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# Scientific Expedition Group Inc.

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#### **SEG Administrative Officer**

Alun Thomas Email: alunulna@gmail.com

**SEG Treasurer**: Graeme Oats Email: gdoats@bigpond.net.au

**Cover Photo**: Adult male and female Glossy black-cockatoos (*Calyptorhynchus lathami halmaturinus*) preening their young fledgling daughter (middle). Photo: Michael Barth

**Rear Cover Photo**: Malleefowl (*Leipoa ocellata*) observed at Bakara Conservation Park during a recent survey. Photo: Jill Tugwell The Scientific Expedition Group is a not-for profit organisation which began in 1984. SEG undertakes several expeditions each year to record scientific information on wildlife and the environment in many parts of South Australia.

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

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

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

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#### Contacts:

**SEG Secretary**: Sarah Telfer PO. Box 501, Unley SA 5061 Email: sarahtelfer@internode.on.net

SEG email: scientificexpeditiongroup@gmail.com

SEG website Http://www.scientificexpeditiongroup.org

Facebook Page ScientificExpeditionGroup



# SEGment



# Volume 36 Number 3 December 2020

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### **GUEST EDITORIAL**

At SEG we aim to encourage knowledge and appreciation of the natural environment. As a SEG member no doubt you've already experienced firsthand how wondrous and beautiful our Australian country is. And as we go on expeditions to learn about the species and landforms with specialists with 50+ years of experience, we are still only toddlers learning to walk when compared to the thousands of years of knowledge that Indigenous people hold.

Indigenous people managed the land in a far more systematic and scientific fashion than we have ever realised. Publications such as Bruce Pascoe's "Dark Emu" and Bill Gammage's "The Biggest Estate on Earth" <u>https://theconversation.com/the-biggest-estate-onearth-how-aborigines-made-australia-3787</u> have challenged our understanding of Aboriginal and Torres

Strait Islander peoples relationship to the land. Not the primitive, savage, hunter gatherer type that you may have been taught about in school, but a highly organised and complex society with a deep understanding of, and intimacy with their environment. Only now is this recognition slowly starting to enter mainstream consciousness: new research is supporting Indigenous-managed lands as important for biodiversity; equal to that of protected areas. https://www.sciencedirect.com/science/article/abs/pii/ S1462901119301042?via%3Dihub ; the final report of the Bushfire Royal Commission acknowledged the role of Indigenous fire managers in mitigating bushfire risks https:// naturaldisaster.royalcommission.gov.au/publications/royalcommission-national-natural-disaster-arrangements-report; and the value of Indigenous Rangers is recognised by the 127 ranger groups funded through the Federal Government, and the recent extension of this funding until 2028 https://www.niaa.gov.au/ indigenous-affairs/environment/indigenous-ranger-program .

But colonialism and colonialist perspectives of history has done us all a great disservice- not only for the First Nations and the brutal and ongoing trauma they've experienced, but also for the impact on the health and sustainability of our Australian environment. Even with the growing recognition and respect of indigenous knowledge, our broader society is still missing an incredible opportunity to learn from First Australians as the authority on our natural environment.

So how do we start engaging with First Nations? Learning and supporting Indigenous languages is an important place to start. Terry Coulthard (Adnyamathanha Elder) said at the launch of his language book that shared language is important for reconciliation and walking together as Australians. Bruce Pascoe also remarks "You learn the name and you learn the Country and respect its history."

Here are some place names to get you started. SEG has been on Adnyamathanha country many times: ongoing since 1988 (Vulkathunha-Gammon Ranges Project), 1999 (Warraweena), 2009 and 2011 (Arkaroola), and 2018 (Ikara Flinders Ranges National Park). We've also visited Barnggala country many times: 1995 (Gawler Ranges), 2002 (Munyeroo), 2005 (Moonabie), 2013 (Hiltaba), and 2015, 2016 (Witchelina). We have camped and walked on Ngadjuri country twice: 2006 (Boolcoomatta) and 2010 (Bimbowrie), and Buandig twice as well: in 1987 (Canunda National Park), and 2014 (Nangwarry). The names and spelling of First Nations' Country were obtained from <u>https://aiatsis.gov.au/</u> <u>explore/map-indigenous-australia</u>. It's a great map. Whose country do you live and work on? What other country do you love to visit?

The word for Country in Adnyamathanha and Kaurna is yarta, in Barngala language it's yarda. In Pitjantjatjara it's ngura.

# AFTER THE BUSHFIRES – GOOD NEWS FOR THE KANGAROO ISLAND GLOSSY BLACK-COCKATOO

# Michael Barth, Tony Robinson and Helen Johnson

Can you imagine eating the same thing every day for your entire life? This is precisely what the Glossy blackcockatoos (GBCs) of Kangaroo Island, South Australia manage to do. All three subspecies of GBC in Australia have highly specialised diets and have evolved to feed on the seeds of various species of *Allocasuarina* and *Casuarina* trees. The endangered Kangaroo Island GBC (*Calyptorhynchus lathami halmaturinus*) is the most specialised of all and relies almost solely on the seeds of *Allocasuarina verticillata* – Drooping Sheoak.

The spectacular Glossy black-cockatoo is now only found on Kangaroo Island. It once also occurred on the southern Fleurieu and Eyre Peninsulas, but with large scale land clearing on mainland South Australia for agriculture and industry, the Drooping Sheoak woodlands upon which the birds relied disappeared and the Glossy black-cockatoo is now extinct on the South Australian mainland with the last mainland record being in 1977. The first systematic population survey on Kangaroo Island was in 1982, when it was estimated that the population numbered at least 115

individuals and probably no more than 150. The number of breeding pairs was at least five but probably did not exceed thirty, but at least on Kangaroo Island there was enough feeding and nesting habitat remaining to sustain a breeding population.

#### **Glossy black-cockatoo Recovery Program**

Clearly something had to be done to give these iconic cockatoos a helping hand and one of Australia's most successful threatened species recovery programs was begun on Kangaroo Island in 1995. There were many parts to this recovery program which were implemented after significant ecological research to identify threats to the population.

The key factor driving population decline was found to be a low recruitment rate due to poor breeding success. Effective and practical measures were then implemented in the field to minimise these threats. These included artificial nest hollows; protecting nesting trees, mostly Sugar Gums (*Eucalyptus cladocalyx*) from egg and chick predation by the very large Kangaroo Island population of brushtail possums (*Trichosurus vulpecula*) by installing "collars" around tree



Adult male Glossy black-cockatoo (left) and adult female showing bands on tail and yellow face markings. Photo: Peter Hammond

trunks and pruning bridging tree canopies; removing feral honey bees (*Apis mellifera*) from nesting hollows; and undertaking an extensive program of planting stands of their specialised food tree, the Drooping Sheoak, on both public and private land all over the island. The recovery program has also addressed other threats including competition for nest hollows by other species such as Galahs (*Cacatua roseicapilla*) and Little Corellas (*Cacatua pastinator*).

As a result of these management actions, nest success rates have nearly doubled and the population has slowly increased by about 3% annually. Before the 2019 fires the KI Glossy black-cockatoo had made a significant recovery with the highest population so far recorded in the annual winter count being 373 in 2016.

#### Extent of the 2019 - 2020 fires on Kangaroo Island

The scale of the Kangaroo Island fires is unprecedented. Started by natural lightning events, beginning on 20 December 2019, a rolling suite of fires collectively known as the Ravine Complex burned about half of the Island. The fires were not finally contained until 21 January 2020.

In early January 2020, 'Birds Australia' estimated that while Australia-wide 19 species of birds had more than half of their former habitat seriously affected by the bushfires, 15 of those were subspecies from Kangaroo Island.

Before the KI fire Tony Robinson and his partner routinely saw flocks of 5-10 glossies in their heritage agreement bushland 'Wiluwilya' adjacent to the Gosse Lands Section of Flinders Chase, and at least one pair nested in a big hollow sugar gum beside the NW River. They have seen individual cockatoos over their property since the fire, so at least some have survived, but many areas of Drooping Sheoaks (including those on their property) planted as cockatoo feeding trees have been burnt and although a few burnt trees are re-sprouting, it is as yet unclear how many, even those 10 to 20 year old plantings will survive the fire, and many will probably have to be re-planted. A large proportion of the natural sheoak stands on the west and north coast

within the fire footprint were also severely burnt. In past fires these areas have regenerated but it is not known if this will happen this time.

#### Good news from the 2020 Census reported in November 'Chewings' Newsletter

It has been four years since the last glossy blackcockatoo population census was carried out and so the Recovery Program team was unsure what to expect in 2020 following the bushfires. They are however happy to report that a minimum of 454 Glossies were counted during the 2020 census, a surprising result for all those involved and indicating that mortality as a direct result of the bushfire is low. The eastern flocks at American River and on the Dudley Peninsula have increased since 2016, and the only flock that seems to have suffered noticeable losses as a result of the 2019-2020 bushfires is the flock that inhabits the south west part of Kangaroo Island.

Before the fires, the GBC population (counted in 2016) was about 370 birds divided into seven major flocks. Six of those flocks had feeding habitat burnt in the recent fires (BioR Newsletter 2020).

Large flocks of GBCs continue to persist along the north coast of KI, even where the bushfires have significantly reduced their feeding habitat. This census has highlighted the importance of long-term recovery actions for threatened species. The past 25 years of work, which has increased the population on Kangaroo Island, has likely made this population more resilient to this recent natural disaster. Given that 54% of the Glossies' available sheoak habitat was burnt in the bushfire, it is now extremely important to protect the habitat that remains and to continue increasing the feeding habitat through revegetation.

#### Habitat and feeding

As the Glossy black-cockatoo population increases, competition for remaining habitat may also increase. Only about 1% of Kangaroo Island's remnant native vegetation is considered suitable feeding habitat for GBCs and before the



Map showing extent of the fires on Kangaroo Island. 'Wiluwilya' is marked with a red cross.



Results of census counts from 1993 to 2020 of Glossy black-cockatoos on Kangaroo Island showing that the long-term trend has been an increasing population making this Recovery Program one of the most successful projects in Australia.

fires about 75% of that was close enough to known nesting areas to be useful to breeding birds during the nesting season (the maximum foraging distance from the nest site is about 12 km).

Within a quality stand of Drooping Sheoak woodland GBCs will only feed on select trees offering the most reward for time spent foraging. This is most likely related to seed quality and quantity within individual trees. On top of this, the Drooping Sheoak is dioecious (separate male and female plants) and as only female plants bear cones, only about half of all sheoaks are potential feed trees.



Adult male holding a sheoak cone with left its foot. A leg band would have been placed upside down on the left leg of the bird as a nestling making it readable to the Recovery Team using a high-powered spotting scope during Glossy blackcockatoo surveys. Photo: Michael Barth

GBCs prefer seed from fresh russet brown cones rather than from the older cones which have less food value. Their beaks are specially designed for tearing apart sheoak cones, which they hold and turn with their (usually) left foot. It takes about three minutes to chew all the seeds from a sheoak cone. Non-breeding GBCs spend about 30-40% of the day feeding on around 60-80 sheoak cones.

A male cockatoo feeding a nesting female needs about 120 or more cones a day, and feeds for over half of the daylight hours. GBCs form strong pair bonds and paired birds are rarely more than a few metres apart, except when the female is in the nest. Between late January and May the GBCs search for a suitable nest hollow, usually in a tall Sugar Gum or a dead tree or (rarely) a South Australian Blue Gum. Females are responsible for incubation of the single egg (1 month) and feeding the nestling until it fledges (3 months). After fledging, the young bird will spend the next 6-8 months with its parents learning to forage for food.

#### **Revegetation of habitat – before the bushfires**

Sites for revegetation were strategically chosen: to address habitat fragmentation; ensure adequate feeding habitat occurred close to known nesting areas; and that Drooping Sheoak had previously occurred at the site. There have also been plantings on the southern Fleurieu Peninsula in hopes it may benefit GBCs in the future should they decide to make the flight from Kangaroo Island back to the mainland.

In recent years, revegetation efforts have incorporated a variety of local native plant species along with the Drooping Sheoak to benefit a wider range of flora and fauna species. Additional biodiverse plantings were established at strategic sites, including BioR's Cygnet Park Sanctuary near Kingscote through the Kangaroo Island Habitat Restoration Program's Annual Planting Festivals.

#### After the bushfires - habitat revegetation update from 'Chewings" and BioR website

Since more than half the Glossies' available feeding habitat was burnt in the bushfire, the Recovery Team's efforts are now focussed on protecting the sheoak habitat that remains in the fire area and continuing to increase the feeding habitat through revegetation. However it is expected to take 15-20 years for this burnt woodland to become a good feeding habitat for glossies once more.

In 2020, many volunteer groups helped to source and plant 7,100 sheoak seedlings, spacing each one several metres from its nearest neighbour to encourage fast growth. Plantings were held from May to August across 44 properties to enhance Glossies' food resources. Surveys have shown that sheoak seedlings have germinated well over winter. However, it takes about 10 years for a Drooping Sheoak regenerating from seed to produce fruits of its own and be available as a stable source of food, although it can take as little as 5-6 years for the Glossies to start using the trees. A further 6,500 sheoak seedlings will be planted in 2021.

By planting Drooping Sheoak trees across Kangaroo Island in smaller plantings, the aim is to "spread the risk", making it less likely that all the revegetation will be lost in one fire event. The Recovery Team is making sure that the remaining unburnt GBC's feeding habitat is identified and protected as well as possible from further losses until the burnt woodlands regenerate.

Discussions with Mike Barth reveal that the 10ha sheoak planting at Stokes Bay on the KI's north coast survived the fire and these trees will provide food in a year or two. The fires that tore through Cygnet Park Sanctuary in early January 2020 burned the northern portion of the 175ha revegetated habitat (1,000,000 native plants), but most of the property – including the large trees that the Glossies nest in and most of their feeding habitat – was spared. <u>Glossy Black-Cockatoo Fire</u> <u>Recovery Project | Bio R Australia</u>

Following the bushfires, the number of Glossy blackcockatoos using Cygnet Park Sanctuary has doubled to about 36 (8% of the population of about 450 birds), demonstrating that the Park is already fulfilling Bio·R's intended purpose of creating habitat for wildlife including species of conservation concern. In May, after spending some time feeding, flocks were observed to move off to the north or the west. Perhaps some birds from the west of the Island were seeking refuge at Cygnet Park for some of the day for feeding and roosting. Cygnet Park Sanctuary | BioR Australia . An amazing video showing a male Glossy black-cockatoo flying in slow motion several kilometres east of the Cygnet Park Sanctuary was taken by Exceptional Kangaroo Island. BioR - Home | Facebook



Adult female Glossy black-cockatoo at nest hollow entrance. Photo: Michael Barth

#### Nesting season update from November "Chewings" Newsletter

Since the bushfires the Recovery Team has worked hard to ensure Glossies have safe nesting sites available to them. In total, 38 nestlings successfully fledging from known nest sites in 2020. The Recovery Team has been heartened to see that Glossies are finding new natural hollows after the bushfires, and so protecting these new nests from brushtail possum predation has been a high priority. Recovery Program staff, Mike Barth and Torran Welz have also been busy repairing damaged possum exclusion collars on nest trees within areas affected by bushfires.

Amazingly, no discernible difference in **overall nesting success** was detected in 2020 compared to recent years, and there was also no difference in nesting success in flock regions significantly impacted by the 2019-2020 bushfires when compared to flock regions that were less impacted. However, **fewer total nesting attempts** were observed at nest sites heavily impacted by the 2019-2020 bushfires. This could be due to birds nesting in different areas closer to remaining food sources or some pairs choosing not to breed this year.

The proportion of females with dependent young during the census was similar between flock regions, indicating that females did still breed in 2020 and have likely moved their breeding grounds to new areas. In 2021, the Recovery Team will be focussing on finding these new nesting areas to ensure as many nests as possible are protected from predation.

Contact: michael.barth@sa.gov.au

Editor's Note: This article was compiled using extracts from an article by Michael Barth, Wildlife Field Officer, Landscapes Kangaroo Island printed in SEGments September 2014 and an article by Dr Tony Robinson printed in SEGments June 2020, as well as extracts from the November GBC 'Chewings' Newsletter and recent BioR Newsletters.

# AN URGENT MESSAGE FROM ADVOCATES FOR THE SA OUTBACK (ASAO)

(ASAO is a group of concerned SA conservationists, scientists and citizens) www.facebook.com/aridadvocates

The SA Liberal Govt has recently released a draft Pastoral Bill 2020, to replace the widely respected Pastoral Land Management & Conservation Act of 1989. The pastoral areas (rangelands) occupy about 40% of the State, and over two thirds of the Outback regions of SA. They are Crown Lands (public owned), leased to about 217 pastoral businesses on 42-year leases, at very reasonable rates. ASAO has a number of concerns (below). If you share those concerns, there is a Petition at: <u>http://chng.it/ZSnnwSV7SD</u> – the petition will go to Premier Stephen Marshall and David Basham (Minister for Primary Industries, who would have drafted the Bill). And please pass the petition info on to anyone you think might be interested!

The new Pastoral Bill 2020 will:

• **Remove the maximum stocking limits** on pastoral leases. These have been in place since the 1930s, when overgrazing and land degradation had reached such extremes that there were at least five Royal Commissions into the matter. While most lessees will behave responsibly, there have been a number of breaches over the last few years. The handful of public and private conservation reserves in the pastoral lands are concentrated in the southern, more scenic, areas of the Gawler, Flinders and Olary Ranges, which leaves the vast northern areas more or less unprotected by either public or private CPs. The current reserves could become small 'islands' in an overgrazed landscape, a situation that is unlikely to result in effective biodiversity conservation.

• **Remove the word 'Conservation'** from the title of the Act, and remove any mention of 'ecology' or 'biodiversity' from the objectives of the Bill (in spite of the fact that these issues were the top priority of 205 respondees to a very brief 'consultation' period from August-September 2019). There are claims that biodiversity can now be measured by 'technology', but this science seems to be at the very early stages of development, and untested on a broad scale.

• Create a new seven-member board with at least **four pastoral lessees** (an instant majority, making it unlikely that overgrazing and land degradation will be properly acted upon)

• Increase tenure on pastoral leases from **42 to 100 years** (with an 'industry-captured' Board, renewal of 100year leases would become a rubber-stamp, creating a tenure very close to **perpetual lease or freehold**)

• **Remove scientific oversight** from the Board: the currently specified positions for an ecologist, a soil conservationist, and a representative of SA Conservation Council have been eliminated.

• The current Board, created November 2019 by the Minister for Primary Industries, is likely not compliant with the 1989 (current) Act – there are already **five pastoralists** on the six-member Board.

• The new **Chair of the Board, David Larkin,** is **CEO of Gina Rinehart's Australian Outback Beef (AOB),** which operates the 'Macumba' and 'Innamincka' leases (which they purchased from Kidman & Co in 2016 – AOB is a consortium between Rinehart and Shanghai CRED). Larkin appears to have had no pastoral experience prior to joining AOB in 2017, prior to that he operated a feed-lot, butchering and export beef business in high rainfall regions of NSW. 'Innamincka' contains the globally significant RAMSAR listed Coongie Lakes NP, and together 'Macumba' (which also contains significant wetlands on the Alberga River) and 'Innamincka' have a land area approximately a third the size of Tasmania. It appears that Rinehart has been behind some of the pressure on Premier Marshall to bring out the new Bill.

• The new Bill will allow and even encourage **'different land uses'** and **'alternative species'** (presumably including goats, camels etc). The publicly stated objectives of AOB are to: increase the number of watering points (which constitutes land clearance under the Native Vegetation Act 1991), so they can 'develop' a larger area of grazing land, and increase the size of their cattle herd. They are also keen to introduce non-native pasture species (such as buffel grass), and put in more bores so they can irrigate pastures and crops.

If you share our concerns, here again is the **petition to sign at the following link** : <u>http://chng.it/ZSnnwSV7SD</u>

# **Garry Trethewey and Chris Wright OAM**

SEG's V-GRaSP teams have been carrying out rainfall and vegetation surveys in the Vulkathunha-Gammon Ranges for more than 32 years. Regular trips are necessary to calibrate and extract data from nine rain gauges (pluviometers) and a stream flow gauge, and to photograph vegetation at permanent photopoints. Feral animal sightings and yellowfooted rock wallaby sightings are reported.

There were two data recovery trips in spring, the first from 18<sup>th</sup> to 21<sup>st</sup> September, when pluviometers in the Ranges were serviced and the photopoints were done. On the second trip from 1<sup>st</sup> to 4<sup>th</sup> October the station country pluviometers were serviced as well as the Arcoona Bluff pluvio and the Exclosure pluvio at Henzall's camp (base camp). Data was retrieved from the stream gauge in Arcoona Creek.

The **first trip** was carried out by Phil and Janet Davill, Graham Blair, Alex Cornish, Neil and Lynn Topping, and Michelle and Garry Trethewey.

For months the team had planned to carry water up the creek to top up SEG's cache and return to the cars, and then begin the usual routines. With rain predictions anywhere between 0 and 80mm, it wasn't clear whether the Day 1 water walk would be necessary. In the event, since the Exclosure Pluvio showed about 20mm and the stream gauge remained dry, the team decided on the water walk. Some carried 13 litres, some 25 litres.

On day two the team walked with overnight packs to Upper Vandenburg. Graham, Alex, Lynn and Neil serviced the Arcoona South Branch pluvio on the way. Phil, Janet, Garry and Michelle went directly to Upper Vandenburg camp. Although most water collections in the creek were muddy and full of twigs, poos, etc, Phil and Janet found a tiny clean pool and so finished filling the cache. Garry and Michelle did all the photopoints below North Tusk, hoping to save time and get away early the next day.

On the third day the team visited the Plateau Pluvio and nearby photopoints, and then walked out to base camp and drove to North Moolooloo in the station country to stay overnight. There has been rain in this country: Pfitzners Well has had 14mm of rain, North Moolooloo 19mm and Maynards Well 38mm. This was enough to alter creek crossings and destroy some infrastructure, and the trip was slower than envisaged. Arriving at North Moolooloo, tracks and creek crossings had already been repaired with a grader.

On the last day most of the team returned to Adelaide and the Tretheweys went to Arkaroola to repeat the Arkaroola 2009 and 2011 SEG Survey photopoints which they have done twice a year for some years now.

Vegetation observations

Garry Trethewey reported that in patches almost all of the bigger trees including E. camaldulensis were dead. Even some of the mallees may not regenerate. Also Eremophila alternifolia and oppositifolia, Dodonae, Senna, sheoak, Callitris, Alectryon oleifolius (Bullock Bush), Acacia aneura (Mulga) looked in dire conditions. But in other patches these were all looking healthy, even with the occasional flowers and seeds. However, he noted there were many ephemerals and short-lived plants doing well. Zygophyllum spp, Solanum spp, grasses, Euphorbia spp, Senna spp, Sida petrophila, Ptilotus exaltatus and obovatus, Sigesbeckia spp, Marsdenia australis, in all stages of sprouting, flowering and seeding, and occasional individual Triodia irritans plants with emerging green shoots. This is against a background of rainfall summarised in the Table below. Rain that fell during the trip is excluded.

Further rainfall and stream gauge data

<u>SEG\_WaterConnect</u> <u>Hydrology 02 – garrytre</u> (wordpress.com)

Mulga regeneration Garry has noticed in the Gammons and at Arkaroola that Mulgas (Acacia aneura) have only 2-4 clearly defined 'generations' - surviving germination events separated by many years. On Arcoona Creek, from the end of The Shortcut to almost Lower Vandenberg, on sand/ gravel flats, the younger



Tipping bucket of a pluviometer

Installation	Early Feb event	Mid Feb - mid Sept total
Arcoona Bluff Pluvio	48mm	33mm
Exclosure Pluvio	48mm	33mm
Plateau Pluvio	42mm	40mm
South Branch Pluvio	36mm	40mm
Arcoona Creek Stream Gauge	no flow	no flow

generation is about 2 metres high, healthy and ungrazed, and the previous generation is about 5-7 metres high. *Callitris glaucophylla* often show size/age cohorts, too, although with more classes and spatial variation.

#### Animal sightings

Garry also reported that it is clear that animals have fared very poorly. Grasses and other edibles are almost completely ungrazed, and almost no fresh footprints or droppings were noticed. On four passings of Woodcutters Well and The Seeps, no live vertebrates were seen, and even the skeletons are starting to disappear. Overall, with an opportune effort of 8 people in two or more groups covering 50km, no macropods, emus, or goats were seen. Vertebrates seen were: a Wedge-tailed eagle soaring at North Tusk, a crow, some smaller birds, fresh dog footprints, and after rain during the trip, fresh echidna diggings on a track that had been used the day before. Smaller vertebrates were a Burton's legless lizard, some masked rock skinks, a skinny tree skink, a report of a 'blue dragon' at Lower Vandenberg, and a pair of sleepy lizards.

#### Water sampling

As part of the "Friends of the Gammon Ranges" Project participants test water quality in the eastern Gammon Ranges, in Weetootla Gorge and Nepouie Springs. Ray Hickman, FOG offered to test water samples from Woodcutters Well and The Seeps for pH, electrical conductivity and calcium. Woodcutter's Well and The Seeps are in the western Gammons. TDS (total dissolved solids) and salinity can be estimated from electrical conductivity. From Garry's point of view it is already a learning experience as he found out when he sampled water from Woodcutter's Well. Because this was after the rain, any gentle inflow of fresh water would lie on top of the saline water and so "I took the sample from as far down through the protective wire grid as I could reach, i.e. wrist depth". A vertical series of water samples might be interesting.

The Seeps, a series of very small pools marginally accessible between boulders in the creek bed, provided one pool, deep and long enough to half fill a 500ml water bottle with disgusting brown tea, droppings having accumulated and not been washed away by any flow.

#### Ray Hickman's preliminary report

Woodcutter's Well conductivity is 8400 microsiemens/ cm, and calcium 225 mg/l. The Seeps conductivity is 22,700 microsiemens/cm, and calcium 275 mg/l.

For Weetootla Spring the values are 1313 microsiemens/ cm for conductivity and 116 mg/l for calcium. For Nepouie Spring values are conductivity 2192 microsiemens/cm and calcium 122 mg/l.

Results show that Woodcutter's Well is 6 to7 times more saline than Weetootla Spring, and 4 times more saline than Nepoule Spring.

The Seeps is 20 times more saline than Weetootla Spring and 10 times more saline than Nepouie Spring... more to

follow.

The **second trip** of the spring survey was carried out by Chris Wright, John Love and Steven Gatti in early October. They calibrated 6 pluviometers and serviced the Arcoona Creek stream gauge.



Steve Gatti servicing the Arcoona Bluff pluviometer. Photo: Chris Wright

On the first day the pluviometer at North Moolooloo was calibrated and the team stayed overnight at the shearers quarters at North Mooloooloo. On the next day the pluviometers at Pfitzner's Well, Mocatoona, and Maynard's Well were calibrated and the team returned to North Moolooloo for the night. On the third day the team moved to the base camp (Henzall's) at Arcoona Creek and calibrated the Arcoona Bluff pluviometer and recovered data from the Arcoona Creek stream gauge. On the fourth and last day the Exclosure pluviometer at base camp was calibrated.

All data was downloaded satisfactorily, all instruments are in good condition and measuring accurately, except for the pluviometer at Pfitzners Well which has a broken bubble-level. The instrument could do with a re-build back in Adelaide, if another instrument can be provided as a swap.

Chris reported that there were 2 dead yellow-footed rock wallabies in a cave on the western side of Evasive Creek coming down from Arcoona Bluff, and the dead bodies on the grill over Woodcutters Well were pretty gruesome.

Sadly, the death of all trees around Henzell's Camp will make it pretty exposed for camping in the future. It is small comfort to realise that the reason for the trees dying is probably not due to the V-GRaSP activities. The condition of the vegetation, as Garry reported, is patchy with the Gammons area looking generally drier than a lot of the station country that was visited.

#### **Revegetation**

Eddy Nichols owner of Maynard's Well has been doing some experimental revegetation planting with a variety of native species. Dripper lines are at 2 m spacing and irrigation is with bore water using solar power for pumping. The results are spectacular. Eddy's intention is to produce a seed bank for propagation whenever there is moisture available for generation.

The team had intended to stop in at Edeowie and take a quick walk up the gorge, but a phone call to the homestead indicated they were fully booked, so the team headed south to Hawker. On Trethewey's trip up, from Beltana to about 5km north, sand was blowing across the road. Then there was rain for the next day or so. On Chris's trip, 2 weeks later, similar amounts of sand were in the same place, and visibility at times was down to about 100m.

There were so many vehicles in Hawker that there was hardly a place to park a car, let alone fill up on fuel if needed. The team decided to continue on to Orroroo to stay in the caravan park, but when they got there, all spaces were taken up and all cabins fully booked so they continued back to Adelaide.

cpwright45@optusnet.com.au garrytre@bigpond.com





Revegetation on "Maynard's Well" with owner Eddie Nicholls. Photo by Chris Wright.

SEG is very grateful to our corporate sponsor Microchips Australia for its invaluable support to the Minnawarra Project.



## **SEG HAS A NEW WEBSITE**

The address is www.scientificexpeditiongroup.org. Thanks to Michelle Trethewey for setting up the site and getting it working.



# Scientific Expedition Group Inc.

SEGments

We are a non-profit organisation which aims to

- Promote and run expeditions of a scientific, cultural and adventurous nature.
- Encourage knowledge and appreciation of the natural environment.
- Promote the values and philosophies of wilderness to develop skills required for competent field work

Journal of the Scientific Expedition Group

In the current edition, there is plenty of interest, including:

 Regenerative Agriculture Can Help Alleviate Climate Change – Helen Johnson

# **SEG AT SCIENCE ALIVE! 6<sup>TH</sup> – 8<sup>TH</sup> NOVEMBER 2020**

### **Helen Johnson**

Science Alive! is held in August each year as part of National Science Week. Although it was not possible to hold the event at the usual time this year because of the pandemic, the organisers pressed on with planning and received clearance from SA Health to hold the festival in the first weekend of November. Crowd numbers were strictly limited and exhibits were spaced more widely than in previous years, and so having more space and being less crowded was an advantage. In fact it was barely a week after this event that South Australia experienced its second wave of Covid 19! Fortunately the event did not become the source of an outbreak.

This is the third year in recent times that SEG has been an exhibitor at Science Alive! SEG's exhibit was well attended and the majority of people seemed interested to hear about some of SEG's projects. As in previous years Friday is for schools. Called 'STEM Day Out', this year fifty schools attended, with the majority of students being in years 7 to 10. A small numbers of senior students attended. On Saturday mostly mums with young children attended and on Sunday mums and dads with young children.

Exhibitors vary from environmental groups, including Junior Field Naturalists, Universities, live animal displays, weird chemistry, Daleks, a huge Lego display, various defencerelated organisations (including Naval Group focussing on the new submarine), robotics, 3-d experiences etc.

Many of our 'customers' took SEG brochures and a flyer about the "Minnawarra" survey. The banners are very useful for explaining SEG's business. Three people directly asked about becoming SEG members, and many families showed an interest in attending the "Minnawarra" survey.

Stick insects are very popular, and even without holding an insect (Covid restrictions) children and parents were entertained. Students of middle school-age are more wary of strange looking creatures. This year we asked children to find the two varieties of insects on our 'gum tree'; spiny leaf insect *Extatosoma tiaratum* and goliath stick insect *Eurycnema goliath*. We had smaller versions of the insects in a box that curious children looked into. Jill Tugwell had a 'Galah' glove puppet and for very disappointed children we allowed the puppet on the child's hand to be the perch for a stick insect, and the Galah and insect were much photographed.

Information and education about ants proved to be a drawcard. With Annette Vincent's engaging approach, many people now know a lot more about ants, and many older children have a school project planned. Annette continuously had a group of visitors across the table from her. This year we chose not to use Annette's binocular microscope, but instead had a laptop showing her drawings of ants from her book "The Art of the Ant".

eyes roamed to our photos and we were asked "What does SEG do?" Our central display of pitline, Elliott and cage trap was then star of the show, and our volunteers, including two of our younger SEG members from previous surveys, Joel and Olly, explained how mammal and reptile trapping is done on a biological survey.

Occasionally I walked across the Jubilee pavilion with a spiny leaf stick insect on my shoulder... or on my back depending on where it wandered. I had the unusual experience of being spoken to by a Dalek... "You have something creepy on your back"!

SEG's show bags were given away to teachers and homeschooling parents and to several potential new members. The bags included a copy of the "30 Years of SEG" book, an edition of SEGments, a few SEG brochures, a flyer about the Minnawarra survey with dates for future surveys, and a map showing where SEG has been on expedition since ANZES days in 1981.

Thank you to the volunteers who helped with organising SEG's attendance at Science Alive! and to SEG members who worked on our exhibit over the three days. A special thank you to Annette Vincent who prepared an educational presentation about the ants of Gluepot Reserve, and attended each of the three days of Science Alive! to engage with visitors, especially students and children. Helen Owens' stick insects are an important feature of our exhibit. Thanks are also due to our photographers for documenting the occasion.

I hope SEG has the chance to do it again next year. I personally was pleased to tell what seemed like thousands of people about SEG's projects. Young and very young people say they are interested in nature, and that is important for conservation in the future.

kdolphin@internode.on.net



Annette Vincent discussing ants with students at Science Alive!

By the time people had seen ants and stick insects their

# MINNAWARRA BIODIVERSITY SURVEY – SPRING 2020

### **Janet Furler**

Spring 2020 brought the challenge of running another Minnawarra survey impacted by COVID-19 restrictions. Trying to find which rules to abide by was interesting, with one set of rules limiting people to 2 per car, including the driver. Given the hills on the property requiring advanced driving skills, and the damaging effects of many cars driving around, a limit on numbers was enforced. We were able to overcome the labour shortage to a large extent by using my close contacts, as then we could fill cars. Unfortunately, several keen people missed out. I am hoping we can expand our workforce next year.

The potential problem of a breakdown of a microchip reader was solved, thanks to the generosity of Microchips Australia. As the one essential piece of equipment for monitoring, it was recognised that backup equipment was highly desirable. Also the current readers are now 10 years old. Microchips Australia very kindly donated two readers, a slightly different kind to what we were already using, with a loop at the top. It wasn't long before we were doing whole body scans of the animals, with bag and all being pulled through the loop. It worked well, with thoughts turning to airport staff or police doing the same thing. We thought putting people into calico bags might be a challenge. Microchips Australia also donated another 100 microchips. SEG is very grateful to Microchips Australia for their support to the Minnawarra biodiversity survey.

The weather for the four days of the survey was mild, with temperatures staying between 10 and 20 the whole time with one rainy night.

We caught 83 individuals. 43 of those were newbies and between them they turned up 194 times. One Rattus rattus was caught, the rest were native rats. The most frequent species was Swamp rat (Rattus lutreolus), with 35 individuals. I think this is the first time this species has been the most numerous. Bush rats (Rattus fuscipes) were the second most frequent, with 31 individuals. 16 Antechinus (Antechinus flavipes) individuals turned up. While this is many fewer than we caught on the autumn 2020 survey (37), it is comparable with the last two spring surveys. In spring 2019, we caught 19 Antechinus, 48 Bush rats and 33 Swamp rats. In spring 2018, 18 Antechinus, 47 Bush rats and 19 Swamp rats were caught.

Site 1 has had the biggest change in numbers, with one Antechinus, one Bush rat and 19 Swamp rats caught. Site 7 had 2 Antechinus, 1 Bush rat and 7 Swamp rats. Whether this is a seasonal blip or a change in the balance, possibly due to a change in vegetation, remains to be seen. Watch this space!

Site 9, the driest, top-of-hill site, had no captures. While swamp rats are very rare (2 in 20 years), there are usually Antechinus and sometimes Bush rats caught at this site. Was it too good a season, such that they didn't need our bait? Site 4,

down the hill from Site 9, is usually one of the popular ones but only yielded 3 animals - one Antechinus, 2 Bush rats and no Swamp rats. The Swamp rat explosion is not universal. thefurlers@gmail.com





Microchip scanners donated by Microchips Australia



Harriet demonstrating the use of a full body scanner by passing the swamp rat in the bag directly through the scanner loop

### **SEG MALLEEFOWL SURVEY 2020 - BAKARA CONSERVATION PARK**

### **Trent Porter**



An active malleefowl mound seen at Bakara Conservation Park. Photo: Jill Tugwell

OH! Is that the phone?.....It's Helen O. .....We have to organise Malleefow!???

Oh!.... that soon???

I better do a ring around ...... Can't wait for emails... Now! ....Who can I Pesterize?????

WOW –FABULOUS--- All these people are willing to help!!! .... Set a date – weather looks OK...not too hot!

Date gets closer >>>>> Bloody Hell!! Going to be a scorcher – can't ask people to run around the scrub in those temperatures ...some (including me, might expire) and how on earth would they ever carry me out??

NEW DATE .... Looks cool enough. Ring around all again!! ........BEAUT.......Got enough Trekkers!!

Date gets closer>>>>>Bloody Hell Again!! Going into lockdown again – can't go..... Etc.Etc.

ANOTHER NEW DATE.....Looks cool enough again! Ring around all again!!...... Beaut!! Still got enough Trekkers!! ......waiting, waiting, WAITING!

Yippeee!! We are all away and meeting at the campground at the end of the dotted line......

Lots of people here and more coming in the morning....... All is good!!!!



Next morning..... set off with Rowena to refresh old memories of how to do this and it all comes flooding back for those who've done it before and the new ones pick it up quite quickly.

Rowena leaves and we are all on our own with each group having a circuit to cover with the malleefowl mounds, cameras needing SD cards changed and mysterious "Hot Spots" to locate.

All goes well, apart from some geographically embarrassed searchers looking for cameras. There was a conflict between different geodetic data sets which meant that the set of the GPS sites for the cameras were some 200 metres

Malleefowl working a mound on Bakara Conservation Park. Photo: Jill Tugwell



Echidna seen during the survey. Photo: Janet Davill

away where they were expected to be using the GPS set for the mounds. Some confusion ensued.

Bruce located one "Hot Spot" seen by infrared camera on satellite. Lightning inspired bushfire quickly extinguished by rain as it turned out.

There were several bonuses on the day with an echidna and a mallee dragon sighted.

My group was very lucky to return to our car at the end of the run and find a flock of the threatened Regent parrots noisily feeding in the tree above. We think around 30 birds. Turns out that they were the same birds which had been flying over our camp on the evening before, but it was too dark to identify them then.

Several active mounds were found on the circuits and the "chooks" seem to be having a good year!



Jill Tugwell and Phil Davill checking a surveillance camera. Photo: Janet Davill



Mallee dragon with part of tail missing. Photo: D Armstrong

<image>

trentasaurus@bigpond.com

# SEG MEMBER GRAHAM MEDLIN HONOURED AS SOUTH AUSTRALIA'S UNSUNG HERO OF SCIENCE

Decades of devotion to tracking the biodiversity of outback wildlife species have been recognised with an award for heroic achievements in science. South Australian **Museum Honorary Research** Associate Mr Graham Medlin was named the Unsung Hero of South Australian Science 2020 by Governor of South Australia Hieu Van Le, AC at the University of Adelaide on 21 September 2020.

South Australian Museum Director, Brian Oldman said the award acknowledges Mr Medlin's commitment to using

subfossils as a means of reconstructing past and present mammal diversity. As Honorary Curator of the Subfossil Collection at the Museum, Mr Medlin has volunteered two days a week over many years, advising students and researchers who use the collections, and supervising a dedicated team of volunteers who sort and meticulously record specimens.

Mr Oldman said "Graham Medlin has dedicated over 30 years to the acquisition, research and curation of the subfossil collection at the South Australian Museum."... "This nationally and internationally significant collection is the largest and best technologies, the significance of Mr Medlin's contribution to -curated of its kind in Australia, and represents a major scientific resource for understanding how climatic variation has impacted Australia's biodiversity. The collection includes specimens from areas across South Australia and interstate, notably the Flinders Ranges, Nullarbor Plain and other arid regions."

"Thanks to Mr Medlin's meticulous nature, several



extinct species have been discovered, including the pig-footed bandicoot (Chaeropus virratii) and a hopping mouse (Notomys robustus) which is known only from subfossil skulls in the Museum's collection. He has also made major contributions to the understanding of existing species using subfossil records, allowing us to help conserve threatened wildlife." the Museum Director said. Mr Medlin donated his private collection from the Flinders Ranges of more than 10,000 subfossils to the South Australian Museum in 1988, which was the catalyst for the creation of its subfossil collection. He has

worked with Dr Catherine Kemper, the South Australian Museum's Senior Researcher – Mammalogy, on a National Estate grant to identify and curate this renowned collection.

Mr Medlin's achievements are testament to his in-depth scientific knowledge and experience, unrelenting enthusiasm and persistence. The extensive subfossil collection he has assembled at the South Australian Museum will be his lasting legacy to Australian natural history, environmental reconstruction and palaeoecology research. Given rapid advances in fields such as ancient DNA and shape analysis science is yet to be fully realised. His legacy will continue to inspire and inform science long into the future.

This article courtesy of a South Australian Museum press release



# MINNAWARRA BIODIVERSITY SURVEYS 2021

# Autumn — Wednesday 14th April to Sunday 18th April

# Spring — Thursday 30th September to Monday 4th October.

Come for half a day, one day or several days. Minnawarra is situated on the southern Fleurieu Peninsula For further information and registration forms, contact: Janet Furler on 0419 842 667 or thefurlers@gmail.com

## VALE GINA BREEN

Gina was born in County Wexford, Ireland in 1939. Early in her life she became a nun and studied as a teacher in England. She left the convent in 1969 and taught in schools in England before she emigrated to South Australia in 1975. Gina taught at Norwood High School, Birdwood High School and Mercedes College teaching geography and language & literature to senior students.

Gina Breen attended SEG annual expeditions to Witjira, Moonabie, Boolcamatta, Scrubby Peak, Marqualpie, Arkaroola and Bimbowrie between 2004 and 2010. Gina loved plants and spent her days working with SEG's botanist Margie Barnett, and her evenings pressing plants back in camp. Gina's expertise in the kitchen amazed and delighted volunteers when she produced delicious cakes and freshly baked bread using the ancient wood oven at Bimbowrie.

Gina became Secretary of SEG in 2008 and remained in that position until she returned on holiday to Ireland in 2011. Unfortunately she contracted encephalitis while on holiday and spent the next 11 months in Wexford Hospital and St Vincent's hospital, Dublin. Back here in Australia, we didn't think we would ever see Gina again. But we didn't take into account Gina's fighting spirit, and in June 2012 she was well enough to come back to Australia.

In 2014 Gina was made a Life Member of SEG in recognition of her dedicated service to the organisation and this was presented to her at the 30th year celebration BBQ.

Gina had a particular love for Gluepot Reserve, situated in the Murray Mallee. On a number of occasions she visited the Reserve and she had a great respect for the environmental work undertaken by the Reserve's many volunteers. Gina had a love of the outdoors and established wonderful produce and flower gardens wherever she lived.

Gina worked with the St Vincent de Paul migrant and refugee service, volunteering every Tuesday and she was

particularly good at writing housing applications. She was especially active within the Sudanese community and there is a Sudanese girl named Sunday Gina who was born on a Sunday and named Gina in gratitude for all her help. Gina also did charitable work in the Solomon Islands.

Gina was an inspirational person with a deep humanity. She was always cheerful whatever difficulties she experienced. She loved and appreciated her friends, of which there were many. Gina passed away peacefully at Estia, Kensington Gardens on 22 November 2020.

Duncan MacKenzie OAM



Gina with her SEG Life Membership Award

### VALE MARIE SENN

Marie passed from this life in August 2020 aged 74. She and her husband Peter were both enthusiastic SEG supporters two or three decades ago. Marie was part of the management committee for several years, bringing common sense, optimism and good humour to each meeting. She was also highly respected as an expedition leader to Lake Newland, a survey site with fresh water, salt water, sandhills, caves, limestone, tea trees and a long beach on Eyre Peninsula's west coast. There were so many applicants that, as an experiment, we ran it in two sections each of two weeks. Marie was leader of the first half which involved young people, with mature-aged in the second half. It worked, but not without a few problems for each half to overcome.

Later she and Peter conducted a comprehensive feasibility study about SEG managing an island off the West Coast when it might have been a possibility. Unfortunately, it was beyond our resources.

Marie was busy throughout her life with many other interests, and I was always pleased to see her at musical events. They have not happened during the Covid lockdown and I will miss her smiling face at these casual meetings in future.

Our thoughts are with Peter, sons Michael and Andrew and their families.

Richard Willing SEG President

### **CHAIRMAN'S REPORT - OCTOBER 2020**

## **Dr Robert Sharrad AM**

How the world has changed since last year's AGM.

We have had the terrible fires on KI and in the Adelaide Hills. The former has had a much larger impact on nature than most of us had anticipated. I recommend that members consult the informative and sobering account provided by Dr Tony Robinson in the June SEG journal.

The pandemic has of course had a huge impact on all of us. It has for example, meant that we didn't have a major survey this year and aren't yet committed to any particular plan for next year although we are determined to do something!

There are many who have despite lockdowns, social distancing etc managed to keep some of our important activities going and the people involved deserve our thanks.

The sturdy group of outdoors types who run the longterm **Vulkathunha – Gammon Ranges Scientific Project** continue to toil up mountain slopes to service the equipment that keeps recording the important data. Well done: Chris Wright, Graham Blair, Garry and Michelle Trethewey, John Love, Alex Cornish, Janet and Phil Davill and others.

**Minnawarra biodiversity surveys** have continued though at times in an abbreviated form. Richard Willing and Janet Furler have again run these long-term (20 years!) activities in Autumn and Spring. They deserve our thanks but also our admiration for the really hard, physical work the surveys require.

SEG continues to support **Malleefowl monitoring** in the Riverland and we expect to have some added responsibilities for movement cameras in the future.

The excellent, informative publication **SEGments** has continued seemingly unaffected this year due to the hard work of Helen Johnson and Alun Thomas. As I have remarked before, this is a most useful contribution that SEG makes to recording the natural history of SA.

The **SEG website** has been upgraded by Michelle Trethewey and we are most grateful to her for providing us with this most useful means of communicating with our people and other members the public.

For the last few years we have had a presence at the **Science Alive** event at the Wayville Showgrounds where we show our work to students and families. We thank Helen Johnson and her intrepid helpers, especially Annette Vincent and Helen Owens.

The **committee** has also kept at it (with zoom at some stages). Thanks to you all:

President, Richard Willing; Hon Secretary, Sarah Telfer (Sarah also organises the venue); Hon Treasurer, Graeme Oats; Administration Officer, Alun Thomas; Helen Johnson, John Love, Duncan McKenzie, Helen Owens, Stuart Pillman, Trent Porter, Jill Tugwell and Leah Feuerherdt.

sharrads1@bigpond.com



# SEG IS SEEKING A VOLUNTEER ACTING MINUTES SECRETARY

We are looking for someone to volunteer to attend SEG committee meetings from and including March to September 2021 to take minutes and circulate them to committee by email. The SEG Committee meets once a month in Norwood from 5.30 – 7.00 pm approx. on second of Monday each month. The successful applicant should have an interest in biological and field science as explained by the aims of the organisation on the inside cover of this SEGments. Interested parties should contact Alun Thomas on: alunulna@gmail.com.

#### Editorial continued from Page 1

Some local (to Adelaide) place names include Onkaparinga (originally Ngangkiparingga), Aldinga (Ngaltingga) and Carrickalinga (Karra-gadla-ngga, from karra 'redgum' + gadla 'firewood' + ngka 'at' 'redgum firewood place'). These names sound very different today to the way they were originally pronounced, mainly because English speakers do not use an ng sound at the beginning of words. Check out this website for more Adelaide-based language <u>http://</u> www.kaurnaplacenames.com/index.php</u>. For more

Adnyamathanha language there is an excellent new book <a href="https://www.openbookhowden.com.au/product/">https://www.openbookhowden.com.au/product/</a> adnyamathanha-dictionary/. Other sites such as <a href="http://">http://</a> www.bom.gov.au/iwk/calendars/kaurna.shtml have

documented Indigenous weather using the local language. It's not too late to start recognising the extensive experience and deep knowledge of First Nation's people. Connect with and support Traditional Custodians in your local community, attend place-based events, and learn more about and celebrate the Country you stand on. Find opportunities to reflect on, and develop your personal sense of connection to the skies, waterways and lands on which you live and learn. Caring for our Country will always start with a deep understanding of the Land you are on. Leah Feuerherdt SEG Committee

feuerherdt@hotmail.com

# SCIENTIFIC EXPEDITION GROUP INC. APPLICATION FOR MEMBERSHIP AND MEMBERSHIP RENEWAL for 2020 — 21

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	\$35.00
Concession cards/ student	\$15.00
Family or Corporate membership	\$40.00

<u>HARD COPY SEGments</u>:- If you like to receive a hard copy through Australia Post of our quarterly journal – SEGments, please include in your payment an additional \$30.00 for a SEGments subscription. All members will receive an electronic copy by email.

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:

.....

#### **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 <u>AND</u> also advise us by email that you have made a payment to our bank account via email to – gdoats@bigpond.net.au

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

The Secretary Scientific Expedition Group Inc. P.O. Box 501 Unley S.A. 5061

#### PLEASE NOTIFY ANY CHANGE OF POSTAL OR ELECTRONIC ADDRESS

