

THE FORAGING BEHAVIOUR OF EASTERN GREY
KANGAROOS AND RED-NECKED WALLABIES

by

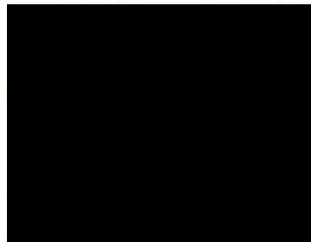
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the degree of Doctor of Philosophy.
University of New England,
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Declaration

I declare that no part of this thesis has been accepted or submitted for the award of any degree or diploma by any University, and that to the best of my knowledge, the thesis contains no material previously published or written by any other person, except where due reference is given to that author by direct credit in the text or bibliography.



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Summary

This study compared the foraging behaviour of two species of macropod; the eastern grey kangaroo *Macropus giganteus* and the red-necked wallaby *Macropus rufogriseus banksianus*. The species differ in their body size (kangaroos are 2-3 times heavier than wallabies) and their grouping behaviour, and both species are highly sexually dimorphic. By looking at the interaction between body size, feeding style and social organization I hoped to find some evidence for evolutionary trends in the development of social organization in macropods. I also aimed to examine the foraging tactics of the species and sexes, under a range of environmental conditions, to see if they revealed the underlying goals behind the animals' foraging strategies.

Individuals from populations of eastern grey kangaroos and red-necked wallabies were observed over a period of three years at Wallaby Creek, in northern New South Wales. The sampling procedure was chosen to quantify or describe each component of foraging behaviour including: when animals feed, where they feed, what items they select and how they ingest food items. The sampling schedule included 24-hour followings of individuals, continuous observations of foraging animals and systematic searches of the study area to record details of foraging and resting sites. A summary of the results and conclusions are as follows:

- i) Different requirements for shelter and different dietary preferences result in a degree of ecological separation between the species. Wallabies are highly selective grazers and appear to adopt a strategy of maintaining (or maximizing?) diet quality. Kangaroos are more tolerant of poor quality vegetation, and selection for bite size and biting rate may be more important to them than selection for bite quality.
- ii) There were surprisingly few differences between foraging tactics of males and females, given their diverse energetic and behavioural constraints. However, the social organization of the kangaroos may prevent ecological separation of the sexes and foragers may need to use their body reserves to even out the fluctuations of energy demands and supplies.
- iii) The two macropod grazers in this study showed highly selective grazing behaviour in comparison to ruminant grazers studied elsewhere, but they are, perhaps, as selective as wild bovids of a similar size that eat grass and browse. The narrower muzzle of the macropods enables them to forage selectively within the sward. The tussock structure of Australian native grasslands has probably encouraged selection for this grazing habit.

iv) The two macropod species were able to change their tactics in all foraging decisions in response to changes in pasture conditions. Some changes were dictated by changes in sward characteristics, but others were facultatively altered by foragers in order to meet their foraging goals.

v) There was some evidence that competition between group members set an upper limit on group size, but there was no evidence to suggest that the distribution of the preferred food items of wallabies was the major cause of their solitary behaviour. In its natural habitat the red-necked wallaby probably relies on crypsis to avoid predation but in the open pastures of Wallaby Creek it may use grouping behaviour as an anti-predator strategy. The social organizations of both species appeared to involve some cost; kangaroos in large groups interfere with one another more often whilst foraging, and wallabies devote more time and energy to vigilance behaviour (although this is partly a result of their smaller body size).

Table of Contents

Chapter 1: Introduction and Aims of the Study

1.1	The value of comparative studies	1
1.2	What is foraging behaviour? ...tactics and strategies	3
1.3	Foraging "decisions"	
1.3.1	What time of the day to forage?	6
1.3.2	How long to forage?	7
1.3.3	Where to forage?	7
1.3.4	What to ingest?	8
1.3.5	How fast to bite and how much to bite?	8
1.4	Aims of the study	10
1.5	The study species	13
1.6	The study populations	15

Chapter 2: The Study Site, Animal and Plant Communities

2.1	Introduction	16
2.2	The study site	
2.2.1	Location and climate	17
2.2.2	Vegetation and land use	18
2.2.3	Other herbivores in the valley	19
2.2.4	Predators in the valley	20
2.3	The study populations	
2.3.1	Individual recognition	22
2.3.2	Population classes	23
2.3.3	Population dynamics	25
2.4	Methods	
2.4.1	Field schedule	29
2.4.2	Animal records	29
2.4.3	Vegetation records	33
2.4.4	Statistical analyses	35
2.5	Seasonal changes in pasture and animals	
2.5.1	Changes in intertussock pasture conditions	38
2.5.2	Seasonal changes in the nitrogen levels of the most abundant vegetation species	39
2.5.3	Burning regimes and changes in burnt pasture	39
2.5.4	Body condition of the study populations	40
2.6	Summary	42

Chapter 3: 24-Hour Patterns of Activity and Movement

3.1	Introduction	43
3.2	Methods	
3.2.1	Introduction	47
3.2.2	Choice of focal animals	47
3.2.3	Recording methods	49
3.3	Success of followings	51

3.4	Activities and movements of eastern grey kangaroos	
3.4.1	General schedule of activity	52
3.4.2	Proportion of time devoted to different activities	53
3.4.3	Posture whilst surveying, at night and in the day-time	55
3.4.4	Feeding rates and total bite number	55
3.4.5	Differences in foraging behaviour between night and day	57
3.4.6	Scheduling of movement	58
3.4.7	Rates of movement	61
3.4.8	Changes in location of kangaroos	62
3.4.9	Total distance moved in 24 hours	62
3.5	Activities and movements of red-necked wallabies	
3.5.1	General schedule of activity	64
3.5.2	Schedules of movement	64
3.5.3	Total distance moved	66
3.6	Discussion	
3.6.1	The success of the 24-hour followings	67
3.6.2	24-hour schedules of activity for kangaroos and wallabies	67
3.6.3	Time-budgets and their relationship to the body sizes of kangaroos and wallabies	68
3.6.4	Foraging time and pasture conditions	69
3.6.5	Activity budgets of males and females	70
3.6.6	Movements of kangaroos and wallabies	71
3.6.7	Day-time and night-time activities and the nocturnal habit of macropods	72
Chapter 4:	Diet Selection and Feeding Site Location	
4.1	Introduction	74
4.2	Methods	
4.2.1	Sources of data used in this chapter	79
4.2.2	Data collection and analyses from searches	79
4.2.3	Data collection and analyses for the vegetation surveys	81
4.3	Results	
4.3.1	Use of burnt areas	82
4.3.2	Distribution of kangaroos and wallabies in relation to ground cover	86
4.3.3	Use of different sward components	90
4.3.4	Use of different ground species	93
4.3.5	The distribution of kangaroos and wallabies in relation to the amount of dead vegetation in the sward	96
4.3.6	Dietary analysis	98
4.3.7	Diet selection in 'cafeteria trials'	103
4.4	Discussion	
4.4.1	Use of burnt vegetation	109
4.4.2	Use of cover	112
4.4.3	Ground species of feeding site and diet quality	113
4.5	Conclusions	118
Chapter 5:	Foraging Behaviour and its Relationship with Sward Characteristics	
5.1	Introduction	119
5.2	Methods	
5.2.1	3-Minute observations	124
5.2.2	Location of foraging observations	125
5.2.3	Seasonal delimitations	126
5.3	Results	
5.3.1	Comparison of kangaroos foraging on different vegetation components	127
5.3.2	Comparison of wallabies foraging on different vegetation components	132
5.3.3	Comparison of wallabies feeding in different vegetaion areas	133
5.3.4	Comparison of kangaroos feeding in two vegetation areas	136
5.3.5	Foraging behaviour of wallabies in relation to sward characteristics	143

5.4	Discussion	
5.4.1	Foraging on different components of the vegetation	146
5.4.2	The effect of sward characteristics on the foraging behaviour of wallabies	148
5.4.3	The effect of sward characteristics on the foraging behaviour of kangaroos	150
5.4.4	Sward characteristics and herbage intake: a comparison with ruminant species	151

Chapter 6: Comparison of the foraging behaviour of kangaroos and wallabies and their population classes

6.1	Introduction	154
6.2	Methods	159
6.3	Results	
6.3.1	Activity from 15-minute observations	161
6.3.2	Levels of alertness from 15-minute observations	162
6.3.3	Posture whilst surveying during 15-minute observations	164
6.3.4	Rate of surveying and length of surveying bouts during feeding	166
6.3.5	Rate of stepping	168
6.3.6	Displacement during 15-minute observations	169
6.3.7	Number of hops taken during 15-minute observations	170
6.3.8	Length of step-sequences during 15-minute observations	170
6.3.9	Feeding time spent in each accepted patch	172
6.3.10	Interactions with other conspecifics	173
6.3.11	Feeding rates	175
6.4	Discussion	
6.4.1	Vigilance behaviour and activity of kangaroos and wallabies	179
6.4.2	Comparison of the vigilance behaviour of males and females	181
6.4.3	A comparison between the species of the movement during foraging	182
6.4.4	Comparison of the movement of the two sexes	185
6.4.5	Comparison of the feeding rates of the species and sexes	185

Chapter 7: Group Size and Foraging Behaviour

7.1	Introduction	
7.1.1	What are groups?	187
7.1.2	Why do animals form groups?	188
7.1.3	The costs and benefits of grouping behaviour	192
7.2	Methods	194
7.3	Results	
7.3.1	Typical group size for kangaroos and wallabies	195
7.3.2	Effect of pasture type on within-season variations in group size	196
7.3.3	Effect of pasture type on between-season variations in group size	197
7.3.4	The effect of cover vegetation on group size	197
7.3.5	Comparison of the typical group sizes of different population classes	199
7.3.6	Comparison of grouping behaviour at night and in the day-time	201
7.3.7	The effect of group size on foraging behaviour	204
7.4	Discussion	
7.4.1	Seasonal changes in group size	208
7.4.2	Changes in group size with pasture quality	208
7.4.3	Group size and the availability of cover	209
7.4.4	Group size and population class	210
7.4.5	Group size in the day-time and at night	211
7.4.6	The costs and benefits of grouping behaviour	212

Chapter 8 Synthesis and Conclusions

8.1	Introduction	215
8.2	Appraisal of the methodology used in the study	216
8.3	Ecological overlap between the species and the opportunities for competition	
8.3.1	Activity schedules	218
8.3.2	Resting locations	218
8.3.3	Selection of feeding sites and diet	219
8.4	The relationship between body size, sociality and anti-predator behaviour	
8.4.1	Factors affecting group size	221
8.4.2	The costs and benefits of grouping behaviour	222
8.4.3	Vigilance behaviour	223
8.4.4	Why are wallabies less gregarious than kangaroos?	224
8.5	Comparison between two macropod grazers and large herbivorous mammals on other continents	
8.5.1	Selection and diet composition	226
8.5.2	Total foraging time and feeding rate	227
8.5.3	Response of foraging rates to changes in sward height	228
8.6	Foraging strategies and changes in pasture conditions	
8.6.1	Changes in total foraging time in 24 hours	
8.6.2	Changing the proportion of foraging time spent surveying the environment	231
8.6.3	Pasture conditions and foraging rates	232
8.6.4	Changes in bite quality with different pasture conditions	233
8.7	Changes in foraging behaviour with reproductive class	
8.7.1	Total foraging time	234
8.7.2	Vigilance behaviour	234
8.7.3	Feeding site choice and diet selection	234
8.7.4	Foraging rates and movement during foraging	235
8.7.5	Foraging tactics of males and females	236
8.8	The contribution of this study to foraging theory	237
8.9	The evolution of feeding styles and social organization in macropods	239

Appendices

- Appendix I: Schedule for calculating a body condition index for eastern grey kangaroos from a visual assessment of fat reserves.
- Appendix II: Means and statistical tests to accompany Table 6.11.
- Appendix III: List of scientific names for plants referred to by their common name in this thesis

List of Tables

Table 2.1 Descriptions of the 18 population classes identified for eastern grey kangaroos and 15 identified for red-necked wallabies.

Table 2.2 Total numbers of adult, sub-adult and young-at-foot eastern grey kangaroos in the study area at Wallaby Creek, each month from May 1985 to February 1988.

Table 2.3 Changes in the numbers of adult and sub-adult red-necked wallabies in the study area at Wallaby Creek, each month from May 1985 to June 1987.

Table 2.4 Categories and states of behaviour and posture used to describe eastern grey kangaroos and red-necked wallabies.

Table 3.1. Significant results for two-way analysis of variance of the proportion of 24 hours that focal animals spent in each activity, grouped by season and sex.

Table 3.2. Mean percentage of time spent in different activity states by males and females, in summer and winter.

Table 3.3. Comparison of the mean feeding rates and total bite numbers of kangaroos followed for 24 hours.

Table 3.4 Medians of day-time and night-time foraging parameters of kangaroos followed for 24-hour periods.

Table 3.5: The percentage of a day's total movement executed per hour by eastern grey kangaroos, in the six time periods defined in the text.

Table 3.6: The percentage of 5-minute periods, in the six time periods defined in Table 3.5, during which a change in location was recorded for the eastern grey kangaroo being watched.

Table 3.7: Average rates of movement, in metres per hour, for the whole of each time period, and for the full 24 hours, of male and female eastern grey kangaroo in summer (December to February) and winter (June and July).

Table 3.8. Comparison of mean daily distances moved by male and female kangaroos in summer and winter.

Table 3.9. The percentage of a day's total movement per hour by eastern grey kangaroos (n=24) and red-necked wallabies (n=4), in the six time periods defined in the text.

Table 3.10. Average rates of movement, in metres per hour, for all the eastern grey kangaroos and red-necked wallabies, in the six time periods.

Table 4.1. The percentages, of all sightings of kangaroos (EGK) and wallabies (RNW), of animals seen on burnt areas in late winter and summer, in each of four time periods.

Table 4.2 Indices of the preference of kangaroos and wallabies for burnt areas over unburnt areas in winter. The index is the ratio of the percentage of animals seen on burnt areas divided by the proportion of the searched area that was burnt.

Table 4.3. Two-way AOV table comparing the densities of kangaroos and wallabies on burnt and unburnt grid cells, using the Brown-Forsythe statistic for groups with unequal variances.

Table 4.4. A comparison of the percentages, of all sightings, of kangaroos and wallabies in areas providing cover in summer and winter, in each of four time periods.

Table 4.5 Indices of the preference of kangaroos and wallabies for areas providing cover, in winter and summer, in four time periods (T1-T4).

Table 4.6. Results of G tests comparing the frequencies of kangaroos and wallabies sighted on each of three cover types.

Table 4.7. The percentages of observations, on a subset of the populations, during which the focal animal was seen feeding on the intertussock sward, within mature tussocks, within mature blady grass, on burnt tussock shoots or on burnt blady grass shoots during 15-minute observations, in each of five seasons between January 1986 and July 1987.

Table 4.8. A comparison of the frequencies of kangaroos and wallabies sighted on each ground-sward type, in each season, and in each time period.

Table 4.9. A comparison of the percentages of kangaroos and wallabies, that were sighted on each of the ground-sward types, with the percentage of the search area covered by those types, in the 3 hours after first light and the 3 hours before dusk.

Table 4.10. The percentages, of all sightings of kangaroos and wallabies, of animals that were in cover, on each of the different ground-sward types, in summer and winter (all time periods).

Table 4.11 Analysis of variance of the proportion of dead vegetation, in burnt and unburnt patches, where kangaroos and wallabies were sighted, grouped by species(S), season(M) and time period(T).

Table 4.12 Significant results for multivariate analysis of variance with species (EGK or RNW) and season (July-Oct and Nov-Feb) as grouping factors.

Table 4.13 A comparison of the composition of the diets of kangaroos and wallabies and the availability of the grass species in relation to the proportion of the study area that they cover.

Table 4.14 Mean percentage of each of the 10 most important monocot species in five diet clusters produced by cluster analysis of the faecal analysis data.

Table 4.15 Frequencies of faecal samples belonging to each of four 'diet clusters' and grouped by species and season.

Table 4.16. Percentage of kangaroo faecal samples belonging to each 'diet cluster' in each of three seasons.

Table 4.17 Regression equations for cumulative pellet counts on each plot and comparison of regression lines for homogeneity of slopes using analysis of covariance.

Table 4.18 Number of pellets found on each plot (having accumulated in 24 hours) on Days 1, 5 and 9 after kangaroos were first allowed to feed on row 2 plots.

Table 5.1 Description of the variables calculated from the 3-minute observations which are used in this chapter and following chapters.

Table 5.2 The composition of non-tussock forming grasses growing inside and outside tussocks in May 1986.

Table 5.3 Medians of foraging parameters for kangaroos feeding outside and inside tussocks in Area 3.

Table 5.4 A comparison of the foraging of kangaroos on different vegetation components.

Table 5.5 A comparison of the foraging of wallabies on the intertussock sward and on burnt tussocks.

Table 5.6 A comparison of wallabies feeding in Areas 1 and 2 in winter 1986 (April-October) and summer 1986/87 (November-March).

Table 5.7 Comparison of the swards in Areas 1 and 2 in winter 1986 and summer 1986/87.

Table 5.8 Sward characteristics of Areas 3 and 4 in summer and winter 1986-1987.

Table 5.9 A comparison of kangaroos feeding in Areas 3 and 4 in four seasons between summer 1986 and winter 1987.

Table 5.10 Correlation matrix for the sward variables in Area 3.

Table 5.11 Partial correlations between each foraging variable for kangaroos and four sward variables in Area 3 for 11 months at the final stage of stepwise regression.

Table 5.12 Partial correlations between each foraging variable of kangaroos and four sward variables in Area 4, at the final stage of stepwise regression.

Table 5.13 Correlation matrix for the sward variables in Area 3.

Table 5.14 Partial correlations between each foraging variable of wallabies and four sward variables in Area 2, at the final stage of stepwise regression.

Table 6.1 Description of the variables, calculated from 15-minute continuous-observations, which are used in this chapter.

Table 6.2 Comparison of the proportion of time male and female kangaroos and wallabies spent biting/selecting bites in morning and afternoon time periods.

Table 6.3. Mean percentage of survey time (standing only) during which kangaroos and wallabies were "not alert" and "alert outside the group", in five different seasons.

Table 6.4. Percentages of Survey time spent in different postures in each of the five seasons between summer 1986 and pre-burn 1987.

Table 6.5. Comparison of the mean rate of lifting the head to survey during feeding and the mean length of the surveying bouts during feeding.

Table 6.6. Results of analyses of variance comparing the step-rates of kangaroos and wallabies in five seasons and comparing the sexes for each species.

Table 6.7. A comparison of the median and mean 15-minute displacements of kangaroos and wallabies in five seasons between summer 1986 and pre-burn 1987.

Table 6.8. A comparison of the percentages of kangaroos and wallabies taking no hops, less than 10 hops and more than 10 hops in a 15-minute period.

Table 6.9. Percentages of kangaroos and wallabies whose mean step sequence length was 1, greater than 1 but less than 2 ($1 < x < 2$) and greater than 2 ($x > 2$) steps.

Table 6.10 The percentage of 15-minute observations in which: the focal animal interacted with another conspecific; the majority of movements were away from the focal animal's nearest neighbour; the focal animal displaced another group member; and the focal animal was displaced itself by another group member.

Table 6.11 Significant results for the comparisons of 3-minute feeding observations, between species, on two vegetation areas and three swards dominated by different ground species.

Table 6.12. A comparison of the mean biting rates (bites/min) of male and female wallabies feeding in Area 1, in summer and winter.

Table 7.1. Typical group size of kangaroos and wallabies seen on systematic searches of the study area between August 1987 and February 1988.

Table 7.2. Results of two-way G-tests comparing frequencies in group size classes in summer and winter for each of four dominant ground species types.

Table 7.3 Percentage of kangaroos and wallabies seen in each group size class in areas with and without cover, in summer and winter. Morning and afternoon time periods are combined.

Table 7.4 A comparison of the percentages of kangaroos in each population class that were seen in groups of different sizes. The population classes are: large male; small male; females with pouch-young (female py); and females with young-at-foot (female yaf).

Table 7.5 A comparison of the percentages of wallabies in each population class that were seen in groups of different sizes. The population classes are: large male; small male; females with pouch-young (female py); and females with young-at-foot (female yaf).

Table 7.6 Comparison of the group sizes of focal animals that were followed for 24 hours (kangaroos only), grouped by sex of focal animal and season of the following.

Table 7.7 Differences in distances to the kangaroos of specified class nearest to the focal animals which were followed for 24 hours.

Table 7.8 Means of foraging parameters for kangaroos observed in groups of different sizes in summer and winter in Area 3 and in summer only in Area 4.

Table 7.9 Results of regressions of each foraging variable on group size of the forager, in Area 3 in summer and winter.

Table 7.10 Results of regression analyses of foraging parameters with group size, for wallabies feeding in Area 1 in summer and winter.

List of Figures

Figure 2.1 Monthly totals of rainfall during the study period, April 1985 to February 1988.

Figure 2.2 Monthly mean daily maximum temperature ($^{\circ}\text{C}$) during the course of the study period, April 1985 to February 1988.

Figure 2.3 Distribution of the forests and the pattern of land-use in the study area.

Figure 2.4 Boundaries of the blocks (1-11) that were searched each month between August 1987 and February 1988.

Figure 2.5 Location of the vegetation areas (Areas 1 to 6) where sward measurements and biting observations were made.

Figure 2.6 Surface height (cm) of the intertussock sward, in Areas 1 to 6, each month from December 1985 to February 1988.

Figure 2.7 Percentages of the sward surfaces in Areas 1 to 6 that were occupied by dead vegetation, each month from December 1985 to February 1988.

Figure 2.8 Nitrogen levels (g/100g of dry matter) in the leaves of carpet grass, paspalum and kikuyu taken from Area 3, each month between January 1986 and February 1988.

Figure 2.9 Distribution of the burned areas following fire in July 1987.

Figure 2.10 Mean body condition indices for a) male b) female and c) young kangaroos in each month between May 1986 and February 1988.

Figure 3.1 Mean percentages of each hour, in 24 hours, spent in different activities by eastern grey kangaroos in a) summer and b) winter.

Figure 3.2 Mean percentages of 24 hours spent in each of four activity states, in summer and winter, by a) male and b) female eastern grey kangaroos.

Figure 3.3 Mean interrupted biting rate in each hour, over 24 hours, for eastern grey kangaroos followed for 24-hour periods, in a) summer and b) winter.

Figure 3.4 Mean uninterrupted biting rate in each hour, over 24 hours, for eastern grey kangaroos followed for 24-hour periods, in a) summer and b) winter.

Figure 3.5 Mean biting ratio (+ s.e.m) each hour, over 24 hours, for eastern grey kangaroos followed for 24-hour periods, in a) summer and b) winter.

Figure 3.6 Mean percentages of the total distance moved in 24 hours, moved in each hour in a) summer and b) winter by eastern grey kangaroos.

Figure 3.7 Mean percentages of each hour, in 24 hours, spent in different activities by 4 red-necked wallabies.

Figure 3.8 Mean percentage of 24 hours spent in each of four activities by 4 red-necked wallabies.

Figure 3.9 Mean percentages of the total distance moved in 24 hours, moved in each hour by four red-necked wallabies.

Figure 4.1 Density (animals per hectare) of a) kangaroos and b) wallabies on burnt and unburnt areas in each month, for seven months following the burning of pasture in July 1987.

Figure 4.2 Nitrogen levels (g/100 g of dry matter) in leaves of burned grasses (swamp foxtail, kangaroo grass and blady grass) and unburned grasses (carpet grass, paspalum and kikuyu) in the months following the burning of pasture in July 1987.

Figure 4.3 The percentages, of all sightings of kangaroos and wallabies, of animals that were in areas providing each of three cover types, on unburnt areas in winter (a) and summer (d), and burnt areas in winter (b) and summer (d).

Figure 4.4 The percentages, of all sightings of kangaroos and wallabies, of animals that were in areas dominated by different ground vegetation species, in four time periods, in winter (a,c,e,g) and summer (b,d,f,h).

Figure 4.5 The percentages of dead vegetation in the swards where kangaroos and wallabies were sighted, in unburnt areas in winter (a) and summer (c), and burnt areas in winter (b) and summer (d), in each of four time periods.

Figure 4.6 The percentages of different grass species in the monocot fraction of the diets of a) kangaroos and b) wallabies, in each season: pre-burn (Mar-Jun); post-burn (Jul-Oct); and summer (Nov-Feb).

Figure 4.7 Diagram of the experimental plots used for the 'cafeteria' trails at Newholme Research Station.

Figure 4.8 Cumulative counts of the number of pellet groups (a) and pellet totals (b) accumulated over 24-hour periods, on each of the experimental plots, on 15 consecutive days following the introduction of the kangaroos to the plots.

Figure 6.1 Mean percentages of time that kangaroos and wallabies spent a) biting or selecting bites and b) surveying, in each of five seasons between January 1986 and July 1987.

Figure 6.2 The mean rates of kangaroos and wallabies raising their heads to survey during feeding bouts (head-up per minute), in each of five seasons.

Figure 6.3 The mean lengths of time, in seconds, for which kangaroos and wallabies surveyed during feeding bouts, in each of five seasons.

Figure 6.4 The mean number of steps taken per minute (+ s.e.m.) by male and female a) kangaroos and b) wallabies, during 15-minute continuous observations, in each of five seasons.

Figure 6.5 The mean length of time (in seconds) spent in each "accepted" patch, by male and female a) kangaroos and b) wallabies, during 15-minute continuous observations, in each of five seasons.

Figure 7.1 Percentages of kangaroos (a) and wallabies (b) sighted on each of four dominant ground types in winter 1987, which were seen in groups of different sizes.

Figure 7.2 Percentages of kangaroos seen in groups of different sizes, on each of four swards dominated by different ground species, in summer and winter.

Figure 7.3 Percentages of wallabies seen in groups of different sizes, on each of four swards dominated by different ground species, in summer and winter.

Figure 7.4 Percentages of kangaroos seen in groups of different size in areas without cover, with blady grass cover and with tussock grass cover, in summer and winter.

Figure 7.5 Percentages of wallabies seen in groups of different size in areas a) without cover, b) with blady grass cover and c) with tussock grass cover, in summer and winter.

Figure 7.6 Means of the sizes of the groups that focal kangaroos were in recorded at half-hourly intervals over 24 hours.

List of Plates

- Plate 1 Large male eastern grey kangaroo. Note the large body size, long forearms, large claws and heavy muscle on the chest and shoulders.
- Plate 2 Female eastern grey kangaroo with her young-at-foot.
- Plate 3 Small female red-necked wallaby resting amongst tussock grasses and blady grass.
- Plate 4 Female red-necked wallaby with a large pouch-young foraging on weeping grass *Microlaena stipoides* on the floor of a gully.
- Plate 5 View of part of the study area, taken from the cleared eastern slopes, facing the valley floor and western forest.
- Plate 6 View of the northern forest with its ground vegetation layer dominated by kangaroo grass *Themeda triandra*.
- Plate 7 View of Area 5 at the height of the drought in August 1986.
- Plate 8 View of Area 2 at the height of the drought in August 1986.
- Plate 9 View of tussocks and the intertussock sward of Area 5 in August 1986. Note the green shoots in the tussocks and the large proportion of bare ground.
- Plate 10 View of the intertussock sward in Area 5 six months later. Note the carpet grass seed heads on the sward surface.
- Plate 11 View of the intertussock sward in Area 2 in August 1986. Clover is the dominant green leaf in the sward.
- Plate 12 View of the intertussock sward in Area 2 six months later. Note the leafy forbs and seed heads of paspalum and carpet grass.
- Plate 13 Surface view of the carpet grass plot in the first row of the experimental plots.
- Plate 14 Surface view of the paspalum plot in the first row of the experimental plots.
- Plate 15 Surface view of the clover plot in the first row of the experimental plots.
- Plate 16 Surface view of the kikuyu plot in the first row of the experimental plots.
- Plates 17 and 18 Small female eastern grey kangaroo foraging within tussocks and with her head raised, chewing and surveying.
- Plate 19 View of Area 1 in August 1987
- Plate 20 Sward of Area 1 in August 1987
- Plate 21 View of Area 1 in February 1988

Plate 22 Sward of Area 1 in February 1988

Plate 23 View of Area 2 in August 1987

Plate 24 Sward of Area 2 in August 1987

Plate 25 View of Area 2 in February 1988

Plate 26 Sward of Area 2 February 1988

Plate 27 View of Area 3 in August 1987

Plate 28 Sward of Area 3 in August 1987

Plate 29 View of Area 3 in February 1988

Plate 30 Sward of Area 3 February 1988

Plate 31 View of Area 4 in August 1987

Plate 32 Sward of Area 4 in August 1987