

## IV Vertebrate Fauna

J. Dell and R.A. How

### Introduction

The vertebrate fauna of the Jackson–Algoorlie Study Area was documented by intensive sampling around two survey areas, at Mt Jackson (MJ) and Bungalbin (BH). These were selected to maximise sampling of different landform units (Figure 3) and vegetation associations (Figure 4). Opportunistic sampling was conducted at other locations within the Study Area.

Fenced pit-traps, metal traps and sampling quadrats were used to document the vertebrate fauna at selected sample sites during September 1979, April 1980 and November–December 1981. These sampling methods have been detailed by the Biological Surveys Committee (1984) and a comparison of results from the first two methods is included in How *et al.* (1984). Descriptions of vegetation structure, floristics and soils of the faunal sample sites are presented in Appendix III.

The rate of recording additional species of amphibians and reptiles (Figure 5) varied between the two survey areas. Only 50% of the 42 species known from Mt Jackson were recorded during the first survey trip while 69% of the 45 species known from Bungalbin were recorded. Each subsequent survey recorded additional species and it appears that further species should occur in the area.

The cumulative number of bird species and the total number of individuals recorded during each survey period at MJ and BH are indicated in Figures 6 and 7. The quadrat and opportunistic recordings combined show that 74% of species were recorded during the first survey at MJ compared to 64% of species at BH. The trend over the three survey periods was similar to that demonstrated for reptiles and amphibians. The lack of an asymptote in species recorded reflects the strong seasonal changes in the avifauna.

At MJ the bird quadrats included 55% of species recorded from the area compared to 61% at BH. These relatively low percentages illustrate the patchiness of bird distributions in the areas of complex mosaic vegetation that form part of the South-Western Interzone between the South-West and Eremaean Botanical Provinces (Beard 1980).

Comparisons between the number of bird species and the total number of individuals in the sample site quadrats at MJ and BH are shown in Figures 8 and 9. Each shows a steady accumulation during the three study periods, indicating that the recorded assemblages from sample sites are far from complete.

Representative specimens of most reptile and amphibian species are lodged in the Western Australian Museum and catalogued as R67001-67203 (September), R72001-72213 (April), and R76001-76241 (November–December). Representative specimens of small mammal species are lodged in the Western Australian Museum M17698-17766 (September), M17904-17950 (April) and M20258-20326 (November–December).

**Table 5** Fauna Sites of the Mt. Jackson Survey Area (MJ)

Site No.	Field No. (BS)			Site Co-ordinates						Vegetation	Site Type	Fauna Survey			
				Latitude		Longitude		FP 123	TL 123			BQ 123	OP 123		
HILL, BIF (HI)															
JK18c	..	..	B3	30	15	10	119	15	50	<i>Eucalyptus ebbanoensis</i> Mallee	S	...	...	XXX	XXX
JK18b	M6	R6	B6	30	15	00	119	15	10	<i>Eucalyptus ebbanoensis</i> Mallee	S	XXX	XXX	XXX	XXX
JK8b	M5	R5	B5	30	15	40	119	16	00	<i>Eucalyptus loxophleba</i> Mallee	S	XXX	XXX	XXX	XXX
JK21	..	..	..	30	23	40	119	37	40	<i>Dryandra arborea</i> Tall Shrubland	O	...	...	...	XXX
SALT LAKE FEATURE (L)															
JK30a	M2	R2	B2	30	20	50	119	11	40	<i>Dodonaea angustissima</i> Tall Shrubland	S	XXX	XXX	XXX	XXX
SANDPLAIN (S)															
JK10a	M1	R1	B1	30	24	40	119	14	40	<i>Acacia</i> aff. <i>aneura</i> Tall Shrubland	S	XXX	XXX	XXX	XXX
UNDULATING PLAIN, greenstone (UN)															
JK44a	M3	R3	..	30	15	10	119	15	10	<i>Eucalyptus salmonophloia</i> Woodland	S	XXX	XXX	...	XXX
JK48a	M4	R4	B4	30	12	40	119	16	50	<i>Eucalyptus salubris</i> Low Woodland	S	XXX	XXX	XXX	XXX
BROAD VALLEY (V)															
JK42a	..	R7	..	30	23	50	119	14	10	<i>Eucalyptus corrugata</i> Low Woodland	S	XXX	...	...	XXX

Field No.: = mammal, R = reptile, B = bird. Site Type: = O = other site, S = sample site. Fauna Survey: FP = Fenced pitline, TL = Trapline, BQ = Bird quadrat, OP = Opportunistic sightings. Numbers indicate period of survey: 1 = 1st survey (September 1979), 2 = 2nd survey (April 1980), 3 = 3rd survey (November-December 1981). Sites numbers ending with a lower case letter differ from typical vegetation sites. Their descriptions and differences are presented in Appendix III.

**Table 6** Fauna Sites of the Bungalbin Hill Survey Area (BH)

Site No.	Field No. (BS)	Site Co-ordinates				Vegetation	Site Type	Fauna Survey					
		Latitude		Longitude				FP 123	TL 123	BQ 123	OP 123		
GRANITE EXPOSURE (G)													
JK15a	. . . . .	30	12	30	119	50	20	Granite Complex	O	. . .	. . .	. . .	XXX
HILL, BIF (HI)													
JK18	M1 R1 B1	30	19	00	119	42	50	<i>Eucalyptus ebanoensis</i> Mallee	S	XXX	XXX	XXX	XXX
JK18a	. . . . .	30	21	20	119	42	00	<i>Eucalyptus ebannoensis</i> Mallee	O	. . .	. . .	. . .	XXX
SANDPLAIN (S)													
JK39	M6 R6 B6	30	17	40	119	44	50	<i>Banksia elderana</i> Tall Shrubland	S	XXX	XXX	XXX	XXX
JK35	M3 R3 B5	30	18	00	119	43	50	<i>Eucalyptus leptopoda</i> Mallee	S	XXX	XXX	XXX	XXX
JK37	M5 R5 B4	30	18	10	119	43	50	<i>Acacia coolgardiensis</i> Tall Shrubland	S	XXX	XXX	XXX	XXX
BROAD VALLEY (V)													
JK44	M2 R2 B2	30	18	50	119	43	30	<i>Eucalyptus salmonophloia</i> Woodland	S	XXX	XXX	XXX	XXX
JK8a	M4 R4 B3	30	18	20	119	43	20	<i>Eucalyptus loxophleba</i> Mallee	S	XXX	XXX	XXX	XXX

See Table 5 for explanation.

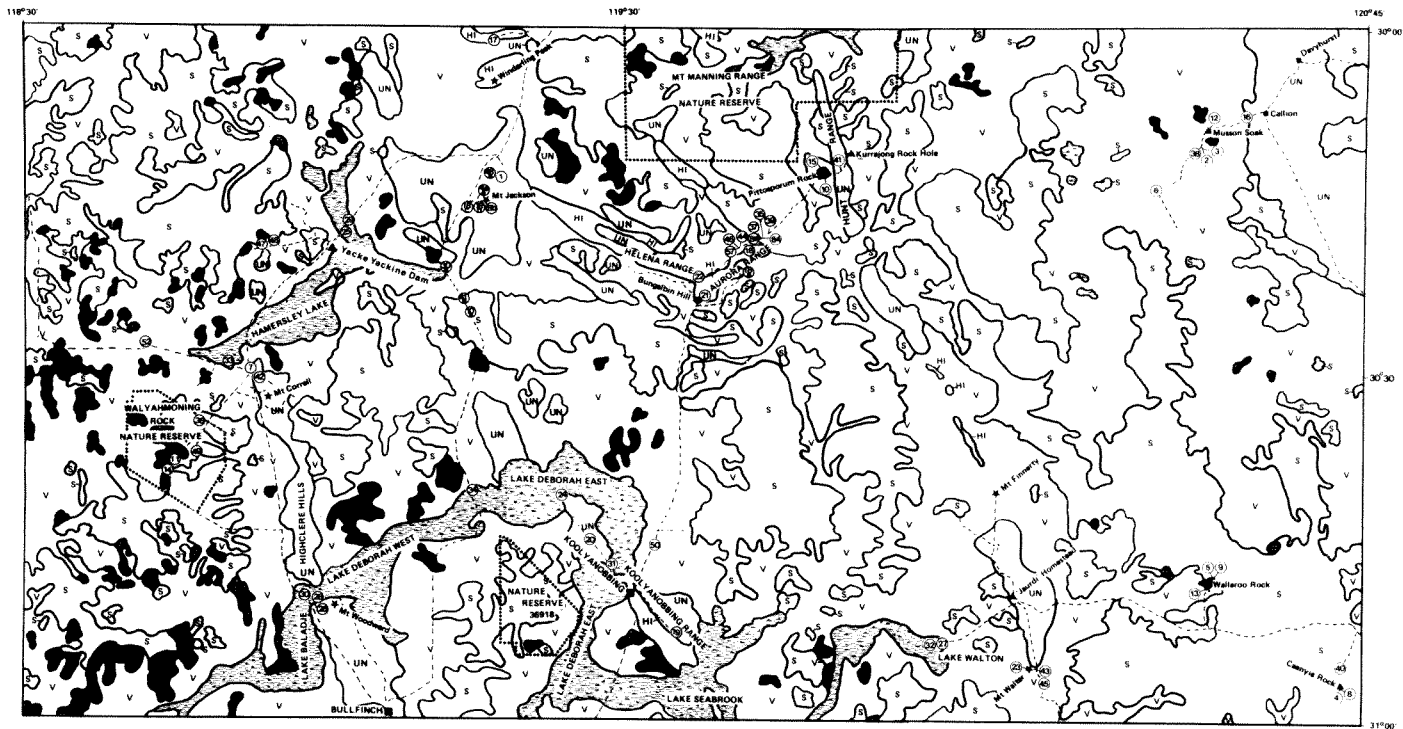
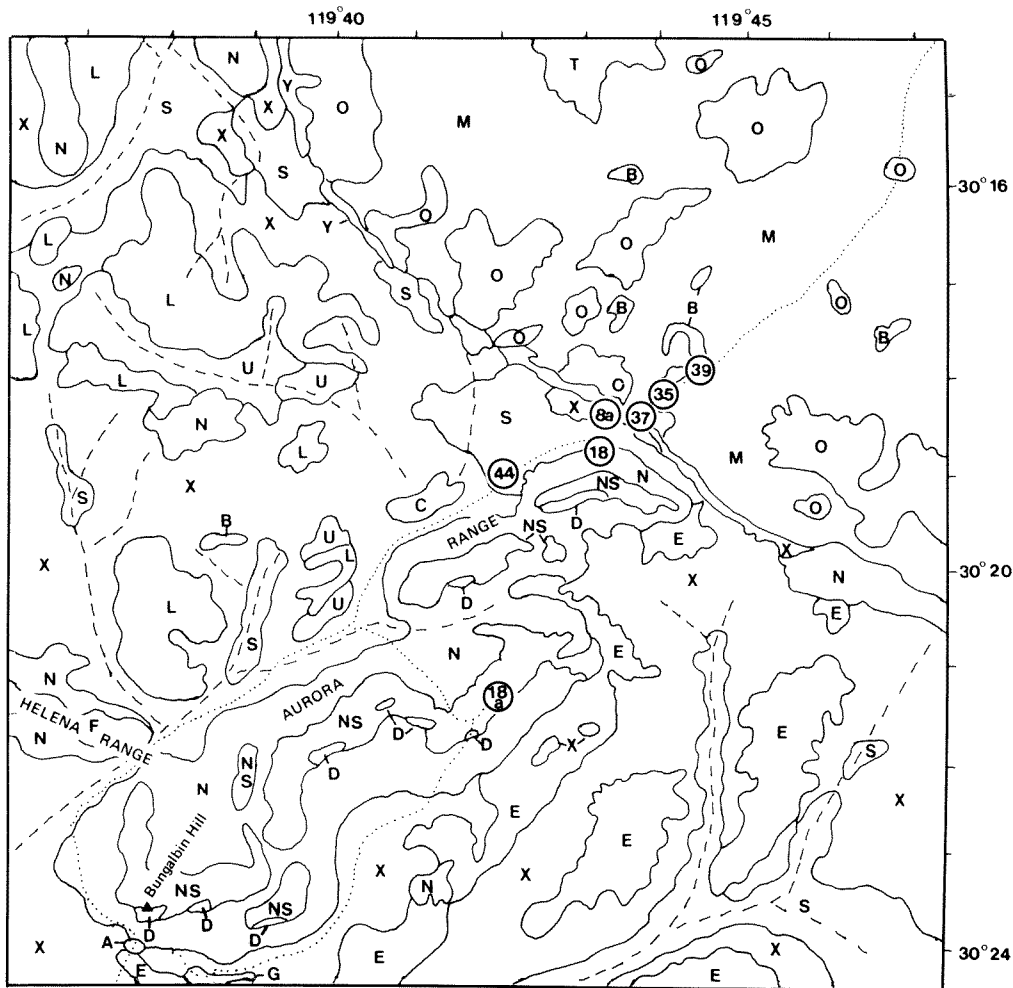
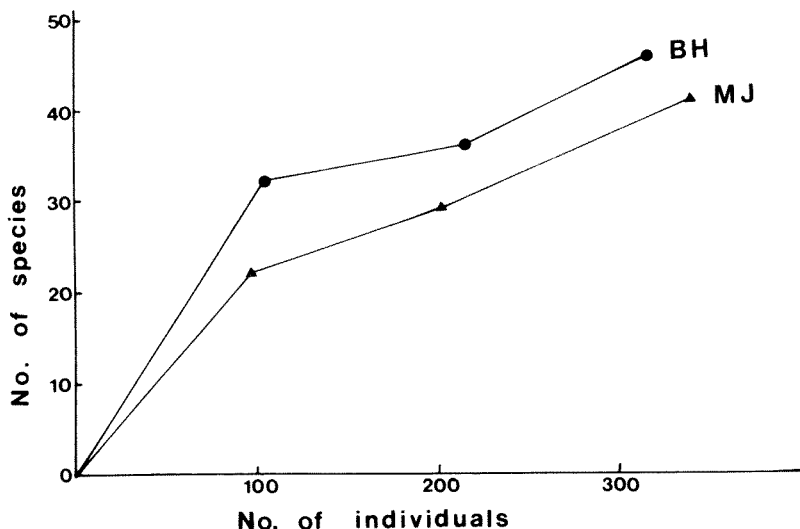


Figure 3 The main landform units of the Jackson-Kalgoorlie Study Area. Field traverses for the vegetation study are indicated with numbers identifying the vegetation sites described.



**Figure 4** Map showing the distribution of vegetation types and the location of fauna sample sites and other sites in the Bungalbin Hill survey area. The number in brackets is the JK number for description of plant formation (Appendix I), apart from 8a and 18a (Appendix III). The vegetation types are: A – *Acacia* aff. *aneura* Low Woodland (16), B – *Banksia elderiana* Tall Shrubland (39), C – *Eucalyptus cylindrocarpa* Mallee (51), D – *Dryandra arborea* Tall Shrubland (21), E – *Eucalyptus oleosa* Mallee (19), F – *Melaleuca filifolia* Tall Shrubland (22), G – *Eucalyptus longicornis* Low Woodland (45), L – *Eucalyptus clelandii* Low Woodland (41), M – *Eucalyptus leptopoda* Mallee (35), N – *Eucalyptus ebbanoensis* Mallee on pediment (18), NS – *Eucalyptus ebbanoensis* Mallee on erosional slopes (18), O – *Acacia coolgardiensis* Tall Shrubland (37), S – *Eucalyptus salmonophloia* Woodland (44), *Eucalyptus transcidentalis* Low Woodland (50), U – *Eucalyptus salubris* Low Woodland (48), W – *Eucalyptus wandoo* Low Woodland (1), X – *Eucalyptus* mixed Low Woodland (46), Y = *Eucalyptus loxophleba* Mallee.



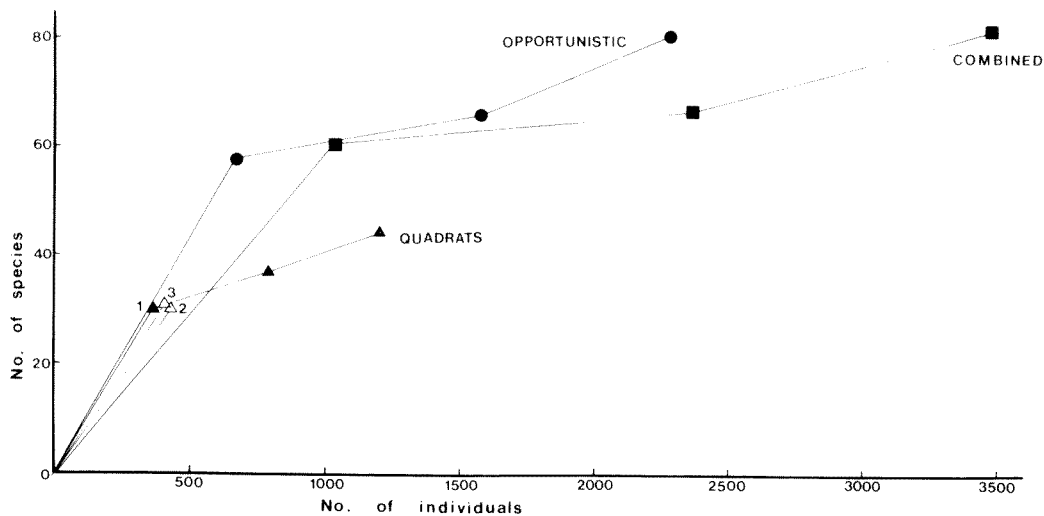
**Figure 5** Number of reptile and amphibian species and the number of individuals caught at Mount Jackson (MJ) and Bungalbin Hill (BH) study sites. Data are cumulative for the three study periods.

### Amphibians and Reptiles

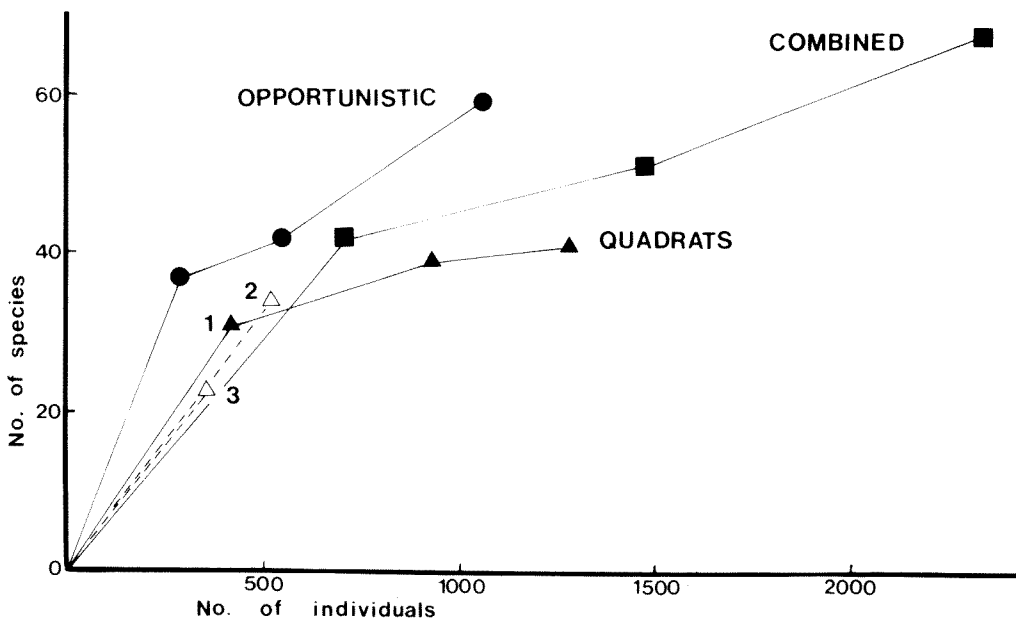
Two amphibian and 55 reptile species were recorded from the MJ and BH survey sites (Table 7). Neither amphibian species and only 31 (56%) of the reptiles were common to both areas. Both species of frog are within their known range. The paucity of amphibians is probably due to the lack of claypans, large granite exposures and streams within the fauna survey areas which are their important habitats in other semi-arid regions.

No species of reptile is restricted to the Study Area, but BH is the type locality of the skink *Ctenotus xenopleura* which is known from only two other localities (Storr 1981). Many of the reptiles are at the extremes of their known ranges. These survey areas contain the most inland and northerly records for *Crenadactylus ocellatus* (BH), *Oedura reticulata* (BH), *Delma australis* (BH), *Ctenotus xenopleura* (BH), *Hemierngis initialis* (BH); while the records for *Diplodactylus elderi* (BH), *D. stenodactylus* (BH), *Nephrurus vertebralis* (MJ), *Ctenotus leonhardii* (BH), and *Varanus giganteus* represent range extensions of over 100 km. *V. giganteus* was recorded photographically at both MJ and BH but neither of these large specimens was collected.

The herpetofauna of the Study Area has not previously been documented. Only three species recorded at Karroun Hill, some 100 km to the west (Youngson and McKenzie 1977), were not recorded in our study sites. These were *Diplodactylus spinigerus* which is replaced by its congener *D. intermedius* at MJ and BH, *Tiliqua rugosa* which does not occur in the MJ/BH area (Chapman and Dell 1985) and *Ctenophorus ornatus* which is restricted to large granite outcrops



**Figure 6** The cumulative number of bird species and number of individuals recorded for the three study periods at Mount Jackson (MJ). Data collected on bird quadrats are indicated separately for each study period (1, 2, 3) and combined as quadrat totals. Data collected opportunistically is indicated separately and also combined with quadrat data.



**Figure 7** The cumulative number of bird species and number of individuals recorded for the three study periods at Bungalbin Hill (BH). Data collected on bird quadrats are indicated separately for each study period (1, 2, 3) and combined as quadrat totals. Data collected opportunistically are indicated separately and also combined with quadrat data.

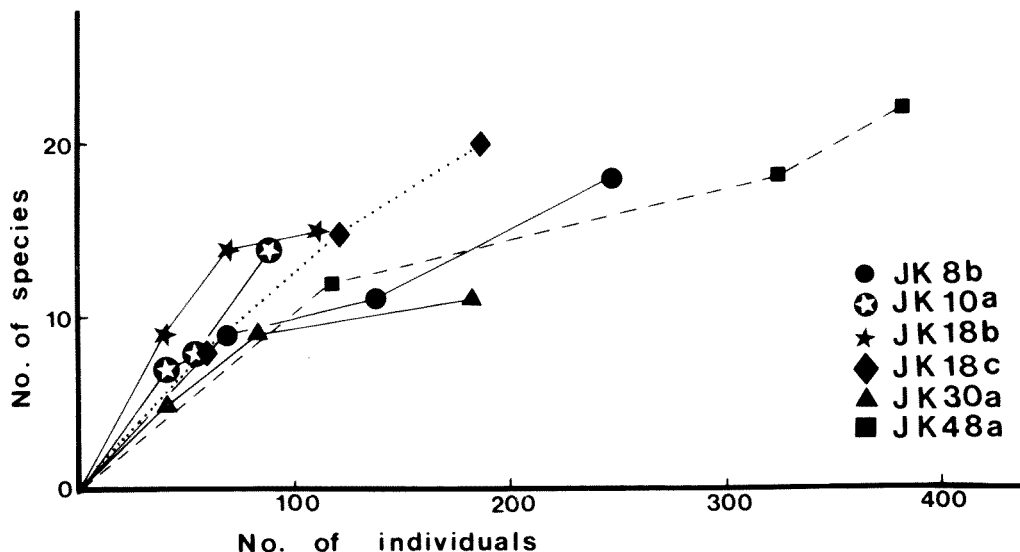


Figure 8 The accumulation during the three study periods of number of bird species and total number of individuals at each of the census quadrats at Mount Jackson study area.

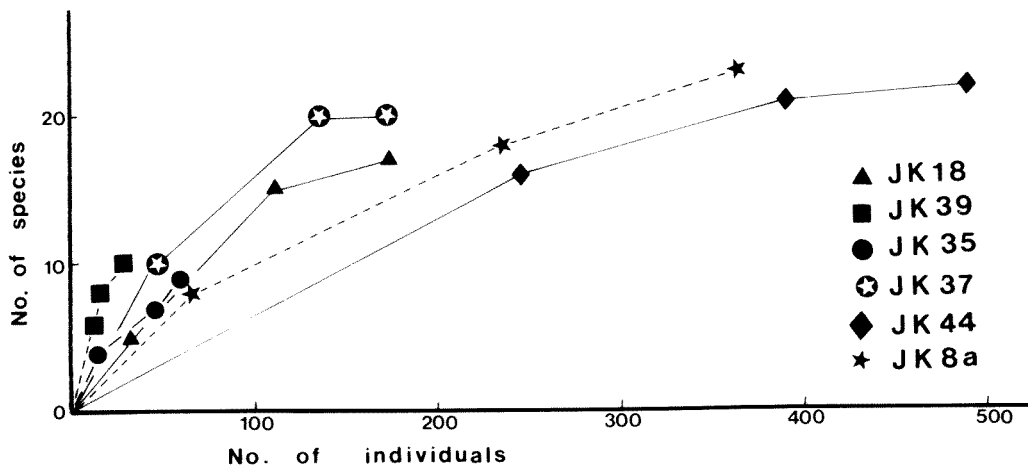


Figure 9 The accumulation during the three study periods of number of bird species and total number of individuals at each of the census quadrats at Bungalbin Hill study area.

which are not present on our survey areas. One amphibian and 35 species of reptile were recorded in our survey sites but were not recorded at Karroun Hill.

The richest herpetofaunal assemblage documented at either survey area was the mallee association JK8b (Table 7) where 17 lizard and 3 snake species were recorded. The richest saurofauna was in the *Eucalyptus corrugata* Low Woodland



over *Triodia* sp. (JK42a) where 19 species were collected, and in the *E. salmonophloia* Woodland (JK44) where there were 17 species of lizards including 8 geckos.

The highest number of gecko species recorded for any survey area in the Eastern Goldfields was 13 at BH. This epitomises the blending of arid zone and south-western elements, a situation which is duplicated to some extent in the other lizard groups. *Diplodactylus elderi*, *D. stenodactylus*, *Nephrurus vertebralis*, *Rhynchoedura ornata*, *Delma nasuta*, *Pygopus nigriceps*, *Ctenophorus fordi*, *C. isolepis*, *C. scutulatus*, *Ctenotus leonhardii*, *C. uber* and *Varanus giganteus* have the major part of their distributions centred on the arid Eremaean Botanical Province, while *Crenadactylus ocellatus*, *Diplodactylus maini*, *Nephrurus stellatus*, *Oedura reticulata*, *Delma australis*, *Ctenotus xenopleura*, *Hemiergus initialis* and *Lerista macropisthopus* have extensive or localised distributions within the South-West Botanical Province or the South-western Interzone.

### Birds

A total of 89 species of birds was recorded during the surveys of MJ and BH. These comprised 29 non-passerines and 60 passerines of which 18 and 42 species respectively were common to both areas. Tables 8 and 9 list all species and indicate the number of sightings and total number of individuals in each vegetation type during each survey.

In both areas the passerine assemblage was not only richer, but it contained more individuals. At MJ the 29 non-passerines included only 538 individuals of which nearly half were *Platycercus zonarius* with 249 individuals. The 54 passerines included 2985 individuals of which four species, *Smicromnis brevirostris*, *Pardalotus striatus*, *Meliphaga ornata* and *Corvus bennetti*, constituted 38%. The passerine assemblage at MJ is dominated by two families — the 7 species of Acanthizidae had 622 individuals and the 10 species of Meliphagidae had 796 individuals.

At BH the 16 non-passerine species included only 267 individuals of which 102 (38%) were *Phaps chalcoptera*. The 48 species of passerines included 2097 individuals of which four species, *Smicromnis brevirostris*, *Acanthiza uropygialis*, *Pardalotus striatus* and *Meliphaga ornata*, constituted 52%. The most abundant species in both areas was the foliage gleaning insectivore, *Smicromnis brevirostris*, with a total of 742 individuals (15%).

Twenty fewer species of birds were recorded at BH than at MJ for approximately the same recording effort. BH also had fewer individuals per species with a mean of 36.9 per species compared to a mean of 41.9 at MJ. The reason for these differences in diversity and abundance is probably the higher density of vegetation and the larger number of different vegetation associations at MJ compared to those at BH (Newbey and Hnatiuk, this publication). We have noted elsewhere in the goldfields that differences in vegetation biomass affected the number of bird individuals but not the number of bird species (Dell and How 1984). The situation at MJ/BH supports Recher (1969) who considered that habitat diversity reflected species richness.

**Table 7.** Amphibians and reptiles at Mt Jackson (MJ) and Bungalbin Hill (BH) survey areas indicating number of species and individuals caught in each sample site. The first figure indicates the number caught in fenced pit lines; the second figure indicates the number caught opportunistically; single figures indicate opportunistic collecting only. Numbers for the three survey periods are combined. Vegetation types are listed in Tables 5 and 6 and described in Appendix III.

Landform Unit: Vegetation Code (JK):	Mount Jackson										Bungalbin Hill							
	HI 8b	HI 18b	L 30a	S 10a	UN 44a	UN 48a	V 42a	HI 21*	G 15*		HI 18	S 35	S 37	S 39	V 44	V 8a	G 15a	HI 18a
<b>LEPTODACTYLIDAE</b>																		
<i>Neobatrachus sutor</i>											1/0					1/0	6	
<i>Pseudophryne occidentalis</i>						0/2			1									
<b>GEKKONIDAE</b>																		
<i>Crenadactylus ocellatus</i>															0/3	0/1		
<i>Diplodactylus elderi</i>														0/1				
<i>D. granariensis</i>		0/4		0/2	1/6	2/10	0/1	3			0/2				1/2	1/0	8	
<i>D. intermedius</i>						0/6					0/1	2/6		1/7	0/2			
<i>D. maini</i>							0/5				0/1				1/8	2/8	2	
<i>D. pulcher</i>	2/0	0/4	1/6	1/0	0/3	1/2	0/1				1/3	2/0			0/2	0/1	6	
<i>D. stenodactylus</i>												2/0		0/1				
<i>Gehyra variegata</i>	1/3	1/2	0/1	0/7	0/1	0/19	0/3	4			0/3		0/1		1/10	0/2	11	1
<i>Heteronotia binoei</i>	0/2	0/3		0/3	0/3	0/2	0/1	12									4	3
<i>Nephrurus stellatus</i>												0/2		0/2				
<i>N. vertebralis</i>				0/1														
<i>Oedura reticulata</i>	0/1					0/6			1		0/1				0/2	0/6		
<i>Phyllurus milii</i>	0/1					0/41		4							1/3			
<i>Rhynchoedura ornata</i>	0/1			0/1	1/0		1/1						0/2			0/1	5	
<b>PYGOPODIDAE</b>																		
<i>Delma australis</i>						0/2			1						1/7	0/3		
<i>D. nasuta</i>							0/1							1/0				
<i>Lialis burtonis</i>							0/1											
<i>Pygopus nigriceps</i>	0/1																	

Table 7 (cont.)

Landform Unit: Vegetation Code (JK):	Mount Jackson										Bungalbin Hill							
	HI 8b	HI 18b	L 30a	S 10a	UN 44a	UN 48a	V 42a	HI 21*	G 15 <sup>+</sup>	HI 18	S 35	S 37	S 39	V 44	V 8a	G 15a	HI 18a	
<i>AGAMIDAE</i>																		
<i>Ctenophorus cristatus</i>						0/1	0/1			0/1				0/2	0/1			
<i>C. fordi</i>											1/0							
<i>C. isolepis citrinus</i>											3/5		5/8					
<i>C. reticulatus</i>	2/6	1/2	0/2		0/1		1/0	1	1		1/0					2		
<i>C. scutulatus</i>	1/2	0/4	0/1	1/3	0/2				1					0/1	0/1			
<i>Pogona minor</i>			0/1	0/1	0/1					0/1	2/1	0/1	1/2				1	
<i>Moloch horridus</i>				1/0								0/1						
<i>Tympanocryptis cephalo</i>	0/4									1/1								
<i>SCINCIDAE</i>																		
<i>Cryptoblepharus carnabyi</i>																	2	
<i>C. plagiocephalus</i>	0/2				0/1	0/1								1/2		1		
<i>Ctenotus atlas</i>							5/0				3/1		3/0					
<i>C. leonhardii</i>																1		
<i>C. mimetes</i>			0/2				0/1											
<i>C. schomburgkii</i>		4/1		1/2			3/0				1/1	5/2			2/0			
<i>C. uber</i>	0/4	1/5	1/0		3/3					1/1							1	
<i>C. xenopleura</i>											9/2	0/1	9/8					
<i>Egernia depressa</i>		0/1																
<i>E. inornata</i>			0/1				1/0								0/1			
<i>Hemiergis initialis</i>	0/4	1/1			0/15	0/3		5		0/2				0/2			13	
<i>Lerista gerrardii</i>																		
<i>L. macropisthopus</i>						2/2		1	1		0/1			0/1		4		
<i>L. muelleri</i>	0/5		0/4	2/1	0/11	0/8	0/2			0/3				1/3	0/2	2	2	
<i>Menetia greyii</i>					0/1	0/1	0/1		1		1/1	0/1		1/2	0/3	1		
<i>Morethia butleri</i>	0/4		0/1		0/2	0/1	0/2							2/4	0/2			
<i>Omolepida branchialis</i>	0/1	0/1					0/1	3									4	
<i>Tiliqua occipitalis</i>												0/1						

Table 7 (cont.)

Landform Unit: Vegetation Code (JK):	Mount Jackson									Bungalbin Hill							
	HI 8b	HI 18b	L 30a	S 10a	UN 44a	UN 48a	V 42a	HI 21*	G 15 <sup>4</sup>	HI 18	S 35	S 37	S 39	V 44	V 8a	G 15a	HI 18a
VARANIDAE																	
<i>Varanus giganteus</i>								1									1
<i>V. gouldii</i>				1/0							1/0						
<i>V. tristis</i>	0/1																
TYPHLOPIDAE																	
<i>Ramphotyphlops australis</i>										1/0			1/0				
<i>R. hamatus</i>													1/0				
BOIDAE																	
<i>Liasis stimsoni</i>	0/1				0/1												
ELAPIDAE																	
<i>Denisonia fasciata</i>							0/1										
<i>Pseudechis australis</i>	0/2																
<i>Rhinoplocephalus monachus</i>				1/0													
<i>Vermicella bertholdii</i>	0/1					0/1			1							1	
<i>V. semifasciata</i>														0/2			
<i>No. of Species</i>	20	11	10	12	16	18	19	9	8	14	13	9	9	19	17	14	9
<i>No. of Pit days</i>	170	160	180	360	328	180	180			170	340	340	340	330	170		

\*Vegetation at these sample sites similar to vegetation sites coded in Appendix I.

The location of MJ and BH in the South-western Interzone of the Eremaean Botanical Province near the eastern part of the South-West Botanical Province indicates that the study sites could be close to the inland edge of distribution of some south-western species. A number of bird species characteristic of the eucalypt woodlands and *Acacia* dominated shrublands of the South-West Botanical Province were recorded at the study sites. These included *Glossopsitta porphyrocephalus* (MJ, BH), *Eopsaltria australis* (BH), *Pachycephala pectoralis* (MJ, BH), *Rhipidura fuliginosa* (BH), *Cinclosoma castanotum* (MJ, BH), *Drymodes brunneopygia* (MJ), *Sericornis cautus* (BH), *Malurus pulcherrimus* (BH), *Climacteris rufa* (MJ, BH), *Pardalotus punctatus* (MJ in May 1978), *Meliphaga ornata* (MJ, BH), *Meliphaga leucotis* (MJ, BH), *Melithreptus brevirostris* (MJ, BH), *Anthochaera carunculata* (MJ, BH), *Epthianura albifrons* (MJ), *Artamus cyanopterus* (MJ, BH) and *Corvus coronoides* (MJ).

Only a few typically Eremaean species were recorded at these survey areas. These included *Turnix velox* (MJ), *Rhipidura albicauda* (MJ), *Epthianura tricolor* (MJ) and *Corvus orru* (BH).

The avifauna of the MJ and BH survey sites consists chiefly of wide-ranging species. However there are 17 species which have a predominantly south-western distribution compared to only 4 species which have a typically arid or Eremaean distribution. Thus the avifauna here has closer affinities with south-western Australia than the arid interior. This is somewhat different to the situation prevailing in the reptiles where a blending of arid zone and south-western elements was noted with arid representatives being more numerous than typically south-western species.

There were differences in the number of individuals of passerines recorded in different seasons at MJ and BH (Tables 8 and 9). Some of these differences may be due to movements by migratory or nomadic species. For example, *Corvus bennetti* at MJ was much more numerous in April when flocks were presumed to be in transit. *Pardalotus striatus* was in similar numbers each season at BH but was considerably less abundant at MJ in November than at other times. *Petroica goodenovii* was more abundant at BH/MJ in November/December than at other times; the converse was the case in *Meliphaga ornata*. *Anthochaera carunculata* was absent at MJ in November but was more common than at BH than at other months. Some differences in population levels may be due to the erratic nature of rainfall (Figure 5). Many nectarivores and insectivores probably move into the area following good rains.

Woodlands at BH have the highest number of species and the greatest aggregate of individuals. The *Eucalyptus salmonophloia* Woodland site (JK44) had 27 species totalling 544 individuals while the *Eucalyptus loxophleba* Woodland site (JK8a) had 28 species totalling 367 individuals. Mallee and Tall Shrubland on Sandplain sites had the lowest number of species and the lowest aggregate of individuals. Site JK35 had 15 species totalling 60 individuals while Site JK39 had 12 species totalling 29 individuals.

**Table 8.** List of birds at Mt Jackson survey area indicating number seen in each sample site. The intensive sample sites (quadrats) are shown in the first columns followed by opportunistic observations. The first figure indicates the total number of individuals, the second figure indicates the number of observations. The three survey periods (September 1979, April 1980 and November-December 1981) are indicated as column 1, 2, and 3 respectively for each sample site. The number of observation days for the quadrat data was 5 and the number of observation days for the opportunistic data was 7 for each survey period. Vegetation types are listed in Tables 5 and 6 and described in Appendix III.

Sites	Quadrats						Opportunistic										
	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam
CASUARIIDAE																	
<i>Dromaius novaehollandiae</i> Emu				T						T							4 1
ARDEIDAE																	
<i>Ardea pacifica</i> White-necked Heron																	1 1
ACCIPITRIDAE																	
<i>Lophoictinia isura</i> Square-tailed Kite													1 1				
<i>Accipiter cirrocephalus</i> Collared Sparrowhawk													1 1				
<i>Aquila morphnoides</i> Little Eagle						3 <sup>B</sup> 2 <sup>B</sup>											
<i>Aquila audax</i> Wedge-tailed Eagle			X		X				1 1		4 2	1 1	2 1			1 1	
FALCONIDAE																	
<i>Falco peregrinus</i> Peregrine Falcon																1 1	
<i>Falco longipennis</i> Australian Hobby											2 1	1 1	1 1				
<i>Falco berigora</i> Brown Falcon												1 1					
<i>Falco cenchroides</i> Australian Kestrel									1 1	1 1	2 2	1 1		1 1	1 1	1 1	6 5
MEGAPODIIDAE																	
<i>Leipoa ocellata</i> Mallec Fowl		T			T	T					T						

Table 8 contd.

Sites	Quadrats						Opportunistic										
	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam
TURNICIDAE <i>Turnix velox</i> Little Button-quail			1 1						1 1								
OTIDIDAE <i>Otis australis</i> Australian Bustard												2 2					
CHARADRIIDAE <i>Charadrius melanops</i> Black-fronted Plover																	2 2
COLUMBIDAE <i>Phaps chalcoptera</i> Common Bronzewing								1 1						1 1			1 4 1 1 1 1
PSITTACIDAE <i>Glossopsitta porphyrocephala</i> Purple-crowned Lorikeet	X						1 1					12 2					
<i>Polytelis anthopeplus</i> Regent Parrot			1 1	X						1 1	2 1						
<i>Platycercus zonarius</i> Ring-necked Parrot	4 1 2 1		1 1 1 1			12 2 3 8 2 2	2 2 7 3 1 1 1 2		2 1			8 15 12 5 8 8	38 18 17 15 8 8	3 2 5 1 1 2	7 9 52 4 4 3	1 1	19 2
<i>Platycercus icterotis</i> Western Rosella																1 1	
<i>Calyptrorhynchus magnificus</i> Red-tailed Black Cockatoo												2 1	19 1	22 1			10 4
<i>Cacatua roseicapilla</i> Galah												7 4 26 1 2 2 3 1			5 5 2 3		6 75 1 5
CUCULIDAE <i>Chrysococcyx osculans</i> Black-eared Cuckoo												1 1					
STRIGIDAE <i>Ninox novaeseelandiae</i> Boobook Owl								2 2				1 1					
PODARGIDAE <i>Podargus strigoides</i> Tawny Frogmouth								1 1									

Table 8 contd.

## Quadrats

## Opportunistic

Sites	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam	
<b>AEGOTHELIDAE</b>																		
<i>Aegotheles cristatus</i>		X				1 1	X	5 5	3 3			2 2	2 2					
Australian Owlet-nightjar																		
<b>CAPRIMULGIDAE</b>																		
<i>Eurostopodus argus</i>													2 2	1 1				
Spotted Nightjar																		
<b>MEROPIDAE</b>																		
<i>Merops ornatus</i>																		
Rainbow Bee-eater														2B 1				
<b>HIRUNDINIDAE</b>																		
<i>Hirundo nigricans</i>					2 1												25 8 56 2 1 2	
Tree Martin																		
<b>MOTACILLIDAE</b>																		
<i>Anthus novaeseelandiae</i>														1 1		1 1		
Richard's Pipit																		
<b>CAMPEPHAGIDAE</b>																		
<i>Coracina novaehollandiae</i>				X		3 3	1 1	1 1		2 2	1 1	1 1	4 3	2 7	2 2	5 3	10 5	
Black-faced Cuckoo-Shrike																	5 2	
<i>Lalage sueurii</i>																		
White-winged Triller														1 1				
<b>PACHYCEPHALIDAE</b>																		
<i>Microeca leucophaea</i>			1 1				X							2 2	3 3	1 1		
Jacky Winter																		
<i>Petroica goodenovii</i>	6 4	2 2	9B 8	3 3	11 9B	4 2	8 8	1 1		3 3			5 5	7A 4	4 3	1 1	2 1	1 1
Red-capped Robin																		2 2
<i>Petroica cucullata</i>				6 4														
Hooded Robin																		
<i>Pachycephala pectoralis</i>		1 1																
Golden Whistler																		
<i>Pachycephala rufiventris</i>	1 1	3 2	1 1	4 4	3 3						X	4 4						
Rufous Whistler																		
<i>Pachycephala inornata</i>					1 1													
Gilbert's Whistler													4 3					



Table 8 contd.

## Quadrats

## Opportunistic

Sites	Quadrats						Opportunistic										
	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam
<i>Colluricincla harmonica</i> Grey Shrike-thrush	2 1	X X 1 1	X 1 2 1 1 2		X 1 1 1 1 1	1 1 X 1 1 1	1 1	1 4 6 1 4 6	2 1 1 2 1 1			3 2 4 3 2 4	3 2 3 2			1 1	
<i>Oreoica gutturalis</i> Crested Bellbird	X 2 2	X	2 3 2 2 3 2	X X	X 1 1	2 X 2	1 1	3 3 3 3 3 3	1 1 1 1	1 1 1 1	1 1 1 1	2 1 1 2 1 1	2 2 3 1 2 2 3 1	1 1		1 1 1 1	1 1
MONARCHIDAE <i>Rhipidura albicauda</i> White-tailed Fantail	1 1				1 1			2 1			2 1						
<i>Rhipidura leucophrys</i> Willie Wagtail						7B 6								1 1		1 1 1 1	3 1 3 1
ORTHONYCHIDAE <i>Cinclosoma castaneum</i> Chestnut Quail-thrush	1 3 1 2	2 1	1 3 1 1 2 1	2 1			4 3		2 1 1 2 1 1				1 2 1 1	1 1			
<i>Drymodes brunneopygius</i> Southern Scrub-robin		X						7 2 4 5 2 4	1 1								
<i>Pomatostomus superciliosus</i> White-browed Babbler	5 1	X	4 2 2 1		2 1			5 6 3 1 2 1	14 1 3 1		3 1				7 2		
ACANTHIZIDAE <i>Aphelocephala leucopsis</i> Southern Whiteface															4 1		
<i>Gerygone fusca</i> Western Flyeater	1 1					X							1 1				
<i>Smicrornis brevirostris</i> Weebill	20 17 14B 10 9 5	35 48 18B 17 20 9	12 2 8 6 1 5	X		2 2 7 1 1 4	X	12 5 8 4 3 4	22 11 21 11 5 9	3 5 2 2 3 1			11 16 14 5 8 8	10 7 3 5 3 1		7 3	
<i>Acanthiza apicalis</i> Broad-tailed Thornbill	6 3 3 2	X	10 9 12B 5 5 7	1 1	15 11 5 6 6 4	X		1 1 1 1	3 6 2 2		8 4 2 4 3 2	1 1	1 1				
<i>Acanthiza uropygialis</i> Chestnut-rumped Thornbill	17 15 16 7 4 2	6 7 8 3 2 2	4 4 2 2	2 1		2 5 4 1 2 1		1 1		1 1	2 1	3 6 1 2	9 3 3 3 1 1	2 1		5 1	
<i>Acanthiza chrysorrhoa</i> Yellow-rumped Thornbill			4 2									3 2 2 1 1 2		1 1			
<i>Pyrholaemus brunneus</i> Redthroat			4 4 3 3 2 2	3 3 3 2 2 3	3 2	5 2 4 4 2 2				1 1	3 1	2 1 6 1 1 5		1 1			

Table 8 contd.

## Quadrats

## Opportunistic

56

Sites	Quadrats						Opportunistic											
	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam	
MALURIDAE																		
<i>Malurus splendens</i> Splendid Fairy-wren						7 3								2 1				
<i>Malurus leucopterus</i> White-winged Fairy-wren				32 22 81 7 4 22						1 10 21 1 2 7								
SYLVIIDAE																		
<i>Cincloramphus mathewsi</i> Rufous Songlark						3 2							3 3					
DAPHOENOSITTIDAE																		
<i>Daphoenositta chrysoptera</i> Australian Sittella								4 1							2 1			
CLIMACTERIDAE																		
<i>Climacteris rufa</i> Rufous Tree-creeper						8 5 19 8 5 15						8 7 16 5 7 11	1 4 1 3		1 1			
DICAEIDAE																		
<i>Dicaeum hirundinaceum</i> Mistletoebird						X		2 1	2 2				1 1					
PARDALOTIDAE																		
<i>Pardalotus striatus</i> Striated Pardalote	16 4 5 9 3 4	9 6	X X	X X X		19 58 3 6 22 3	10 19 8 4 5 4	12 6 5 5 3 4	2 1 1 1	4 4 1 1		6 15 9 2 8 6	6 7 2 3		43 8 2 8			
MELIPHAGIDAE																		
<i>Lichmera indistincta</i> Brown Honeyeater		X	20 5	X		10 8		2 1	2 1			10 4				4 3	3 3	
<i>Meliphaga virescens</i> Singing Honeyeater	X	X		X X X	6 5	X X	2 2	3 3	7 2 2 6 2 2		6 5	1 2 3 2 1 1				1 1 1 1	3 6 2 2 5 1	
<i>Meliphaga ornata</i> Yellow-Plumed Honeyeater		X				43 84 14 26 36 8						24 10 9 7 5 6	19 2 4 1				8 1	4 1
<i>Meliphaga leucotis</i> White-eared Honeyeater	X 1	5 6 10 5 6 6		X			2 3 2 3	12 7 6 8 3 5	3 3 3 1	1 1		2 1	2 2		2 2	1 1	3 2	
<i>Melithreptus brevirostris</i> Brown-headed Honeyeater	2 1	X	10 1	20 5		2 2		5 3	2 1	6 1		2 1	5 1	4 1	4 2			
<i>Phylidonyris albigrons</i> White-fronted Honeyeater			9 4		15 1	5 2							2 1					

Table 8 contd.

## Quadrats

## Opportunistic

Sites	Quadrats											Opportunistic																							
	18b	8b	18c	30a	40a	48a	18b	8b	18c	30a	40a	48a	Mixed Woodlands	Mixed Shrublands	Salmon Gum Woodlands	Hills	Marda Dam																		
MELIPHAGIDAE (contd)																																			
<i>Manorina flavigula</i> Yellow-throated Miner	X	8 2	4 2			19 7	X	1 1	3 2	9 4 <sup>A</sup>	8 1		33 6	13 4	2 1	3 2	5 2	1 1	6 1	2 1	5 1	35 3													
<i>Acanthagenys rufogularis</i> Spiny-Cheeked Honeyeater	X	1 1	1 1	X	X	X	2 1	X	X	18 9	X	1 1	1 1	1 1	10 6	2 1	2 2	2 2	3 3	1 1	1 1	4 3	2 2	1 1	29 3				3 1	4 2					
<i>Anthochaera carunculata</i> Red Wattle-bird	X				X	5 3	5 5	4 3	1 1				2 1	9 5	6 4	11 9	1 1			6 2								15 2							
<i>Epthianura tricolor</i> Crimson Chat				X								2 1																							
PLOCEIDAE																																			
<i>Poephila guttata</i> Zebra Finch												2 1																		11 3					
GRALLINIDAE																																			
<i>Grallina cyanoleuca</i> Magpie-lark						X								1 1																					
ARTAMIDAE																																			
<i>Artamus cyanopterus</i> Dusky Wood-swallow		5 1												2 1 <sup>A</sup>																					
<i>Artamus minor</i> Little Wood-swallow				X	2 1	X																								10 1	2 1				
CRACTICIDAE																																			
<i>Cracticus torquatus</i> Grey Butcherbird	X	1 1	2 2	X	2 2	2 2	X	X		X	2 1	1 1	1 1	3 3	4 3	4 4	1 1	1 1						1 1	6 3	3 1	1 1	3 1	1 1			1 1			
<i>Cracticus nigrogularis</i> Pied Butcherbird		1 1			2 1			X	4 1	X		1 1	1 1												5 3	3 2	9 8	3 2	6 4	3 2			2 2	3 3	
<i>Cracticus tibicen</i> Magpie					X			X						3 1	6 1										4 1	11 4	6 3	12 4	1 1			3 1	1 1	1 1	
<i>Sirepera versicolor</i> Grey Currawong	2 2	X	1 1		1 1			X	3 1	1 1	1 1	1 1													3 3	3 3	1 1				1 1	1 1			
CORVIDAE																																			
<i>Corvus bennetti</i> Little Crow				X		10 2																			2 1	15 1	7 8	3 3			13 2	70 2	10 2	2 2	2 1
<i>Corvus coronoides</i> Australian Raven	X			1 1				X	X	X		2 1													5 4	6 3	2 1	2 1	2 1			5 1		5 3	

A = Adults feeding young B = Breeding T = Tracks • = Overhead

**Table 9.** List of birds at Bungalbin Hill survey area indicating number seen in each sample site. For explanation of data see Table 8.

Site	Quadrats						Opportunistic										
	JK18	JK37	JK35	JK39	JK44	JK8a	JK18	JK37	JK35	JK39	JK44	JK8a	JK18a	JK15b			
CASUARIIDAE <i>Dromaius novaehollandiae</i> Emu																	
ACCIPITRIDAE <i>Lophoictinia isura</i> Square-tailed Kite																	
<i>Aquila morphnoides</i> Little Eagle			X						1 1•		1 1•						
<i>Aquila audax</i> Wedge-tailed Eagle													1 1				
FALCONIDAE <i>Falco peregrinus</i> Peregrine Falcon													1 1				
<i>Falco berigora</i> Brown Falcon											1 1		1 1	1 1			
<i>Falco cenchroides</i> Australian Kestrel			1 1	X		X				1 1		4 2					
MEGAPODIDAE <i>Leipoa ocellata</i> Mallee Fowl						T											
COLUMBIDAE <i>Phaps chalcoptera</i> Common Bronzewing														102 2			
PSITTACIDAE <i>Glossopsitta porphyrocephala</i> Purple-crowned Lorikeet					4 3	2 1					6 1	5 1					
<i>Platycercus zonarius</i> Ring-necked Parrot	11 3	1 1		2 1	9 5	1 1	1 1	7 3	10 5		8 5	11 6	11 6	2 1	4 2	1 1	2 1
<i>Calyptorhynchus magnificus</i> Red-Tailed Black Cockatoo											6 1•					6 1	
<i>Cacatua roseicapilla</i> Galah																25 4	

Table 9 contd.

## Quadrats

## Opportunistic

Site	JK18	JK37	JK35	JK39	JK44	JK8a	JK18	JK37	JK35	JK39	JK44	JK8a	JK18a	JK15b
STRIGIDAE														
<i>Ninox novaeseelandiae</i> Boobook Owl											1 1 1 1			1 1
PODARGIDAE														
<i>Podargus strigoides</i> Tawny Frogmouth											1 1			
AEGOTHELIDAE														
<i>Aegotheles cristatus</i> Australian Owlet-nightjar						X					1 1	1 1	1 1	
CAPRIMULGIDAE														
<i>Eurostopodus argus</i> Spotted Nightjar													4 3	3 2
MEROPIIDAE														
<i>Merops ornatus</i> Rainbow Bee-eater													2 1	2 1
HIRUNDINIDAE														
<i>Hirundo nigricans</i> Tree Martin											2 1			
MOTACILLIDAE														
<i>Anthus novaeseelandiae</i> Richard's Pipit														2 1
CAMPEPHAGIDAE														
<i>Coracina novaehollandiae</i> Black-faced Cuckoo-shrike	X 2 1 X	X X	X X		2 5 4 1 4 4	X	1 2 1 2	2 3 1 1	1 1 1 1		5 5 11 3 4 10	8 1 1 1	1 1 1 1	
PACHYCEPHALIDAE														
<i>Microeca leucophaea</i> Jacky Winter	X 1 2 1 2				9 10 6 8 X		2 1 3 2 1 3				5 12 5 2 7 5			
<i>Petroica goodenovii</i> Red-capped Robin	6 5 5 4	2 10 2 8 B	5 4	2 2	1 2 1 2	5 19 4 17	2 2 1 2	2 1			1 1	1 3 1 2	1 1	1 1
<i>Petroica cucullata</i> Hooded Robin				2 1										
<i>Eopsaltria australis</i> Yellow Robin		3 2				1 1								
<i>Pachycephala pectoralis</i> Golden Whistler		4 4												

Table 9 contd.

Site	Quadrats						Opportunistic							
	JK18	JK37	JK35	JK39	JK44	JK8a	JK18	JK37	JK35	JK39	JK44	JK8a	JK18a	JK15b
PACHYCEPHALIDAE contd.														
<i>Pachycephala rufiventris</i> Rufous Whistler	1 1	1 1	X		2 1 2 1	1 1		1 1			1 1 1 1 1 1			
<i>Colluricincla harmonica</i> Grey Shrike-thrush		2 4 2 4	X		X	X	2 2	2 3 2 3	1 1		3 2 3 2	1 2 1 2	3 2 1 3 1 1	
<i>Oreoica gutturalis</i> Crested Bellbird	X	2 1	2 1	X	1 1 X X 2 1 X	2 2	3 3		1 3 1 3	3 1 1 3 1 1	4 2 4 4 2 4		1 2 1 2	
MONARCHIDAE <i>Rhipidura fuliginosa</i> Grey Fantail		1 1												
<i>Rhipidura leucophrys</i> Willie Wagtail			X			2 2			1 2 1 2		1 1 1 1		1 1	
ORTHONYCHIDAE <i>Cinclosoma castanotum</i> Chestnut Quail-thrush		2 1									1 1			
<i>Pomatostomus superciliosus</i> White-browed Babbler												1 1		
ACANTHIZIDAE <i>Aphelocephala leucopsis</i> Southern Whiteface														6 1
<i>Gerygone fusca</i> Western Flyeater						3 3								
<i>Smicromis brevirostris</i> Weebill	14 39 13 7 12 6	9 11 6 3 3 3			21 35 13 11 10 6	37 55 23 17 16 12	7 4 14 4 4 6	1 1			16 12 36 6 7 15	10 4 5 12 4 5 5	4 1 2 2 1 1	
<i>Acanthiza apicalis</i> Broad-tailed Thornbill	X	23 10 13 12 6 11	9 8 3 3 4 2	1 2 1 2		1 4 6 1 3 5	2 1	2 1 7 1 1 5				5 2		
<i>Acanthiza uropygialis</i> Chestnut-rumped Thornbill	2 2 6 1 1 3	4 18 2 1 6 1	11 3		4 4 2 1	X 40 40 12 12	2 1 1 1				2 5 1 1	3 4 12 2 2 4		
<i>Acanthiza chrysorrhoa</i> Yellow-rumped Thornbill	X				7 1	2 1	7 2		1 1					
<i>Pyrholaemus brunneus</i> Redthroat		1 2 3 1 2 3	2 1			1 1		2 1				1 1		

Table 9 contd.

## Quadrats

## Opportunistic

Site	JK18	JK37	JK35	JK39	JK44	JK8a	JK18	JK37	JK35	JK39	JK44	JK8a	JK18a	JK15b	
ACANTHIZIDAE contd.															
<i>Sericornis cautus</i>		2 1 1 1													
Shy Hylacola															
<i>Sericornis fuliginosus</i>			4 4	1 6 1 4					3 3	4 6 3 5					
Fieldwren															
MALURIDAE															
<i>Malurus splendens</i>		X						6 1						2 1	
Splendid Fairy-wren															
<i>Malurus pulcherrimus</i>		5 1													
Blue-breasted Fairy-wren															
DAPHOENOSITTIDAE															
<i>Daphoenositta chrysoptera</i>	2 1														
Australian Sittella															
CLIMACTERIDAE															
<i>Climacteris rufa</i>					2 11 4 2 8 2		2 1				9 10 6 8 6 6				
Rufous Tree-creeper															
DICAEIDAE															
<i>Dicaeum hirundinaceum</i>			X						1 1		1 1				
Mistletoebird															
PARDALOTIDAE															
<i>Pardalotus striatus</i>	14 9 14 5 6 7	1 1			28 15 15 8 9 13	19 32 2 7 9 2	3 2 8 1 2 7	3 1			27 17 36 2 7 26	3 4 5 1 4 4			
Striated Pardalote															
MELIPHAGIDAE															
<i>Lichmera indistincta</i>					12 1 8 1						7 4		3 2 2 2		
Brown Honeyeater															
<i>Meliphaga virescens</i>	2 1	3 3	2 2	1 1 1 1	1 1 1 1	4 4	4 3	1 1		3 3	1 1		2 2	6 1 5 1	1 1
Singing Honeyeater															
<i>Meliphaga ornata</i>					149 71 15 26 15 6		2 1					23 26 3 7 9 2			
Yellow-plumed Honeyeater															
<i>Meliphaga leucotis</i>		X 2 1 2 1			1 4 1 4	4 5 1 3 4 1		1 1			1 1 1 1	3 3 3 3	3 1 3 1	1 1	
White-eared Honeyeater															
<i>Meliphreptus brevirostris</i>	X 1 1				2 1		2 1 1 1							10 1	
Brown-headed Honeyeater															

Table 9 contd.

Site	Quadrats						Opportunistic							
	JK18	JK37	JK35	JK39	JK44	JK8a	JK18	JK37	JK35	JK39	JK44	JK8a	JK18a	JK15b
MELIPHAGIDAE contd.														
<i>Phylidonyris albifrons</i> White-fronted Honeyeater	1 1	6 1 2 1	X	2 1 1 1	13 3	3 11 1 5	1 1		2 2		5 3	3 3		
<i>Manorina flavigula</i> Yellow-throated Miner					12 26 1 7	1 1 1 1	X				12 2 5 2 2 2	9 8 8 1 3 3	2 1	
<i>Acanthagenys rufogularis</i> Spiny-checked Honeyeater	1 1 1 1	1 14 1 3	X	1 1	5 2 X	X 2 3 2 2			1 1	1 1	3 2 2 2 2 2	1 1 1 1	1 6 1 4	2 2
<i>Acanthochaera carunculata</i> Red Wattlebird	4 1				4 1 2 3 1 2	1 2 1 1 1 1					7 4 16 5 4 5	3 11 2 3	1 1 1 1	
PLOCEIDAE														
<i>Poephila guttata</i> Zebra Finch														3 1
ARTAMIDAE														
<i>Artamus cinereus</i> Black-faced Woodswallow		1 1	10 1	6 2										
<i>Artamus cyanopterus</i> Dusky Woodswallow											1 1			
<i>Artamus minor</i> Little Woodswallow		X								10 1			14 2	
CRACTICIDAE														
<i>Cracticus torquatus</i> Grey Butcherbird	X 1 1 1				X X	X 2 X 2 2	1 1 1 1				3 6 2 3 5 2	4 2 1 3 2 1	2 2	
<i>Cracticus nigrogularis</i> Pied Butcherbird	1 6 7 1 4 5				1 4 3 1 3 2	X 6 5	1 1 1 1 1 1				3 12 12 3 8 10	1 1	3 2	
<i>Cracticus tibicen</i> Magpie	1 2 1 1	X			X X		1 2 1 2				5 2 2 2			
<i>Strepera versicolor</i> Grey Currawong					X	1 X X 1					2 1 1 2 1 1	2 1 2 1		
CORVIDAE														
<i>Corvus orru</i> Australian Crow				X	X X		1 1			1 1	4 5 3 5			5 1
<i>Corvus bennetti</i> Little Crow						X						5 1		

B includes adults incubating

• overhead only

T tracks



A similar pattern of species richness was evident at MJ. The *Eucalyptus salubris* Woodland site (JK48a) had 31 species totalling 382 individuals compared to the *Eucalyptus loxophleba* Mallee site (JK8b) which had 25 species totalling 246 individuals. The *Acacia* aff. *aneura* Tall Shrubland site (JK10a) had 18 species totalling only 88 individuals.

An additional 21 species were recorded in the Jackson—Kalgoorlie Study Area. During a reconnaissance survey in May 1978 *Pardalotus punctatus* was recorded in vegetation type JK8b at Mt Jackson and *Anas rhynchotis*, *A. gibberifrons*, *Podiceps poliocephalus*, *Gallinula ventralis*, *Cuculus pallidus* and *Hirundo neoxena* were associated with lakes north of Bullfinch. *Cacatua leadbeateri* was near a dam, north of Bullfinch in September 1979; *Epthianura albifrons* were feeding among seedling grasses at Mt Jackson Homestead in April 1980, and *Halcyon pyrrhopygia* was near Koolyanobbing in December 1981. B. Newbey (pers. comm.) recorded *Tadorna tadornoides*, *Chenonetta jubata*, *Charadrius cucullatus* and *C. ruficapillus* on lakes in the southern part of the Study Area in July/September 1981, *Tringa nebularia* at Yacke Yackine Dam in October 1981, *Accipiter fasciatus* at Wallaroo Rock in September 1981, *Platycercus varius* at several locations in southern part of the Study Area in July/September 1981, *Chryso-coccyx basalis* widely spread in the Study Area in August/October 1981, *Artamus personatus* near Mt Jackson in September 1981 and *Cincloramphus cruralis* and *Cheramoeca leucosterna* in south of Study Area in September 1981.

Appendix IV lists breeding data recorded during this survey. Many of these were recorded by B. Newbey (pers. comm.) during the vegetation survey by K.R. Newbey.

### Mammals

The mammal fauna of the Study Area is one of the richest recorded in the Eastern Goldfields with 30 native and feral species documented. Additionally, sheep (*Ovis aries*) and cattle (*Bos taurus*) are grazed on the Mt Jackson property. Of the 30 species recorded, only 17 (57%) were common to both the Mt Jackson and Bungalbin survey areas (Table 10).

The evidence for Echidnas (*Tachyglossus aculeatus*), Dogs (*Canis familiaris*), Foxes (*Vulpes vulpes*) and Cats (*Felis catus*) was based on fresh tracks or scats. A lower mandible of the Western Quoll (*Dasyurus geoffroyi*) was collected from the base of a decaying hollow tree near the Bungalbin campsite (its age was indeterminable), and the cranium of a Goat (*Capra hircus*) was found in a cave in the Mt Jackson Range. At both survey areas conspicuous nest remains of the Stick-nest Rat (*Leporillus* sp.) were recorded, but no evidence of recent occupancy (fur or tracks) was noted. All other species were either caught or observed and representative specimens collected of all small mammal species.

The bat fauna is relatively diverse with seven species being recorded at each survey area and eight altogether in the Study Area. Documentation of this faunal component was assisted by the scarcity of free-standing water in the area during survey periods and the consequent aggregation of bats at dams and rockholes

**Table 10:** List of mammals recorded at Mount Jackson and Bungalbin Hill indicating number trapped in each sample site. Tracks are indicated by T and animal sightings by S ( $S_1 = < 5$ ;  $S_2 = 5-10$ ;  $S_3 = > 10$  individuals); C = cranium only, N = old nests. Totals for the three survey periods (September 1979, April 1980 and November-December 1981) are included. Vegetation types are listed in Tables 5 and 6 and described in Appendix III.

Landform Unit: Sample Site No. (JK)	Mt Jackson							Bungalbin Hill									
	HI 8b	HI 18b	L 30a	S 10a	UN 44a	UN 48a	V 42a	Month S A N	G 15	HI 18	HI 18a	S 35	S 37	S 39	V 8a	V 44	Month S A D
<b>TACHYGLOSSIDAE</b>																	
<i>Tachyglossus aculeatus</i>				T				T - -									
<b>DASYURIDAE</b>																	
<i>Dasyurus geoffroi</i>															C		
<i>Ningau ridei</i>												3		4			3 2 2
<i>N. yvonneae</i>												1		1			- 2 -
<i>Sminthopsis crassicaudata</i>			1			1		- 2 -									
<i>S. dolichura</i>		2	3	8	1	2		2 7 7		2		2	2	2	3	3	2 7 5
<i>S. hirtipes</i>												1		1			- 2 -
<b>BURRAMYIDAE</b>																	
<i>Cercartetus concinnus</i>						1		1 - -					1		2	1	2 2 -
<b>MACROPODIDAE</b>																	
<i>Macropus fuliginosus</i>			$S_1$	$S_3$		$S_1$		$S_3 S_1 S_1$		$S_1$		$S_2$					$S_1 S_1 S_1$
<i>M. robustus</i>	$S_1$					$S_1$		$S_1 S_1 -$						$S_1$			$- S_1 -$
<i>M. rufus</i>			$S_1$					$- - S_1$									
<b>MOLOSSIDAE</b>																	
<i>Momopterus planiceps</i>						4		4 - -									
<i>Tadarida australis</i>					2*	12		4 8 -							1		- - 1
<b>VESPERTILIONIDAE</b>																	
<i>Chalinolobus gouldii</i>						25		21 - 4	237						2		112-127
<i>C. morio</i>									2								1 - 1

Table 10 (cont.)

Landform Unit: Sample Site No. (JK)	Mt Jackson								Bungalbin Hill								
	HI 8b	HI 18b	L 30a	S 10a	UN 44a	UN 48a	V 42a	Month S A N	G 15	HI 18	HI 18a	S 35	S 37	S 39	V 8a	V 44	Month S A D
<i>Eptesicus regulus</i>	2	1*				10		5 6 1	1								1 - -
<i>Nycticeius balstoni</i>						3		1 - 2	1								1 - -
<i>Nyctophilus geoffroyii</i>						2		2 - -	1								- - 1
<i>N. major</i>						1		1 - -	2								2 - -
MURIDAE																	
<i>Leporillus</i> sp.		N											N				
<i>Mus musculus</i>	7	5	6		6	5		9 4 16		3		1		2	2	6	- 4 10
<i>Notomys alexis</i>												1		1			- - 2
<i>N. mitchellii</i>					1			- - 1				1					- 1 -
<i>Pseudomys albocinereus</i>												5		21		1	2 16 9
<i>P. hermannsburgensis</i>		1	1	1				- 2 1				2	2			1	2 3 -
CANIDAE																	
<i>Canis familiaris</i>				T	T			- T -								T	T - -
<i>Vulpes vulpes</i>				T	T			T T -				T			T		- - T
FELIDAE																	
<i>Felis catus</i>								- T -									
BOVIDAE																	
<i>Capra hircus</i>				C*													
LEPORIDAE																	
<i>Oryctolagus cuniculus</i>			S <sub>2</sub>		S <sub>1</sub>	S <sub>3</sub>		S <sub>3</sub> S <sub>3</sub> S <sub>3</sub>						T		S <sub>1</sub> S <sub>3</sub>	S <sub>1</sub> S <sub>1</sub> S <sub>3</sub>

\*Collected in May 1978

during warmer weather. At Pittosporum Rock gnamma hole during a 1.5 hour period in September 1979, 112 *Chalinolobus gouldii* (69♂: 37♀: 6?) were caught in a 10 m mist-net, while at Kurrajong Rockhole over the same time in December 1981, 125 *C. gouldii* (9♂: 116♀) were caught in a similar net. The great activity over such a short period precluded marking individuals before their release.

The sample sites in the Mallee and Tall Shrubland on Sandplain at Bungalbin (JK35 and JK39) have one of the richest small mammal faunas of any sites examined in the Eastern Goldfields. The JK35 and JK39 sites are remarkably similar in vegetation structure and floristics (Appendix III), are only 400 m apart and contain seven species each (eight when combined). Both *Ningauai ridei* and *N. yvonneae* occur at each site and these represent the only habitats where these species are known to be sympatric; the rodents *Pseudomys albocinereus* and *P. hermannsburgensis* were sympatric at JK35. The nearby floristically and structurally distinct Sandplain site JK37, contained an additional two small mammal species. Thus a total of 10 species was recorded on this landform type at sites within 1.5 km of each other.

The only mammals collected in the Study Area prior to the present survey were the bats *Tadarida australis* and *Chalinolobus gouldii* (Kitchener and Vicker, 1981). However, Youngson and McKenzie (1977), surveying an area nearly 100 km to the west recorded 17 extant species of mammals, of which only the bat *Eptesicus pumilus* was not recorded by us in the Jackson-Kalgoorlie Study Area. A survey by A. Baynes and A. Chapman (pers. comm.) of the Walyahmoning Rock Nature Reserve in 1970 and 1972 documented seven species of mammals with *E. pumilus* again the only species not recorded by us.

The proximity of the two survey areas to the mulga-eucalypt boundary probably accounts for the richness of the small mammal fauna. The *Ningauai* spp. *Notomys* spp. and *Pseudomys* spp. are species pairs that are close to the extremes of their ranges at the Bungalbin survey area.