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A SURVEY OF BARROW ISLAND FOR THE BLACK-FLANKED ROCK-WALLABY (Petrogale lateralis lateralis)

by

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INTRODUCTION

Rock wallabies (genus *Petrogale*) are found only in Australia and offshore islands and are not present in Tasmania or Papua New Guinea (Strahan 1983). As their name implies, rock wallabies live in rocky habitats and prefer steep rocky slopes, cliffs, boulders and gorges (Sharman and Maynes 1983).

Currently 23 taxa of rock-wallabies have been described (Briscoe *et al.* 1982) but there has been little agreement as to the status of these taxa.

The type specimen of *Petrogale lateralis lateralis* was described from Western Australia in 1842 (Sharman and Maynes 1983). Common names for this species include black-footed and black flanked rock wallaby. The latter name is preferred as this distinctive feature is more evident in the field (Hall and Kinnear 1991).

P.l.lateralis is discontinuously distributed within Western Australia from the western Pilbara to the Little Sandy Desert and also occurs on Salisbury Island in the southern Ocean and Barrow island off the north-west coast. Figure 1 illustrates the known sites where populations have been recently confirmed.

On Barrow Island Butler (1964) reported that rock-wallabies "occur mainly on the west coast and no trace was found on the east coast... colonies occur in the cliffs both at sea level and at 200 feet". WAPET's Environmental Review states (p. 63) "population estimates have not been conducted for rock wallabies... the only estimate available in 500 plus from surveys in the 1960's.

The aim of our study was to conduct a survey of the distribution and abundance of the black-flanked rock-wallaby on Barrow Island and compare our data with the information available from the 1960s.

METHODS

Following on from Butler's 1964 report, studying aerial photos of Barrow Island and discussions with Russell Lagdon we concentrated our efforts on the west coast of the island between Cape Malouet and The Chair. We also surveyed isolated inland areas such as around wells Q21, T12 and R84. Other sites on the east and north coasts and rocky inland areas were also examined.

At each site we walked along the cliffs and slopes and recorded:

a) number of rock-wallabies sighted;
b) scat density;
c) physical attributes such as the abundance of ledges and cover and the occurrence of *Ficus* trees which are often used as shelter.

We spent six nights spot-lighting in order to verify our day-time observations.

At John Wayne Country we set eight Bromilow traps for five consecutive nights in order to live-trap animals. When a rock-wallaby was captured it was ear-tagged, weighed and measured and bled for DNA profiling. The animal was then released at the point of capture.

RESULTS

1. Sites

Table 1 records the sites examined during this survey. We examined a range of sites with various physical attributes in order to accurately define the habitat of the animals on the island.

Table 1. Sites examined on Barrow Island for rock-wallabies.

SITE NO.	LOCATION
1	Between Y63M and Y14M, centred on Y23M.
2	Between S27, T12 and YS88.
3	Between S84 and S47, centred on John Wayne Country
4	Between Q21 and Q32.
5	Between Turtle Bay, R37 and R43, centred on Biggida Creek.
6	Between Boggs Beach, R87 and K23.
7	Between The Ledge, J48 and The Chair.
8	Cape Dupuy.
9	Perentie 1.
10	Perentie 2.

Table 2 documents the density of scats at each site in relation to the physical attributes of the sites and the relative abundance of spinifex. Spinifex was chosen as a site-indicator because we always observed rock-wallabies eating this grass at night.

Table 2. Rock-wallaby scat density and characteristics of the sites.

SITE	SCAT DENSITY*	FOOD ABUNDANCE	PHYSICAL ATTRIBUTES
1	Moderate	*Spinifex wiseana* & *S. augusta* on cliffs & landward.	Extensive cliffs, many ledges & caves. Fig trees on cliffs
2	Low	Spinifex only to landward	Flat, exposed cliffs. Some ledges and caves. No fig trees.
3	High	Extensive spinifex areas to seaward & landward.	Many cliffs, ledges and caves. Many fig trees.

4	High	Extensive spinifex throughout the area	Limited cliffs, but many caves & some ledges. Fig trees throughout.
5	Low	Spinifex sparse on cliffs, limited only to landward.	Exposed flat cliffs. Limited ledges & caves. Few fig trees present.
6	Low	Spinifex restricted only to landward.	Exposed flat cliffs. Variable ledges & caves. Patchy fig trees.
7	Low	Most spinifex limited to landward.	Flat cliffs to the north & sandhills to the south. Limited ledges, few caves. Very few fig trees.
8	Zero	Abundant spinifex.	No cliffs. Sandhills & sand plain. No fig trees.
9	Zero	Abundant spinifex.	No cliffs. Sandhills. Some fig trees away from the headlands.
10	Zero	Abundant spinifex.	Only sandhills & no cliffs. Limited fig trees away from the headlands.

* scat density: low = less than one scat/m^2
moderate = 1-5 scats/m^2
high = more than 10 scats/m^2

10, one metre square quadrants were examined at each site.

Scat density was highest when the habitat was the most diverse. The best habitat occurred at sites 3 and 4 where there were many ledges and caves within a fractured cliff structure, an abundance of spinifex close to the cliffs and numerous fig trees.

The area around Q21 was the most inland site which had a high scat density. No rock-wallaby scats were seen at inland sites such as R84 & R27.

2. Rock wallaby abundance.

Based on the daytime observations and scat distribution, spot-lighting was conducted at the following locations:

1. Q21 and surrounds between 2135 and 2225 hours on 27 February 1993, and again between 1940 and 1950 hours on 28 February.

2. Biggida Creek area between 2130 and 2200 hours on 28 February.

3. John Wayne Country between 1950 and 2030 hours on 1 March, and the area to the south of John Wayne Country between 1930 and 2100 hours on 2 March.

4. Y23 and surrounds between 1925 and 2015 hours on 3 March.

Kinnear (unpubl.) sights approximately 25-33% of the population of *P. lateralis* known from intensive trapping in other areas. Using this estimate we collated our day-time and spotlight data into an estimate of abundance. We wish to emphasise that the figures should not be seen as an absolute number. Rock-wallabies are retiring creatures and the probability of sighting all of the individuals present in a locality in the short time available to us was low. We observed that animals were moving out to feed from their rocky shelters very soon after dark. For this reason we attempted to start spotlighting to correspond with the animals still being on the rocks, and before they became obscured by the spinifex. Since the timing was so critical we may have missed those animals which were already feeding and those which had not yet left the caves.

Given this proviso our estimates for the abundance of rock-wallabies at the various sites is:

Site	Estimated Number
1	33-44
2	12-16
3	42-56
4	18-24
5	3-4
6	3-4
7	5-6
8	0
9	0
10	0
Total	116-154

3. Trapping

In 40 trap-nights at John Wayne Country we captured four rock-wallabies, four Golden Bandicoots and three possums. The latter two species were immediately released.

The rock-wallabies were tagged with stainless steel fingerling tags in the right ear. The numbers 1976 to 1979 inclusive were used. The three males and one female were all bled for on-going studies into DNA profiling of rock-wallabies. The animals were measured and then released.

DISCUSSION

The Barrow Island populations of Black-flanked Rock-wallabies are one of only two pristine colonies known to exist. On the mainland Kinnear *et al.* (1988) and Pearson (1992) have recorded recent population extinctions and declines due to predation by the introduced European red fox. Since the fox has never been present on Barrow Island the island presents an opportunity to study and conserve rock-wallabies free of the damaging effects of predation and the associated problems of population fragmentation and inbreeding.

Little data exist on the Barrow Island rock-wallabies. Butler (1964) conducted a survey of distribution and abundance and Bradshaw (pers. comm.) has used rock-wallabies for physiological studies. However we are not aware of any surveys of the species abundance since the commencement of full-scale oil and gas production. Our survey represents the first step in a potentially longer-term genetic and demographic study of the species.

Our results, albeit limited by time, indicate that the species is secure and under no immediate threat. The largest population appears to exist at John Wayne Country, which is outside of the oil field. Even those populations which are near to the field, such as around Y23, do not appear to be disturbed. Individuals were easily sighted on rocky ledges in the hottest part of the day, and observers could approach to within 20 metres before the animal would move away.

Our population estimate of 116-154 animals is below Butler's (1964) estimate of "500 plus". However we are unsure of how Butler reached his figure and the time and area which he surveyed. Suffice to say that the animals which we captured appeared healthy and the areas which we surveyed were very suitable for continued occupation by rock-wallabies. However numbers may fluctuate temporally and spatially in response to climatic variables.

We would recommend two areas of research in the future. First that the rock-wallaby populations be surveyed every 3-5 years to accurately determine any fluctuation in numbers and status. A helicopter survey of some of the more inaccessible cliffs throughout the island would be worthwhile to determine the presence of small populations. An estimated maximum of 60 minutes flying time would be required for each survey.

Second, that blood samples be taken from individuals in each population to examine the genetic makeup within populations and the degree of gene flow between populations. Such a study would be particularly instructive relative to mainland populations where genetic bottlenecks due to predation and limited gene flow now occur. Indeed, such genetic studies have commenced for populations of rock-wallabies in the wheatbelt of WA, and the Barrow Island animals would make an ideal control for these studies.

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