

2003 Progress Report
Ecological Aspects of *Pseudomys shortridgei* (Heath Mice) in Southern Western Australia

Summary of Field work over the Last Twelve Months

- 5/3/03 – 14/3/03: Fitzgerald River National Park (1100 trap nights)

Objective: To locate extant populations of *Pseudomys shortridgei* (Heath Mice).

Several sites were trapped within the Fitzgerald River National Park (FRNP) with no captures of Heath Mice. The first two sites, Moir Track and Hamersley Drive, were sites where successful past captures by Chapman and Sanders had occurred. A range of habitat types has now been sampled within the FRNP. Following a meeting with mine site managers, a tour of the RNO lease was undertaken to inspect the results of the major wildfire that impacted on the site and surrounding areas

- 25/3/03 – 28/3/03: Lake Magenta Nature Reserve (320 trap nights)

Objective: A reconnaissance of Lake Magenta Nature Reserve (LMNR) to sample predicted sites and test standard trapping methods.

100 Elliott traps were set out in three locations in the park resulting in the capture of two female *P. shortridgei*. These animals were recaptured each night, indicating no general trap or bait shyness.

- 5/5/03 – 14/5/03: Lake Magenta Nature Reserve (1260 Trap nights)

Objective: To undertake a more comprehensive surveys of known sites and commence ecological investigations.

Planned to coincide with the CALM Western Shield monitoring program of LMNR. The Heath Mouse component followed up the March trip by trapping each of the two sites (East Rd and Southern) that had previously yielded *P. shortridgei*. Two other smaller plots of 40 Elliott traps were set in possibly suitable vegetation. Four *P. shortridgei* were captured at East Rd and two were captured on the Southern grid. The smaller sites yielded no *P. shortridgei* captures.

Five animals were fitted with radio collars and their movements monitored for 6 days to begin to understand aspects of their ecology such as home range, territory issues and life histories. All collars were recovered prior to departing the site.

- 15/6/03 – 20/6/03: Ravensthorpe; Bandalup Hill (720 trap nights)

Objective: A Preliminary reconnaissance trip to Bandalup Hill to allow a more detailed inspection of the mining lease.

Traps were placed along the top of Bandalup Hill to determine if any *P. shortridgei* occupied the area. This trapping resulted in no *P. shortridgei* and only 2 *Rattus fuscipes* (Bush Rat) and 2 *Sminthopsis griseoventer* (Grey Bellied Dunnart) on the lower slope near the northern end of the hill. The vegetation on the top of

at LMNR 03/04.

to Vic

Bandalup Hill is considerably different to the heath vegetation of Lake Magenta and the FRNP and it is becoming clear that Heath Mice have historically utilised a wide range of habitat types.

Mal Grant (CALM) did notify us that a *P. shortridgei* had recently been found dead in a mousetrap at the Eremia Camel Farm in Ravensthorpe indicating that *P. shortridgei* are still present in the area.

- 8/10/03 – 15/10/03: Dunn Rock Nature Reserve and Dragon Rocks Nature Reserve (1137 trap nights)

Objective: To survey historical sites for extant populations of Heath Mice.

P. shortridgei have been caught in Dragon Rocks Nature Reserve (DRNR) in the recent past (late 90's, early 00's) so this trip was planned to determine the presence of *P. shortridgei* in nature reserves near LMNR. After 3 nights trapping in Dunn Rock Nature Reserve (DuRNR) no *P. shortridgei* were captured even though comparable habitat was found. 3 nights trapping at DRNR also resulted in no captures of *P. shortridgei*.

- 11/11/03 – 20/11/03: Lake Magenta Nature Reserve (1422 trap nights)

Objective: To establish a permanent monitoring site and continue ecological studies.

Planned to coincide with the spring CALM monitoring of LMNR of which the CALM trapping resulted in 1 *P. shortridgei*. After setting up a permanent grid of 200 Elliott traps and 6 pitfall traps at the East Rd site, 10 *P. shortridgei* individuals were repeatedly captured giving a further indication of home range, territory issues and life history strategies. Four individuals were recognised as juvenile's giving and approximate breeding season of around September. An extra 60 Elliott traps were set at another likely site resulting in another four individuals at that site. 40 Elliott traps were also set for three nights at the sight where CALM staff caught one individual. This site was in Mallee scrub and after no success we think that that individual may have been transient, on the search for more suitable habitat.

- 19/01/04 – 25/01/04: Waychinicup National Park (660 trap nights)

Objective: To determine suitable techniques for looking at the effect of habitat change, caused by dieback, on rodents.

This trip was planned to complete two objectives. Firstly to look at field sites where a study could be completed to look at the effect that the plant pathogen *Phytophthora cinnamomi* has on the habitats of *Rattus fuscipes* (Bush rats). Secondly to practice different methods of attaching radio collars to large/medium sized rodents to enable more effective use of the radio collars at the Lake Magenta site in March this year. Eight *R. fuscipes* individuals were repeatedly captured over the 6 nights that we trapped. One animal was fitted with a radio collar on 20/01/04 and tracked over the week and he remained on the eastern side of the trapping grid. Traps were moved over the last two nights to the area immediately around the collared animal but there was no success in recapturing the animal.

- 02/02/04 – 06/02/04: Bandalup Hill, Ravensthorpe (994 trap nights)

Objective: To survey Bandalup Hill for Heath Mice

Scheduled to precede any further disturbance and construction at Bandalup hill, a survey was undertaken of the proposed mine footprint for any detectable populations of *P. shortridgei* (heath mice). Andy Chapman assisted with locating the past capture sites of *P. shortridgei* on the lease. Traps were set at each of the two sites that were unaffected by the Jan 03 wildfires. One site to the north and one to the west have been burnt out. Once again vegetation varied considerably from Lake Magenta NR and other historical sites. Traps were also set at two more sites around the hill. Over the four nights trapped only 11 *Mus musculus* (House mice), 1 *R. fuscipes* and 3 reptiles were caught.

- 15/03/04 – 26/03/04: Lake Magenta NR (1384 Elliott/ 24 pitfall trap nights)

Objective: To look at home range issues using radio telemetry

This year we are planning to focus our efforts on the populations at Lake Magenta NR. On the afternoon that we arrived we set up the east rd grid of 200 Elliots in an effort to catch enough individuals to attach radio collars. After a successful morning of 10 individual captures we attached 8 functioning collars and released them back onto the grid. The next morning only five animals (3 collared animals) were recaptured plus 6 new individuals. The East rd grid was then closed and 100 more Elliots were set up at a new site (South rd). This grid was set up for four nights and resulted in 8 individuals (4 male/ 4 female) being captured. Over this period all the collared animals were being tracked twice a day (morning/evening). The performance of the collars was poorer than we had hoped with many failing fairly quickly

Collar #	1	2	3	4	5	6	7	8
Days lasted	3	4	2	6	7	7	5	8

This has been attributed to the collars being 6 months old (from manufacture). The relatively limited data still shows fairly good results in terms of their relative territory and interactions. All animals were accounted for as having no collars even though only three collars were recovered.

Total Trap nights – 9021

Summary of Important findings So Far

Research to date has yielded significant information. Considerable effort has been made to establish the presence/absence of Heath Mice in many different locations. Surveys of all sites that had previously resulted in *P. shortridgei* records (Within the last 15 years) revealed that only one site, Lake Magenta NR, resulted in any captures.

This possible reduction in populations and distributions appears quite dramatic. We can only speculate reasons at this point in time but the significant reduction in rainfall experienced in 2002 may have resulted in a contraction of the species to more optimum habitat. In the case of Bandalup Hill itself this may be a significant factor compounded by the impact of exploration and test mining

undertaken to date. The major wildfire of 2003 and impact of feral predators may also be factors at this site. Following the near average rainfall of last year we may be able to detect some reversal of these trends in future work.

Initial radio-tracking work has revealed significant information. Firstly *P. shortridgei* build multiple shallow burrows, usually dug under a low bush, in which they seek shelter. They utilise several burrows that may be visited by other Heath Mice but not concurrently it appears. They also seem to be more active diurnally than once thought and they will move considerable distances if disturbed during the day. Reproduction times also seem to differ from the *P. shortridgei* in Victoria, with the Victorian Mice Breeding in Nov-Jan and the WA mice breeding around September.

Changes in Research Focus

After the first year of my research it has become obvious that certain areas of study will have to change. The interactions and competition aspects of the rodent guild in Southern Australia will be dropped as this was only included as an option if no *P. shortridgei* were found but a significant population of *P. shortridgei* was found and sufficient data can be obtained to complete my PhD thesis. The second area of study that needs to be altered is the effect that the plant pathogen *Phytophthora cinnamomi* has on the ecology of the heath mouse. This is still an important part of my research but I believe that the outcomes and results that I will get from looking at the effect that *P. cinnamomi* has on *Rattus fuscipes* (bush rats) will be as valid when extrapolated to Heath Mice as any other small mammal interactions that have already been completed. But looking in the literature at other studies on the interactions between fauna and *P. cinnamomi* I believe I can answer as best as possible how a *P. cinnamomi* infection will affect the habitat of Heath Mice. Another reason for altering this section is due to the time and resources needed to complete it, which can be better used to further research aspects of the Heath Mice.

Work in Progress

Dietary analysis – Analyse scat samples to determine the diet of *P. shortridgei* through out the year. This analysis is planned to start 16/02/04. A suitable method has been determined and I foresee no major complications, as all equipment and materials has already been sourced.

Planned Fieldtrips

- 15/03/04 – 27/03/04: Lake Magenta NR – Primarily trapping and radio tracking. Continuation of vegetation survey and begin environmental factor survey for GIS - completed
- 3/05/04 – 14/05/04: Lake Magenta NR – Primarily trapping and possibly radio tracking. Complete Environmental Factor Survey.
- 30/05/04 – 6/06/04 – Lake Magenta NR Continue with trapping to help look at longevity of individuals in the population.
- 1/11/04 – 12/11/04: Lake Magenta NR – Trapping and Radio tracking

- September or October 04 – a trip will be planned in here but as yet we are not certain of where this trip will be focused.

Thesis Completion

1. Completed literature search and I am now working on the literature review.
2. I have begun working on the Thesis introduction.
3. Completed methods for scat analysis
4. Begun introductions for Chapters 2, 3 and 4.

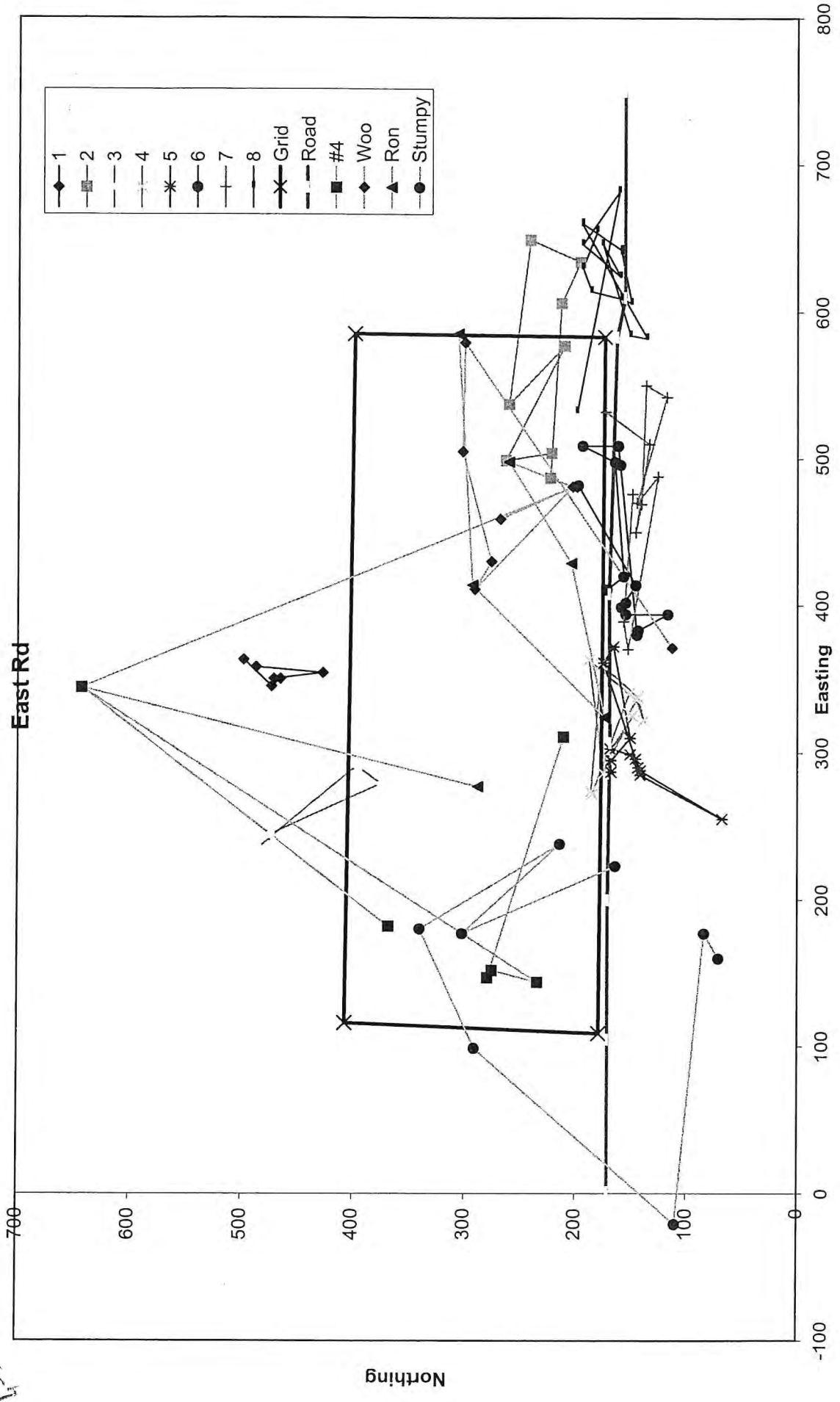
Skills Gained and Problems encountered

Even though I have only really just started my research project, the last year has taught me a huge number of skills such as animal identification, microchip implantation and scanning, radio tracking, animal handling, organizational skills (such as organizing a two week trip for three people that needs to be self sufficient), collaboration with peers and enhanced library research skills, as well the learning the proper use of various equipment such as Compass, GPS, 4X4 vehicles, Elliott and Cage traps, Radio collars and Radio receivers.

The amount of in kind support that I have received from the Department of Conservation and Land Management has far exceeded that which was originally hoped for. Principle technical officer Brent Johnson has made himself available for six of the eight field trips (Total of 7.5 weeks full time in the field) and has provided all trapping equipment, some radio tracking equipment and a huge amount of experience and Knowledge. Mal Grant (CALM – Ravensthorpe) has also given this project a lot of support by providing local knowledge of the Ravensthorpe region and giving us a few hours every trip for a chat and advice on any problems we are experiencing. Mitch Davies (CALM Operations officer – Katanning), Kris Narducci (CALM Reserves Officer – Katanning) and Nicole Weber (CALM Reserves Officer – Katanning) have also provided a large amount of support during the May and November Fieldtrips to Lake Magenta.

This research project is also allowing newly graduated students and postgraduate students the opportunity to gain field experience. So far six individuals have volunteered for my field trips where they have learnt various skills such as trap setting and placement, animal handling and identification, navigational skills etc. This has been an unexpected bonus for me as it helps my own learning having volunteers from various backgrounds attend my field trips.

The only difficulty that I have encountered thus far is finding heath mice, apart from at Lake Magenta NR. But I guess you get that when you are researching rare native fauna.



Handwritten note: Survey of the road and the area around it.

