World Wide Fund for Nature Australia

Progress Report No. 2

P145 The Status and Conservation of the Western Mouse (Pseudomys occidentalis)

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by

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1. Objectives

a) To determine the distribution and status of the Western Mouse (Pseudomys occidentalis) in the south-west of W.A.

b) To assess the habitat requirements and other factors which may determine this species distribution.

c) To assess the impact of fire, exotic predators, and rabbit control programs on the Western Mouse.

d) To prepare a species management program for this species.

2. Methodology

This project commenced in January 1990 when Mr Leigh Whisson was employed as a consultant to undertake the work. A meeting between Mr Whisson and the Principal investigators was held just prior to this, in December 1989, to develop a work program. This is shown in Appendix 1. In September 1990, Mr Whisson was seconded for 6 weeks to work on a program to eradicate the introduced Black Rat (Rattus rattus) on Barrow Island. With the approval of the WWFFN this extended the work program to be completed in mid August 1992. A second meeting between Mr Whisson and the principal investigators was held in February 1991 to review the progress of the project.

3. Summary of Work to Date

3.1 Literature review

All published and unpublished information was collected on:

- the biology of the Western Mouse.
- the physical and natural characteristics of conservation reserves within the known range of the Western Mouse.
- current management practices on these reserves.
- sympatric species, particularly rodents.
- predator species, particularly exotics.

3.2 Western Mouse distribution and biology:

In January and February 1990 nature reserves in the southern wheatbelt where the Western Mouse had previously been recorded were inspected. Other reserves with similar habitat were also inspected and a list of reserves to be surveyed for the Western Mouse was prepared. These reserves are listed in Table 1 and their location shown in Figure 1. Between March 1990 and February 1991, several of these reserves were surveyed for the Western Mouse (Table 1). Both Elliott and pit trapping techniques have been used in these surveys. These surveys have not only provided information on the present distribution and biology of the Western Mouse, but also information on other native mammal species on the reserves (Table 2). Many of the reserves had not been surveyed for 15 - 20 years and this present work provides a useful comparison.

Long term study sites have been established at Anderson Lake Nature Reserve and Dragon Rocks Nature Reserve. These sites are surveyed with trapping grids,

covering 1 and 4 ha. respectively, every 6 weeks to assess seasonal population fluctuations, diet, reproduction, and the effect of exotic predators on the Western Mouse. Radiotelemetry is being used to determine home range size and burrow locations and characteristics. Radiotelemetry will also be used to determine if the Western Mouse moves into adjacent cleared farmland and hence if it is at risk from rabbit poisoning programs.

3.3 Assessing the impact of exotic predators.

The Dragon Rocks study site is to be used in an experiment to assess the impact of exotic predators (foxes and cats) on the Western Mouse. While it has been shown in other studies that the fox has been responsible for the decline of several species of medium sized marsupials, it's effect on smaller rodents has not been demonstrated. Little is known about the effect of cats on native rodents. It is proposed to test this through a fox and cat baiting program in one part of the study area and comparison of Western Mouse numbers in baited and unbaited areas. This program is being developed in conjunction with CALM regional staff. Pre-baiting population estimates are presently being obtained, and the baiting program will commence in June 1991. Dried meat baits containing 4.5 mg of 1080 will be laid along tracks in the area to be baited at 200 m intervals every 6 weeks for 10 months.

4. Results

4.1 Literature review:

A bibliography on the Western Mouse has been prepared and is shown in Appendix 2.

4.2 Western Mouse distribution and biology:

4.2.1 Distibution:
This survey has recorded the Western Mouse at Anderson Lakes, Dragon Rocks and Bendering Nature Reserves and at Fitzgerald River National Park. Initial problems in distinguishing between the Western Mouse and the Ash Grey Mouse (Pseudomys albocinereus) have been overcome. Other vertebrate species recorded are shown in Table 1.

At Dragon Rocks Nature Reserve trap success rates varied significantly, ranging between per 100 trapnights to per 100 trapnights.. Most animals were caught in February when juveniles from the previous breeding season were in the population and probably dispersing. Very few animals were trapped during the winter. At Anderson Lake Nature Reserve trap success rates did not vary as much.(see Figure. 2.)

4.2.2 Home range:
Radio tracking of four individual Western Mice was undertaken at Dragon Rocks Nature Reserve during February 1991. Animals moved up to 600 m linear distance .

4.2.3 Burrows:
Radiotracking revealed that the Western Mouse occupies burrows during the day. One of the burrows was excavated (Figure 3). This burrow was approximately two meters in length, and consisted of a vertical shaft to approximately 20 cm depth and a horizontal shaft burrow that looped with a small nesting chamber located on the center of the loop. Burrows were found in sandy clay loams and sandy clays, with a laterite component.

5. Breeding biology

Previously the breeding season was found to be early spring with the young emerging in the late spring, early summer period. The data collected during this project confirms this. The juveniles reach adult body weight (40-45 g) in 8-10 months and probably breed within their first year.

6. Habitat preferences

From initial observations made at reserves where the Western Mouse was caught, it appears that the preferred vegetation types are those that have been unburnt for 20-40 years and that contain areas with 90-100 % canopy cover at one or two levels ie. at 0.7 meters and 2-3 meters.

Soil types in these areas include sandy clay loams and sandy clays with a large component of laterite throughout, two of the three Dragon Rock trapping grids are located on or around granite outcrops.

7. Diet

Observations made by C.A.L.M. Katanning District Officers indicate that Western Mice are feeding on Hakea and Lepidosperma seeds and Hibbertia flowers and seeds. These observations were made during the day, after an animal was released.

On these reserves there is also a common occurrence, of Santalum accuminatum (Quandong) seeds, that have been chewed to obtain the kernels. On two of the reserves there are accumulations of nuts (in excess of 150-200 nuts) found under dense Divesia and Lepidosperma bushes (Anderson Lakes and Dragon Rocks). The mice appear to remove the nuts from under Quandong trees to the dense bushes for cover and protection as very few chewed nuts are found in the proximity of the tree.

It appears that the Western Mice are using these nuts as a protein source but there dependance on this source has yet to be determined.

Western Mice kept within the laboratory also readily eat the Quandong nuts in conjunction with other food stuffs. (Apples, Grapes and an assortment of seeds)

Analysis of stomach contents from specimens contained in the Western Australian Museum indicates that, vegetative matter and underground tubers and invertebrates (beetles) comprise a component of the Western Mouse diet.

4. Preliminary Recommendations for Management.

No recommendations for management can be made at this stage.

5. Work Still to be Completed

a) Further trapping of selected conservation reserves.
b) Collar and radio track individual animals at the long term study sites.
c) Assessment of habitat preferences, diet, reproduction and population parameters.
d) Assessment of introduced species predation (foxes and cats) herbivore competition (rabbits) and their control on Western Mouse populations.
e) Assess the impact of fire history on the Western Mouse
f) Development of a species management program.

6. Difficulties Encountered

None.

7. Reports and Publications Arising

"Daily News" Newspaper article on Endangered Species in W.A. (copy contained within Progress Report No. 1.).

8. Summary of Work Completed on the Projects Objectives

Objective a) To a large extent this has been completed, although there is still scope for further survey work on nature reserves within the Western Mouse known range, this will be undertaken between work on the long term study sites.

The status of the Western Mouse is still to be determined but due to its low densities and numbers and the small number of reserves on which it is found it should still be classified as rare and endangered.

Further trapping on five wheatbelt reserves where Western Mice were caught in 1975 indicates that they may have disappeared from two reserves, though they could still survive as only one trapping session has been undertaken at these sites.

Objective b) Due to the difficulty in finding suitable populations of the Western Mouse it has up until now been difficult to assess the factors determining the species distribution, though now we have developed two long term study sites this part of the project can now proceed Further trapping will continue on reserves within the Western Mouse known range

Objective c) Due to the difficulty in finding suitable populations of the Western Mouse assessing the impact of predation and fire history on Western Mouse populations has been difficult in the past. Now this section of the project can go ahead.

Objective d) The management plan can not be developed until further information can be collected on predation diet vegetation preferences and the impact of fire history on populations.

9. a) Budget: WWF Contribution

Financial Statement as at June 30 1990

Receipts 1989/90

January 1990		6 625.00	
April 1990	6 625.00		
August 1990	6 625.00		
January 1991		6 625.00	$26 500.00

Expenditure

Consultant's Salary	(35-08-752-01E)	23 500.00	
Equipment	(35-08-752-02K)	500.00	
Travel Costs	(35-08-752-03F)	1 339.00	
Miscellaneous Costs	(35-08-752-04A)	1 000.00	
Publication Costs	(35-08-752-0SG)		$26 339.00

Balance on hand at January 30 1990 $ 161.00

b) Budget: CALM Contribution

For the six months to June 30th

	Expenditure V's	Budget
Salaries	$ 15 600.00	$ 15 500.00
Equipment	$ 2 090.00	$ 2 000.00
Maintenance	$ ---	$ ---
Travel	$ 6 500.00	$ 6 700 00
Administration	$ 2 000.00	$ 2 000.00
TOTAL	$ 26 190.00	$ 26 200.00

Figure. 1. Location of sites surveyed and visited for the Western Mouse Project.
1. Bendering, Karlagrin and Roe, 2. Tarin Rock and North Tarin Rock, 3.Dragon Rocks, 4. Lake Grace and Lake Chinocup, 5. Dunn and Commander Rocks, 6. Lake Magenta, 7. Anderson Lakes Nature Reserves 8. Fitzgerald River National and 9. Frank Hann National Park, 10. Ravensthorpe Range.

APPENDIX 1
Western Mouse - Work Program

1990

Jan-March

a) review literature
b) purchase maps, equipment etc.
c) select survey sites
d) collate reserve information
e) organize field program, data sheets, etc.

March-Dec

a) survey previous sites for presence / absence
b) determine preferred vegetation associations
c) select and survey other sites
d) begin detailed surveys of 2 or 3 selected populations collecting data on the following:

- diet
- abundance estimates
- burrowing activities
- reproduction
- movements - radio-tracking
- effect of fire and introduced species
- effect of baiting program for foxes and rabbits

1991

a) continue detailed surveys of selected populations
b) input and analyse data

1992

Jan-March

a) complete above

April-September

a) prepare final report
b) prepare draft wildlife management program

Figure 3. Diagram of Western Mouse burrow located at Dragon Rocks Nature Reserve.