



# SEGments

Journal of the Scientific Expedition Group Inc.

Volume 39 No. 3 Dec 2023



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

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

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

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

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## **ISSN 2208-7443**

SEGments is the authorised journal publication of the Scientific Expedition Group Inc., 111 Franklin St, Adelaide, SA 5000. It is published four times a year to promote articles about biodiversity, scientific exploration and ecological research.

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**Cover Photo:** Mangrove trees ready to plant in Timor Leste.

**Rear Cover Photo:** Mangroves, water and mountains, Timor Leste.



# SEGments



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## EDITORIAL

SEG was founded nearly 40 years ago with a set of aims which include:

- \* 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.

For all of the 39 years SEG has been fulfilling the first of these aims by doing just that, the running of expeditions of a scientific, cultural and adventurous nature. The list of expedition sites is very long but a few stand out such as the Nullabor Plain, Witchera, Coongie Lakes and the Gammon Ranges plus at least 30 other locations. Besides the longer annual expeditions there are the shorter regular expeditions to the Gammon Ranges for rainfall and vegetation monitoring, Bakara for malleefowl monitoring and Minnowarra for biodiversity monitoring on Heritage Blocks. I think this first aim has been fulfilled.

During the recent Minnowarra survey I was very impressed by the work of the team and specifically Janet Furler, working hard to introduce the many

children who attended to the importance of accurate field work and understanding the many animals located. I have no doubt that the second SEG aim is being fulfilled.

I think that the third aim is being fulfilled because so many of our expeditions are held in areas which can rightly be termed as wilderness. The attendees have a chance to get out and appreciate the magnificence of this wilderness.

Possibly the fourth aim is the one that SEG has stressed the most because that is one in which the group has special expertise. The very fact that most expeditions are in remote locations means that skills are required planning and running the expeditions. Early in the life of SEG most of the expeditioners were around university student age as this was a niche market which was not being serviced. More recently the attendees have been mostly of an older demographic but still eager to go on expeditions and learn field survey techniques.

In the scientific report prepared by Andrew Sinel of Ecosphere Ecological Solutions for the Nature Foundation of South Australia on the Witchelina Expedition in April Andrew included the paragraph:

The use of the Scientific Expedition Group (SEG) to undertake fauna surveys was unexpectedly smooth sailing and very efficient. The level of expertise within the group was outstanding and provided for a high-level survey to be undertaken in short time.

Of the party on this expedition about a quarter were "newbies" and these learned sound field techniques. I think our fourth aim is being fulfilled.

SEG is coming up to our fortieth year next year and I think we can grow from strength to strength.

Alun Thomas  
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# WITCHELINA RESERVE TERRESTRIAL FAUNA SURVEY APRIL 2023

## ANDREW SINEL

### Introduction

This report details the results of a terrestrial fauna survey undertaken at the Witchelina Nature Reserve, situated approximately 540km North of Adelaide and 30 km northwest of Leigh Creek in the arid rangelands of South Australia, bordering Lake Torrens in the south and Marree to the north. Witchelina Station has been a formally recognised reserve since 2010 and has been destocked from pastoral activities since that time. Reserve management actions have primarily been targeted towards reducing the incidence and population of feral fauna and flora with the natural indigenous flora cover allowed to regenerate naturally dependent on the provision of suitable seasonal conditions.

The various fauna surveys undertaken at the Witchelina reserve historically were carried out to provide baseline and monitoring fauna datasets for areas across the various landforms with a primary focus on identifying any changes in fauna species presence or abundance. To conserve biodiversity at Witchelina, a goal of understanding the ecological communities present as well as the various processes and interactions that create them is at the forefront of efforts. Fauna species are known to be crucial facilitators of restoration generally, and within arid ecosystems particularly, responding to species which burrow or condition soils which aids in regeneration of profiles, nutrient cycling and seed dispersal and burying.

‘Rehabilitation’ and ‘restoration’ have historically been somewhat synonymous with vegetation and floristic species richness (Cross et al. 2017), leading to a focus on restoring plant diversity in degraded landscapes however, fauna from multiple trophic levels play crucial and regionally-variable roles in ecosystem function, and that ecosystem function is tightly linked to fauna diversity (Coggan 2018).

This survey focussed on terrestrial mammals and reptiles within a cross section of vegetation communities and was designed to inform species richness within both chenopod shrubland stony plains landforms in the northern section of the lease and flood out country associated with the Mulgaria Watercourse in the southwestern corner of the pastoral lease.

### Background

#### Purpose

The fauna surveys were carried out within two study areas defined as western and northern sites.

The scopes of the fauna surveys reported here were to:

- document the vertebrate fauna assemblages within the habitats of the study area using established sampling techniques; and
- identify fauna of conservation significance (particularly state and federally listed threatened,

migratory and priority fauna species) present or potentially present within the areas surveyed.

### Location of sites

Witchelina Nature Reserve is situated approximately 540km North of Adelaide and 30 km northwest of Leigh Creek in the arid rangelands of South Australia, bordering Lake Torrens in the south and Marree in the north and is situated 50 km south of the Lake Eyre region.

Sites were based on previously existing monitoring sites and selected to cover habitats that were most likely to have changed in structure or condition in the time period that Witchelina has been a reserve. The northern sites were largely comprised of low chenopod shrubland habitats, known to support populations of the nationally threatened species Thick-billed Grasswren (*Amytornis modestus raglessi*).

The western sites were targeted at flood country that had landforms dominated by stony plain landforms which were associated with self-mulching cracking clay soils, known to support nationally threatened species such as Plains Mouse (*Pseudomys australis*).

### Research Licensing

The survey and research of fauna during the 2023 Witchelina Fauna monitoring period was undertaken under the licence in accordance with the *National Parks and Wildlife Act 1972* (NPW Act).

### Climate

Witchelina Station: Marree (Witchelina Station) Number: 17055 Opened: 1898 (BOM 2023) has a long term mean annual rainfall of 153mm (Figure 1), however, 2022 saw 433mm of rainfall of which 308mm fell in two events, January (176.2mm) and October (131.9). In the three months prior to the survey, totals were quite lean with just 8.4 mm of rain recorded, well below the average for the same period of 54mm.

### Methods

The Witchelina fauna survey was conducted from 16-22nd April 2023 as a joint project with the Nature Foundation and the Scientific Expedition Group (SEG). Andrew Sinel from Ecosphere Ecological Solutions on behalf of the Nature Foundation was the survey team leader and co-ordinator. Leaders representing SEG were Bob Sharrad as the Science Leader and SEG Camp Leader was Alun Thomas. A total of nineteen people attended the survey and contributed to pitfall trap line installation, morning and afternoon pitfall trap checks, terrestrial fauna identification and pit line removal.

### Sites

A total of eight pitfall trapping sites were employed in the 2023 surveys (Table 1 & Figure 2). The sites included three semi-permanent sites which consisted of two lines of PVC pits 225mm in diameter and 600mm deep. The remaining five sites

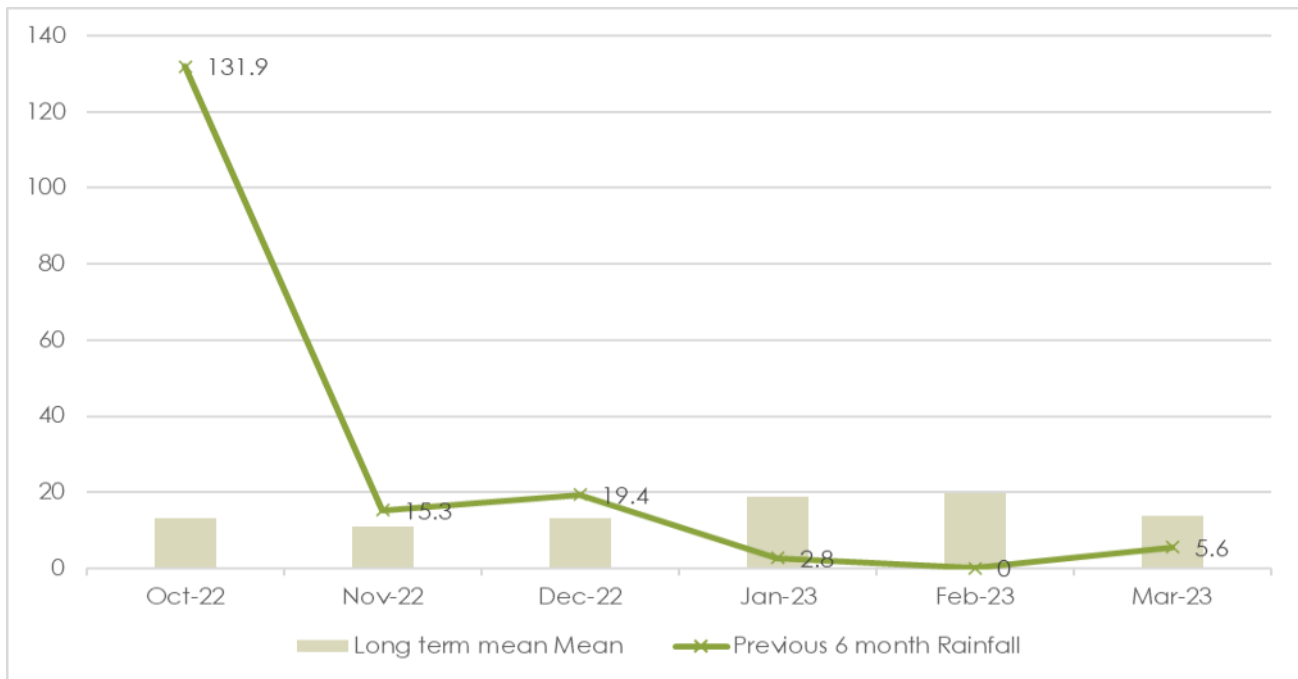


Figure 1. Mean rainfall in the 6-month period prior to the surveys

were temporary pits utilising 150mm diameter pits with 400mm depth. Two lines of 15 Elliott trap only sites were used opportunistically at a coolabah woodland soak. The fauna trapping layout was divided into northern and western zones (Figure 3 & Figure 4) with four sites located within each.

Pitfall trapping lines with terminal funnel traps were broadly based on the guidelines for vertebrate surveys in South Australia (Owens 2000) and set-up and surveyed utilising the following methodology:

- Set-up: A temporary 70 m transect with six pitfall buckets, placed at 10 m intervals along the transect. Pitfall buckets of 225 mm diameter and 600 mm deep were used to target small to medium sized mammals, reptiles and amphibians (if conditions allowed). Two funnel traps were positioned at each end of the 70m drift line (four total per line).

- Survey: Pitfall and funnel traps were each checked morning and evening for a total of four nights per site. Captured mammals and reptiles were temporarily marked with non-toxic Texta along the underside of the tail to distinguish first and subsequent recapture of individuals. This enabled a better estimation of population sizes. Each captured individual was checked for the presence of previous Texta markings. If present, the individual was recorded as a 'recapture'.

Elliott traps were set-up and surveyed utilising the following methodology:

- Set up: Elliot style aluminium folding box traps were placed at each site and baited using an oat/peanut butter/ sesame oil bait ball to target small to medium sized mammals and reptiles.

- Survey: Elliott traps were deployed each evening and checked each morning for a total of four nights per site. Elliott traps were not deployed during the day. Captured mammals

and reptiles were temporarily marked with non-toxic Texta along the underside of the tail to distinguish first and subsequent recapture of individuals. This enabled a better estimation of population sizes. Each captured individual was checked for the presence of previous Texta markings. If present, the individual was recorded as a 'recapture'.

Datasheets were used to record the following capture data:

- monitoring site number/identification.
- date of trapping session.
- trap session (morning or afternoon session).
- capture method (pitfall, funnel, Elliot, opportunistic).
- species.
- sex (mammals and selected reptile species only).
- age-class (adult, sub-adult, juvenile).
- first capture (no Texta markings) or recapture (animal with marked tail).

### Field survey limitations

The fauna assessment was designed and carried out to conform with biological survey standards however some variability was used. The additional depth of pitfalls renders Elliott traps largely ineffective, so these were reduced to 15 traps per site. Cage traps were used at each site roughly aligning with the centre point of the two lines of pits. With respect to trapping, targeted and opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to:

- seasonal inactivity during field survey;
- species present within micro habitats not surveyed;
- cryptic species able to avoid detection; and
- transient wide-ranging species potentially not present during survey period.



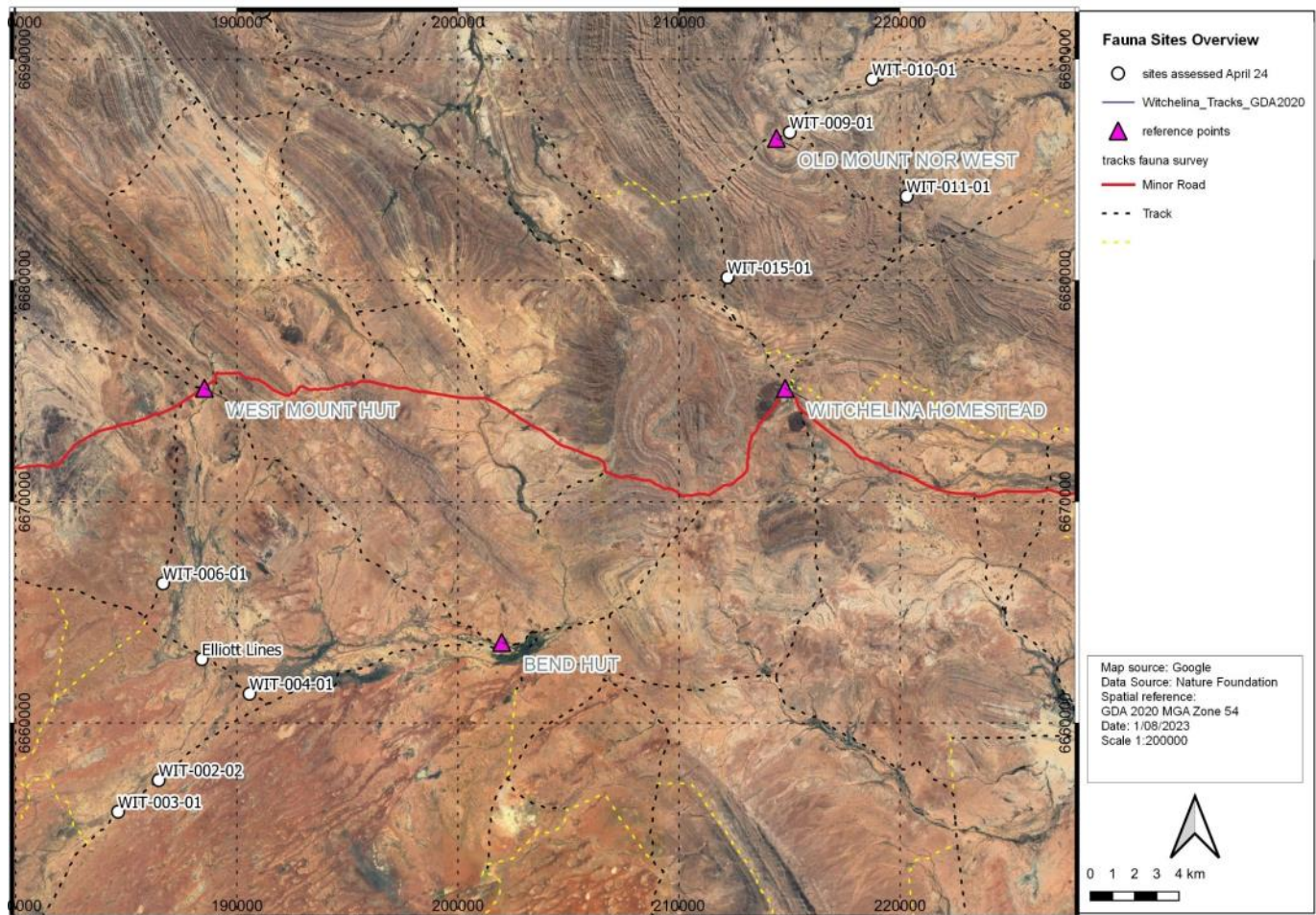


Figure 2. April trapping survey overview.

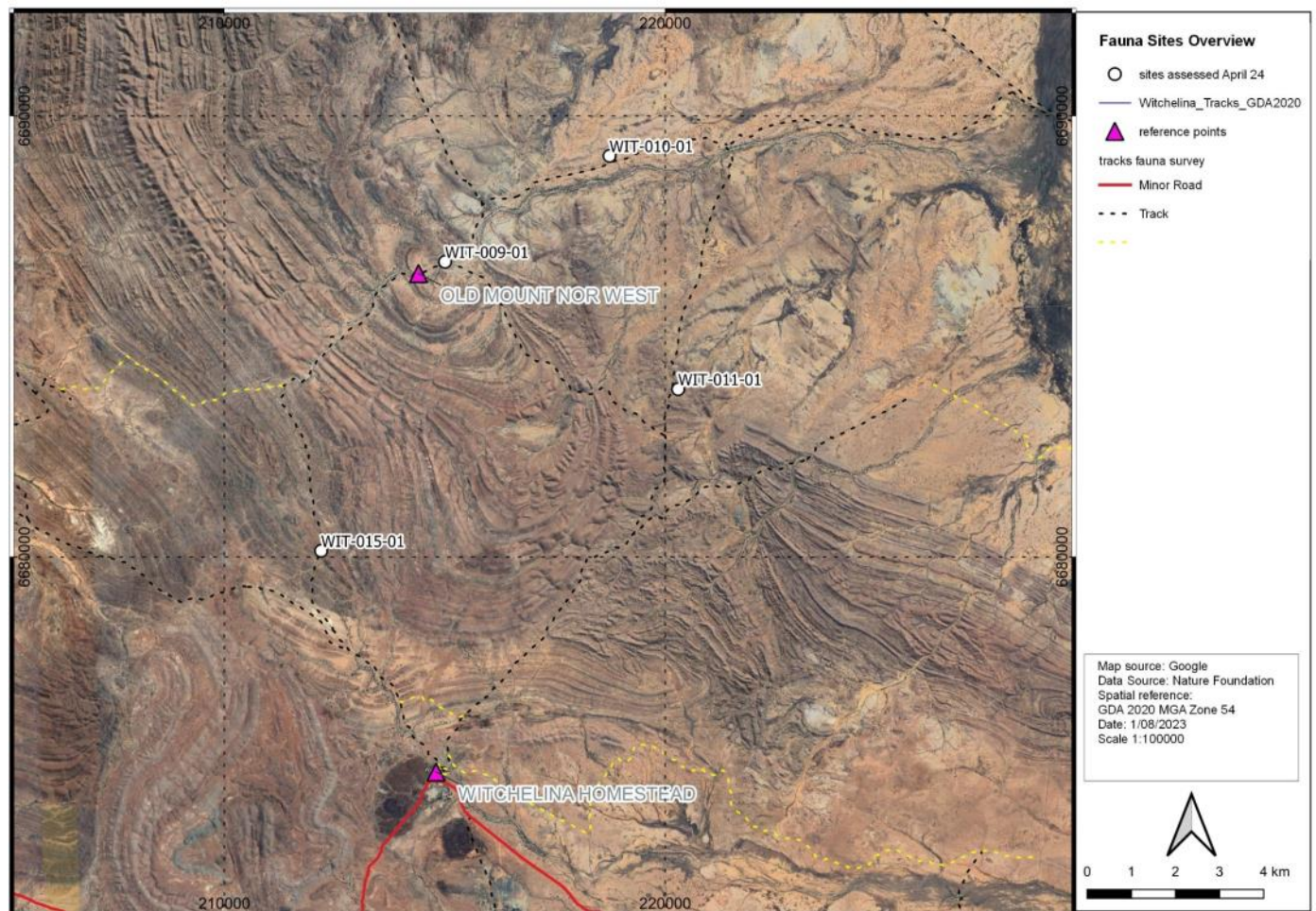


Figure 3. Northern sites location



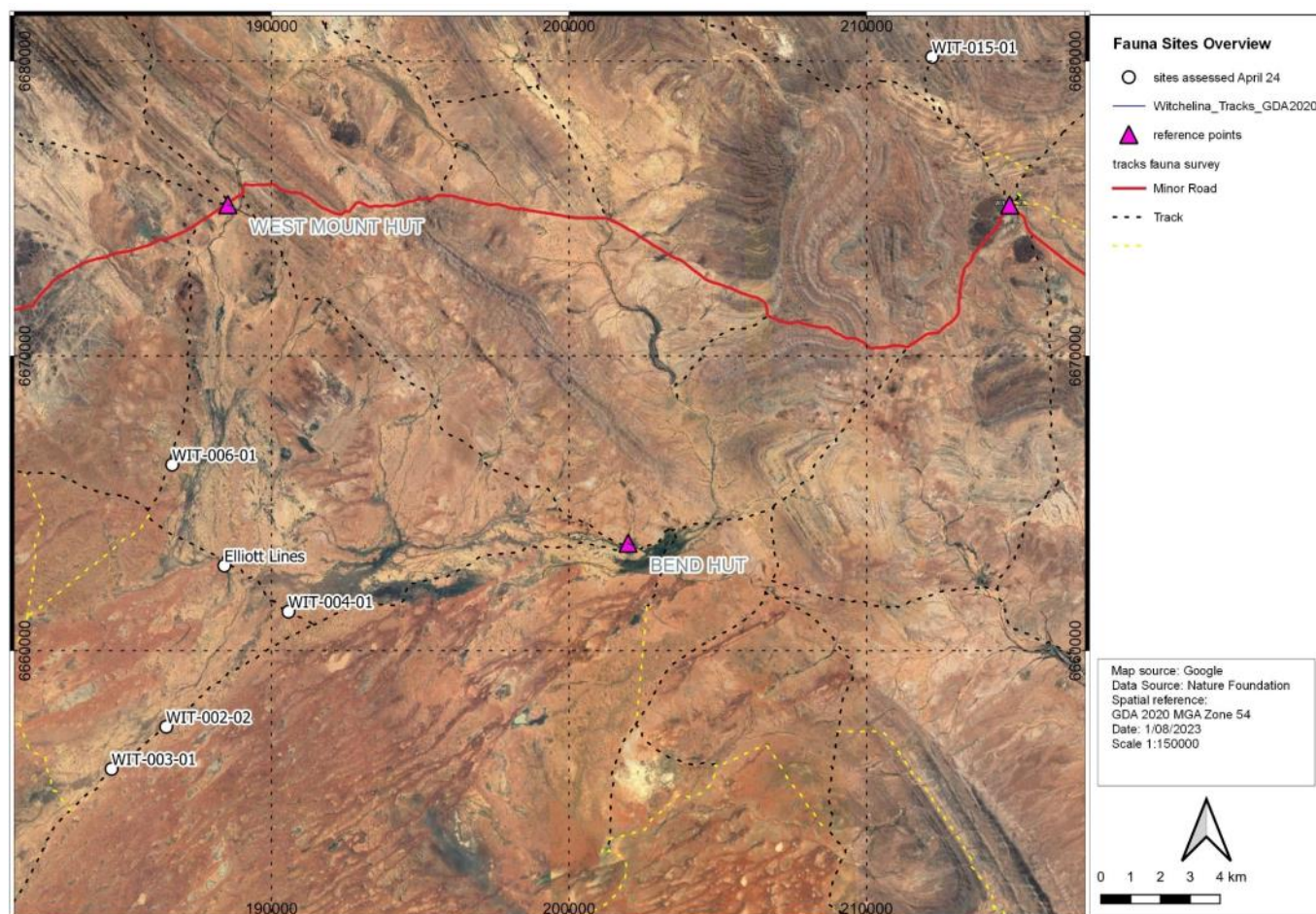


Figure 4. Western Sites location.

Table 1. Summary of fauna monitoring locations within the Witchelina Nature Reserve

Site	Site Location	Coordinates (UTM 54H)	
		Easting	Northing
WIT002	<i>Atriplex nummularia</i> (Old Man Saltbush) Floodplain	186464	6657419
WIT003	<i>Atriplex nummularia</i> (Old Man Saltbush) Floodplain	184626	6655989
WIT004	<i>Maireana astrotricha</i> (Low Bluebush) / <i>Maireana aphylla</i> (Cottonbush) / <i>Atriplex vesicaria</i> (Bladder Saltbush) Low Open Shrubland	190571	6661323
WIT006	<i>Maireana astrotricha</i> (Low Bluebush) / <i>Maireana aphylla</i> (Cottonbush) / <i>Atriplex vesicaria</i> (Bladder Saltbush) Low Open Shrubland	186662	6666309
WIT009	<i>Atriplex vesicaria</i> (Bladder Saltbush) Low Chenopod Shrubland associated with creek terrace	214990	6686651
WIT010	<i>Maireana astrotricha</i> (Low Bluebush) <i>M. pyramidata</i> (Black Blue-bush) Low Open Chenopod Shrubland +/- Senna Shrubland	218693	6689075
WIT011	Mixed Low Chenopod Shrubland	220237	6683793
WIT015	<i>Maireana astrotricha</i> (Low Bluebush) Low Open Shrubland	212191	6680140
Elliott Lines	<i>Eucalyptus coolabah</i> (Coolibah) Woodland Adjacent Low dune	188416	6662884

The lack of observational data on some species should therefore not be taken as necessarily indicating that a species is absent from the site. In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/ residents and the habitat knowledge of the Author has been assumed to potentially occur, although not necessarily on a permanent basis or in significant numbers

## Trapping assessment

### Weather

11.3 mm of rain fell at the Witchelina homestead which delayed the start of the survey by one day. Day-time maximum temperatures were mild ranging from 19.9°C to 29.7°C with trap nights dropping to around 10°C (Table 2).

### Trap effort

Two temporary pitfall lines totalling 12 pits, eight funnel traps, 15 Elliot traps and two cage traps were used at each of the eight sites for a total of four nights per site. An additional two lots of 15 Elliot Traps were set for two nights and one night respectively (called Elliott Lines site). This resulted in a total trap effort of 139 trap nights across pitfall, funnel and Elliot and cage traps (Table 3).

## Trapping Overview

### Species abundance

The fauna trapping effort recorded a total of 132 individuals for the period 16th April 2023 – 22<sup>nd</sup> April 2023 (Table 4). These were represented by 18 species from three classes (one amphibian species, four mammal species and thirteen reptile species). One amphibian species was captured during the survey period, Sudell's Frog (*Neobatrachus sudellae*). Four mammal species were captured including the exotic House Mouse (*Mus musculus*), and three native dasyurids species. A total of thirteen reptile species were captured during the survey period. No species of conservation significance were captured during the survey period.

From a total of 132 captures, trap method saw 99 captures within pitfall traps (75%), Funnel traps, 7 captures (5.3%) and Elliott traps 26 captures (19.7%). Of note was the number of House Mouse (*Mus musculus*, 23 individuals) captured in Elliott traps making up 88% of all Elliott trap captures.

## Species richness

Species richness was recorded as highest at Sites 4, 11 and 15 with seven species recorded (Table 5). Site 2 had the lowest species richness with just two species recorded.

## Amphibians

One amphibian species, Sudell's Frog (*Neobatrachus sudellae*) was captured during the survey period (Table 6). Two individuals of the species were captured across two sites (Table 6).

Table 2. Weather conditions during the survey period (trap nights shaded green).

Date	Min Temperature (°C)	Max Temperature (°C)	Rainfall (mm)
15/04/2023	16.8	19.9	6.0
16/04/2023	10.0	20.9	5.3
17/04/2023	8.0	24.1	0.0
18/04/2023	10.2	26.6	0.0
19/04/2023	11.8	26.5	0.0
20/04/2023	-	23.8	0.0
21/04/2023	8.9	26.1	0.0
22/04/2023	10.3	28.9	0.0
23/04/2023	12.9	29.7	0.0



Figure 5. Sudell's Frog (*Neobatrachus sudellae*) Photo credit: Piers Brissenden.

Table 3. Trap effort for pitfall lines, funnel traps and Elliot traps.

Trap Type	Sites	Trap Nights	Total trap nights	Trap Effort/night	Total Trap Effort
Pitfall	8	4-5	34	12	408
Funnel	8	4-5	34	8	272
Elliot	10	1-5	37	15	555
Cage	8	4-4	34	2	68
Total					1,303



Table 4. Overview of Elliot, funnel and pitfall trap captures.

Scientific Name	Common Name	Elliot	Funnel	Pitfall	Total
Amphibians					
<i>Neobatrachus sudellae</i>	Sudell's Frog			2	2
Total Amphibians		0	0	2	2
Mammals					
<i>Mus musculus</i>	House Mouse	23		4	27
<i>Planigale tenuirostris</i>	Narrow-nosed Planigale			2	2
<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart			3	3
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	1		10	11
Total Mammals		24	0	19	43
Reptiles					
<i>Ctenophorus nuchalis</i>	Central Netted Dragon			2	2
<i>Ctenotus olympicus</i>	Saltbush Ctenotus	1	2	10	13
<i>Ctenotus regius</i>	Eastern Desert Ctenotus		1	5	6
<i>Ctenotus saxatilis</i>	-	1			1
<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus		3	31	34
<i>Ctenotus taeniatus</i>	Eyrean Ctenotus			1	1
<i>Lucasium stenodactylum</i>	-			1	1
<i>Menetia greyii</i>	Dwarf Skink			5	5
<i>Morethia boulengeri</i>	Common Snake-eye		1	1	2
<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko			4	4
<i>Suta suta</i>	Curl Snake			1	1
<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon			11	11
<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon			6	6
Total Reptiles		2	7	78	87

## Mammals

Forty-three individuals representing four mammal species were captured during the survey period (Table 7). This was followed by the native Stripe-faced Dunnart (*Sminthopsis macroura*) which had 11 individuals captured across five sites.

## Reptiles

Eighty-seven individuals representing thirteen reptile species were captured during the survey period (Table 8). The most abundant species captured was the Sandplain Ctenotus (*Ctenotus schomburgkii*) of which 34 were caught across six sites (Table 8). This was followed by the *Saltbush Ctenotus* (*Ctenotus olympicus*) which had thirteen individuals captured across five sites.

### Catch per unit effort (CPUE)

Due to some sites having a higher exposure with sites 10 and 11 left for an additional night and variation in numbers of traps a catch per unit effort calculation is made that gives an accurate guide to species or individual abundance across the entire site.

For all captures, Site 15 had the highest catch per unit (Table 9). This was largely driven by the high capture rate of Sandplain Ctenotus (*Ctenotus schomburgkii*) at this site with 16 individual captures of this species. Site 9 was the next highest which was due to the high numbers of House Mouse captured at this site and is likely to be associated with factors

such as proximity to creek, and physical elements such as sheets of tin, and rock piles etc. associated with the old Mount Norwest shearing shed ruins. Seventeen individual mice were captured at site 9 from a total of 27 in total (Table 9). House Mouse made up 67.5% of total mammal captures.

When assessing the capture rates excluding exotic species (House Mouse) and taking away the two additional Elliott lines, the overall CPUE was 0.087 captures per trap night with the northern sites having a capture rate of 0.103



Figure 7. Example of reptiles set for submission into SA Museum collection

captures per trap night and the western sites with 0.07 captures per trap night (Table 11).

### Opportunistic Observations

One additional amphibian species and three additional reptile species were opportunistically observed during the survey period, the Desert Tree Frog (*Litoria rubella*), Red-barred Dragon (*Ctenophorus vadrappa*), Gidgee Skink (*Egernia stokesii*) and Five-ringed Snake (*Pseudonaja modestus*).

### Voucher Specimens

Eighteen animal specimens and associated liver samples were retained from the survey for placement into the SA Museum collection (Table 12). Voucher specimen collections fulfills requirements under the state Department for Environment and Wildlife (DEW) permit to undertake scientific research and the Wildlife Ethics Committee (WEC) approval to use animals For the Purpose of Research, Teaching or Experimentation involving animals. This information is valuable in providing genetic and morphological material in determining species variability and provides information related to the conservation and management of indigenous species.

### Discussion

The outcomes of the survey showed that a variety of reptile and mammal species continue to utilise the reserve



Figure 7. Example of reptiles set for submission into SA Museum collection

system and that species richness based on the landforms assessed were consistent with those recorded historically.

No new species were recorded from the areas that haven't been recorded previously however it could be stated that conditions were not ideal for fauna surveys with overnight temperatures particularly much cooler than ideal. Rainfall at the start of the survey period did allow for the capture of amphibians however the subsequent cool and moist air across the region was likely to have shut down

Table 5. Species richness at each trapping site.

Scientific Name	Elliott	WIT00 2	WIT0 03	WIT00 4	WIT00 6	WIT00 9	WIT01 0	WIT01 1	WIT01 5	Total
<i>Ctenophorus nuchalis</i>			✓							1
<i>Ctenotus olympicus</i>			✓	✓	✓		✓	✓		5
<i>Ctenotus regius</i>			✓	✓	✓		✓	✓		5
<i>Ctenotus saxatilis</i>	✓									1
<i>Ctenotus schomburgkii</i>		✓		✓		✓	✓	✓	✓	6
<i>Ctenotus taeniatus</i>				✓						1
<i>Lucasium stenodactylum</i>									✓	1
<i>Menetia greyii</i>							✓	✓		2
<i>Morethia boulengeri</i>						✓			✓	2
<i>Neobatrachus sudellae</i>			✓			✓				2
<i>Planigale tenuirostris</i>		✓								1
<i>Rhynchoedura eyrensis</i>				✓			✓	✓		3
<i>Sminthopsis crassicaudata</i>				✓					✓	2
<i>Sminthopsis macroura</i>			✓		✓	✓		✓	✓	5
<i>Suta suta</i>					✓					1
<i>Tympanocryptis intima</i>			✓	✓	✓		✓		✓	5
<i>Tympanocryptis tetraporophora</i>					✓			✓	✓	3
<b>Grand Total</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>7</b>	<b>6</b>	<b>4</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>46</b>



Table 6. Amphibians captured at each site.

Species	Sites									Total
	WIT 002	WIT 003	WIT 004	WIT 006	WIT 009	WIT 010	WIT 011	WIT 015	Elliot Lines	
<i>Neobatrachus sudellae</i>		1			1					2

Table 7. Mammals captured at each site.

Species	Sites									Total
	WIT 002	WIT 003	WIT 004	WIT 006	WIT 009	WIT 010	WIT 011	WIT 015	Elliot Lines	
<i>Mus musculus</i>		2	1		17	4	1	2		27
<i>Planigale tenuirostris</i>	2									2
<i>Sminthopsis crassicaudata</i>			1					2		3
<i>Sminthopsis macroura</i>		3		3	2		1	2		11

Table 8. Reptiles captured at each site.

Species	Sites									Total
	WIT 002	WIT 003	WIT 004	WIT 006	WIT 009	WIT 010	WIT 011	WIT 015	Elliot Lines	
<i>Ctenophorus nuchalis</i>		2								2
<i>Ctenopus olympicus</i>		2	3	4		3	1			13
<i>Ctenopus regius</i>		1	1	1		1	2			6
<i>Ctenopus saxatilis</i>									1	1
<i>Ctenopus schomburgkii</i>	3		1		5	1	8	16		34
<i>Ctenopus taeniatus</i>			1							1
<i>Lucasium stenodactylum</i>								1		1
<i>Menetia greyii</i>						1	4			5
<i>Morethia boulengeri</i>					1			1		2
<i>Rhynchoedura eyrensis</i>			2			1	1			4
<i>Suta suta</i>				1						1
<i>Tympanocryptis intima</i>		1	2	2		2		4		11
<i>Tympanocryptis tetraporophora</i>				2			3	1		6

Table 9. Catch per unit effort (CPUE) for individual sites with total captures by class. A=amphibian, M= Mammal, R=Reptile

Location	Site	A	M	R	Total	Units	CPUE
North	WIT009	1	19	6	26	140	0.186
	WIT010		4	9	13	175	0.074
	WIT011		2	19	21	175	0.120
	WIT015		6	23	29	140	0.207
West	Christine.01			1	1	45	0.022
	WIT002		2	3	5	140	0.036
	WIT003	1	5	6	12	140	0.086
	WIT004		2	10	12	140	0.086
	WIT006		3	10	13	140	0.093
<b>Total</b>		<b>2</b>	<b>43</b>	<b>87</b>	<b>132</b>	<b>1235</b>	<b>0.107</b>

animal activity somewhat. Historically, based on previous Table 10. House Mouse captures by site.

surveys undertaken by Ecosphere, nighttime temperatures

Site	<i>Mus musculus</i>	Total
WIT002	0	0
WIT003	2	2
WIT004	1	1
WIT006	0	0
WIT009	17	17
WIT010	4	4
WIT011	1	1
WIT015	2	2
<b>Grand Total</b>	<b>27</b>	<b>27</b>

Table 11. CPUE of indigenous species.

Location	Site	A	M	R	Total	Units	CPUE
North	WIT009	1	2	6	9	140	0.064
	WIT010			9	9	175	0.051
	WIT011		1	19	20	175	0.114
	WIT015		4	23	27	140	0.193
<b>North Total</b>		<b>1</b>	<b>7</b>	<b>57</b>	<b>65</b>	<b>630</b>	<b>0.103</b>
West	WIT002		2	3	5	140	0.036
	WIT003	1	3	6	10	140	0.071
	WIT004		1	10	11	140	0.079
	WIT006		3	10	13	140	0.093
<b>West Total</b>		<b>1</b>	<b>9</b>	<b>29</b>	<b>39</b>	<b>560</b>	<b>0.070</b>
<b>Total</b>		<b>2</b>	<b>16</b>	<b>86</b>	<b>104</b>	<b>1190</b>	<b>0.087</b>

Table 12. Voucher specimens retained for SA Museum collection.

Voucher ID	Scientific Name	Common Name
BS018632	<i>Ctenotus schomburgkii</i>	Sandplain Ctenotus
BS018633	<i>Tympanocryptis intima</i>	Smooth-snouted Earless Dragon
BS018634	<i>Litoria rubella</i>	Desert Tree Frog
BS018635	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon
BS018636	<i>Ctenophorus nuchalis</i>	Central Netted Dragon
BS018637	<i>Rhynchoedura eyrensis</i>	Eyrean Beaked Gecko
BS018638	<i>Ctenotus taeniatus</i>	Eyrean Ctenotus
BS018639	<i>Ctenotus olympicus</i>	Saltbush Ctenotus
BS018640	<i>Mus musculus</i>	House Mouse
BS018641	<i>Ctenotus regius</i>	Eastern Desert Ctenotus
BS018642	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
BS018643	<i>Neobatrachus sudellae</i>	Sudell's Frog
BS018644	<i>Pseudonaja modesta</i>	Five-ringed Snake
BS018645	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
BS018646	<i>Morethia boulengeri</i>	Common Snake-eye
BS018647	<i>Lucasium stenodactylum</i>	(blank)
BS018648	<i>Ctenotus saxatilis</i>	(blank)
BS018649	<i>Ctenophorus vadrappa</i>	Red-barred Dragon



above 20 degrees are far more favourable particularly if combined with overcast conditions and low moonlight. Another factor affecting capture rates could be the very high annual grass cover has provided significant resource availability and that animals are not forced to move far from cover or shelter to forage limiting the pitfall capture rates.

The presence of higher species richness at chenopod shrubland sites generally was unexpected. The cracking clay soils associated with the Mulgaria watercourse and Old Man Saltbush shrublands was expected to provide high species richness for mammals. *Leggadina forresti* (Sandy Inland Mouse) was conspicuous by its absence across all sites. Timing of the survey may have something to do with this as captures in similar landscapes in spring recorded high numbers of this species.

The use of the Scientific Expedition Group (SEG) to undertake fauna surveys was unexpectedly smooth sailing and very efficient. The level of expertise within the group was outstanding and provided for a high-level survey to be undertaken in short time.

Future surveys would be well placed to occur within dune habitats and associated plains landforms adjacent after a run of good seasons which would mean that these are well covered in vegetation and there was some regeneration of woodland trees such as Mulga observed within these zones.

Targeting a spring survey in these areas during a hotter period means that the effort required is increased but can be rewarded with higher captures of species. It is recommended that a survey undertaken in mid to late November would allow for a better snapshot of the species utilising habitats.

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A Typical Survey Site WIT006



# PLANTING MANGROVES IN TIMOR LESTE

## ANTHEA HABEL

In February 2023 I travelled to Dili the capital of Timor Leste to visit four ladies who had recently been master's students at universities in Adelaide and meet their families.

The flight from Darwin to Dili is one of the worlds shortest international flights at just ninety minutes but with the usual long wait to board. Timor Leste is Australia's nearest neighbour. It only gained independence in 2002 after Portugal had been the colonial power for over 500 years and then an Indonesian invasion that lasted for twenty-five years.

The 1.5m population are predominantly Catholic. The national languages are Portuguese and Tetum but there are many smaller dialects spoken. The working languages and television are English and Bahasa Indonesian. The currency is the US dollar.

The country has a variety of natural resources including natural gas, petroleum, marble, manganese, gold and coffee. The country has some of the world's highest levels of marine biodiversity.

Early one Saturday morning we left the house on scooters to meet my friend's work colleagues and family members before going on to a mangrove planting area. The

staff of St John of God International Health Operations Team have made planting mangroves their quarterly community service. The planting area was about 20km east of Dili. The natural environment and the colours are amazing.

The trees had been grown by members of Konservasaun Flora & Fauna (like Trees for Life) and placed in batches of twenty in the shade. The area had been securely fenced without a gate and the wires were so well tensioned that we had to use a plastic chair on each side to gain entry to the planting area. The process was quickly established, dig a hole, unwrap the tree, plant the tree, pack the soil, pick up the plastic and any other rubbish. No need to water them in because the area is muddy and with plenty of moisture. With this process working very well in two hours we had planted 400 mangrove trees. With the sun getting extremely hot and the was humidity increasing it was time to find a sheltered spot for morning tea. There are many Australians on the staff and one couple had made scones, provided plum jam and aerosol whipped cream. At first there was some hesitancy to try the scones until those Timorese who had lived in Australia told them they would be missing a real treat!



Anthea at the Sentru Estudu Mangrove Centre in Timor Leste



There were another three groups rostered to plant later in the day when it would have been even hotter. Many embassies and big corporate business have staff joining in conservation projects. Some also financially contribute to these important environmental projects. Many NGO and conservation groups have active aid projects.

We planted four varieties of mangroves in the location, all of them from the genus *Rhizophoraceae*, tropical mangrove trees. *Ceriops tagal* (spurred or Indian mangrove), *Ceriops australis* (yellow or smooth fruited mangrove), *Stylosa* (spotted or small stilted mangrove) and *Apiculata* (tall stilted mangrove). These mangroves with their different heights and growth habits will contribute to a good canopy for nesting birds and a good water environment for marine life.

When our mangrove planting shift ended, we were driven back to Dili and arrived at a park which had a Monument to Our Lady. Many hundreds of young people had gathered there. My friend quickly realised that Xanana Gusmão the much-revered first president of independent Timor Leste was in the middle of the crowd. He heard my Aussie accent and offered to have a photo taken with me and my Timorese friend.

When I arrived at Darwin International Airport on the way back to Adelaide the staff were very keen to check my

shoes because I had stayed in a semi-rural area and participated in planting mangroves. I had taken the time to scrub my sand shoes and passed through customs without any issues.

Being able to participate in the important environmental activity is one I will remember for a long time.

Timor Leste is the eastern end of Timor Island and has a land border of 253 km with the Indonesian area of East Nusa Tenggara. There is a small enclave of Timor Leste Oecusse on the northern coast in Indonesian territory. The coastline is 706km, the land area is 15,006km<sup>2</sup> and the highest point is 2,963m. It is the only Asian country to lie entirely in the Southern Hemisphere. Timor-Leste's tropical climate is heavily influenced by West Pacific Monsoon, there are distinct wet and dry seasons and flooding during the wet season is common.

Timor Leste is a country of contrasts.

Over half the country has a slope of >40% - in the wet season water moves through the landscape with great power causing large scale erosion and the destruction of infrastructure. The rainfall on the northern coast is <1000mm/year. Much of the landscape is arid and in the places the mountains go straight into the sea. The area has relatively high salinity levels. The rainfall on the southern coast is >1500 -



Anthea planting a mangrove tree



2000mm/year. The landscape is much greener and the salinity levels considerably lower. The wet season often lasts no longer than the northern coast season.

Climate change, increased temperatures, decreased rainfall, increased evaporation and increased sea surface temperatures are all elements causing scientists to be very concerned.

Mangrove forests occupy a relatively small area (1.330 ha) of the coastal area of Timor Leste. On the south coast of the island, they are found in sand dominated deposits, on the northern coastline they are found in the sheltered embayment's. Mangrove forest areas have declined markedly year on year, and none are still pristine. A mangrove forest is a specific and unique ecosystem affected by the tide. They have a high carrying capacity for marine and bird life. Many migratory birds seek shelter in mangrove forests. Mangroves in Timor Leste face an uncertain future due to being fragmented patches being ever encroached by human activity. This loss of mangrove forest has negative consequences for both humans and the environment.

A series of permanent plots were established in mangrove forests in 2015 to monitor the changes in forest structure, and composition, nature pools, and soil metabolism. Material such as gravel, sand and fine sediments cause erosion

during the rainy season. This material builds up and then smoothers ariel tree roots. Sea level rise is seen as a cause of the high mortality rate of young mangrove trees, ocean acidification, chemical and fertiliser runoff may also cause young mangrove trees to die.

Mangrove forests reduce both the height and velocity of incoming waves, helping to reduce the levels of inundation. They also reduce the impact of damaging winds. They help considerably in binding the soil and removal of pollutants.

Areas of mangroves that are logged often become fishponds, rice paddies or palm oil plantations. The government and other agencies are working very hard to give the mangrove areas a sustainable income for the local people.

The community-based approach to conservation and sustainable management of the remaining mangrove forests of Timor Leste is being used for many projects. Many communities consider the mangrove forests as a source of livelihood and coastal areas are become very important part in development activities and the economy.

Tara Bandu is a long-established Timorese custom which guides people's interactions with one another and the environment. It sets guidelines for harvesting natural resources and imposing penalties for those who violate them.



Mangrove planting day in Timor Leste February 2023



It ensures community members are involved at all levels of decision making.

Engagement with communities has informed them of the value of healthy coastal ecosystems and involved them in the protection and restoration of mangroves. Theatre groups are a different way of imparting the importance of mangroves and the environment in general.

Many programs prioritise giving people sustainable alternative livelihoods, which is key to managing the mangrove forests. Approximately 70% of the population live in rural areas where agriculture is the major livelihood. Every day people access the mangrove areas to harvest wood, pick berries and fish. Mangrove wood is used for cooking, heating and as a building material. Mangrove tree bark, leaves, fruits, roots, seedlings, and stems are used to treat various conditions and contain anti-inflammatory and antibacterial properties. The Stylosa mangrove is widely used in traditional medicine with antioxidant and anti-inflammation properties. Many stakeholders in the pharmaceutical and medical industries are very interested in researching the medicinal qualities of mangroves.

Wandering hard hoofed buffalo, pigs, cows and goats also access the mangrove forests and their uncontrolled grazing of leaves, berries and young seedling causes major environmental damage. The community needs to better manage this issue. Strong fencing to exclude animals is required which will let young trees grow and not be trampled. Keeping the forest monkeys out is a lost cause!

Sentru Estudu Mangrove (mangrove study centre) is not far along the coast from the area we were planting. It was established by young Timorese in 2016 and over six years they have planted about 15,000 trees. The area is also a tourist and information centre. The walks have many signs with interesting facts relating to mangroves. There are surprising

views around each corner and the monkeys are always watching. World mangrove day is July 26.

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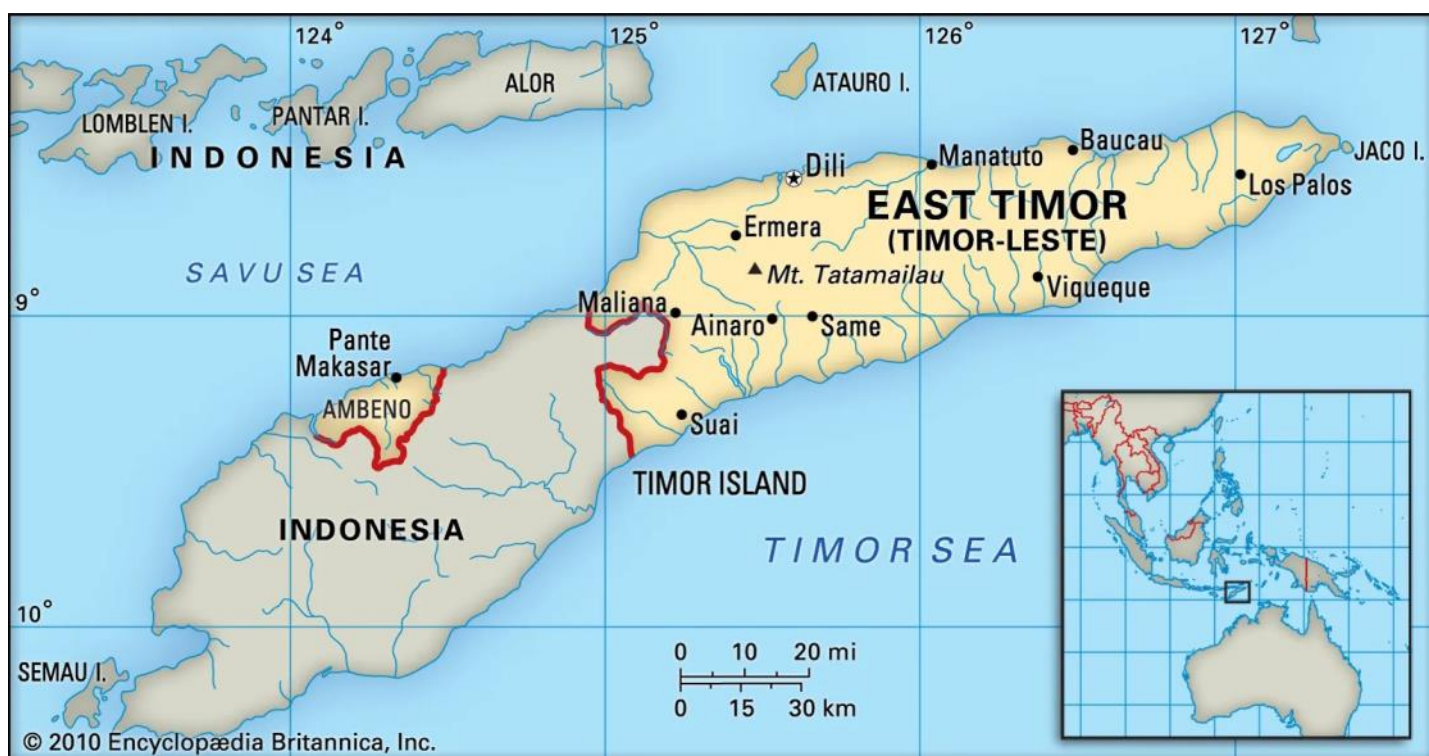
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Xanana Gusmão with Anthea and her friend Umbelina



# CHAIRMAN'S REPORT 2023

## BOB SHARRAD

For nearly 40 years, scores of people have given their time to support the Scientific Expedition Group in its many activities. Remarkably among us we have some who have worked for SEG for most of those years. Like Ulysses' heroes we can say of these venerable ones - "made weak by time and fate, but strong in will to strive, to seek, to find, and not to yield".

We plan to have a 40-year celebration in 2024 to reflect on the achievements of our volunteers and will be sending out information about this soon I hope.

The committee has worked hard again this year to organise a variety of events and we thanks them all.

President: Alun Thomas Vice-Chairman, Duncan McKenzie, Secretary: Michael Brown (retiring), Treasurer: Peter Whitehead, Committee members: Trent Porter, John Love, Helen Owens, Jill Tugwell.

Sadly, our organised and efficient Secretary, Michael, is retiring from the committee and we thank him sincerely for his work. Sarah Telfer, a former secretary, is filling the void at the moment.

During the meeting we will have reports on our ongoing, long-term projects:

- **Malleefowl monitoring** has been organised again by our excellent Helen Owens at Bakara Conservation Park, and we are particularly grateful to Janet and Phil Davill for their hard work on this project.

- The **Vulkathunha Gammon Ranges Scientific Project** (V-GRaSP) workers have been working hard again this year to service the measuring devices and to assess the vegetation. Graham Blair, Chris wright, John Love and Gary and Michelle Trethewey

Have achieved a great deal again, though they claim to have seen an impossible small mammal – black with white stripes!!?? Do they take hard liquor on these trips?

- Richard Willing and Janet Furler continue to lead the **Minnawarra project**, conducting, with volunteers, autumn and spring surveys of terrestrial vertebrates and we look forward to their report.

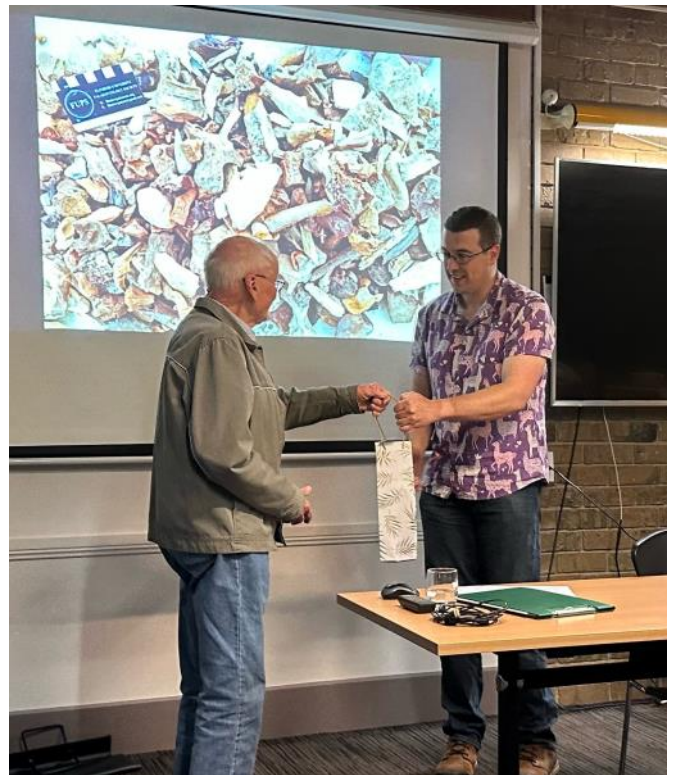
**Communication: SEGments.** This excellent publication is edited by Alun Thomas who continues to maintain its high standards and is always looking for articles and photographs.

### Expeditions:

**Witchelina fauna survey:** 14 – 22<sup>nd</sup> April. Based at the Witchelina homestead we lived in relative comfort but had long distances to travel each day one group heading north and another south each day for survey sites. A most enjoyable experience except for those of us who wrecked tyres.

**Fossil Discovery Expedition:** June. This trip to the NE of Lake Eyre involved a stalwart SEG crew with staff and students from Flinders University and was a great success in that fossils were found and brought back for study.

sharrads1@bigpond.com



SEG President Emeritus, Richard Willing thanking our AGM speaker Aaron Camens

## MINNAWARRA BIODIVERSITY SURVEYS 2024

Autumn Survey    Saturday 13 to Wednesday 17 April

Spring Survey    SATURDAY 28 September to 2 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](mailto:thefurlers@gmail.com)



# SCIENTIFIC EXPEDITION GROUP INC.

## APPLICATION FOR MEMBERSHIP AND MEMBERSHIP

### RENEWAL for 2023 — 24

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 ----- \$40.00

Concession cards/ student ----- \$20.00

Family or Corporate membership ---- \$50.00

HARD COPY SEGments:- If you would 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 **AND** also advise us by email that you have made a payment to our bank account via email to – [scientificexpeditiongroup@gmail.com](mailto:scientificexpeditiongroup@gmail.com)

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

The Secretary

Scientific Expedition Group Inc.

111 Franklin St,

Adelaide, SA 5000.

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

