



**Resource use and preference of the
southern ningai, *Ningai yvonneae*
(Dasyuridae: Marsupialia), in the Middleback
Ranges, South Australia.**

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Contents

Abstract	i
Statement of originality	iii
Acknowledgements	iv
Chapter 1 The use and selection of resources	1
1.1 Introduction	1
1.2 Making decisions regarding resource use	3
1.2.1 Considering risk	4
1.2.2 Accessing and obtaining resources	6
1.3 Resource selection in dasyurids	8
1.4 The genus <i>Ningau</i>	10
1.5 The purpose of this study	12
Chapter 2 General methodology	14
2.1 Study Site	14
2.2 Trap design, trapping effort and animal processing	15
2.3 Seasons	16
Chapter 3 Population ecology	18
3.1 Introduction	18
3.2 Methods	18
3.2.1 Trapping and data collection	18
3.3 Results	19
3.3.1 Trends in population abundance and recapture rates	19
3.3.2 Sex ratios	23
3.3.3 Life history and reproduction	23
3.3.4 Growth and development	26
3.4 Discussion	27
Chapter 4 Movement patterns and behaviour	32
4.1 Introduction	32
4.2 Methods	33
4.3 Results	34
4.3.2 Distance moved	35
4.3.3 Trapping grid fidelity	39
4.3.4 Radio tracking	39
4.4 Discussion	41

Chapter 5	Habitat preferences	44
5.1.	Introduction.	44
5.2	Methodology	45
5.2.1	Animal trapping	45
5.2.2	Habitat measurements	45
5.2.3	Statistical analysis	46
5.3	Results	47
5.3.1	Local scale	47
5.3.2	Trap scale	48
5.4	Discussion	51
Chapter 6	Foraging behaviour and habitat selection	54
6.1	Introduction	54
6.2	Methods	55
6.2.1	Habitat use	55
6.2.2	Habitat measurements	58
6.2.3	Data analysis	58
6.3	Results	60
6.3.1	Habitat availability	60
6.3.2	Habitat use	61
6.3.3	Behaviour and use of habitat	63
6.4	Discussion	69
Chapter 7	Diet and prey preferences	73
7.1	Introduction	73
7.2	Methods	74
7.2.1	Prey consumption	74
7.2.2	Sampling prey availability	74
7.2.3	Statistical analysis and definitions	75
7.3	Results	76
7.3.1	Prey availability	76
7.3.2	Observed prey consumption	77
7.3.3	Faecal and stomach contents	81
7.4	Discussion	86
Chapter 8	Influence of predation on behaviour and habitat preference	91
8.1	Introduction	91
8.2	Methods and results	92
8.2.1	Giving up density	92
8.2.2	Behavioural trials	93
8.4	Discussion	97

Chapter 9	Discussion and conclusion	101
References		108
Appendices		
A.1	Observations of the response to pit-fall drift fences	122
A.2	Observations on foraging behaviour	126
A.3	The introduction of ningauis to the laboratory	130

Abstract

This study was the first detailed investigation on the ecology of the southern ningauai (*Ningauai yvonneae*). It focused on the use of resources by this small nocturnal species, with particular reference to diet and habitat. Baseline information on *N. yvonneae*'s biology and population ecology found that *N. yvonneae* had an annual and seasonal breeding cycle which commenced after winter (early October). This was thought to be linked to the increase in prey availability and timed to maximise the opportunities for juveniles to survive the following winter (a time of stress for *N. yvonneae*). *N. yvonneae* was also recorded to have a relatively high capture rate, which was influenced by seasons. Investigation of movement behaviour found frequent but temporally spaced captures, which were thought to be indicative of large or drifting home ranges. *N. yvonneae* was also found to undertake regular large movements. There was much variation recorded within the population, with movement behaviour dependant on sex, season and location of capture. Females tended to be more sedentary than males and may establish larger home ranges. Males were more mobile, with short-term site fidelity. Seasonal differences in movement revolved around the breeding season, especially for males. In general, *N. yvonneae* was more sedentary during pre-breeding (winter) or post breeding (mature adults).

The distribution and abundance of *N. yvonneae* at the local scale were found to be influenced by *Triodia* and a combination of the cover of *Triodia* and shrub. At least some *Triodia* was required for *N. yvonneae* to be present in the landscape, while shrub was only used when *Triodia* was present. The requirement for cover was considered an indication that predation influenced *N. yvonneae* habitat selection. *Triodia* was also found to be important for foraging *N. yvonneae* during the investigation of fine-scale habitat use. However, ningauis used a wide range of habitat components, with some being more important at certain times of the year. Leaf litter was also used frequently for foraging, although ningauis tended to remain close to *Triodia*. Underground was used specifically as a refuge, mostly in cooler temperatures. Overall, habitat use by foraging ningauis was influenced by season, including a reduced use of *Triodia* during winter, possibly due to reduced predation, reduced prey (requiring more foraging time) or predators (snakes) using *Triodia* themselves as a refuge.

Examination of dietary preferences showed that *N. yvonneae* consumed a wide range of prey. Although considered a dietary generalist, ningauis showed some a distinct preference for

certain taxa, including Blattodea, Orthoptera, Chilopoda, Lepidoptera and Araneae. There were noted differences in prey consumption between sexes, possibly because of different nutritional requirements or because of varying habitat preferences. The effect of predation risk on *N. yvonneae* was also investigated. Due to the nature of the habitat (in particular, the regular availability of *Triodia*), predation was thought to have only a marginal impact on behaviour at a fine scale. However, at a broader scale, it was believed that predation may have a greater effect on habitat selection and the distribution of *N. yvonneae*.