MAMMAL MONITORING, BARROW ISLAND NATURE RESERVE

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Keith Morris[1], Andrew A Burbidge[2], Michelle Drew[3] and Geoff Kregor[4]

[1] Science Division, Department of Conservation and Land Management, WA Wildlife Research Centre, PO Box 51, Wanneroo WA 6946

[2] Nature Conservation Division, Department of Conservation and Land Management, WA Wildlife Research Centre, PO Box 51, Wanneroo WA 6946

[3] IRC Environment, Ground Floor, 26 Colin St, West Perth, WA 6005

[4] Department of Conservation and Land Management, Pilbara Region, PO Box 835 Karratha, WA 6714

CHEVRON TEXACO

DEPARTMENT OF Conservation AND LAND MANAGEMENT
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EXECUTIVE SUMMARY

Monitoring of the abundance and condition of native mammals on Barrow Island was conducted at the five trap locations and along the two spotlighting transects as described in Burbidge *et al.* 1998. In addition, monitoring of Black-flanked Rock-wallabies commenced via trapping and spotlighting. Trapping for the presence of introduced mammals (particularly rodents) was conducted around the Base and Landing warehouses and in dunes adjacent to Boomerang Island. No other islands were visited during this survey.

Despite lower than average rainfall in the 12 months leading to the October 2001 sample, overall mammal trapping rates were similar to that recorded in previous years. However, breeding appeared to be suppressed in both the Barrow Island Golden Bandicoot and the Northern Brushtail Possum compared to previous years. This may be associated with the low rainfall.

Regular monitoring of Black-flanked Rock-wallabies was commenced and eight were captured; two males and six females. Four of the females had large (just furred) pouch young.

Both the Barrow Island Mouse and the Tan Pseudantechinus were trapped for the first time at trap site M21. The Barrow Island Mouse had been previously caught at on all grids except S62 and M21, while the Tan Pseudantechinus had previously only been captured at Bandicoot Bay.

The taxonomy of the two small dasyurids on Barrow Island has recently been reviewed. The Planigale, formerly *P. maculata*, is now regarded as a yet un-named Pilbara endemic *Planigale* species 1. The Pseudantechinus, formerly known as *P. macdonnellensis*, is now regarded as the Tan Pseudantechinus *P. roryi*, another Pilbara endemic. The taxonomic status of the Barrow Island Golden Bandicoot is also under review.

Sufficient spotlighting data is now available to estimate mammal density; however spotlighting data should be treated with caution, as, in addition to night-to night variation, counts have been made in different seasons and by different observers. The variations in the sampling may severely influence species and total mammal abundance records between years and to a lesser extent within trips. Despite the shortcomings, the spotlighting data is still useful as it will highlight major changes in mammal abundance within and outside the oilfield, should this occur.

Trapping and track searches for introduced rodents revealed no evidence of these species on Barrow Island.

A significant number of road kills were observed during the October 2001 field trip some of which were not reported. These may have been associated with the increased number of night time vehicle movements. Reduced speed limits on some roads are recommneded.

The efficiency of the "Euro" mats on the Lufkin pumps should be reviewed as it was found that Euros still seek shelter under the pumps despite the presence of the mats. It is also recommended that gates be installed on the entrances to the camp swimming pool to eliminate the potential of animals drowning.

1. INTRODUCTION

Barrow Island, as well as being of considerable nature conservation significance for other reasons, is one of Australia's most important mammal conservation areas. It supports 14 terrestrial mammal species, of which five are listed as threatened pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and another is listed under the Western Australian *Wildlife Conservation Act 1950* (Table 1). Barrow Island has been a producing oil field since 1964, until recently the operator was West Australian Petroleum Pty Ltd (WAPET); the operator is now ChevronTexaco Pty Ltd.

Table 1. Terrestrial mammals of Barrow Island

Species	**Conservation status (*EPBC Act 1999*)**
Planigale, *Planigale* 'species 1' (Blacket *et al.* 2000)	not threatened
Tan Pseudantechinus, *Pseudantechinus* sp.(prob *P. roryi,* Cooper *et al.* 2000)	not threatened
Barrow Island Golden Bandicoot, *Isoodon auratus barrowensis*	Vulnerable
Northern Brushtail Possum, *Trichosurus vulpecula arnhemensis*	not threatened
Barrow Island Boodie, *Bettongia lesueur* (Barrow Island subspecies)	Vulnerable
Barrow Island Spectacled Hare-wallaby, *Lagorchestes c. conspicillatus*	Vulnerable
Black-flanked Rock-wallaby, *Petrogale lateralis lateralis*	Vulnerable
Barrow Island Euro, *Macropus robustus isabellinus*	Vulnerable
White-striped Mastiff-bat, *Tadarida australis*	not threatened
Common Sheath-tail Bat, *Taphozous georgianus*	not threatened
Finlayson's Cave-bat, *Vespadelus finlaysoni*	not threatened
Rakali (Water-rat), *Hydromys chrysogaster*	not threatened
Djoorri (Common Rock-rat), *Zyzomys argurus*	not threatened
Barrow Island Mouse, *Pseudomys nanus ferculinus*	not threatened (but listed as Specially Protected Fauna under the WA *Wildlife Conservation Act 1950*)

The Black Flying Fox *Pteropus alecto* has been reported on Barrow, but these records apparently represent vagrants.

The Interim Management Guidelines (IMG) for Barrow Island Nature Reserve (CALM 1999) recommended that a formal mammal monitoring program be established. The former National Parks and Nature Conservation Authority, in reporting on a visit in September 1997, also recommended additional mammal monitoring. In the IMG, Section 6.4 – Management Actions states:

- "Establish protocols for terrestrial fauna monitoring on Barrow Island. These need to include:
  a) monitoring of mammal populations inside and outside the oilfield with a combination of spotlight transects and trapping;
  b) monitoring fauna recovery where rat eradication was undertaken (south end); and
  c) monitoring to ensure that feral animals, especially rodents and cats, do not establish.
- Establish protocols for determining the impact, if any, of road kills on mammal populations.
- Monitor the reintroduced population of Boodie *Bettongia lesueur* on Boodie Island.
- Continue monitoring the marine turtle rookeries on the west and east coasts of Barrow Island."

The mammal monitoring program was commenced in 1998 to address the first three of these dot points, although the full trapping program did not commence until 2000. The marine turtle rookeries are being monitored under a separate program. Unpublished reports (Burbidge *et al.* 1998, 2000, and Morris *et al.* 1999) provide the results of previous mammal monitoring surveys. This report covers the fourth mammal monitoring visit undertaken between 15 - 24 October 2001.

2. OBJECTIVES

The objectives for this survey were:

1. To monitor abundance and condition of native mammals (excluding bats). Euros, Spectacled Hare-wallabies, Brushtail Possums and Boodies were monitored via spotlight runs, while Boodies, Golden Bandicoots, Brushtail Possums, native rodents and small dasyurid marsupials were monitored via trapping. Monitoring of rock-wallabies (the least abundant mammal on Barrow Island) was commenced this year via both spotlighting transects and targeted trapping. Rock-wallaby scat collections continued at Q21.
2. To trap for introduced rodents around the Base and Landing warehouses, and on that part of Barrow Island adjacent to Boomerang Island (where black rats were eradicated in 1984).
3. To inspect the Narrow Neck area for black rat tracks.
4. To collect a specimen of *Pseudantechinus* for the WA Museum so that the species present on the island can be confirmed.
5. To make recommendations to the oilfield operators on practices which may detrimentally impact mammal abundances.

3. METHODS

3.1 Trapping

Five trapping grids, each covering 1 hectare, were established in November 1998 (completed in October 1999, but all grids were not fully operational until 2000) and a brief description of each is included in Burbidge *et al.* 1998. In 2000, the four corner points of each grid were located with GPS (using the AUS 84 datum) for long-term future reference and placing on ChevronTexaco operational maps, so that disturbance is avoided. After correction for the WGS 84 datum, grids have now been located on Barrow Island operational maps.

Sheffield cage traps, medium Elliott traps and pitfall traps were set on all grids in a 5 x 5 pattern (20m trap spacings) for four nights. In addition, Elliott and cage traps were set at the Base, medium Elliott traps were set at the Landing warehouses, and cage and Elliott traps run in the sand dunes adjacent to Boomerang Island, to detect any introduced rats and mice. For the first time, Bromilow traps were set near the west coast at John Wayne, Q21, Flacourt Bay, YS88 and Y23 to monitor rock-wallabies. A summary of the trapping effort is shown in Table 2.

Table 2. Summary of trapping effort – October 2001

DATE	Tues 16/10	Wed 17/10	Thur 18/10	Fri 19/10	Sat 20/10	Sun 21/10	Mon 22/10	Tues 23/10	Wed 24/10	Total
Bandicoot Bay	25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P						**100 C** **100 E** **100 P**
John Wayne	25 C 25 E 25 P	25 C 24 E 24 P	25 C 25 E 24 P	25 C 25 E 25 P						**100 C** **99 E** **98 P**
M21		25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P					**100 C** **100 E** **100 P**
Landing					25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P		**100 C** **100 E** **100 P**
S62					25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P	25 C 25 E 25 P		**100 C** **100 E** **100 P**
Landing Pipe laydown					15 E	15 E	15 E	15 E		**60 E**
Coast adj to Boomerang Is						10 E 10 C	10 E 10 C	10 E 10 C		**30 E** **30 C**
Base warehouses						5E 5C	10E 5C	10E 15C		**25E** **25C**
Mud warehouse								6C		**6C**
John Wayne RW	10 B	10 B	10 B	10 B						**40 B**
Q21 RW	5 B	5 B	5 B	5 B						**20 B**
Flacourt Bay RW						5 B	5 B	5 B	5 B	**20 B**
YS 88 RW						5 B	5 B	5 B	5 B	**20 B**
Y23 RW						5 B	5 B	5 B	5 B	**20 B**

Trapping effort:

C = Cage	561
E = Medium Elliotts	615
P = PVC pits	500
B = Bromilow	120
TOTAL	**1796 trap nights**

Most animals trapped on grids were marked by ear notching in the # 7 position (right ear) in the 1,2,4,7 system. In 1998 animals were marked with # 1, in 1999 they were marked with # 2, and in 2000 with # 4. Hare-wallabies on the Bandicoot Bay, M21 and Landing grids were ear tagged in the left ear. All rock-wallabies were marked with a Trovan PIT implant, those trapped at Y23 also had an ear tag put in each ear.

Trap success rates for Boodies and Brushtail Possums were calculated on cage trap numbers only, those for Golden Bandicoots on cage and Elliott trap numbers, those for the Tan Pseudantechinus, Barrow Island Mouse and Common Rock Rat on Elliott and pit trap numbers, and those for the Planigale on pit trap numbers only. Spectacled Hare-wallabies were caught only in cage traps. Rock-wallabies were caught only in Bromilow traps. Not included in the above trapping effort figures are the cage trap nights set around the Bromilow traps to reduce the impact of possums.

3.2 Spotlighting

The standard spotlighting transects (one in the largely undisturbed northern end of the island and one within the oilfield towards the southern end of the island) were run on six nights (16/10, 17/10, 19/10, 20/10, 22/10 and 23/10). Each transect was about 30 km long. A 4WD tray-top vehicle was driven at 12 -15 km/h with one spotlighter observing animals. Distance from the centre-line of the transect was recorded for each sighting to enable density calculations. To eliminate observer bias, each spotlighting team recorded on both runs on consecutive nights and the data from the two nights were combined.

Because the standard spotlighting transect does not adequately monitor the least abundant mammal, the Black-flanked Rock-wallaby, an additional transect was established running for 11.9 km in the Flacourt Bay / YS88 / Y23 area. A descriptive log of this transect is shown below:

0.00 km – Start transect at West Coast Highway (WCH) / Flacourt Bay track intersection, proceed to Flacourt Bay.
2.10 km – turn around at Flacourt Bay, return to WCH.
4.30 km – WCH / Flacourt Bay intersection, turn north.
5.60 km – WCH / YS88 track intersection, proceed to YS88.
6.80 km – turn around at YS88, return to WCH.
8.10 km – WCH / YS88 track intersection, turn north.
10.90 km – WCH / Y23 track intersection, proceed to Y23.
11.50 km – Y23 turn around. End of transect.

Spotlighting runs in a single vehicle were undertaken along this transect on 18 and 21 October and took approximately 65 minutes to complete.

3.3 Tissue collection for taxonomy

The taxonomy of *Pseudantechinus* has recently been reviewed (Cooper *et al.* 2000) and a male *Pseudantechinus* sp. was collected from the Bandicoot Bay grid (WAM # 51527) to allow confirmation of the species on Barrow Island. It is thought that the species on Barrow Island is *P. roryi,* a widespread, but endemic species on the adjacent Pilbara mainland. DNA has been extracted from the ear tissue samples collected in 2000 from a range of species and Dr Peter Spencer is presently comparing this with DNA from mainland individuals.

It should be noted that a recent taxonomic study of the genus *Isoodon* based on mitochondrial DNA analysis suggest that *Isoodon obesulus* and *I. auratus* merit inclusion as a single subspecies *I.o fusciventer.* It is suggested that *I. a. barrowensis* deserves further investigation given its extremely close genetic relationship to mainland *I. obesulus*, yet highly distinctive morphology (Pope *et al.* 2001).

3.4 South End search

The Narrow Neck area was searched for black rat tracks by two people for 30 minutes.

3.5 Rainfall

During the last 12 months (from 1 October 2000 to 30 September 2001), only 109.2 mm of rain from 22 rain days fell on Barrow Island. This is 38% of the average rainfall. No significant rainfall came from tropical cyclones in this period. In 1999, 423 mm of rain was recorded and in 2000, 289 mm of rain fell. Much of this rain was from cyclonic events. Biotic productivity of arid areas such as Barrow Island are linked with rainfall events and it could be expected that lower rainfall would result in lower mammal abundances and animals in poorer condition.

4. RESULTS AND DISCUSSION

Eight species of native mammal were trapped on the grids and six species identified during spotlight transects. The Black-flanked Rock-wallaby was not trapped on grids, but at selected sites along the west coast of Barrow Island. No introduced mammal species were recorded.

4.1 Trapping

The mean trap success rates for mammals trapped on the five grids since 1998 are shown in Table 3. Trap success rates for each of the grids is shown in Figures 1 – 5, and species trap success rates are shown in Figures 6 – 13. A summary of the grid trapping results showing individuals trapped is shown in Appendix 1, and trapping results for rock-wallabies in Appendix 2.
The Bandicoot Bay grid (coastal sand dune) was the most diverse with eight species of mammal trapped. Seven species were trapped on the M21 grid, including the first captures on this grid of the Barrow Island Mouse and Tan Pseudantechinus. Six species were trapped on the John Wayne and Landing grids, and three on the S62 grid. The lack of captures of the smaller *Planigale*, *Pseudantechinus*, and rodents at S62 may have been due to the excessive Elliott trap disturbance by possums.

Despite the low rainfall total in the last 12 months, overall mammal trap success rates were similar to the previous two years, when at least one cyclone per season delivered above average rainfall to Barrow Island. The smaller rodents and dasyurids, in particular, do not appear to exhibit the "boom-bust" population abundance cycles evident in mainland desert environments.

Table 3. The mean trap success rates (± SE) for mammals on Barrow Island since 1998. Data from grids and rock-wallaby transects only

	1998	1999	2000	2001
Golden Bandicoot	25.9 ± 4.6 %	34.7 ± 5.4 %	30.9 ± 4.8 %	27.6 ± 3.0 %
Brushtail Possum	6.3 ± 1.9 %	15.4 ± 7.0 %	20.0 ± 6.2 %	24.8 ± 5.0 %
Boodie	5.1 ± 2.9 %	9.2 ± 3.5 %	8.2 ± 3.5 %	7.6 ± 2.2 %
Spectacled Hare-wallaby	Not processed	Not processed	3.0 ± 2.2 %	3.6 ± 2.2 %
Black-footed Rock-wallaby	Not trapped	Not trapped	Not trapped	9.5 ± 4.4 %
Pilbara Planigale	0.4 ± 0.1 %	1.2 ± 0.1 %	1.8 ± 0.7 %	2.8 ± 1.2 %
Tan Pseudantechinus	0	1.0 ± 0.2 %	0.4 ± 0.4 %	0.4 ± 0.4 %
Barrow Island Mouse	1.9 ± 0.7 %	1.6 + 0.4 %	2.1 ± 1.0 %	1.7 ± 0.8 %
Common Rock Rat	0.1 ± 0.1 %	0.1 ± 0.1 %	0.7 ± 0.2 %	0.6 ± 0.4 %

4.1.1 Golden Bandicoot *Isoodon auratus barrowensis* (Figure 6)

The Golden Bandicoot was again the most commonly trapped species, with trap success rates similar to that reported in previous years (21.0% to 38.5%). An average of 25 individuals was caught on each grid, ranging between 39 individuals on the John Wayne grid to 15 on the M21 grid. Of the 123 individuals trapped on all the grids, 55 (44.7%) were male and 68 (55.3%) were female. The majority of females were not breeding; four had small pouch young (crown-rump length approximately 10 – 26 mm) and another four had elongated teats and were probably suckling young at heel. This is in contrast to 2000 when 20 – 50 % of adult females were carrying pouch young (10 – 20 mm crown rump length). This reduced breeding may have been related to the low rainfall conditions.

4.1.2 Northern Brushtail Possum *Trichosurus vulpecula arnhemensis* (Figure 7)

The Brushtail Possum was trapped on all grids, but was most abundant at S62 (42% trap success). As mentioned above, there was considerable disturbance of Elliott traps at S62 by possums and this may have contributed to the lack of small mammals trapped at this site. Overall, trap success rates were higher than 2000 on all grids except for John Wayne. Of the 61 individuals trapped, 39 (64%) were male and 22 (36%) female. Only one female (4.5%) was carrying a pouch young, compared with last year, when one third of the adult females were carrying pouch young.

4.1.3 Boodie *Bettongia lesueur* (Figure 8)

Boodies were again trapped on all grids except John Wayne, and while there was a significant increase in trap success rates for Boodies at M21 compared to 2000 (2.0 % to 6.0 %), overall trap success rates were similar to 2000. The highest trap success rate was again at the Landing, which probably reflects this grid's proximity to a nearby warren. Of the 21 individuals trapped, 11 (55 %) were males and 10 (45 %) were females. Three of the females had large, unfurred pouch young and two had elongated teats.

4.1.4 Spectacled Hare-wallaby (Figure 13)

Spectacled Hare-wallabies were trapped on all grids except S62. Seven males and six females were trapped. Four of the females had unfurred pouch young up to 40 mm CR.

4.1.5 Black-flanked Rock-wallaby (Appendix 2)

Black-flanked Rock-wallabies were trapped at four sites along the west coast. None were trapped at the Flacourt Bay site, although fresh scats were found in that area. Trap success rates were highest at Y23 (25%). Eight individuals were trapped (perhaps 5% of the total estimated population); two males and six females. Four of the females had large (just furred) pouch young. Two females trapped at Q21 and one male trapped at John Wayne are believed to have been recaptures from Juliet King's PhD work in 1994/5.

Rock-wallaby scats were again collected from the colony near Q21 for David Pearson's study on estimating rock-wallaby abundance from scat accumulations.

4.1.6 Pilbara Planigale *Planigale* sp. (Figure 9)

Planigales were trapped at all grids except S62. Trap success at the Landing grid was significantly higher than in 2000 (7.0 % cf 2.0 %). A total of nine individuals were trapped; five males and four females. Three of the females were carrying at least 4 pouch young, approximately 8 – 18 mm crown-rump length. Measurements of individuals trapped are shown in Table 4.

Table 4. Measurements of *Planigale* trapped on Barrow Island in 2001 (one male not measured)

Sex	Body weight (g)	Head length (mm)	Pes length (mm)	# pouch young	Grid
Male	8.8	23.9	8.4	-	Bandicoot Bay
Male	9.5	23.4	8.8	-	Bandicoot Bay
Male	8.5	25.1	9.9	-	Landing
Male	8.5	22.2	10.2		M21
Female	7.5	21.5	9.2	>4	Landing
Female	7.8	22.2	9.5	0	Landing
Female	7.8	22.5	8.6	4 CR 8.1mm	John Wayne
Female	-	25.8	-	4 CR 18 mm	John Wayne

4.1.7 Tan Pseudantechinus *Pseudantechinus roryi* (Figure 10)

Pseudantechinus were only trapped at the Bandicoot Bay and M21 grids. This was the first record of *Pseudantechinus* at M21. Three individuals (one male, two female) were trapped at Bandicoot Bay and one female trapped at M21. The females at Bandicoot Bay were each carrying six pouch young (approximate CR 9.6 – 11.7 mm). Measurements are shown in Table 5.

Table 5. Measurements of *Pseudantechinus* trapped on Barrow Island in 2001

Sex	Body weight (g)	Head length (mm)	Pes length (mm)	# pouch young	Grid
Male	22.0	32.6	15.1		Bandicoot Bay (WAM 51527)
Female	28.5	30.4	15.0	6, CR 11.7 mm	Bandicoot Bay
Female	23.0	31.3	14.4	6, CR 9.6 mm	Bandicoot Bay
Female	22.0	32.5	14.1	0	M21

4.1.8 Barrow Island Mouse *Pseudomys nanus ferculinus* (Figure 11)

The Barrow Island Mouse was trapped in low numbers on all grids except S62. For the first time it was trapped at M21. This species is more abundant on the white sands at Bandicoot Bay and the red sands at John Wayne than on the brown loams and gravels at M21 and the Landing. This species is probably more abundant than indicated by these trap success rates as disturbance of Elliott traps by bandicoots and possums probably reduces their capture rate. Of the 11 individuals trapped, four (36%) were males and 7 (64%) were females. One female appeared to be pregnant and another had developed teats.

4.1.9 Common Rock Rat *Zyzomys argurus* (Figure 12)

The Common Rock Rat was trapped in low numbers only on the Bandicoot Bay and John Wayne grids. Two males were trapped at Bandicoot bay and one female trapped at John Wayne. The female had developed nipples, but was not lactating. In 2000, this species was also trapped at Landing and S62 grids. Since this study started, trap success rates have always been low (0.5 % – 1.5 %) and this is one of the less common species on Barrow Island.

4.2 Spotlighting

Spotlighting data are presented in Table 6. Sufficient data are now available for analysis using the line transect method to produce density estimates. This will be carried out before next year's visit. Table 7 presents mean count data from all years.

Rock-wallaby numbers are not reported in Tables 6 and 7 as they are sighted rarely and only on the north transect; no suitable habitat being traversed on the south transect. On the specific rock-wallaby spotlighting transect, four rock-wallabies were seen on 18 Octover and one on 21 October. In addition another rock-wallaby was seen near the sandpit at John Wayne on 18 October.

The spotlight transect counts have limitations for estimating mammal abundances because of issues related to observer experience and skill, varying visibility and varying animal behaviour related to environmental conditions. In addition, on Barrow Island, there are differences in topography and vegetation between the two transects. Most counts in the past have occurred over two nights only. We are now carrying out counts over six nights and this should improve data quality by averaging night-to-night variability.

Differences in species abundance and total mammal abundance between years should be treated with extreme caution, as, in addition to night-to-night variation, counts have been made in different seasons and by different observers. Counts are probably affected by past rainfall and by severe cyclones, which may cause the death of some mammals. Additionally, the vegetation of some areas has become increasingly high and dense as the time since fire increases, and there are now tall *Triodia angusta* along many road verges, even in areas dominated by the low *T. wiseana*, significantly affecting visibility. Thus, the data-set should be used primarily for comparing mammal abundance between the two transects within one trip.

Whatever the shortcomings of spotlight data, the value of these data is that they will pick up major changes in animal abundance within and outside the oilfield, should this occur. Between transects total numbers seen of all species are probably not significantly different; however, further analyses will be undertaken in 2002. Variations in numbers of some species between the north and south transects are probably due to differences in habitat. More Boodies were recorded for the north transect than the south one—this has also been noted in some, but not by any means all, past counts. This may be due to be more Boodie warrens occurring close the north transect. Higher hare-wallaby numbers in the south have also been noted on many, but not all, previous counts and are probably due to the relatively large area of regenerating borrow pits and other disturbed areas within the oilfield. These provide a greater variety of food plants and allow better visibility away from the edge of the roads.

Table 6. Combined numbers for the three transects, October 2001

Transect	Golden Bandicoot	Brushtail Possum	Boodie	Hare-wallaby	Euro	Rodents/ Dasyurids	Total
16-17 Oct N	26	16	9	49	0	4	107
16-17 Oct S	29	19	16	54	6	4	128
19-20 Oct N	31	17	9	23	4	11	95
19-20 Oct S	31	17	9	23	4	10	97
22-23 Oct N	18	19	14	58	5	3	119
22-23 Oct S	34	18	15	65	2	1	135
Mean/night N	**11.0**	**8.7**	**5.5**	**20.3**	**1.7**	**1.7**	**49.7**
Mean/night S	**14.3**	**8.7**	**6.2**	**26.3**	**2.0**	**2.5**	**60.0**

Table 7. Comparable spotlighting data since 1973

Date	# of nights	Golden Bandicoot		Possum		Boodie		Hare-wallaby		Euro		Rodent/ Dasyurid		Total	
		N	S	N	S	N	S	N	S	N	S	N	S	N	S
Dec 72	2	7.5	11.0	7.5	15.0	23.0	10.5	51.5	61.5	10.0	5.5	6.0	4.5	106.5	108.0
Jan 75	4	8.5	7.8	4.5	6.3	7.5	5.0	14.3	11.3	5.5	2.0	10.3	2.3	50.5	34.5
Feb 77	2	12.0	7.5	6.5	7.5	3.0	8.5	16.5	17.0	2.0	2.5	3.0	1.5	59.0	72.0
Feb 79	2	6.5	6.5	11.0	20.0	4.0	6.5	17.0	45.0	4.0	1.5	0.5	3.0	43.0	82.5
Feb 81	2	17.0	15.5	9.5	16.0	7.0	6.0	37.5	82.5	5.5	8.0	3.0	6.0	79.5	134.0
Mar 83	2	21.5	23.0	6.0	15.5	4.5	5.0	30.5	37.0	3.5	3.0	5.5	3.0	72.0	86.5
Feb 85	2	13.5	13.5	4.5	10.5	8.5	5.5	43.0	46.5	1.5	1.5	1.5	3.5	72.5	81.0
Nov 85	2	10.0	8.5	6.5	9.0	12.0	7.5	24.0	19.5	3.0	4.5	3.5	3.0	61.0	52.0
May 87	2	9.5	7.0	11.5	6.5	6.5	4.0	32.0	34.0	5.5	5.5	2.0	2.0	67.5	59.0
Mar 89	2	11.0	9.5	12.0	8.5	5.0	5.5	24.5	23.5	3.0	2.0	1.5	1.0	58.5	50.0
Jun 91	2	5.0	7.5	9.0	8.0	2.0	3.0	32.0	37.0	10.0	3.5	4.0	2.5	62.5	61.5
Oct 95	2	8.0	9.5	7.0	6.0	13.0	9.5	31.5	17.0	4.0	1.5	2.0	3.0	65.5	46.5
Sep 97	2	3.5	4.5	8.0	2.0	1.5	4.0	9.0	13.5	8.5	3.5	5.0	3.0	37.0	30.5
Nov 98	6	16.7	19.3	7.7	7.2	6.2	5.8	27.0	28.0	5.3	1.2	2.0	3.7	65.5	65.2
Oct 99	2	19.5	15.5	14.0	7.5	6.0	5.0	16.5	23.0	4.0	2.0	3.5	2.0	63.5	55.0
Oct 00	6	22.5	19.8	11.3	8.7	9.2	2.8	17.0	24.0	4.0	2.3	4.2	4.2	68.5	61.8
Oct 01	6	11.0	14.3	8.7	8.7	5.5	6.2	20.3	26.3	1.7	2.0	1.7	2.5	49.7	60.0

5. MAMMAL CASUALTIES

ChevronTexaco have in place procedures for dealing with the death or injury of mammals on Barrow Island and these are included in the workforce induction process. The death or injury of any animal is supposed to be reported to the line manager, via a HazOb form, who in turn reports it to the Environmental Coordinator.

In 2000, 83 animals were reported killed, and in 2001 (to November) 46 casualties were reported. During our 10 day visit, we saw six mammal roadkills: one bandicoot, two possums, two hare-wallabies and one rock-wallaby. Some of these were not reported. There was a large workforce on the island at the time and an oil drilling rig was operating 24 hours a day. There was probably more night traffic than usual, both for work and recreational purposes.

Euro mats were installed on many of the Lufkin pumps in 1998/9 to prevent euros resting in the shade of the Lufkin and being killed by the counterweights when the automatic pumps start up with no warning. During this visit we found evidence of euros still sitting under the pumps despite the mats being present. We believe that the concept of the mats is good, but that the cones need to be more numerous, randomly scattered and sharper to prevent the Euros being able to rest their hind feet between the cones.

The swimming pool at Camp is surrounded by a fence, however there are no gates on the two entrances. Euros regularly pass through and drink at the pool. In the past, other animals have fallen into the pool and drowned. It is recommended that gates be installed on the entrances to prevent animals having access to the pool area.

6. FUTURE WORK

Annual mammal monitoring should be continued to at least 2004, as this will provide five complete years of baseline data for subsequent comparisons. In 2002 it is proposed that all animals including, and larger than Golden Bandicoots, will be individually marked with PIT implants. This will allow better information to be gained on abundance, longevity and movement between grids. The mammal monitoring program may have to be modified / upgraded if any major developments occur on Barrow Island in the future, particularly in the relatively undisturbed northern half of the island. The next visit should occur in mid-October 2002.

The South End of Barrow Island has not been trapped since 1991 and this area should be checked for black rats with both Elliott and cage trapping in 2002.

Improved monitoring of rock-wallabies will continue and become a regular undertaking of the mammal monitoring visits.

ACKNOWLEDGMENTS

ChevronTexaco arranged our visit and paid all travel, freight, vehicle and accommodation costs. We received assistance from many ChevronTexaco and contract staff. We would like to thank Stephan Fritz, Luke Ulstrup and Les McClements for arranging logistics for the visit. We also thank those who filled the positions of vehicle drivers during spotlighting transects: Les McClements, Luke Usltrup, Ken Nankervis, Mark Campbell, Jason Maynard and Brian Cikara. David Pearson (CALM) assisted on the trapping grids and in establishing the rock-wallaby spotlighting and trapping transects.

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Figures 1 – 13

Appendices 1 and 2

Figure 6. Grid trap success rates for the Golden Bandicoot on Barrow Island

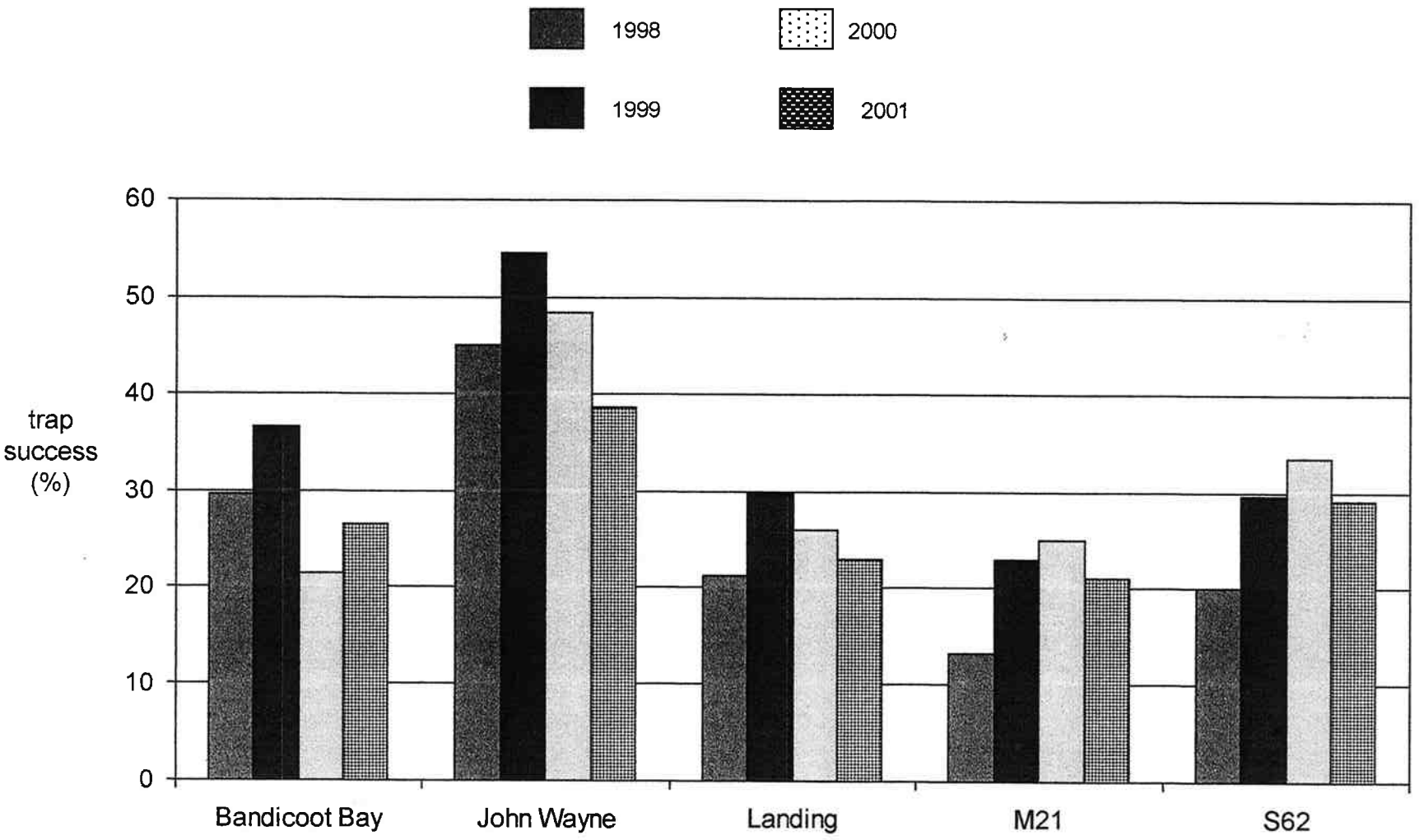


Figure 7. Grid trap success rates for the Brushtail Possum on Barrow Island

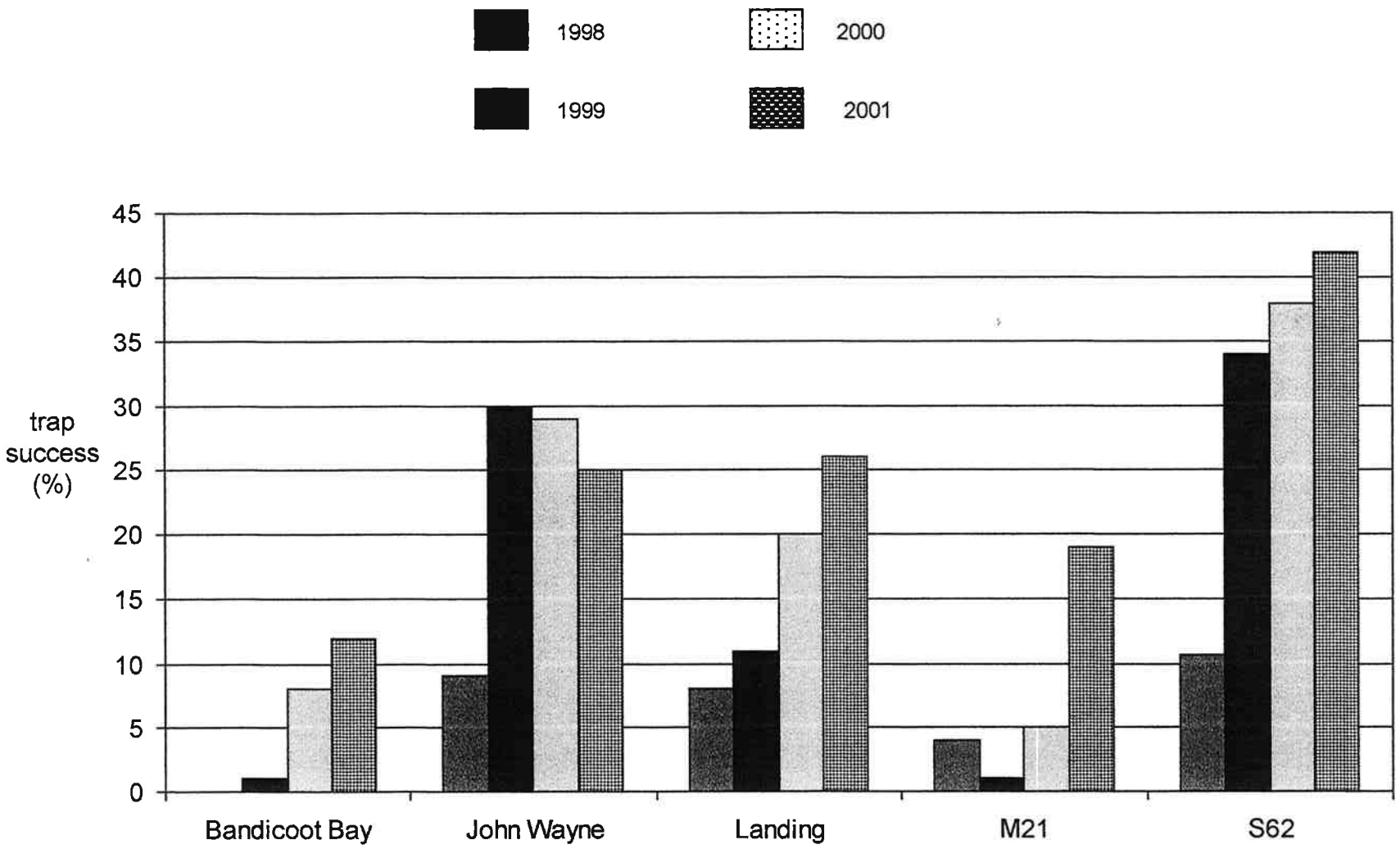


Figure 8. Grid trap success rates for the Boodie on Barrow Island

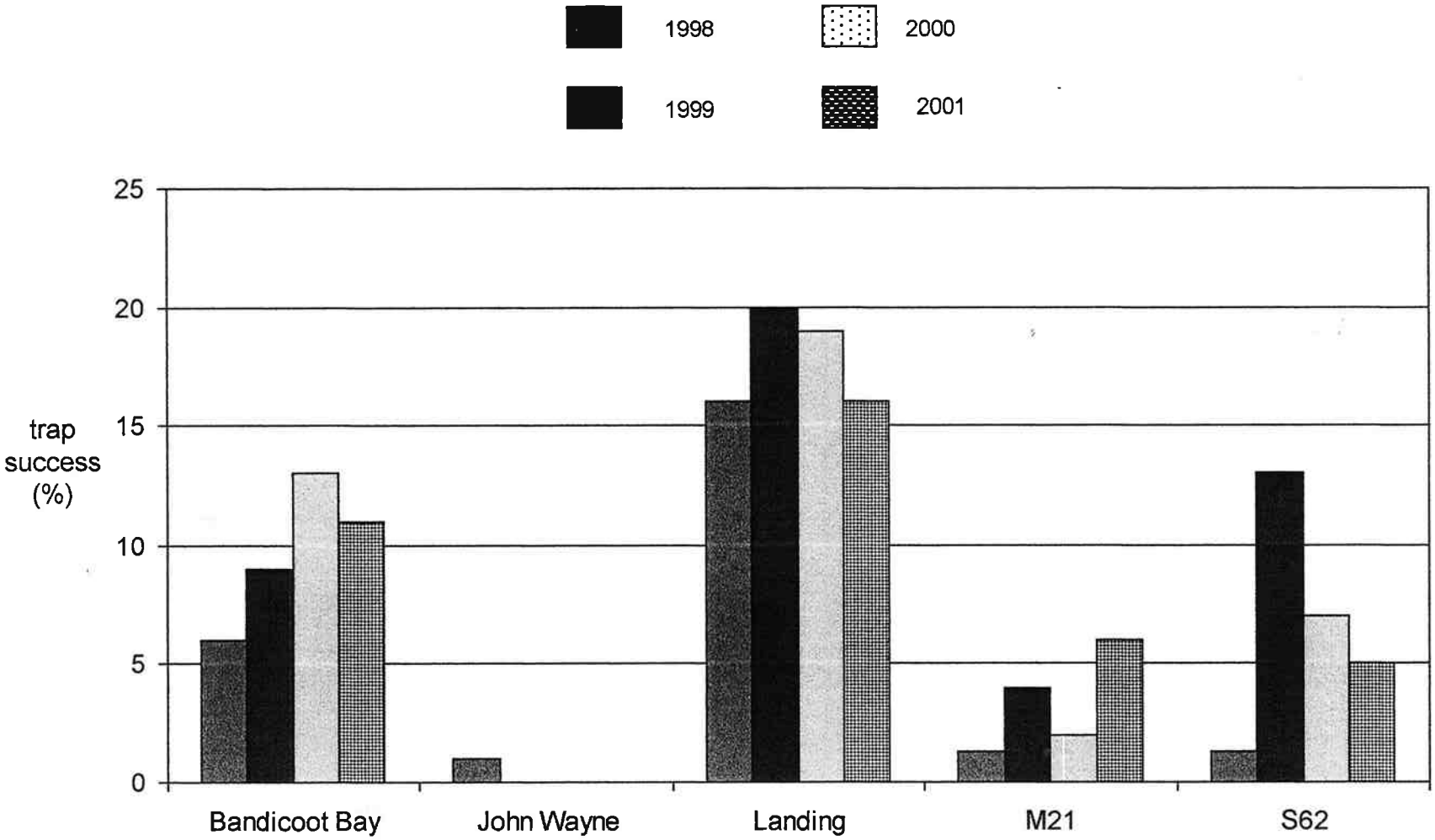


Figure 9. Grid trap success rates for the Planigale on Barrow Island

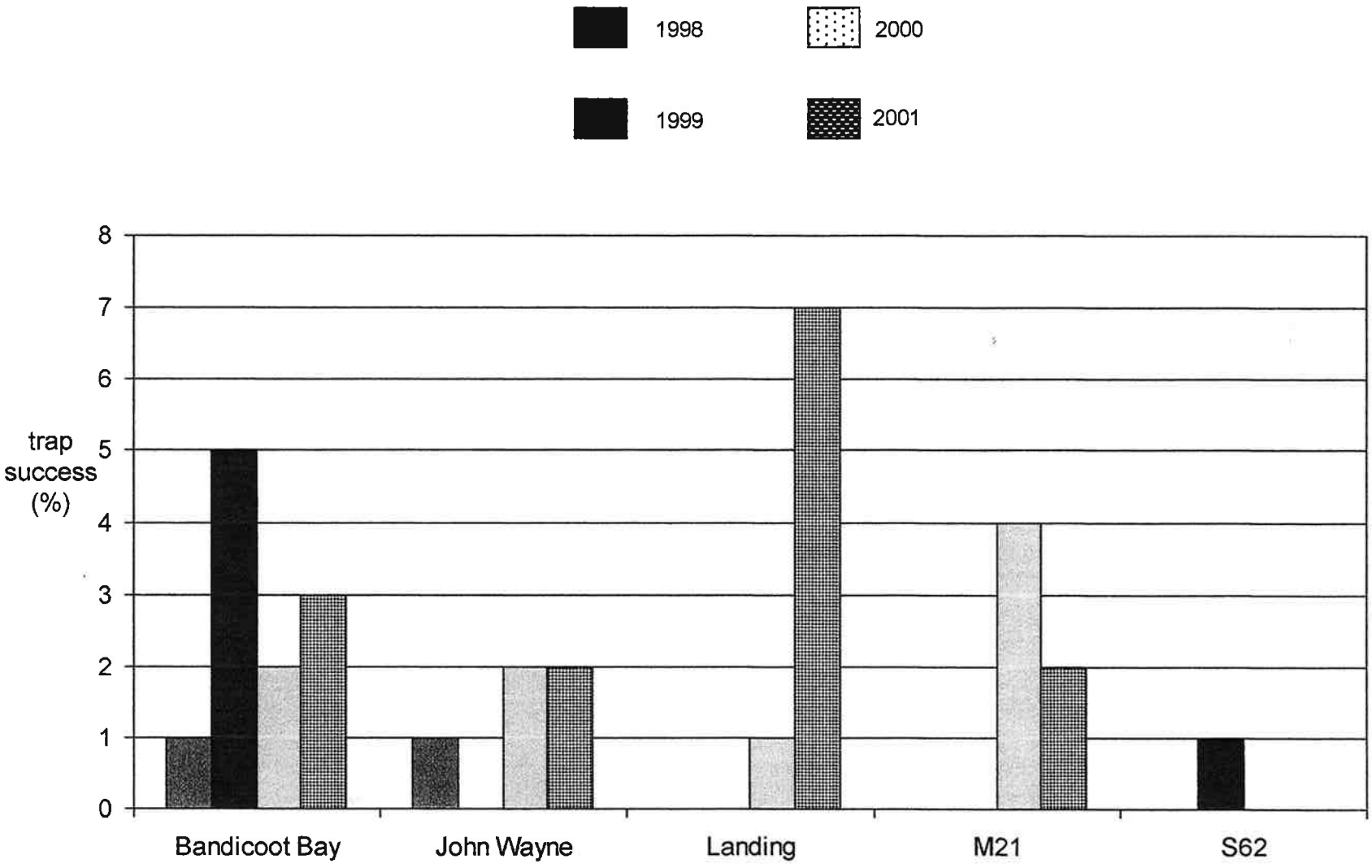


Figure 10. Grid trap success rates for the Tan Pseudantechinus on Barrow Island

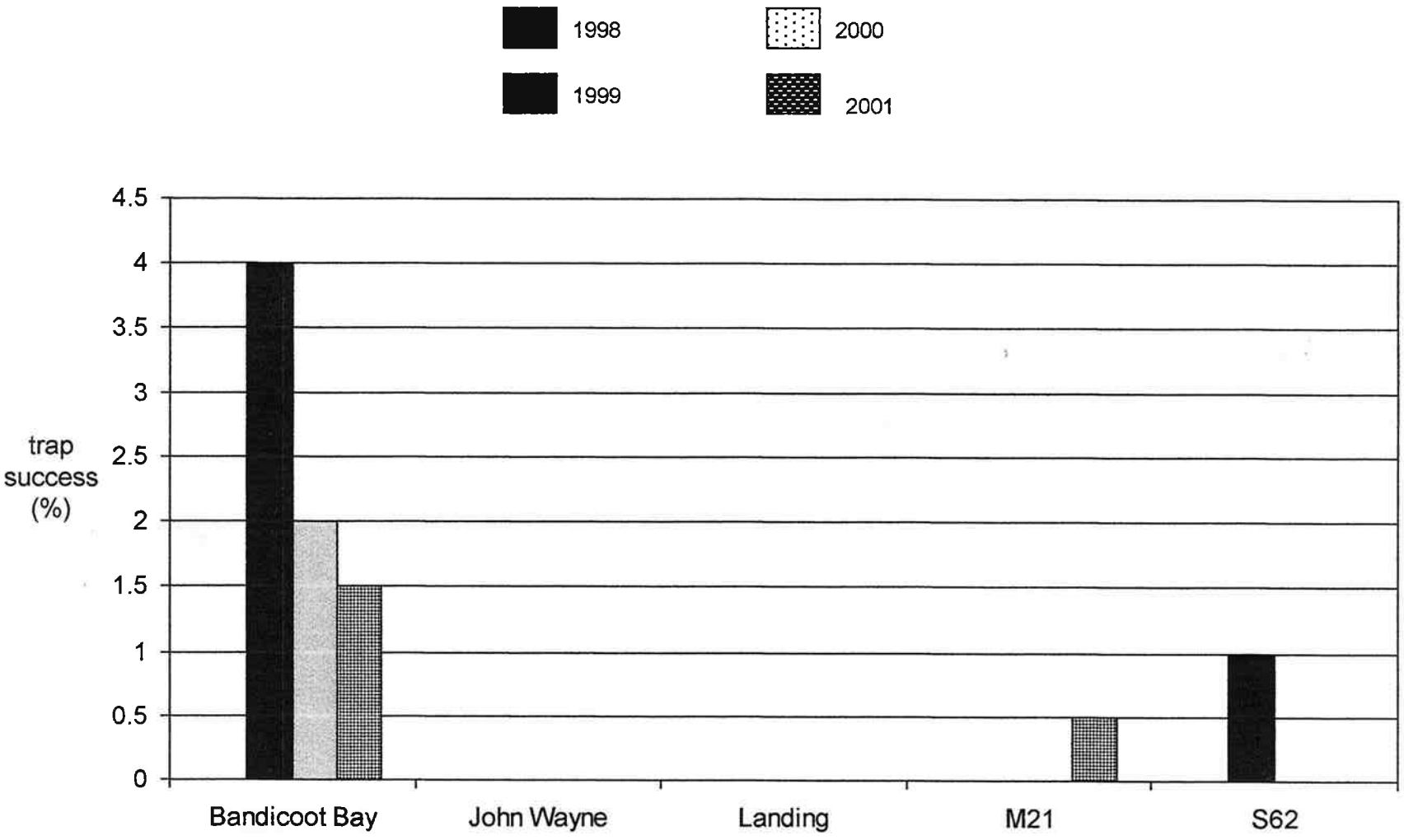


Figure 11. Grid trap success rates for the Barrow Island Mouse on Barrow Island

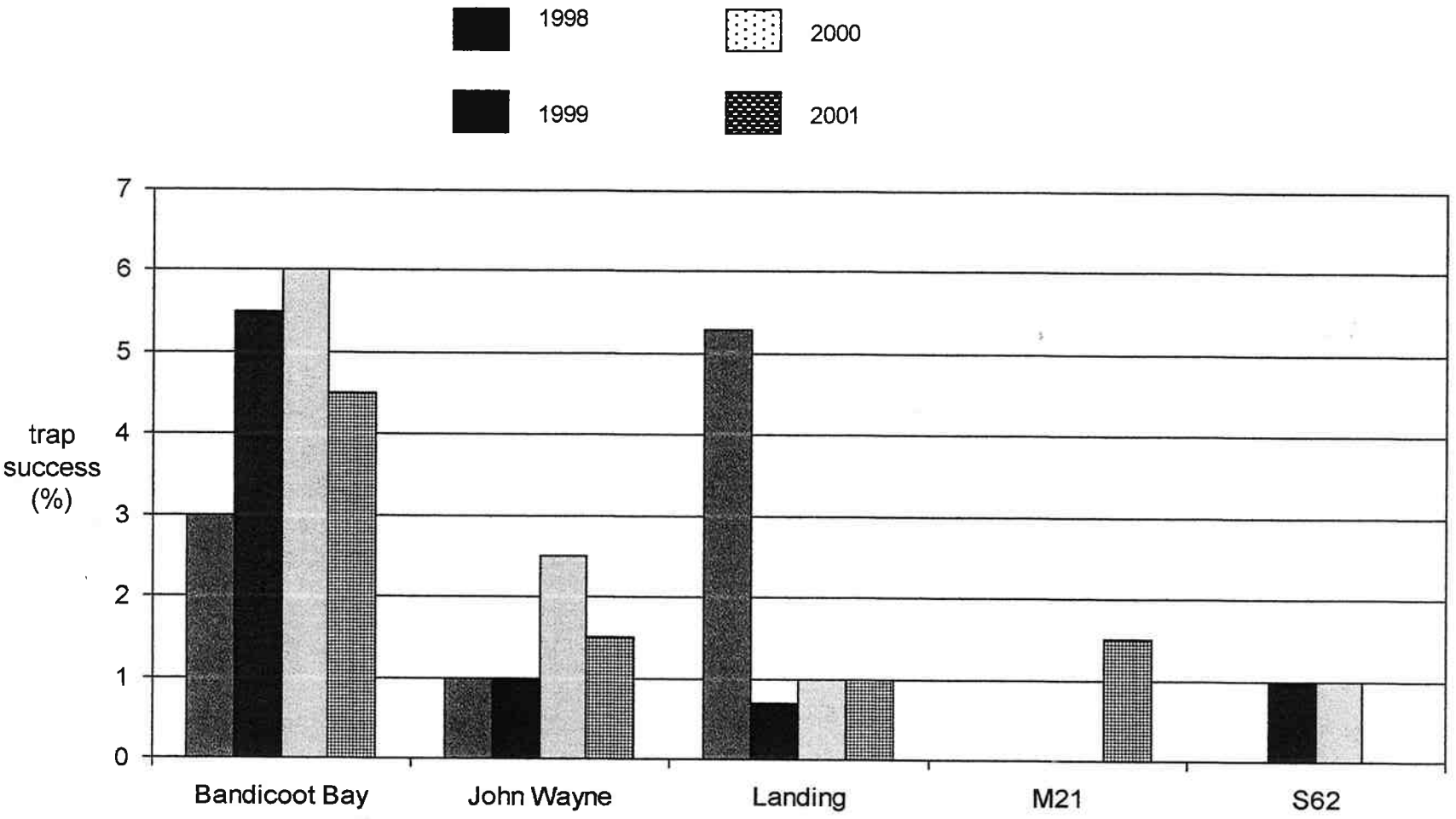


Figure 12. Grid trap success rates for the Rock Rat on Barrow Island

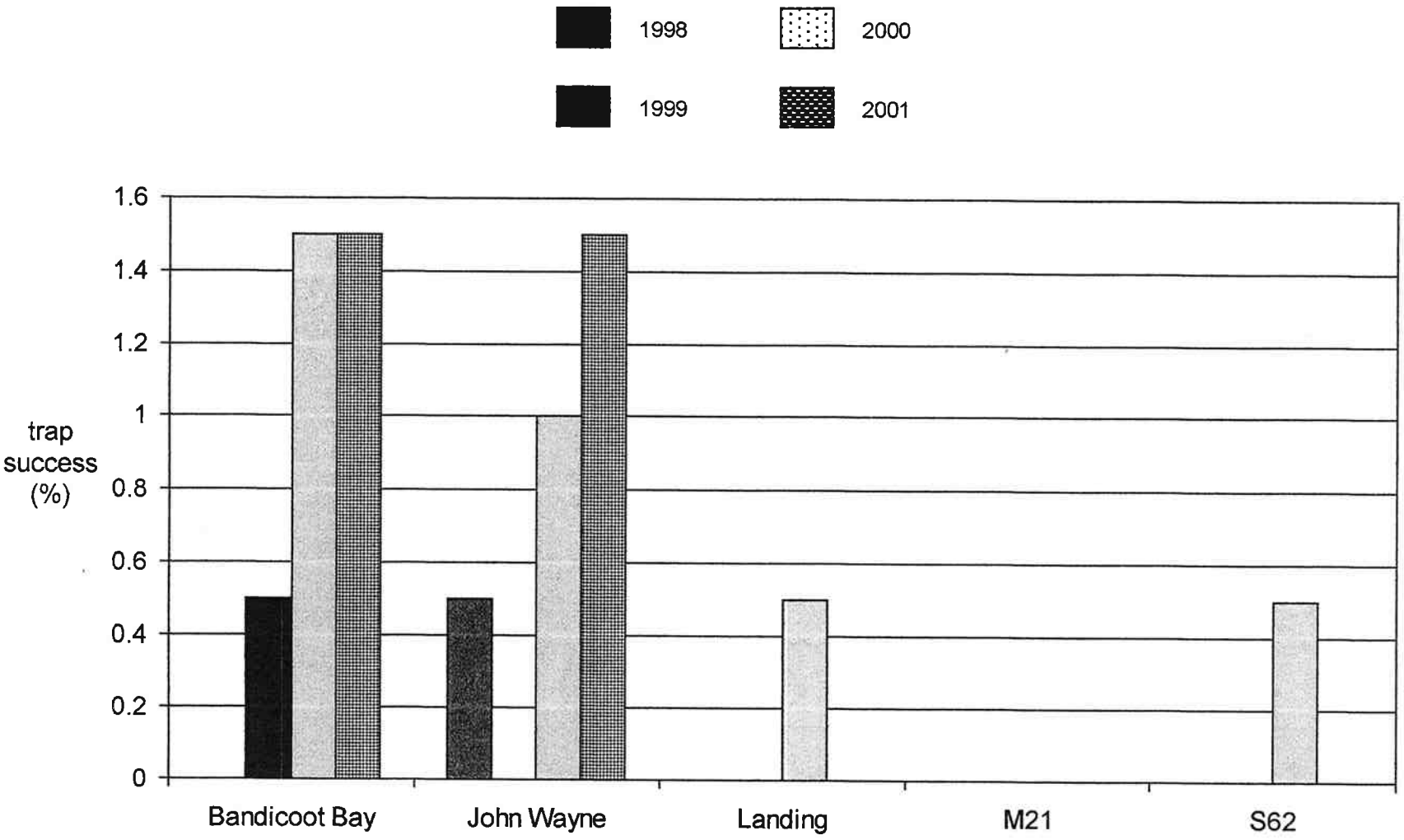


Figure 13. Grid trap success rates for the Spectacled Hare-wallaby on Barrow Island (not reported in 1998 and 1999)

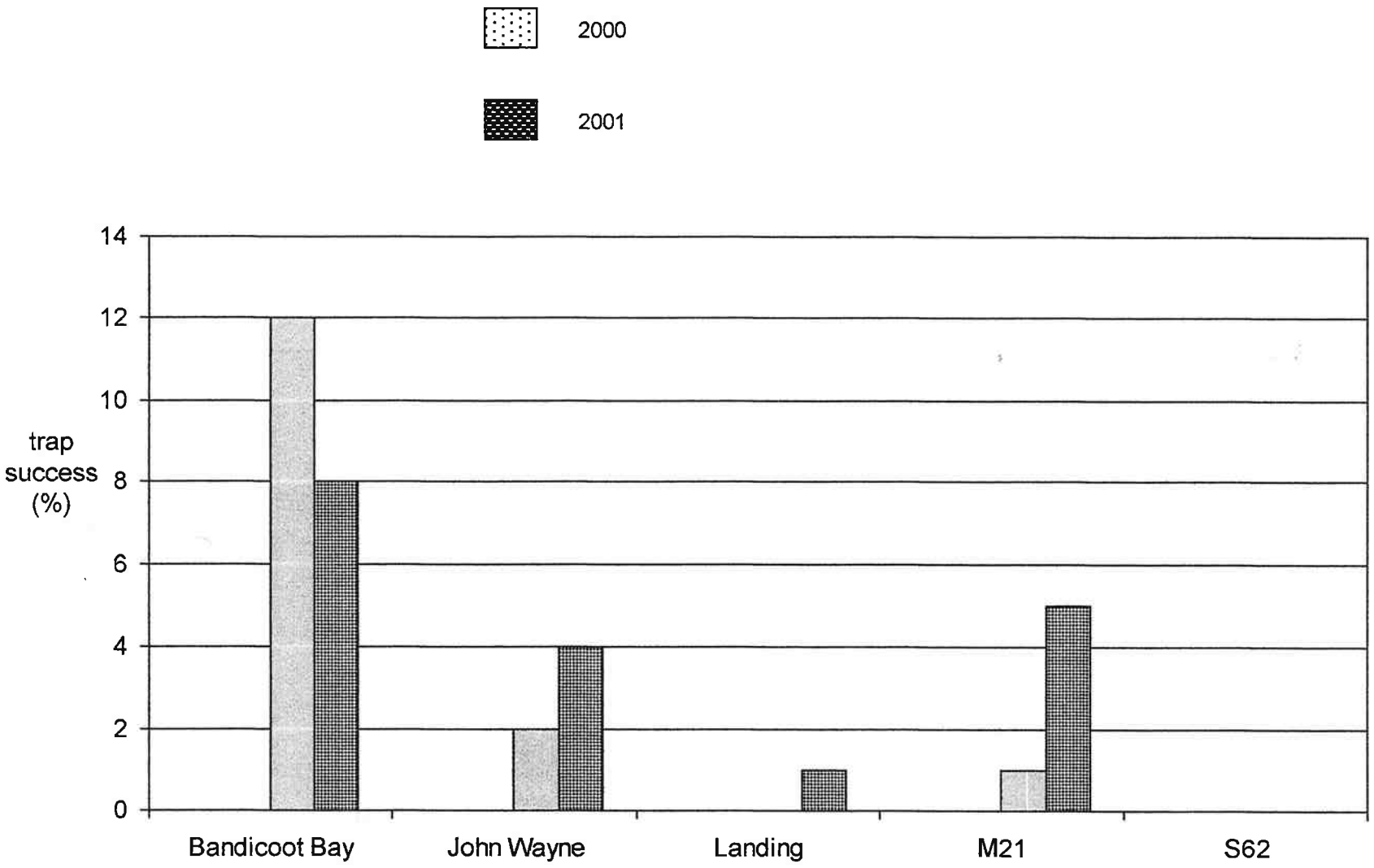


Figure 1. Mammal trap success rates on the Bandicoot Bay grid, Barrow Island

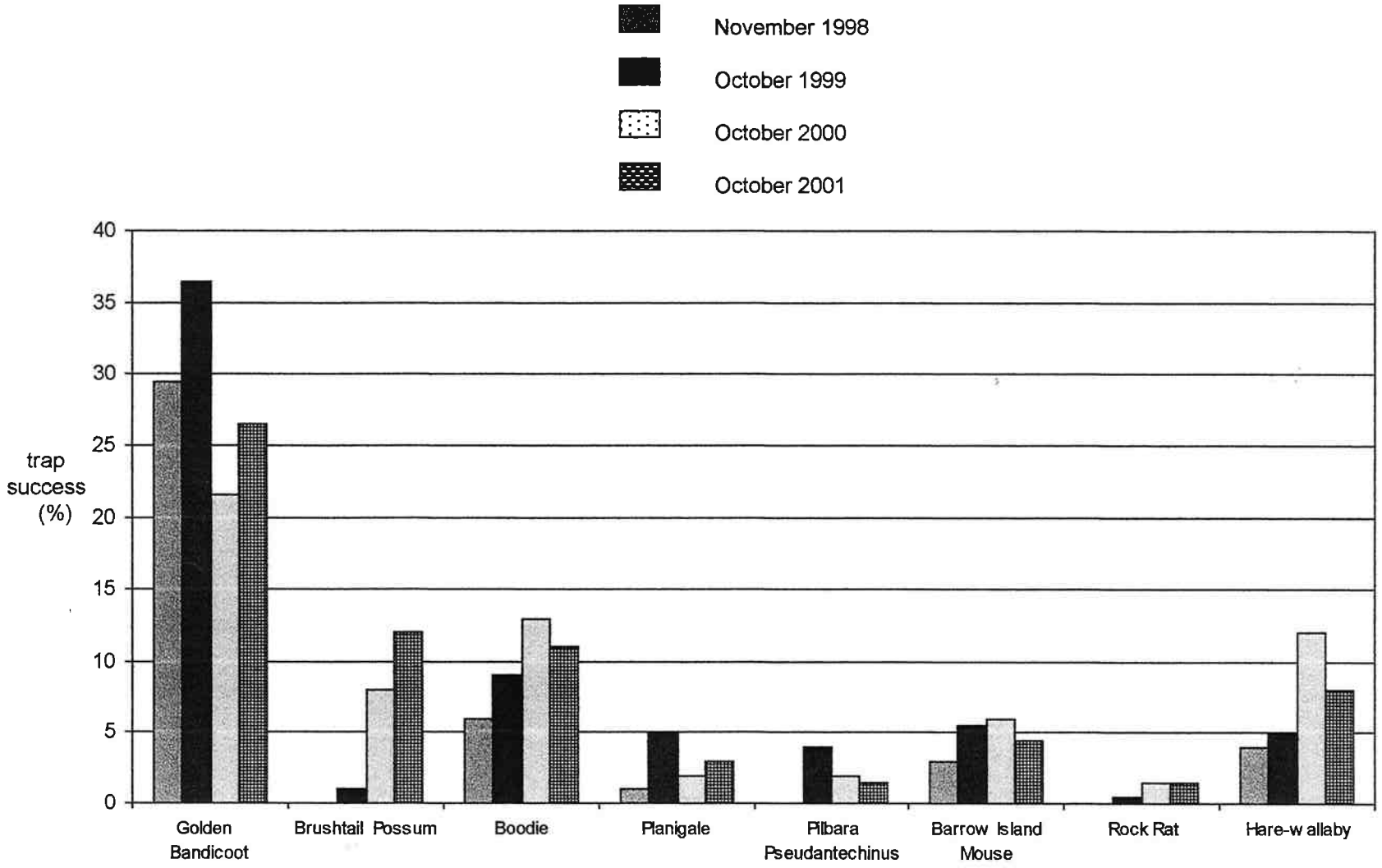


Figure 2. Mammal trap success rates on the John Wayne grid, Barrow Island

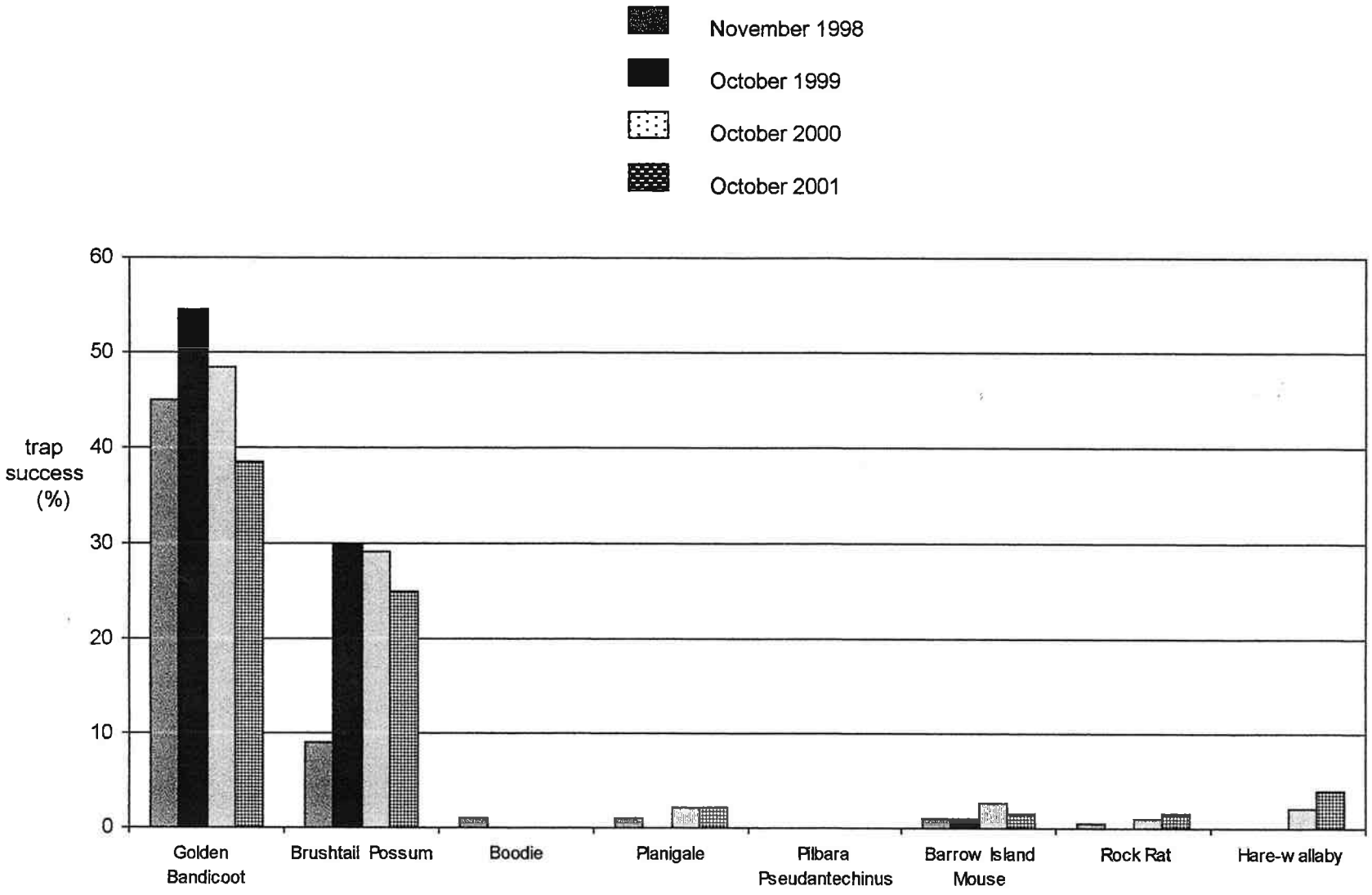


Figure 3. Mammal trap success rates on the Landing grid, Barrow Island

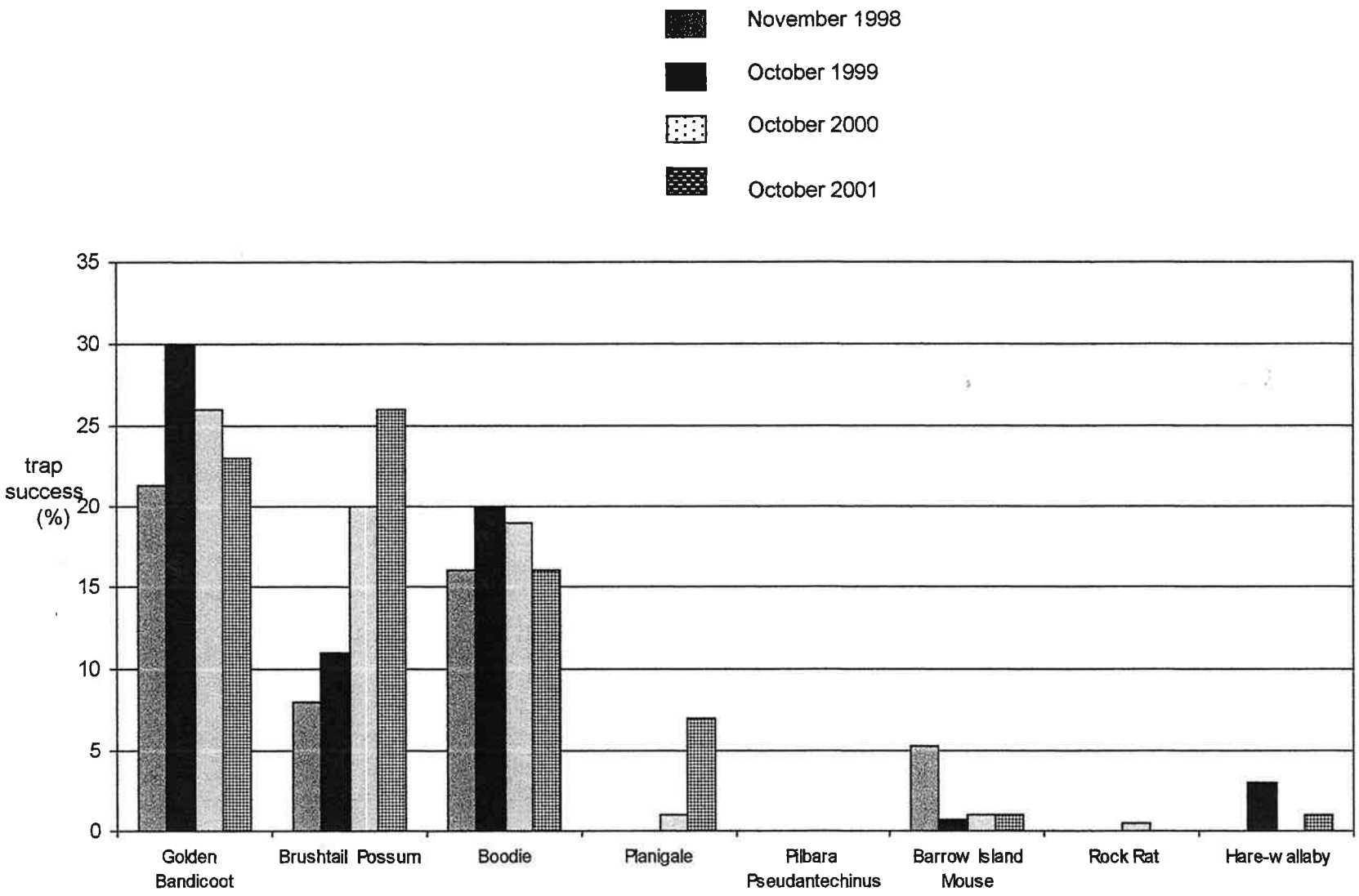


Figure 4. Mammal trap success rates on the M21 grid, Barrow Island

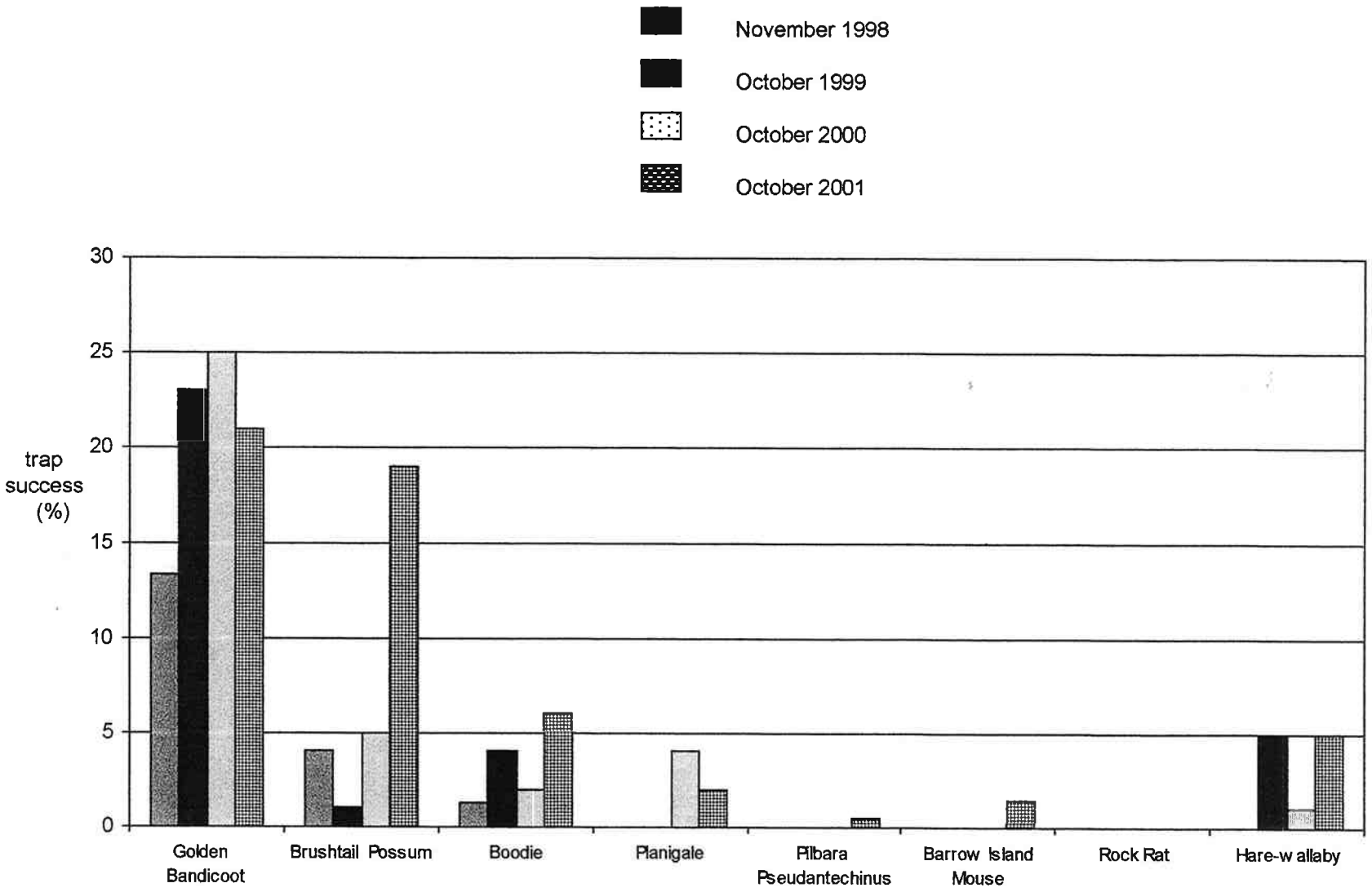
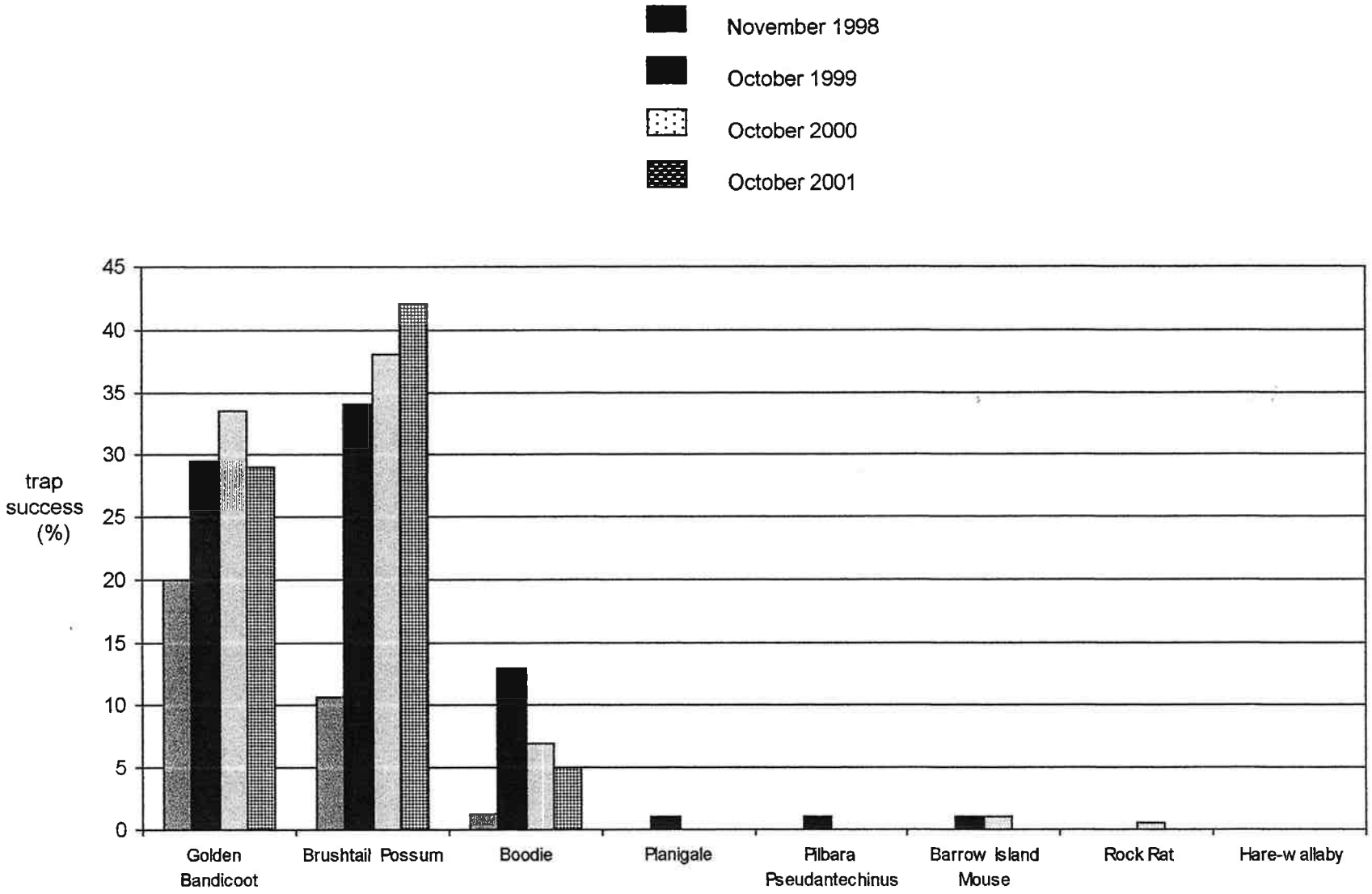


Figure 5. Mammal trap success rates on the S62 grid, Barrow Island.



APPENDIX 1

BARROW ISLAND GRID TRAPPING SUMMARY

OCTOBER 2001

JOHN WAYNE GRID

	G Bandicoot (200 trapnights)			BT Possum (100 trapnights)			Boodie (100 trapnights)			Hare-wallaby (100 trapnights)			Planigale (100 trapnights)			Pseudantech (200 trapnights)			Bl Mouse (200 trapnights)			Rock Rat (200 trapnights)		
	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt
Total captures	23	16	38	6	8	11	0	0	0	2	1	1	2	0	0	0	0	0	2	0	1	1	0	2
Total individuals	**39**			**14**			**0**			**3**			**2**			**0**			**2**			**1**		
% trap success	**38.5**			**25.0**			**0.0**			**4.0**			**2.0**			**0.0**			**1.5**			**1.5**		

BANDICOOT BAY GRID

	G Bandicoot (200 trapnights)			BT Possum (100 trapnights)			Boodie (100 trapnights)			Hare-wallaby (100 trapnights)			Planigale (100 trapnights)			Pseudantech (200 trapnights)			Bl Mouse (200 trapnights)			Rock Rat (200 trapnights)		
	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt	N	R	Rt
Total captures	18	8	27	5	0	7	1	6	4	5	0	3	3	0	0	3	0	0	3	3	3	2	0	1
Total individuals	**26**			**5**			**7**			**5**			**3**			**3**			**6**			**2**		
% trap success	**26.5**			**12.0**			**11.0**			**8.0**			**3.0**			**1.5**			**4.5**			**1.5**		

N = new animal capture
R = recapture animal from previous trappings
Rt = retrap animal from this trapping
Total individuals = N + R
% trap success = [(N + R + Rt) / # trapnights] x 100

S 62 GRID

	G Bandicoot (200 trapnights)			BT Possum (100 trapnights)			Boodie (100 trapnights)			Hare-wallaby (100 trapnights)			Planigale (100 trapnights)			Pseudantech (200 trapnights)			BI Mouse (200 trapnights)			Rock Rat (200 trapnights)		
	N	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**
Total captures	7	20	31	16	6	20	2	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Total individuals	**27**			**22**			**3**			**0**			**0**			**0**			**0**			**0**		
% trap success	**29.0**			**42.0**			**5.0**			**0.0**			**0.0**			**0.0**			**0.0**			**0.0**		

M 21 GRID

	G Bandicoot (200 trapnights)			BT Possum (100 trapnights)			Boodie (100 trapnights)			Hare-wallaby (100 trapnights)			Planigale (100 trapnights)			Pseudantech (200 trapnights)			BI Mouse (200 trapnights)			Rock Rat (200 trapnights)		
	N	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**
Total captures	7	8	27	7	3	9	2	2	2	4	0	1	2	0	0	1	0	0	2	0	1	0	0	0
Total individuals	**15**			**10**			**4**			**4**			**2**			**1**			**2**			**0**		
% trap success	**21.0**			**19.0**			**6.0**			**5.0**			**2.0**			**0.5**			**1.5**			**0.0**		

LANDING GRID

	G Bandicoot (200 trapnights)			BT Possum (100 trapnights)			Boodie (100 trapnights)			Hare-wallaby (100 trapnights)			Planigale (100 trapnights)			Pseudantech (200 trapnights)			BI Mouse (200 trapnights)			Rock Rat (200 trapnights)		
	N	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**
Total captures	7	9	30	4	6	16	4	3	9	1	0	0	3	0	4	0	0	0	1	0	1	0	0	0
Total individuals	**16**			**10**			**7**			**1**			**3**			**0**			**1**			**0**		
% trap success	**23.0**			**26.0**			**16.0**			**1.0**			**7.0**			**0.0**			**1.0**			**0.0**		

APPENDIX 2

BARROW ISLAND ROCK - WALLABY TRAPPING SUMMARY

OCTOBER 2001

	John Wayne (40 trapnights)			Q21 (20 trapnights)			Flacourt Bay (20 trapnights)			YS88 (20 trapnights)			Y23 (20 trapnights)		
	N	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**	**N**	**R**	**Rt**
Total captures	0	1*	0	0	2*	0	0	0	0	2	0	0	3	0	2
Total individuals	**1**			**2**			**0**			**2**			**3**		
% trap success	**2.5**			**10.0**			**0.0**			**10.0**			**25.0**		

* originally trapped by Juliet King 1994.