



LANDSCOPE EXPEDITIONS

Western Australian Department of Conservation and Land Management,
Locked Bag 104, Bentley Delivery Centre, WA 6983
in association with
UWA Extension, The University of Western Australia, Nedlands, WA 6907

Gibson Desert - Buckshot and Breakaways 1996 LANDSCOPE Expeditions Report No. 18

On behalf of CALM and UWA Extensions, we would like to thank all members of the Buckshot and Breakaway Expedition to the Gibson Desert for their fantastic support in making this trip such a success. Feral track counts, vegetation collections and the Dalgyte (Bilby) surveys continue to add to our knowledge in these arid areas.

Thanks to Jon and Leotine for driving us around and for their excellent culinary skills.

All would have benefited from the opportunity to see and work in this remote area of Western Australia, camping under the clouds, stars and rain and returning home unscathed.

We hope future Landscape Expeditions will have the pleasure of your company.

Per Christensen, Neville Marchant, Bruce Ward, Alex Robinson, Graeme (Tub) Liddelow



Members of the Gibson Desert *LANDSCOPE* Expedition 1996

EXPEDITION ACHIEVEMENTS

Feral animal counts in both baited and unbaited areas.

Aerial baiting of 400 square km of the study using experimental cat baits.

Pit trapping in all sites both baited and unbaited and also the site established by Landscape Expedition 1994.

Photographic records again taken of the 11 permanent vegetation sites within the study area.

Vegetation samples collected from within the study site plus opportunistic samples collected as we travelled around.

Survey of 25 permanent sites checking on the activity of the Dalgyte in the Gibson Desert.

The continued updating of bird species in the area and this year we added two species not previously recorded by us.

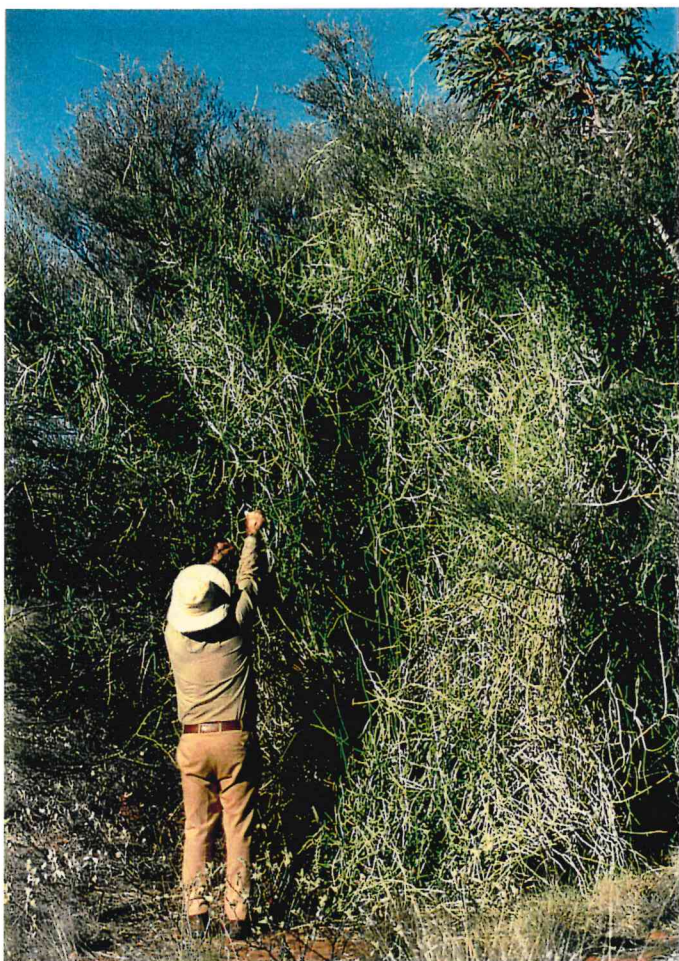
The airstrip at Hussah was dragged to keep it serviceable in case of emergency.

Establishing an airstrip at our camp at Eagle Bore for us to use for baiting as on this trip.

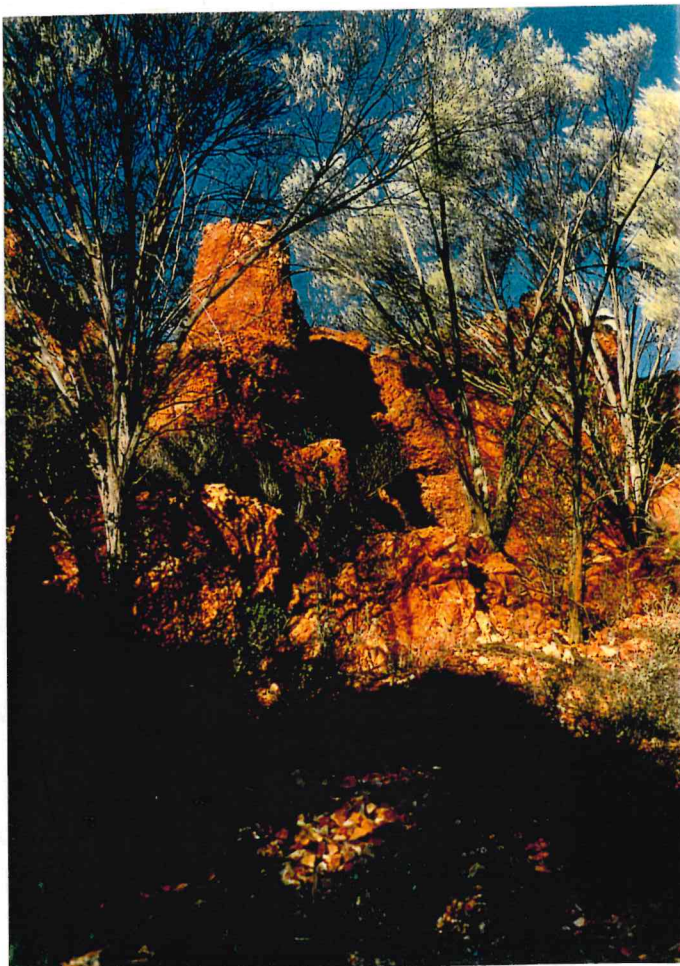
LIST OF PARTICIPANTS

Leona Knight, Christine Crafter, Judy Mitchell, David Rickson, Peter Russell, Elizabeth Sanderson, Deborah Darling, Richard Darling, John Stevens, Kath Verrier, George Agar, Joanna Amos, Peter Anstis, William (Dusty) Millar, Roli Bodenmann, Pat Stoll, David Loton, Ian Lovegrove, Graham Lucas, Neville Passmore.

Cover photo taken by Neville Passmore, all others by Graeme Liddelow.



Neville Marchant examining
a caustic bush (*Sarcostemma australe*)

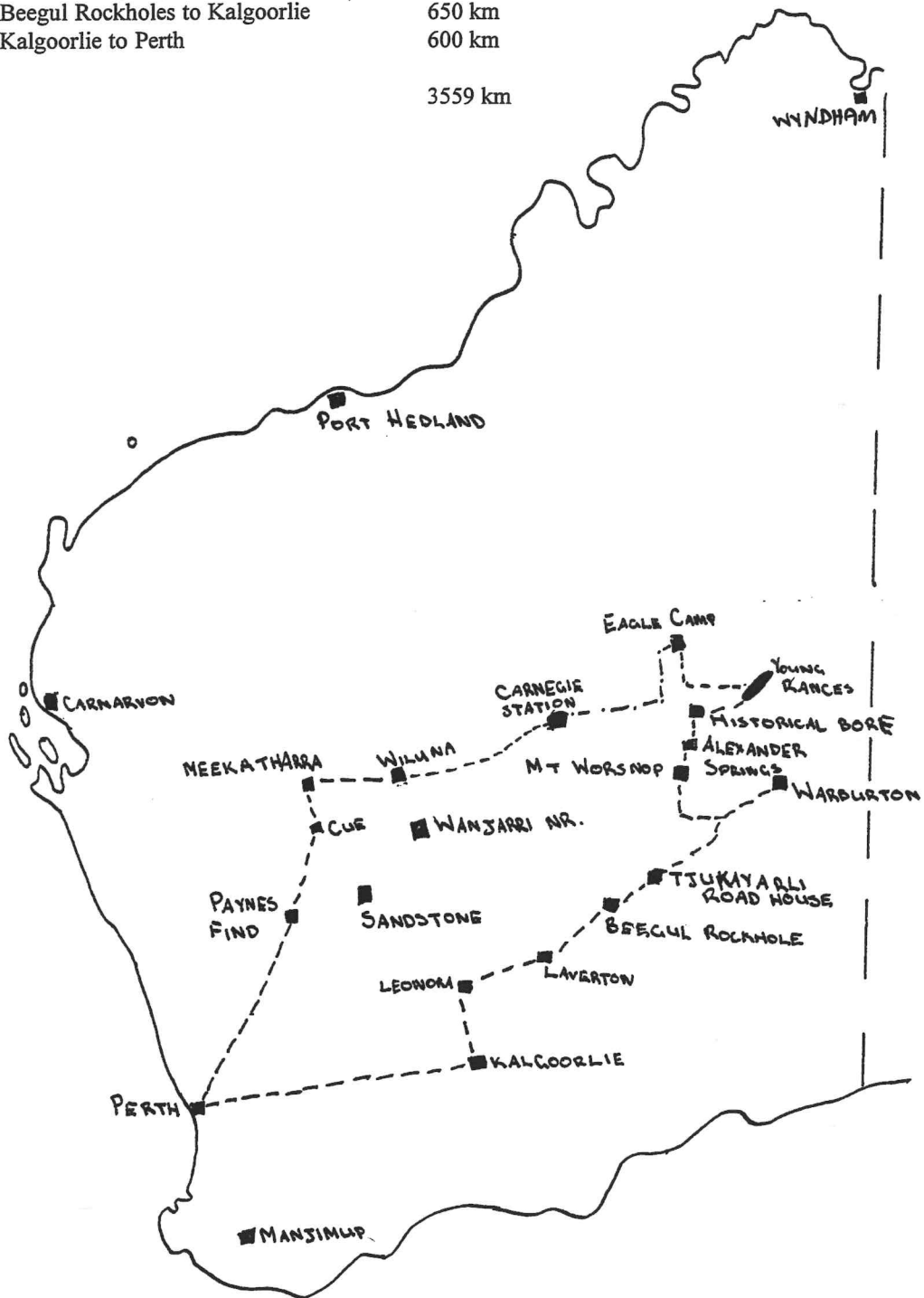


Breakaway on the Young Ranges

WHERE WE WENT

Perth to Gibson Desert Camp = 1615 km

Day 1 Perth to Cue	680 km
Day 2 Cue to Carnegie Station	670 km
Day 3 Carnegie to Gibson Camp	265 km
Day 4 In Gibson Study Area	
Day 5 "	
Day 6 "	Approx 400 km
Day 7 "	
Day 8 Gibson Camp to Young Ranges	54 km
Day 9 Young Ranges to Alexander Spring	160 km
Day 10 Alexander Spring to Beegul Rockholes	480 km
Day 11 Beegul Rockholes to Kalgoorlie	650 km
Day 12 Kalgoorlie to Perth	600 km
Total	3559 km



DIARY OF GIBSON DESERT LANDSCOPE EXPEDITION 1996

Wednesday August 21 Assemble at UWA Extensions with Per Christensen and Neville Marchant from CALM and Jon and Leotina from Travelabout for an early morning start. The first day's trip was up the Great Northern Highway to Paynes Find and was then supposed to go to Wanjarri Nature Reserve via Sandstone. However, the road to Sandstone was closed due to rain and so the journey continued up to Cue for the first night's camp.

Thursday August 22 Left Cue very early and travelled to Meekatharra, then to Wiluna and on to Carnegie Station for the second night.

Friday August 23 Left Carnegie Station, left an updated will, the end of civilization with the next stop, the camp in the Gibson Desert. Arrive at the Gibson camp (Eagle Bore Camp) and people scatter to all points of the compass to set up swags (hope there are no biting things here on the ground). Joined by Bruce, Alex and Tub (who have already been here a week) from dragging tracks and setting traps. More traps need to be set. Some went with Per and Tub to set them whilst others explored the camp area. After tea Per gave a slide show and talk on the Desert work to date, the directions for the future work in the arid areas and then a run down of tasks to be undertaken on this Expedition and the allocation of tomorrow's work group.

Saturday August 24 Up early - two groups head off with Bruce and Alex to check on the feral tracks and then the remaining groups head off with Per, Tub and Neville to check the traps and to look at the vegetation. Where do the hours disappear to? Morning's disappeared, lunch over, afternoon activities commence and vanish in the dust, time to return to camp for SHOWERS and evening meal, day's end so soon.

Sunday August 25 Aren't we supposed to sleep in, Sunday papers and late morning church service? Eagle campers are up early, no papers and all day work service in God's open air church. Feral track counts with Bruce and Alex, traps with Per and Tub and vegetation with Neville. It's time for the evening meal already. Spot lighting after tea and then to bed.

Monday August 26 Did it rain last night! CALM people obviously don't suffer from Mondayitis as its up early as usual in this work station. No rest for the meek - into groups and off to feral track counts, traps and vegetation and away. Per's group had to bail out many of their pit traps after the overnight mist. Dalgyte survey done today in the north and we continue to compile the bird list. The plane arrives for the cat baiting (no Sunday papers). Bruce and Alex spend the afternoon in the plane dropping baits. Its almost sunset - another day gone.

Tuesday August 27 Feral trackers away, trappers away, vegetators away, bait droppers away. All traps are to be closed today. Who wants to go to the northern trapline-40 km of Brain st. Closed all traps and checked the area to the east for Dalgytes. Late afternoon back to camp and start packing as tomorrow we are off to the Young Ranges. Showers tonight will be the last for a couple of days, its marvellous how far 7 litres of water can go. Last night in Eagle Camp, new horizons tomorrow.

Wednesday August 28 Sleep in today don't have to get up till 6 am - bliss. The camp is cleaned and all gear packed for the journey that will eventually get us home. We travel via a track south from camp to a 200 litre drum in the middle of nowhere then turn east until we get to the Gary Highway!!! Here we split into two groups to check on Dalgyte sites and then travel south to the Young Ranges. We have lunch and claim swag spots then its south for more Dalgyte site inspections. Again no luck. We return to the Young's for a tinnie on "Charlie's Knob" and a walk along the ranges looking at the extinct stick nest rats nests followed by a pleasant night in the Young's with jokes by Leona and Kath, the stars are beautiful tonight.

Thursday August 29 On the road again down to the Gunbarrell to Everard Junction then West to the Historical Bore. Tub picks up water from an emergency tankstand on the way. From the bore we head south to Alexander Spring with stops to check seven more Dalgyte sites. Another disappointing day for the Dalgytes. We travel long and arrive at the Spring for a late lunch after which we climb Mt. Worsnop. Once again the view from this Messa is magnificent. Back to the springs camp and a walk up to Alexander Spring. For only the second time since 1988 we see water in the spring. Per and Roli perform the floundering duck splash for the enjoyment of all. Male members of the party depart as ladies business takes over.

Friday August 30 Leave Alexander Spring and head down to the Laverton-Warburton road checking on a further 8 Dalgyte sites, again we don't find any fresh evidence. Of all the sites we did check there was only one that had fresh signs. Down the road to the Tjukayarli Road House for a late lunch and showers and icecreams and lollies and stuff. We continue south and attempt to go to Empress Spring but alas rainfall a few days previously puts a stop to this so we proceed further south to the Beegull Rockholes and camp under the stars for the last night.

Saturday August 31 After a pleasant walk around the wildflowers with the 2xNeville show we head to Leonora with stops along the way for wildflowers, Oka repairs and necessities. Fuel, pies, icecreams, etc. then out to Gwalia for a browse around the old settlement and then lunch and on down the blacktop to Kalgoorlie. Long hot showers, sit down to a catered meal almost as good as Jon and Leotines, soft beds, no stars, walls.

Sunday September 1 Not Breakfast at Tiffanys but very nice thank you. The day we head for home is always a sad one. All good things must come to an end so after we arrive at UWA Extensions and unload then farewell new friends we depart for home and loved ones. The Gibson Landscape for 1996 has finally come to an end. It was an enjoyable time together but more importantly it was very successful with all targets being achieved. Thank you for your support and excellent efforts.

TRAPPING RESULTS 1996

SPECIES	BAITED (WEST)				UNBAITED (NORTH)				UNBAITED (EAST)			
	24	25	26	27	24	25	26	27	24	25	26	27
MAMMALS												
<i>Pseudomys desertor</i>	1				1	1						
<i>Pseudomys hermannsburgensis</i>		2	1									
<i>Sminthopsis youngsoni</i>	1	2					1					
<i>Sminthopsis macroura</i>				1								
<i>Ningauai ridei</i>	1	4	2	1		1						
<i>Mus musculus</i>						1			1		1	1
SKINKS												
<i>Ctenotus pantherinus ocellifer</i>		1	1	1	1	1	2	2	1			
<i>Omolopidia branchialis</i>			1									
<i>Morethia ruficauda</i>					1							
<i>Tiliqua multifasciata</i>								1				
<i>Egernia striata</i>												1
PYGOPODS												
<i>Delma haroldi</i>			2					1				
<i>Delma nasuta</i>			1								1	
<i>Delma borea</i>									1			
<i>Lialis burtonis</i>												1
DRAGONS												
<i>Ctenophorus inermis</i>								1				
<i>Ctenophorus isolepis gularis</i>						1	2	2				
<i>Pogona minor minor</i>							1					
GECKOES												
<i>Diplodactylus conspicillatus</i>			2			1	2					1
<i>Diplodactylus elderi</i>			1								2	
<i>Nephurus levis</i>							1	1		1	1	
SNAKES												
<i>Rhinoplocephalus monachus</i>				1		1						
<i>Pseudonaja modesta</i>			1									

SUMMARY

	BAITED (WEST)			UNBAITED (NORTH)			UNBAITED (EAST)		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
MAMMALS	7	19	16	13	5	5	na	3	3
SKINKS	6	19	5	16	5	8	na	2	1
PYGOPODS	2	6	1	4	3	0	na	7	3
MONITORS	0	1	0	2	1	0	na	0	0
DRAGONS	0	0	0	6	1	7	na	8	0
GECKOES	2	6	4	1	0	6	na	8	6
SNAKES	0	0	2	0	0	1	na	0	0
Total	17	51	28	42	15	27		28	13

Trapping results from this year show that the mammal numbers have remained constant but reptile numbers have declined in the baited area and unbaited east and increased in the unbaited north area. Seasonal trends obviously have a bearing on the trapping results we get, however, it will be interesting to see the trap results next year to see if the same trend develops after this years baiting as happened after the baiting in 1994.

FERAL BAITING AND TRACK COUNT

Baiting of feral cats was trialed in the Gibson Desert (Eagle Bore Study Site) in 1994 using a new style of bait. The impact of this baiting has been monitored opportunistically since. Many aspects of this baiting were left to chance as knowledge of timing and baiting density were not well understood. The good result achieved in the 1994 baiting (nearly 80% knock down) and from work undertaken on the Peron Peninsular (Project Eden) has led to the formulation of a standard cat baiting strategy. This includes small 40 g fresh meat baits about one third the size of the standard fox bait. Timing of baiting was estimated by bait uptake trials to determine optimum timing. Bait intensity increased up to 5-10 times that of fox baiting with bait numbers divided into three separate drops, which ensure fresh baits are available over a 6-9 day period.

There is sufficient data to conclude that there is a "baiting season" - a time of the year which would be the most effective baiting time or other seasonal factors which influence baiting time.

This year's baiting was done specifically to test the theories developed with Project Eden and to provide the data on timing of baiting and whether there is a baiting season in other arid areas such as the Gibson Desert. To progress in feral cat research it is important to answer some of these basic questions. The bait uptake trials are an integral part of assessing when is the best time for baiting. The data collected on this trip showed the bait uptake was low (only 12%) and supports the theory that this time of year would be far too low for a successful baiting of cats. To follow up on the actual baiting we did on this trip a follow up track count will be done in December.

TRACK COUNT DATA FERAL PREDATORS

DATE	BAITED	UNBAITED
March 1993	35	35
May 1994	32	52
June 1994	20	32
Sept 1994	8.5	35
Sept 1995	10	No record
Aug 1996	8.6	10.6

TRACK COUNTS ALL SPECIES 1996

SPECIES	WESTERN CIRCUIT			EASTERN CIRCUIT		
	24/8	25/8	26/8	24/8	25/8	26/8
Kangaroo	57	22	107	33	16	18
Camel	18	10	5	3	4	0
Cat	1	3	0	3	2	3
Rabbit	4	1	0	0	0	0
Bustard	2	8	0	13	13	21
Dingo	2	2	3	6	4	1
Fox	0	0	0	0	0	0

The results of this year's track counts shows feral cat numbers are down on previous years' counts and is evidence that the past season or two have become dry and harsh. In relative terms, the baited area has not fully recovered to prebaiting levels and is currently about 80%.

While feral track counting is the main aim, numbers of other species are also taken and are a good guide to the condition of the country. The past year has been relatively dry, although some localised rain had put water in some claypans sustaining populations of kangaroo and some bird species, which would otherwise have had to move on to find permanent water. However, the populations of some of the less mobile fauna such as rabbits, cats and foxes are quite low and it is possibly due to the harsher conditions.

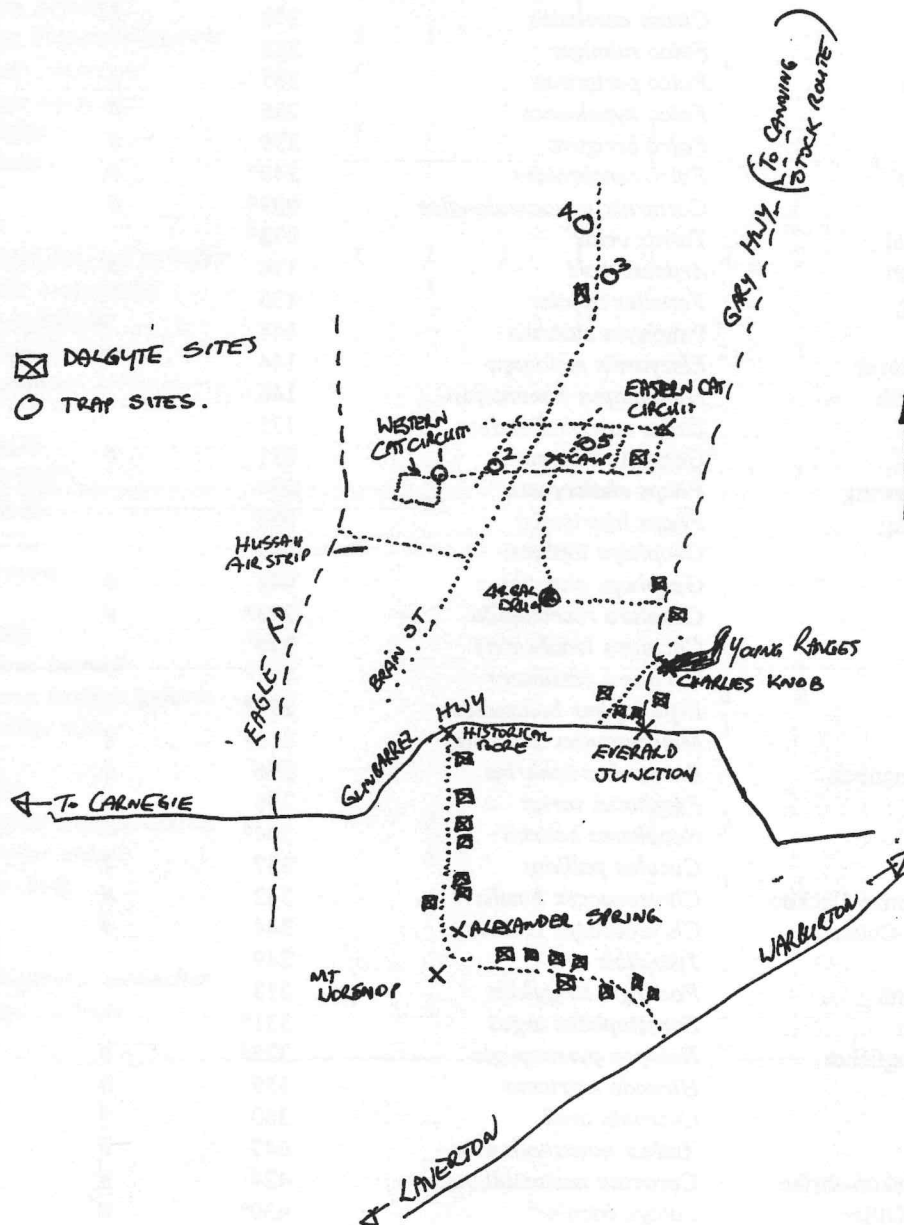
DALGYTE SURVEY 1996

Twenty-five sites were visited and surveyed during this expedition, of these only one showed any fresh evidence of Dalgyte activity. The table below shows the recorded activity of these sites since we started monitoring them in 1988. Not all sites are visited each year.

NUMBER OF MONITORING SITES VISITED EACH YEAR

Est. age of digging	1988		1989		1990		1991		1992		1993		1994		1995		1996	
	no	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%
0-3mth	3	60	21	55	3	60	5	24	2	10	1	14	4	22	4	16	1	4
3-6mth	1	20	3	8	1	20	1	5	1	5	0	0	0	0	0	0	2	8
6-12mth	1	20	8	21	0	0	0	0	2	10	1	14	2	11	1	4	2	8
12+mth	0	0	6	16	1	20	15	71	15	75	5	72	12	67	20	80	20	80
Total	5	100	38	100	5	100	21	100	21	100	7	100	18	100	25	100	25	100

These results suggest a reduction in digging activity at the monitoring sites which can only be interpreted as a reduction in Dalgyte numbers over the study area. From Christensen and Liddelow 1996 (in press).



BIRDS OF THE GIBSON - LANDSCOPE '96

Although very few birds were recorded on this trip, the list below represents those that we did see plus all the birds we have recorded from the study site and surrounds. No effort has been made to keep numbers of individuals sighted, we have just concentrated on species and breeding records where possible.

No.	COMMON NAME	SCIENTIFIC NAME	RAOU	1995	1996
1	Emu	<i>Dromaius novaehollandiae</i>	001*	#	#
2	Pacific Heron	<i>Ardea pacifica</i>	189		
3	White Faced Heron	<i>Ardea novaehollandiae</i>	188		#
4	Straw-necked Ibis	<i>Threskiornis spinicollis</i>	180		
5	Pacific Black Duck	<i>Anas superciliosa</i>	208		
6	Black-shouldered Kite	<i>Elanus notatus</i>	232*		
7	Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	231		
8	Whistling Kite	<i>Haliastur sphenurus</i>	228		#
9	Brown Goshawk	<i>Accipiter fasciatus</i>	221*	#	#
10	Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>	222		#
11	Wedge-tailed Eagle	<i>Aquila audax</i>	224	#	
12	Little Eagle	<i>Hieraaetus morphnoides</i>	225	#	
13	Spotted Harrier	<i>Circus asseimilis</i>	218	#	
14	Black Falcon	<i>Falco subniger</i>	238		#
15	Peregrine Falcon	<i>Falco peregrinus</i>	237	#	
16	Grey Falcon	<i>Falco hypoleucos</i>	236	#	
17	Brown Falcon	<i>Falco berigora</i>	239	#	#
18	Australian kestrel	<i>Falco cenchroides</i>	240*	#	#
19	Stubble quail	<i>Corturnix novaezealandiae</i>	009*	#	#
20	Little Button-quail	<i>Turnix velox</i>	018*		#
21	Australian Bustard	<i>Ardeotis kori</i>	176	#	#
22	Banded Lapwing	<i>Vanellus tricolor</i>	135		
23	Inland Dotterel	<i>Peltohyas australis</i>	145		
24	Black-fronted Plover	<i>Elseyornis melanops</i>	144		
25	Black-winged Stilt	<i>Himantopus himantopus</i>	146		
26	Silver Gull	<i>Larus novaehollandiae</i>	125		
27	Diamond Dove	<i>Geopelia cuneata</i>	031	#	#
28	Common Bronzewing	<i>Phaps chalcoptera</i>	034		
29	Flock Bronzewing	<i>Phaps histrionica</i>	036		
30	Crested Pigeon	<i>Geophaps lophotes</i>	043		
31	Spinifex Pigeon	<i>Geophaps plumifera</i>	042	#	
32	Galah	<i>Cacatura roseicapilla</i>	273*	#	#
33	Pink Cockatoo	<i>Cacatura leadbeateri</i>	270		#
34	Little Corella	<i>Cacatura pastinator</i>	271		
35	Cockatiel	<i>Leptolophus hollandicus</i>	274*		#
36	Budgerigar	<i>Melopsittacus undulatus</i>	310*	#	#
37	Port Lincoln Ringneck	<i>Barnardius zonarius</i>	294	#	#
38	Mulga Parrot	<i>Psephotus varius</i>	296	#	#
39	Bourke's Parrot	<i>Neophema bourhii</i>	304*		#
40	Pallid Cuckoo	<i>Cuculus pallidus</i>	337	#	#
41	Horsefield's Bronze-Cuckoo	<i>Chrysococcyx basilis</i>	342	#	#
42	Shining Bronze-Cuckoo	<i>Chrysococcyx lucidus</i>	344	#	
43	Barn Owl	<i>Tyto alba</i>	249		
44	Tawny Frogmouth	<i>Podargus strigoides</i>	313		
45	Spotted Nightjar	<i>Eurostopodus argus</i>	331*		#
46	Red-backed Kingfisher	<i>Halcyon pyrrhopygia</i>	325*	#	#
47	Tree Martin	<i>Hirundo nigricans</i>	359	#	
48	Fairy Martin	<i>Cecropin ariel</i>	360	#	
49	Richard's Pipit	<i>Anthus novaehollandia</i>	647	#	#
50	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	424	#	#
51	White-winged Triller	<i>Lalage tricolor</i>	430*	#	#
52	Red-capped Robin	<i>Petroica goodenovii</i>	381	#	#

No.	COMMON NAME	SCIENTIFIC NAME	RAOU	1995	1996
53	Hooded Robin	<i>Melanodryas cucullata</i>	385	#	#
54	Rufous Whistler	<i>Pachycephala rufiventris</i>	401		#
55	Grey Shrike-thrush	<i>Colluricincla harmonica</i>	408*	#	
56	Crested Bellbird	<i>Oreoica gutturalis</i>	419*	#	#
57	Willie Wagtail	<i>Rhipidura leucophrys</i>	364*	#	#
58	Chiming Wedgebill	<i>Psophodes occidentalis</i>	865	#	#
59	Chestnut Quail-thrush	<i>Cinclosoma castanotum</i>	437		
60	Cinnamon Quail-thrush	<i>Cinclosoma cinnamomeum</i>	440*		#
61	Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	443	#	
62	White-browed Babbler	<i>Pomatostomus superciliosus</i>	445	#	
63	Spinifex Bird	<i>Eremiornis carteri</i>	507	#	
64	Rufous Songlark	<i>Cinclorhampus mathewsi</i>	509		
65	Brown Songlark	<i>Cinclorhampus cruralis</i>	508	#	#
66	Variiegated Fairy-wren	<i>Malurus lamberti</i>	536		#
67	White-winged Fairy-wren	<i>Malurus leucopterus</i>	535	#	#
68	Rufous-crowned Emu-wren	<i>Stipiturus ruficeps</i>	528		
69	Striated Grasswren	<i>Amytornis striatus</i>	513	#	
70	Inland Thornbill	<i>Acanthiza apicalis</i>	476		
71	Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>	481		#
72	Southern Whiteface	<i>Aphelocephala leucopis</i>	466*	#	
73	Banded Whiteface	<i>Aphelocephala nigrincta</i>	469*	#	#
74	Variied Sitella	<i>Daphoenositta chrysoptera</i>	549		#
75	Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	640		
76	Yellow-throated Minor	<i>Manorina flavigula</i>	635	#	#
77	Singing Honeyeater	<i>Lichenostomus virescens</i>	608	#	#
78	Grey-headed Honeyeater	<i>Lichenostomus keartlandi</i>	621	#	#
79	White-plumed Honeyeater	<i>Lichenostomus penisillatus</i>	625		#
80	Black Honeyeater	<i>Certhionyx niger</i>	589		
81	Pied Honeyeater	<i>Certhionyx variegatus</i>	602*	#	
82	Crimson Chat	<i>Epthianura tricolor</i>	449*	#	#
83	White-fronted Chat	<i>Epthianura albifrons</i>	448	#	
84	Misteltoebird	<i>Dicaeum hirundinaceum</i>	564	#	#
85	Painted Firetail Finch	<i>Emblema picta</i>	654		
86	Zebra Finch	<i>Taeniopygia guttata</i>	653*	#	#
87	Masked Woodswallow	<i>Artamus personatus</i>	544*	#	
88	Black-faced Woodswallow	<i>Artamus cinereus</i>	546	#	#
89	Little Woodswallow	<i>Artamus minor</i>	548		#
90	Pied Butcherbird	<i>Cracticus nigrogularis</i>	700	#	#
91	Australian Magpie	<i>Gymnorhina tibicen</i>	705		
92	Little Crow	<i>Corvus bennetti</i>	691	#	#

* denotes breeding record

BOTANICAL NOTES: GIBSON DESERT, LANDSCOPE EXPEDITION 1996

The 1996 winter of the south-west extended well into the interior judging by the fantastic display of everlastings we saw en route to Carnegie Station. At our first botanical stop near Wubin we saw evidence for the late start to the rains through the number of winter flowering species like the flat-leaved sundew (*Drosera macrophylla*), mixed with spring flowers, in other words the season was somewhat "telescoped". All the way to Carnegie was a carpet of different species of everlasting and other annuals such as the blue-flowered *Erodium* which has a taproot which tastes like parsnip.

The winter rains hadn't reached the Gibson and it seemed that 1996 summer ones hadn't either; it was very dry. At first the area appeared to be botanically disappointing until the party realised that this is why the area is a desert and the flora is really adapted to irregular rainfall and long drought. In fact with a closer look there was a range of small everlastings and other annuals and a variety of shrub species flowering, fruiting and seeding. The desert gave us an opportunity to examine a number of ecological principles without being overwhelmed with high species numbers and being able to concentrate on a single or only a few key environmental factors at a time.

The characteristically unreliable rainfall resulting in prolonged drought is an overriding environmental factor. We were able to see how plants cope with drought and the heat of the long summer through their morphology. Parakeelya (*Calandrinia* species) for example were particularly common with their succulent, edible leaves. Ephemerals were present in special habitats where there was sufficient moisture such as low-lying claypans or where there was some moisture as well as protection from the drying wind. Around the camp site at Eagle Bore the everlastings and other annuals like *Stackhousia* were mainly found inside the rings of spinifex, many growing in the protection of the spiny leaves. Other species with marked adaptations include the upside down pea (*Brachysema chambersii*) with its ring of bird-pollinated flowers close to the ground and a very corky stem able to withstand hot, reflective soil. Another characteristic noted was the frequent "top shaped" shrubs particularly in those which are about a metre tall, including juvenile mulga which assume a more diffuse growth when more mature.

Eucalypts (a common term now covering the genus *Eucalyptus* and *Corymbia*) such as the campsite tree *Corymbia candida*, have a few, very long "dropper" roots which reach soil water. These trees are scattered on the plains where water occurs at depth. They really form single species "oases" which avoid drought, provide shelter for birds and, when they flower, they provide a critical source of nectar for birds and insects and insect feeding animals even when there is severe localised drought.

It always takes an introductory period to appreciate the subtle ecological relationships when entering a new environment but after a few days we all began to see patterns and were able to sort out the differences between common species. The initial impression of uniformity of plants soon disappeared; it only took a short time to learn how to recognise the various forms of mulga (*Acacia aneura*) and to sort out beefwood (*Grevillea juncifolia*) from corkwood (*Hakea lorea*) and to register that *Canthium latifolium* only grew under the "umbrella" of another shrub. We saw also that the native poplar or mustard bush (*Codonocarpus cotinifolius*) only grows after fire and it dies after about six or more years. What happens to its seeds? This type of question and the ecological observations made me appreciate that the desert, with its highly adapted plants, is a fantastic location to appreciate the complexity of ecosystems.

The Gibson Desert, like other areas of Australia, provides many examples of plant-animal interactions. There were many different families flowering over the whole area we traversed from Eagle Bore and we were able to investigate how some of these are pollinated. An example of a pollination syndrome was illustrated with a few blue-flowered shrubs but unfortunately it was difficult to find them growing in close proximity. The shrubby species *Halgania* (Boraginaceae), *Keraudrenia* (Sterculiaceae) and a few species of *Solanum* (Solanaceae) all have star-shaped, deep blue flowers with the same basic shape with a central "spike" of closely packed yellow stamens. Yet, they are from very different families and the flowers only superficially resemble each other. For example, the floral whorl of the fire bush, *Keraudrenia integrifolia*, is made up of a modified calyx rather than petals as is the case with the other two genera. The theory is that all of these species are "geared" to the same pollinator.

Another plant-animal interaction observed involved ants and old flowers of poverty bush (*Eremophila*). Ants were seen to be busy removing the tubular corollas of poverty bushes and, even though these were many times bigger than the ant, they carried them to their nests to use as growing media for fungal cultivation deep in the soil. Termites with their enormous mounds also interact with living and dead plants, the termite mounds were seen to grow close to spinifex clumps from which the termites remove fallen leaves as a compost for their fungal farms and once a spinifex clump dies then the colony must move or die as well.

Many plants we encountered were noted as having antifeedant properties, some have foul smelling leaves and others have poisonous principles. The caustic bush which was common near the water pump has a white, toxic, milky latex and there is no evidence that it is ever grazed by insects or vertebrates, including the camel. Acacias have tannin rich leaves and some species have toxic substances. However, animals have co-evolved with most of these evolutionary plant developments and made a very complex story of animal-plant interactions.

On the night that it rained the ground surface changed dramatically. Where there was enough water, especially when added by me to a small area on the roadside, a whole complex ecosystem appeared within a few hours. Cryptogams such as a relative of the mosses, a liverwort, rapidly unfolded from a hard, black resting stage and developed a flat thallus up to 4 mm long with glistening surface of pale green cells. The heat soon dried plants again but if the rain had continued then there would have been a range of cyanobacteria, mosses, algae, fungi and lichens which form discrete areas called cryptogam mats. These mats were even visible as crusts when dried and they form on the open ground between spinifex clumps. In a more or less pristine area like the Gibson Desert the cryptogam mats are assumed to play a key role in the ecosystem. They make nitrogen available as well as providing protection for seedling establishment. In the desert fringes and the pastoral districts cryptogam mats are adversely affected by hard-toed sheep and the mechanical destruction of a single mat may cause sheet erosion, obliterating cryptogam mats over a wide area and increasing soil loss over the landscape.

The 1996 *LANDSCOPE* Expedition added a considerable amount of knowledge about plant morphology and as well, a few new records. A pre-expedition check of CALM herbarium computerised records listed 435 taxa recorded from the Gibson Desert; this includes all records of species, and infraspecific categories (subspecies and varieties). We added at least three as well as proving that lichens, liverworts and mosses also occur.



Neville Passmore (left) explaining floral parts to John Stevens

Gully with *Eucalyptus youngiana* in the Young Ranges



A pink everlasting daisy



Peter Russell giving an impromptu geological lesson on top of Mt Worsnop

Sturt pea



Hop bush
(*Dodonaea lobulata*)

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