RECOVERY PLAN
FOR
THE CENTRAL ROCK-RAT
Zyzomys pedunculatus

A report submitted to, Endangered Species Program
– a program of the Natural Heritage Trust
–
Project N^{o} 583

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for the

Central Rock-rat Recovery Team

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Natural Heritage Trust
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PARKS AND WILDLIFE COMMISSION NORTHERN TERRITORY

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SUMMARY

Current species status:
Critically endangered (IUCN 1996). Previous distribution included Cape Range WA, Uluru–Kata Tjuta National Park, James Range, West MacDonnell Ranges, Mt Liebig, Napperby Station, Devils Marbles, The Granites (Tanami Desert), and Davenport Range. Currently known only from a 77 km length of the West MacDonnell Ranges. Populations are disjunct and density is low.

Habitat requirements and limiting factors:
There is insufficient data available to define specific habitat requirements or limiting factors. This lack of data will be addressed by the implementation of this Interim Recovery Plan.
Zyzomys pedunculatus has been found in only 17 sites in a range of habitats from tussock and hummock grasslands to low open woodland on ridge tops, cliffs, scree slopes, hills and valley floors. Several habitats share the following characteristics: south or east facing, a high proportion of rock outcrop, very steep slope, very stony soil surface, presence of Native Pine *Callitris glaucophylla* and Hill Mulga *Acacia macdonnelliensis* and close proximity to dense spinifex *Triodia brizoides* and *T. spicata*, however, some sites contain only a few of these elements. The limiting factors are unknown, however, fire shadow areas with a particularly high number of rare or fire sensitive plants may act as refugia during hard times. The number and size of fire shadow vegetation patches available may limit the area which can be recolonised by *Zyzomys pedunculatus* during good times and the speed with which recolonisation can take place. Predators appear to be in low numbers in the West MacDonnell Ranges and do not appear to be a significant limiting factor, however, the presence of horses and cattle may limit the central rock-rat to the higher slopes. It is possible that refugia may by areas that have been protected from fire and grazing.

Overall Objective:
To stabilise and maintain the species as at least Critically Endangered over the next two years.

Recovery Criteria:
The species stops decreasing and remains stable or increases over the two years of Interim Recovery Plan implementation.

Specific Objectives:
1 Clarify the distribution, population size and trends and specific habitat requirements of *Z. pedunculatus*
2 Develop and implement appropriate management strategies to secure the known sub-populations
3 Maintain captive populations
4 Investigate those aspects of the biology of the central rock-rat which can be carried out on captive animals
5 Raise the profile of central rock-rats in the community

Recovery Actions:
1 Using Biophysical Mapping to aid in site selection, establish the extent of central rock-rat distribution
2 Establish the size of some known sub-populations, monitor changes to those sub-populations and investigate threatening processes
3 Implement a fire management strategy for known central rock-rat sites
4 Capture additional animals for the captive breeding programme and maintain the captive population
5 Implement education and extension work
6 Operate the Recovery Team
7 Produce Reports and update the Interim Recovery Plan to a full Recovery Plan

Estimated Costs of Recovery (in $000/year)

YEAR	1	2	TOTAL
ACTION			
1.1	44.9	46.7	**91.6**
1.2	115.0	133.3	**248.3**
2.1	53.3	55.9	**109.2**
2.2	0	0	**0**
3	26.2	27.6	**53.8**
4.1	0	0	**0**
4.2	12.3	13.0	**25.3**
5	6.5	4.0	**10.5**
6	6.5	7.1	**13.6**
7	17.7	38.9	**56.6**
TOTAL	**282.4**	**326.5**	**608.9**

Biodiversity Benefits

- Resolution of the current distribution of the central rock-rat and an estimation of the size of the population
- Increased knowledge of the biophysical attributes of the central Australian ranges
- Protection from fire of rare and fire sensitive plants and fire shadow areas in the MacDonnell Ranges
- Protection of habitat in which central rock-rats are known to be found. This will also benefit other species which use this habitat e.g. common brushtail possum, black-footed rock-wallaby
- Distribution information of non-target species will be collected concurrently with that of the target species

Contributors to the Interim Recovery Plan

Endangered Species Program
Parks and Wildlife Commission of the Northern Territory
Alice Springs Desert Park
Department of Conservation and Land Management
Threatened Species Network
Bushfires Council of the Northern Territory
Central Land Council

1.0 INTRODUCTION

1.1 Description of the species

The central rock-rat is a small native rodent weighing about 50 – 120 g. It has harsh, long, yellow-brown fur above and cream or white fur below. Adults are strongly built and have a distinctive "Roman nose" and a fat, carrot-shaped tail (Watts and Aslin 1981). Rock-rats are known to lose their tails, fur and skin very easily and are, therefore, difficult to handle.

Many arid zone mammals undergo large fluctuations in the size of their populations, usually associated with variations in rainfall. It is not unreasonable to assume that this is true for the central rock-rat.

1.2 Distribution

The central rock-rat was first scientifically described in 1896 by Edgar Waite after the Horn Scientific Expedition to central Australia. The specimens were found at "Alice Springs" and Illamurta in the James Range (Spencer 1896). H. H. Finlayson (1961) expanded the range of the species by including The Granites, Hugh Creek, Napperby Hills and Davenport Range although he described it as being rare. Cave deposits of bones show central rock-rats to have been present in the Cape Range (1993), Uluru Kata-Tjuta National Park (Baynes and Baird 1992) and the West MacDonnell Ranges (Johnson and Baynes 1982). Anecdotal evidence also suggests that the species occurred at Mt Barkley and the Devil's Marbles.

Until the 1996 capture, the central rock-rat had not been seen since 1960 when a single specimen was caught raiding a stockman's tuckerbox near Mt Liebig,. Since that time several species-specific searches in the former locations and general fauna surveys had been conducted in the West MacDonnell Ranges without success.

On September 3, 1996 Australian Trust for Conservation Volunteers trapped an animal which was later identified from photographs as the central rock-rat. Since that time sub-populations have been found at 15 other sites over a small area of the West MacDonnell Ranges. The full range of the current distribution of the species is unknown.

1.3 Population Size and Structure

The size of the population is unknown. There is also nothing known about social interactions, sex ratios, nesting behaviour, group dynamics or other aspects of population structure.

1.4 Habitat

Very little is known of the habitat requirements of *Z. pedunculatus*. They have been found in a variety vegetation communities from hummock grassland through low open shrubland over hummock grassland to low open woodland. Most sites with positive sign have been very steep southerly to easterly slopes, although, recent captures have been in the valley floor and on north facing slopes. All sites have had a high proportion of rock outcrop and a very stony soil surface. Vegetation elements common to most sites are *Callitris glaucophylla, Acacia macdonnellensis,* various tussock grasses and close proximity to dense spinifex.

1.5 Life History/Ecology

Despite the central rock-rat having been described over 100 years ago, almost nothing is known about its life history or ecology. Captive animals have bred and have had litters of 3, 2, 2, 2, 1, 1 and 4 (Karen Brisbane pers. comm.) Juveniles have been captured in the wild in June. Dietary analysis performed on scats has shown the central rock-rat to be primarily granivorous with leaf, fern sporangia and insects being taken in smaller quantities (Jefferys 1998).

1.6 Reason for Listing

The central rock-rat meets IUCN Red List category "Critically Endangered" under criteria B1+2a,b (IUCN 1994). Lee. (1995) listed it as Endangered and Critical using the earlier criteria of Mace and Lande (1991). The proposed ANZECC Threatened Fauna List 1999 lists *Z. pedunculatus* as Critically Endangered using 1994 IUCN guidelines.

1.7 Current Threats

Although current threats are unknown it is thought that grazing by stock and feral herbivores may have contributed to the decline of the central rock-rat. Feral predators (cats and foxes) could have a negative effect on the small, dispersed populations of the species. Fire may have a limiting effect on the spread of the central rock-rat by limiting the availability of suitable habitat.

1.8 Existing Conservation Measures

The West MacDonnell Range National Park has a fire management strategy in place to protect areas that contain rare plant species. This fire management strategy will help to protect the presumed refugia of the central rock-rat which generally correspond to areas containing rare plant assemblages.

2.0 RECOVERY OBJECTIVES AND CRITERIA

2.1 Overall Objective

To stabilise and maintain the species as at least Critically Endangered over the next two years.

2.1.1 Specific Objectives during the implementation of the IRP

1 Clarify the distribution, population size and trends and specific habitat requirements of *Z. pedunculatus*
2 Develop and implement appropriate management strategies to secure the known sub-populations
3 Maintain captive populations
4 Investigate those aspects of the biology of the central rock-rat which can be carried out on captive animals
5 Raise the profile of central rock-rats in the community

2.2 Recovery Criteria

1 Production of a map of known current distribution
2 A description of the habitat of known central rock-rat sites
3 Estimates of population size and trends
4 A knowledge of diet and reproduction
5 Implementation of a fire management strategy for ecological communities associated with rare and fire-sensitive plants and fire shadow areas in the MacDonnell Ranges
6 Increase community awareness and involvement in the conservation of *Z. pedunculatus*.

2.3 Recovery Actions

1 Using Biophysical Mapping to aid in site selection, establish the extent of central rock-rat distribution
2 Establish the size of some known sub-populations, monitor changes to those sub-populations and investigate threatening processes
3 Implement a fire management strategy for known central rock-rat sites
4 Capture additional animals for the captive breeding programme and maintain the captive population
5 Implement education and extension work
6 Operate the Recovery Team
1 Produce Reports and update the Interim Recovery Plan to a full Recovery Plan

3.0 RECOVERY ACTIONS

ACTION 1 Conduct Biophysical Mapping and establish the extent of central rock-rat distribution,

1.1 Conduct Biophysical Mapping

Biophysical Mapping is the mapping of the biological and physical attributes of the landscape. The landscape is mapped into Vegetation Units, each of which represents an area that is relative homogeneous with respect to the vegetation, landform, geology, plant community and soil. Vegetation Units are initially mapped on aerial photographs. Units are then ground truthed and described by detailed field survey. The unit description is extrapolated to other similar areas allowing us to predict the occurrence of particular plant species and communities and, therefore, the fauna species associated with them.

Biophysical Mapping has played a crucial role in identifying the occurrence of central rock-rat habitat and it is the keystone in selection of potential central rock-rat sites.

Responsibility: PWCNT

Cost	1999	2000
TOTAL	**1999**	**2000**

1.2 Investigate further sites

In order to determine the success, or otherwise, of the recovery actions, we need to know the species' current

distribution to be able to measure any expansion or contraction in range. Biophysical Mapping will be used to identify further sites for investigation in the East MacDonnell Ranges and some sites in the West MacDonnell ranges will be visited to clarify their status. Other sites will be identified using our current knowledge of broad habitat requirements of the species. Many of the sites will be in remote locations, often widely scattered and with little or no conventional access. In these instances it will be necessary to use helicopters. Occasionally, flying conditions are such that the helicopter is grounded. Under these conditions it may not be possible to check Elliott traps on a daily basis. Hair tubes will be used as they have proved to be the most practical central rock-rat detection technique available under these circumstances (remote, scattered locations, poor flying conditions) Elliott traps will also be used whenever practical.

During site investigations, potential sites for reintroductions will be noted. Reintroductions will be considered in the Recovery Plan once there is more data on the distribution, abundance and habitat requirements of the species.

Responsibility: PWCNT, CALM

Cost	1999	2000
TOTAL	**1999950**	**133300**

ACTION 2 Establish the size of some known sub-populations, monitor those sub-populations and investigate the processes threatening them

2.1 Establish the size of some known sub-populations and monitor those sub-populations

The success of any management regime can only be measured in terms of an increase in population size and an expansion in range of the species. To establish any change in population size we need to know the initial size of the population. This can only be established by estimating the size of the sub-populations.

The size of known sub-populations will be estimated using mark – recapture techniques.

To secure populations in the wild it is necessary to reduce or eliminate the threatening processes. Although fire is implicated in the decline of the species there may be other factors that have also contributed. It has been suggested that horses and cattle may have had a detrimental effect on Central Rock-rats. Predation by cats and foxes may also have had an effect, however, the density of these predators seems to be very low in the ranges. This study will attempt to determine potential threatening processes.

In order to know if the central rock-rat is secure in the wild we need to know if the sub-populations are increasing, decreasing or stable.

Selected sub-populations will be monitored for changes in population size using mark - recapture techniques.

Responsibility: PWCNT

Cost	1999	2000
TOTAL	**53292**	**55852**

2.2 Investigate threatening processes

Potential threatening processes will be identified during monitoring trips.

Responsibility: PWCNT

Cost	1999	2000
TOTAL	**0**	**0**

ACTION 3 Implement a fire management strategy for rare and fire sensitive plants and fire shadow areas

A fire management strategy developed to protect the rare plants, fire sensitive plant communities and fire shadow areas in the MacDonnell Ranges will be implemented to protect central rock-rat refugia. A fire management strategy such as this will not only protect central rock-rat habitat, it will also afford protection to other rare and fire sensitive plant communities and species which inhabit them e.g. common brushtail possums. Any off-park fire management will require the permission of the landowner. The Bushfires Council of the Northern Territory will be available to facilitate off-park burning if this is required.

Responsibility: PWCNT

Cost	1999	2000
TOTAL	**1999**	**2000**

ACTION 4 Capture additional animals for the captive breeding programme and maintain the captive population

4.1 Capture additional animals for the captive breeding programme

If it is deemed necessary, additional animals will be captured from larger sub-populations during monitoring exercises to supplement the captive breeding program. Genetic analysis may show sufficient genetic variability in the existing captive population at the ASPD. If this is the case no new animals may need to be added to the ASDP population. It is hoped that the genetic work will be carried out prior to the implementation of this Interim Recovery Plan. It may be necessary, however, to capture more animals to establish breeding populations in other institutions.

Responsibility: PWCNT

Cost	1999	2000
TOTAL	**0**	**0**

4.2 Maintain the captive population

The captive breeding population will be maintained at the Alice Springs Desert Park. ASDP staff will negotiate with other institutions interested in breeding central rock-rats, and will liaise with these institutions. Data collected from the captive population will add to our knowledge of the biology of the species as well as producing sufficient central rock-rats to allow for a reintroduction if this is deemed necessary. Captive animals may go on display at the Alice Springs Desert Park as part of the public education programme.

Responsibility: ASDP

Cost	1999	2000
TOTAL	**1999**	**2000**

ACTION 5 Implement education and extension work

The project officer will disseminate information to the community through press releases, popular magazine articles and the Threatened Species Network newsletters. The Alice Springs Desert Park will also be an outlet for information. The project officer will give full cooperation to the media e.g. film makers, and journalists. Community involvement will be encouraged through the Threatened Species Network and the PWCNT "Volunteers in Parks" scheme. A professional wildlife photographer will be commissioned to photograph the central rock-rat at ASDP as high quality photographs are needed for use in publications and presentations.

Responsibility: All Recovery Team members

Cost	1999	2000
TOTAL	**1999**	**2000**

ACTION 6 Operate Recovery Team

Recovery team meetings will be held once per year. The Central Rock-rat Recovery Team will meet as part of the Arid Zone Recovery Teams combined meeting to keep costs to a minimum. The operation of the recovery team will be administered by PWCNT as the lead agency. Team members will meet their own costs to attend meetings.

Responsibility: All Recovery Team members

Cost	1999	2000
TOTAL	**1999**	**7100**

ACTION 7 Produce Reports and update the Interim Recovery Plan to a full Recovery Plan

Information obtained from the actions of the Interim Recovery Plan should be sufficient to update it to a full Recovery Plan. The cost of preparing the Recovery Plan will be administered by PWCNT as the lead agency. This action will include preparation of progress and annual reports by PWCNT.

Responsibility: All Recovery Team members

Cost	1999	2000
TOTAL	**1999**	**38900**

4.0 IMPLEMENTATION SCHEDULE

Action N^{o}	Action	Priority	Feasibility	Responsible party	Cost Estimates ($000)		Total
					1999	2000	
1.1	Conduct Biophysical Mapping	1	100%	PWCNT	**1999**	**2000**	**0**
1.2	Investigate further sites	1	100%	PWCNT	**1999.0**	**2000**	**0**
2.1	Establish size of some known sub-populations and monitor those sub-populations	2	100%	PWCNT	**53.3**	**55.9**	**109.25**
2.2	Investigate threatening processes	2	60%	PWCNT	**0**	**0**	**0**
3	Implement fire management strategy	1	100%	PWCNT	**0**	**0**	**0**
4.1	Capture additional animals	2	80%	PWCNT, ASDP	**0**	**0**	**0**
4.2	Maintain captive population	1	100%	ASDP	**03**	**13.0**	**16**
5	Continue education and extension	2	100%	PWCNT, ASDP, CALM,TSN, ESP	**3**	**13.0**	**16**
6	Operate Recovery Team	1	100%	PWCNT, Recovery Team	**3**	**13**	**13.6**
7	Produce Reports and Recovery Plan	1	100%	PWCNT, Recovery Team	**3**	**13**	**13.6**

5.0 ACKNOWLEDEMENTS

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