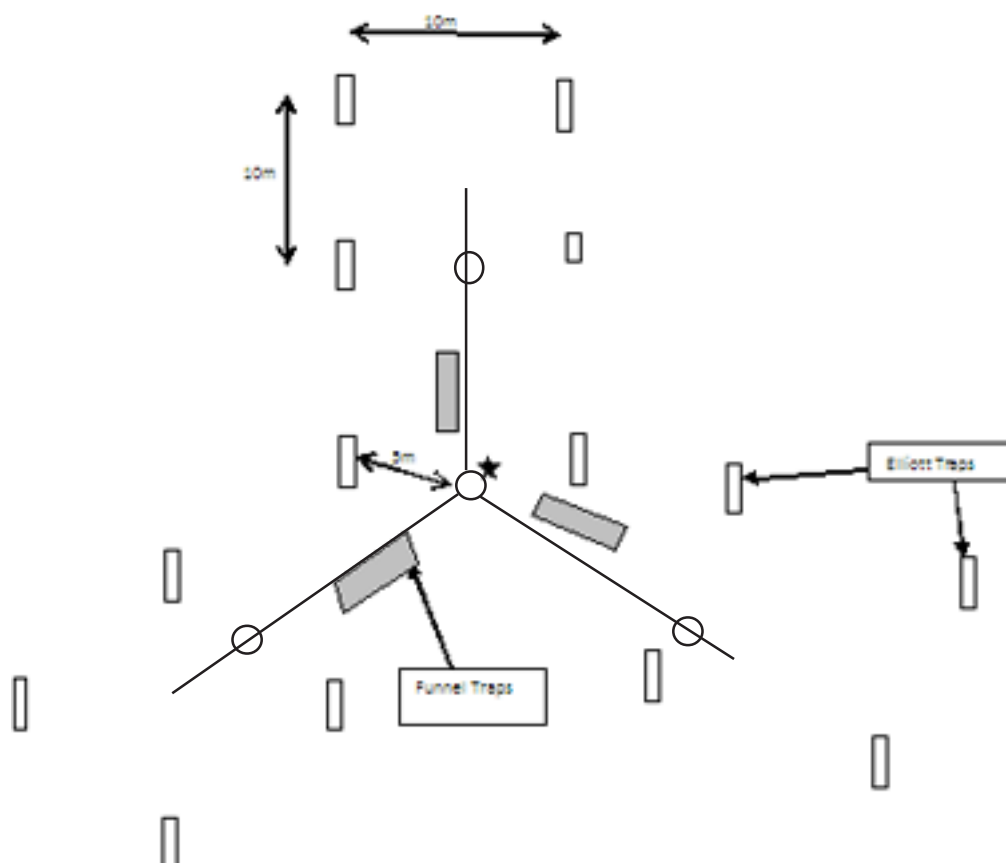


Figure 2. 4 x 166mm D pipe 600mm deep joined from the edge of the centre pit by 15m of 30cm high flywire. The radiating pits are positioned 10m out from the centre pit.

can be brought back to camp without bagging as traps will be returned with the animal in the afternoon. Elliotts can also be used to transport bagged reptiles as this protects them from being crushed provided that traps with animals are kept out of direct sunlight. Make sure that each bagged animal has the Site Code, Date, Time and trap type and number marked on the outside of the bag or trap – usually written onto masking tape which can later be removed. Animals will be marked with paint or permanent texta. A different colour for each patch in a site group (at least four colours will be required and can be kept consistent for patch number, eg 1=black, 2=yellow, 3=red, 4=blue), this enables any movements between arrays to be recorded.

Trap arrays need to be checked early morning (preferably before 10:00 hrs) and late afternoons (after 16:00 hrs). there will be no requirement to search sites for reptiles or mammal sign. However, the recording of extra species is encouraged as long as the method of observation is recorded. Traps will be open for 5 nights. Ideally four teams, each consisting of a trained Team Leader plus 1-4 helpers would service the 20 arrays each day. This would involve checking all traps each morning, removing bait and closing Elliott traps. It is also important to note if any traps are having issues with ants so that ant powder can be sprinkled around the outside of those traps (no powder

should be placed inside any pit or Elliott trap). In the evening the same group should return to the same sites, check pit and funnel traps for reptiles, bait and open Elliott traps. When setting Elliott traps it is important to test the trap mechanism to ensure that it is working and the trap shuts properly – it is the team leader's responsibility to ensure that members of the team are able to recognise potential problems and are shown how to fix them.

Two teams will be required to service 6 arrays each daily on Bimbowrie, whilst the 2 Plumbago teams will only be required to service 4 arrays. If vehicles and team leaders are in short supply then 1 efficient Plumbago team could probably cope with 8 arrays, as there is less distance to travel and easier access. The following sampling structure proposed in table 2 could be adopted.

Birds

Each patch should be sampled on at least three separate mornings (an early, middle and late) with sampling occurring within the first 4 hours after sunrise. 3 ha areas should be searched at each patch for 20 minutes. The area to be sampled should be inside a 100m radius from the star dropper that marks the centre of the array. The radius can be determined and maintained using a GPS, in some



Figure 3. Elliott cover held down with rocks to stop Australian Ravens from attempting to pull out Elliotts. This level of fortification should not be required at Bimbowrie.

instances the patch may be irregular before changing habitat. If possible a 3 ha within the appropriate habitat should be attempted, and if smaller then the whole patch should be searched and the smaller size noted on the datasheet. The amount of information recorded will be simplified in comparison to a standard biological survey as only species, method, number observed, whether or not it is inside or outside the sample area and on shrub, ground or flying overhead needs to be recorded. Other information of interest can be noted in the comments field (refer to attached bird datasheet). An order of sampling has been produced with the assumption that 2 birders in 1 vehicle, parking between sites and sampling adjacent patches

The numbers in the table indicate the order of the sampling for each birder. If there were extra birders with independent transport then more visits to sites could be attempted eg if the second vehicle had 2 birders then both could work the same schedule but on alternating days which would double the three replicates. This would be advantageous and enable an assessment of optimum sample replicates for future monitoring of these sites.

Vegetation

The vegetation samples will differ from the general biological survey methodology because it is not designed to effectively record cover or detect changes in species abundance. Also there is no advantage in recording annual and short lived species for this type of monitoring program because of the large variation in abundance and occurrence that relates directly to recent rainfall and season. Methods that rely on observer estimates of cover are also highly variable. For this reason a point transect approach will be used at each patch plus notes on the occurrence of key indicator species.

The point transect method will use the central site marker (star dropper) as the starting point for 20 transects. Each transect will start 20m out from the star dropper and run for 50 points at 1m intervals (total 49m). Therefore a 70m-plus tape measure will be required to guide 1m point placements, a peg for keeping the tape measure tight will also be useful. The direction of the 20 transects have been determined by random selection between 1 and 360 degrees of a circle. Use compass to line up each transect to the post. Ideally two to three people will work together at each site for the point transect data collection – one to drop the pin and identify the hits and one to fill out a datasheet. A third person could be useful on windy days to ensure the tape stays secured. Alternatively a wheel point with 1m intervals could also be employed. Ideally each transect should be done in ~ 5 minutes so that no

more than 2 hours is spent at each site, so it will be worth recording the time taken.

Summary

Mammal and Reptiles

For pit trap set up it would be best to break into at least 2 teams 4 of 4 or more people. They will need to ensure that they have a box of 15 Elliott Traps plus 9 covers, 3 Funnel traps, a bundle of 15 fence pins, at least 2 phillips head screw drivers and 3 x 15m lengths of pit fence for 10 arrays (fence material is already at Bimbowrie). The intention to set up 20 arrays (Table 1) in one day.

For trap checking 4 teams of 2-5 people (including team leaders) will be required from first light each morning and after 1600 hrs in the afternoons.

Birds

Morning bird surveys will be taken care of by expert birders who will finish their work by 10 am – this is to ensure the efficiency and consistency of the sampling within the required time frame. Also the bird fauna is likely to be sparse and repetitive. More interesting and diverse samples can be conducted in the afternoons at previous sites established in 2005. There are 10 of these to choose from that are west of the Kalabity road for the first week (BIM00301-BIM01201) – extra opportune bird samples along densely vegetated drainage lines, floodplains and scattered hill tops are also encouraged. During week 2 there are 16 sites east of the Kalabity road though some may be difficult and time consuming to access (11 BIM sites 01301 to 02801 and 5 OLA sites along the Kalabity road 01101-01301 and 05301-05401).

Plants

Ideally at least 2 teams of 1-3 people would be involved in point transect vegetation data collection to do 2 patches per day. This will enable all sites to be sampled in 10 days. It would be useful to have at least 1 or two SEG leaders with basic botanical knowledge trained to lead sampling teams provided they were committed to sampling at least 10 patches each. Other more widely roaming opportune botanical data collection is encouraged as is the collection of voucher specimens for unusual species or good examples with flowering and fruiting parts.

Contact: Robert Brandle

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Figure 1: Survey Vehicle preparing for lift-off?

The streets were deserted, no sign even of the usual high octane hoons bent on self destruction or the bleary eyed night clubbers wending their weaving way through the early morning mists toward bed for the rest of the day.

Raylene and I were on our (also bleary eyed) way to pick up Brian Blaylock and then Michelle Trethewey to do a reconnaissance in preparation for the Expedition to Bimbowrie Conservation Park which is happening in October. The plan was to meet with Department of Environment and Natural Resources (DENR) bio-survey people Rob Brandle and John MacDonald at Olary but as luck would have it they were very close behind us and we arrived at roughly the same time at the Burra Bakery to partake of strong coffee and breakfast/morning tea just as the shop opened.

Next stops were the usual, at the bustling metropolis of Yunta and in the pouring rain at Olary before tackling the slippery-slidy track into Bimbowrie Homestead. It must have been quite hard driving for the DENR boys as they had a large trailer loaded with all the pitfall traps etc. for the

expedition and traction in the mud was a bit tenuous.

On arrival we were greeted by Dick Hoare (Works Supervisor) and Pamela his partner and had to hose off several tonnes of mud before the trailer hitch could be found to unhook. Dick showed us the road to *Antro* as the shearing shed and quarters is known and we set off on the 8km journey there to offload our sleeping and feeding gear.

Antro is HUGE – a real cathedral of a shearing shed, massively built with even after a vacancy of some 7-8 years a powerful aroma somewhat reminiscent of sheep. The wool room will make a vast Science room with the addition of generator and lighting kit – enough room to swing many cats simultaneously!

The Kitchen is a marvel – there are freezers and fridges, a large wood stove and a great big gas stove and oven – maybe even scones, cakes etc. for morning tea??? What fun for the daily cooking teams! There are showers, plumbed toilets, a wood BBQ and even a conversation pit complete with central fireplace – what luxury!!!



Figure 2: What luxury at this residence!

The bedrooms in the shearer's quarters are quite nice too, with good quality single beds, 2-3 to a room and plenty of suitable camping spots for the hardy. Altogether a very good setup!

The next couple of days were spent with the DENR boys travelling around the property, locating sites with the right vegetation suitable for trapping, so that the aims of this expedition can be achieved. This is mainly saltbush, bluebush and black bush scrubland, both on Bimbowrie and next door on Plumbago Station (for comparison). These sites are quite widely separated, so daily checking of catches might be something of a challenge but will be achievable. All this driving in the wet and muddy conditions was a bit interesting with some testing creek bed crossings - sideways, wheels all spinning, mud flying everywhere, screaming, swearing, paint removing, crud accumulating, engine howling, tree encountering, passengers abandoning—all good fun!!!

Eventually the sites were all identified and marked and the holes will all be dug and the pits all installed by the people from MOWCAMP (prisoners from Pt. Augusta) as part of their rehab I suppose. This will make for a pretty easy trip for SEG but leave lots of time for exploration of the rest of the park which has some wonderful granite outcrops and gorges with rock-wallabies, aboriginal sites etc.



Figure 3: Wedge tailed Eagles in the tree. (Or are they vultures?)

Contact: Trentasaurus@bigpond.com

Photography by: Ray Klinger

Look forward to seeing you there!

Minnawarra Autumn Report

Janet Furler

There were 29 helpers who contributed a total of 416 volunteer hours to make it all happen, both before and during the survey. Six scouts from Victor Harbor came along, five for one day and Robert making the most of the opportunity to sleep in a tent for three nights. We also got visitors from Inman Valley, Hahndorf and Blackwood, including a few grandparents and grandchildren. Thank you to all for your help and enthusiasm.

Weather Autumn survey 14th-18th, 2010

The weather was fine and mild throughout, very unlike last autumn!

Temperature ranges:

- Wed 8-18
- Thurs 8-18
- Fri 9-21
- Sat 13-23
- Sun 14-25

Mammals



Figure 1: *Rattus fuscipes* from the traps

The total number of mammals caught was 133, of which 19 have been around for previous surveys. Some of the native rats were 3 and 4 years old. This shows we are building a picture of how long they can survive in the wild. With the guys which came back for several feeds of our peanut butter and oat bait, we weighed and checked 215

beasties. The one we didn't weigh on our 200g scales was the Brush-tailed Possum, who disappeared rapidly up a tree as soon as possible. Unfortunately, along with our high numbers of native rats and marsupial mice were high numbers of feral rats (6) and house mice (17). At least the native ones are still in the majority.

Site 1, alongside a swamp, was again our most populated site. Overall we caught 27 mammals 48 times. (5 *Antechinus flavipes*, 8 *Rattus fuscipes*, 16 *Rattus lutreolus*, 2 feral rats and 6 feral *Mus musculus*). It is the only site to have the Swamp Rat (*R lutreolus*) as the most populous species, despite other sites being as near swamps. One of the female Swamp rats was first caught in autumn 2006.

Other findings

Probably due to the fairly dry conditions we caught only 2 brown froglets (*Crinia signifera*). The warm weather brought out 24 Garden skinks (*Lamprolaima guichenotii*) and 1 Southern grass skink (*Pseudomoia entrecasteauxii*).

Our most exciting find was a Yellow Bellied Water Skink, (*Eulamprus heatwohlii*) which is uncommonly recorded in the area. They are larger than the garden skinks, with



Figure 2: *Eulamprus heatwohlii* from the traps

attractive patterns down the sides. One caught opportunistically the month before donated the end 1mm of her tail to the SA Museum for a genetic bank, and was described as very girly and pretty.

In addition 4 scorpions and one spider were caught in pits.

Summary

Once again we achieved 1 capture of very useful data, 2) introduction to scrub wildlife and field work for a number of observers. This is very pleasing given this is what SEG is about. We would love to see more new or return visitors for the next one!

APPLICATION FOR MEMBERSHIP AND MEMBERSHIP RENEWAL for 2011

SUBSCRIPTIONS

Adult member - - - - - \$30.00

Concession cards/ student----- \$15.00

Family membership - - - - - \$30.00

Corporatemembership - - - - - \$35.00

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.....

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.....

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.....

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:

.....
.....

Send a cheque (Scientific Expedition Group Inc.) with a Photocopy of this page to

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Malleefowl Monitoring

Bruce Gotch

Final details have now been worked out with Dave Setchell about the upcoming 2010 Malleefowl Survey at Bakara CP and Henry Short's Heritage Agreement site. Henry's farm is adjacent to the Bakara Conservation Park in the Murray Mallee region south of Loxton. Henry has again kindly allowed us to camp on his property for the weekend. This survey necessitates walking long distances in heavy Mallee scrub. The survey is scheduled for Saturday 30th October to Sunday 31st October 2010 (weekend following return from Bimbowrie).

There will be some signage from the turnoff at Martin Rd. on the Swan Reach to Loxton road (SEG on a cross with flagging tape). Arrive at site Friday afternoon or evening and camp overnight so that an early start (08:30 am) can be made on Saturday morning. I plan to arrive about 6:00 pm on Friday. If you can't arrive Friday night, please arrive very early Saturday morning so that you don't get left behind. Training will take place early Saturday morning.

All food and drink requirements, something to cook on, something to sleep in (tent, swag, van etc.), chair, UHF radio if you have one, suitable clothing. Henry can supply water. Toilet facility (with door) will be available. There are no showering facilities, so plan to go without. We may be able to have a campfire depending upon weather conditions. Lunch will be in the field, so if you want to eat don't forget to pack it. You need to be self sufficient in everything. Covered shoes/boots suitable for extended walking, hat, long sleeved shirt (recommended), long trousers (snake habitat), gaiters (recommended), high vis.

jacket (if you have one). I have some high vis. jackets in various sizes for loan.

Saturday morning will begin, after a leisurely breakfast, with David explaining how to use the equipment. Dave will supply monitoring kits which contain a Palm Pilot, digital camera, GPS. Feel free to bring your own GPS and camera.

We will be divided into groups, each with a GPS and Palm Pilot (PDA) which are linked together, a UHF radio and a map showing the numbered mounds and the sequence in which they should be visited. There are also some other recording aids, such as (camera & blackboard etc.) so each person had responsibility for a section of the operation. Each searcher will take turns in using the equipment so that all quickly became proficient in all areas.

The rest of Saturday will be spent visiting the mounds in our respective areas in the Bakara park and recording all the characteristics of each nesting mound as we came to it. The GPS points are preloaded so it is easy to move from one mound to the next (about 300m apart on average) and answer the standard questions on the PDA.

We should be finished by 4:00 pm on Sunday. It could be earlier than this depending on the number of participants. Please email me your intention to attend ASAP so that final numbers can be given to Dave. This is a fun weekend and is an opportunity to catch up with old acquaintances. Hope to see you all there.

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Figure1: David Setchell instructing the Survey group



Figure 1: Chris Wright at the Arconna Bluff pluviometers

Since the first raingauge and data logger were set up, in September 1988, much effort has been expended on ensuring that the data collected has been accurate, and that the record has been continuous – no gaps. The original HYDROMACE data logger looked like an aluminium shoe box. It could run for 90 days, after which it would overwrite whatever was in the memory. The next generation loggers were manufactured by SDS, an Adelaide company. They had much longer battery life and were designed not to lose any data.

Dates	Logger Type	Battery life Months	No. of instruments
1988-1991	HYDROMACE	3	1
1992-2006	SDS Cherryville	12+	8
2006-2008	HS RRDL3	6	10
2008-	Davill mod	36	18

Figure 2: Battery life details since 1988

There were several problems that had to be overcome in ensuring that the instruments worked correctly and most importantly that they didn't lose any data. A major part of the problem turned out to be training volunteers to recover data from the instruments, and to set them up ready for the next period of data recording.

Raingauges

The RIMCO tipping bucket raingauges have proved to be reliable and reasonably robust. Over time, we have adopted calibration procedures, and generally know when accuracy is starting to drift. In recent times, the use of a standard calibration cylinder and nozzle has helped ensure accurate performance, within $\pm 3\%$. Calibration is also easier now that we have a digital counter that will count the bucket tips, we don't have to sit beside the gauge and count each "clunk". Adjustment of the gauge is generally done on site, using a small spanner and a lot of care.



Figure 3: Chris Wright and Chris Kemp working on the raingauge on the Plateau.



Figure 4: Chris is using the calibration device to check the accuracy of the gauge.

Duplication of Loggers

We learnt at an early stage that what can go wrong will go wrong, and in particular it was easy to make mistakes setting up loggers, batteries went flat, things got forgotten. At all sites, two loggers were installed, recording in parallel, if one instrument failed, hopefully the other would continue. Since that procedure was applied there has been negligible loss of data.

Logger Downloading

Data was recovered from the loggers by removing a memory card and replacing with a blank card. This should be easy but wasn't always. Particularly the SDS Cherryville instruments were designed to ensure that data was never lost. However they were tricky to use and it could be very frustrating to be out on site and unable to install a new memory card because it had locked itself up. The newer generation HS RRDL3 loggers, designed for use by the Bureau of Meteorology, were much simpler and more robust to use.

Over the years we have used various computers and terminals to download data on site, with mixed results. Laptop computers do not enjoy field conditions and we have had a few accidents with them. Over the past few years we have used palm-held PDA mini-computers. (See Figure 5) They don't need a keyboard and battery life is quite good. It can be difficult for old eyes to read the small screen display in bright light. It has always been useful to be able to display to the volunteers, the rainfall that has been recorded at the site. However the data file format is tricky to work with, and we have not yet found a software application that will run on the PDA and display the data. These days note-pad computers are not much bigger than PDAs, and have the advantage that there is a keyboard, and that they run on standard Windows software, they are also no more expensive than PDAs, so I think that we will use them in the future, and hopefully someone will write an application so that we can show the rainfall on the screen, while on site, which will help to demonstrate the value of the project.



Figure 5: Palm held PDA data logger

Battery Life

The HS RRDL3 loggers were designed to be exchanged once every 1 to 3 months, although battery life could reasonably reliably be allowed to extend to 6 months. There were times during the past few years when for all sorts of reasons, it was necessary to cancel a trip or miss visiting a site, and all of a sudden we found that the batteries were likely to run flat and they would stop recording.

Development of Davill Loggers

Christopher Davill designed a modification that would allow use of an external battery pack (8 Alkaline Battery C Cells). He used the old SDS logger boxes and fitted an HS RRDL3 logger, plus the battery pack. These have been tested and found to be able to operate for more than 3 years on a single set of batteries. Christopher Kemp then built another 9 of these boxes and they were installed in August 2010.



Figure 5: The old HS logger "B" inside the larger sealed box. The Battery pack is installed just above, and will last for 3 years without needing a change.

For the future

Since 1988 considerable progress has been achieved in remote interrogation of data loggers –ie. Talking to the loggers by mobile phone and recovering the data. The CDMA network was used successfully, and when it was replaced by Telstra NextG, the performance has been better. 4 of the 9 stations are fitted with modems and downloaded every day by the Bureau of Meteorology. The rainfall is then displayed on the Web. Plans are in place to include the Gammon Plateau pluviometer, and radio path checks have confirmed that communication is feasible on NextG. We hope that next year this site will also be included on the Web. Beyond that, the remaining

sites are in the valley and not directly accessible to NextG. We are considering using short-haul modems to send data from the lower sites to Arcoona Bluff, and from there to the mobile network. However this will require upgrade to all of the data loggers and may be feasible when the HS RRDL3 loggers have reached the end of their lives and are replaced by the new Campbells.



Figure 6: The Modem box which contains the telemetry equipment at Arcoona Bluff, a Yagi antenna is used to send the signal to Mt Scott Repeater at Leigh Creek.

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Photography : Janet Davill

Postscript

Part of the interest in collecting rainfall and river flow data from this remote area was generated in the early 1980s when the writer was involved in designing the water supply for the Leigh Creek Mine. At that stage there was no data and little knowledge of the hydrology of this semi-arid area. Subsequently a network of rainfall and flow gauges was installed, and ran for nearly 20 years, after which funding was short and a decision made to close down most of the stations. At this stage (2003) SEG expressed its concern and offered to operate the gauging stations at Maynards Well, Pfitzners Well and North Moolooloo. We have been operating them ever since, and through SEGs efforts the flow gauging stations at Emu and Windy Creek were reopened some 12 months ago. As it happens there was a huge flood on Windy Creek in April 2010, so large that it went over the top of the whole gauge tower at Windy creek, depositing a tree branch on the roof. Rainfall on 9 April was of the order of 50 year Average Recurrence Interval (ARI), based on pluviometer data at the Leigh Creek Airport, where 74.4mm of rain was recorded on a 3 hour period commencing at 7:30am. As there was a further 17.6mm of rain in the 24 hour period before this, the catchments were already wet. The flows were therefore probably of the same ARI as the rainfall. The rainfall from North Moolooloo, Pfitzner's Well and Maynards Well and most of the flow data has been recorded and this flood event is now included in the hydrographic record. I think that it is a credit to SEG and its support team that this has been achieved.

GLUEPOT RESERVE – A RESERVE WITH A DIFFERENCE

Not long ago, one of Australia's most highly rated ABC journalists described Gluepot as "one of the conservation miracles of the 21st century".

Birds Australia Gluepot Reserve is Australia's largest community managed and operated conservation reserve. Situated 64 km from Waikerie on the River Murray in South Australia's Riverland, the reserve is managed and operated **entirely** by volunteers. Some 54,000 ha in size, it is home to 18 nationally threatened species of birds, 53 species of reptiles and 12 species of bats, some of which are nationally threatened. **There are few areas of the world that support such a concentration of threatened species.**

By successfully combining the elements of biodiversity conservation and enhancement through land management, scientific research and monitoring, environmental education and sustainable ecotourism, Gluepot Reserve has taken conservation management into a new era. The Reserve is providing an international model to show that sustainable use of the landscape is both feasible and desirable. A highly successful program of this size and complexity is unique in Australian land management.

Gluepot is protected in perpetuity as a conservation reserve by the signing of a SA Heritage Agreement and is the largest area of land in South Australia under Heritage Agreement. Gluepot is also part of the National Reserve System, is on the Register of the National Estate and is further protected under the Commonwealth EPBC Act as '*critical habitat*' – the first area of land on mainland Australia to have achieved this protection.



The Reserve is part of the largest block of intact mallee left in Australia and so the viability of threatened bird populations and other flora and fauna is high. Prior to the November 2006 fire (that burnt 8,000 hectares of the Reserve's 54,000ha) the last major fire on Gluepot was over half a century ago in December 1950. Importantly, some whole areas were not burnt at all during these widespread fires. A diversity of fire impacts, together with a diversity of understoreys within the mallee and other woodland communities, gives rise to a wide variety of niches for birds and other animals. Many of the trees within the mallee and Casuarina woodland are hundreds of years old with numerous hollows. Such old-growth habitat is essential for many species including threatened species.

The Reserve has an excellent, well-marked track system. Tracks are suitable for 2 WD vehicles and mountain bikes. Three camping grounds provide well-spaced sites that are suitable for tents, caravans and vehicles.

14 marked walking trails lead visitors through the variety of casuarinas and mallee woodlands. Detailed maps, walking trail brochures, and lists of birds, mammals, reptiles and plants can be obtained from the Reserves award winning Visitor Information Centre.

Visitors are encouraged to participate in research projects being conducted at the Reserve. Volunteer Rangers are permanently on site and are happy to provide any further information.

The Reserve can be contacted at: (08) 8892 8600



Visit the Scientific Expedition Group Website



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