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& LAND MANAGEMENT
WESTERN AUSTRALIA

LACEPEDE ISLANDS - JULY 1987

INTRODUCTION

The Black Rat Rattus rattus has long been known to occur on the Lacepede Islands north of Broome. Previous visits by Government departmental officers, viz. Youngson and Johnson (1973), Fuller and Lane (1982) and Prince and Williams (1986) reported large concentrations of these rats on Sandy, Middle and West Lacepede Island. The rats almost certainly reached the islands during the guano mining operations of the last century. It is likely that their presence has had and continues to have a detrimental effect on nesting seabirds especially the smaller more susceptible species.

In October/November 1986, while conducting the initial turtle tagging operation on the Lacepedes, CALM officers intensively baited Sandy Island, Middle Island and West Lacepede Island in an effort to exterminate the rats. Baits, made up of oats impregnated with Pindone, were prepared and supplied by the Agriculture Protection Board for the baiting program.

1987 ISLAND SURVEY

Between 4th and 10th July 1987, Kimberley region Wildlife Officer Mike Osborne, Steve Story of Kununurra and myself visited the Lacepede Islands. Arrangements had been made with Mr Steve Arrow of the Barrow Pearling Co., Broome, to transfer us and our equipment to the islands on 4th July and then bring us back to the mainland on 10th July. This arrangement worked extremely well and gave us five full working days on the islands. Steve Arrow provided an aluminium dinghy for transportation between the islands during the course of the survey. Base camp was established for the duration of the visit at the eastern end of West Island.

The objectives of the 1987 visit were as follows:

I To investigate the effects of the 1986 rat baiting program on the island rat populations.

II To erect wooden routed CALM Nature Reserve signs on West, Middle and Sandy Islands.

III To compile bird species lists for each island and estimate (if time permitted) the numbers of breeding seabirds on the islands.

IV To report on Green Turtle nesting activity on the islands and tag turtles where possible.

V To collect and prepare samples of the seagrass species present in the intertidal areas around the islands.

I RAT PRESENCE INVESTIGATIONS

(A) West Island

This is the largest and most diverse island in the Lacepede group, with an area of 107 hectares. Three of its major habitats, the Spinifex longifolius grassland, the dense low cover around the margins of the tidal inlet and the areas denuded from past guano mining were all densely populated with rats in 1986. These habitats were all tested for rats in July 1987.

Methodology:

Six Test Bait Stations, each containing 25 packets of un-poisoned oats, were distributed as follows: Two in the Spinifex grassland, two in the guano mined areas, one along the edge of the tidal inlet and one along the island's southern shoreline (Fig. 1). In the case of the extensive Spinifex habitat and the old guano mined areas the baits were set out in 40 metre x 40 metre grid squares. (Note: Except Bait Station No. 1 which measured only 20 metres x 20 metres and had baits laid

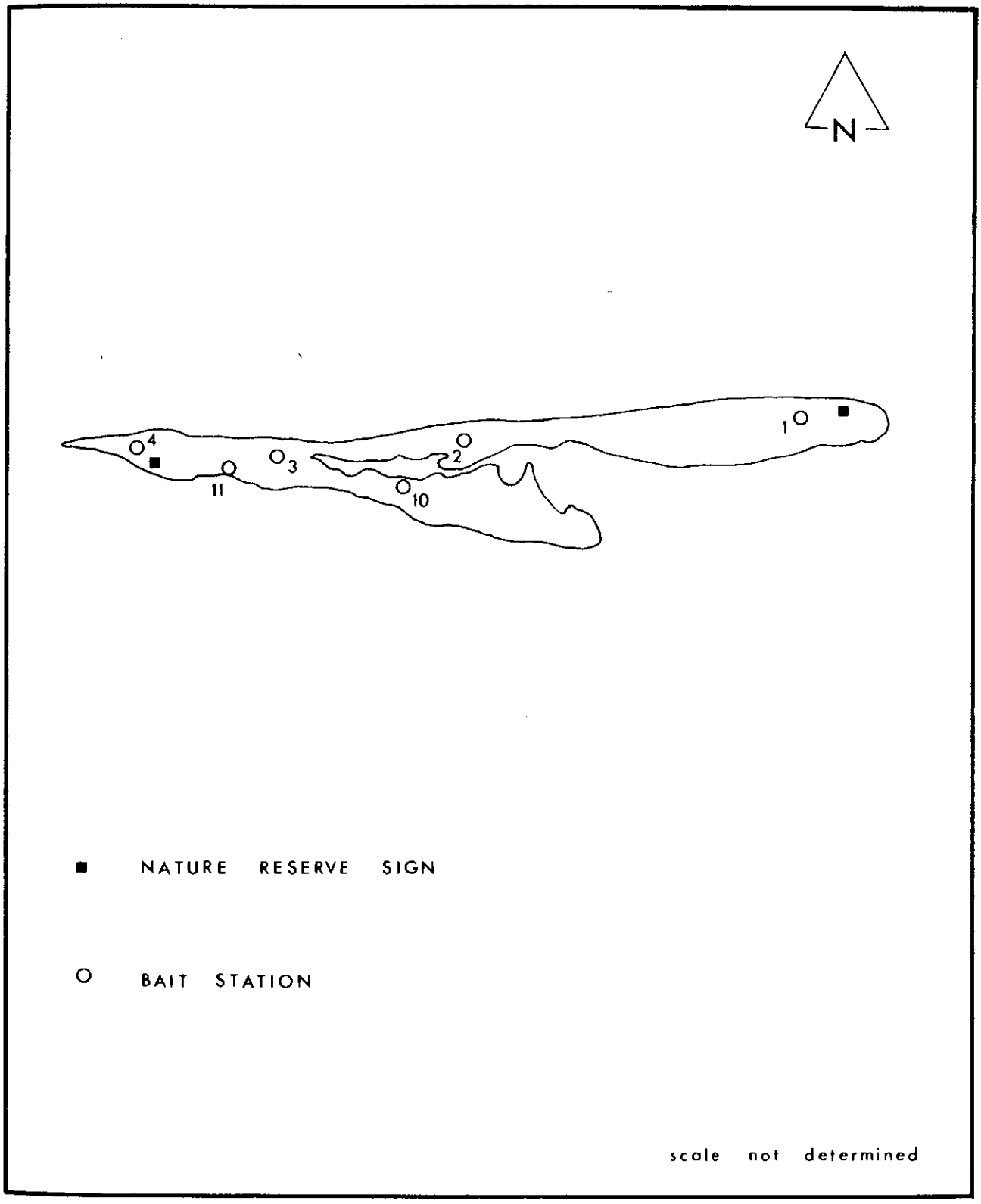


Figure 1. West Island : Location of Nature Reserve Signs and Test Bait Stations

5 metres apart.) Within each grid the bait packs were placed 10 metres apart. Where the habitat was limited in area or narrow in configuration baits were laid out in a single long line with each bait placed 10 metres apart.

West Island Test Bait Stations

Bait Station	Habitat	Baiting Pattern	Baits
No 1	Spinifex Grassland	20 m x 20 m grid square	25
No 2	Spinifex Grassland	40 m x 40 m grid square	25
No 3	Guano mined area	40 m x 40 m grid square	25
No 4	Guano mined area	40 m x 40 m grid square	25
No 10	Tidal creek margin	Single line 240 m	25
No 11	Rocky shoreline	Single line 140 m	15

Bait Stations No. 1, 2, 3 and 4 were set up on 5th July and were checked for signs of rats over the following four days. Bait Stations No. 10 and 11, which were set up on 7th July, were checked on 8th and 9th July. Rats did not touch any baits on West Island.

Night time head-torching traverses were undertaken from 20:30 hrs to 21:20 hrs on 4th July, from 21:00 hrs to 21:30 on 5th July and from 20:00 hrs to 20:30 hrs on 6th July. No rats were seen during these excursions. During the day, especially in the early mornings, smooth sandy areas were carefully examined for rat tracks but none were found.

(B) Middle Island

This is the second largest island in the Lacepede group with an area of 54 hectares. The central part of the island has been denuded by past guano mining and for the most part supports only sparse annuals. Around the

perimeter a narrow strip of Spinifex longifolius grassland still remains. Both the denuded area and the Spinifex grassland were infested with rats in 1986.

Methodology:

Four Test Bait Stations were set up to test for rat presence, two in the Spinifex habitat and two on the exposed guano mined area (Fig. 2).

Middle Island Test Bait Stations

Bait Station	Habitat	Baiting Pattern	Baits
No 6	Spinifex Grassland	40 m x 40 m grid square	25
No 7	Guano mined area	40 m x 40 m grid square	25
No 8	Guano mined area	40 m x 40 m grid square	25
No 9	Spinifex Grassland	Single line 240 m	25

All the Bait Stations on Middle Island were established on 6th July. They were examined three days later on 9th July. One bait pack at Bait Station No. 6 in Spinifex grassland had a possible rodent chew-hole. However there was no sign of the usual oat husking which so often characterise a rats visit. No other baits had been touched on Middle Island.

(C) Sandy Island

Sandy Island had extremely high rat numbers in 1986, especially in areas dominated by the prostrate creeper Ipomoea pes-caprae. The island was intensively baited in 1986.

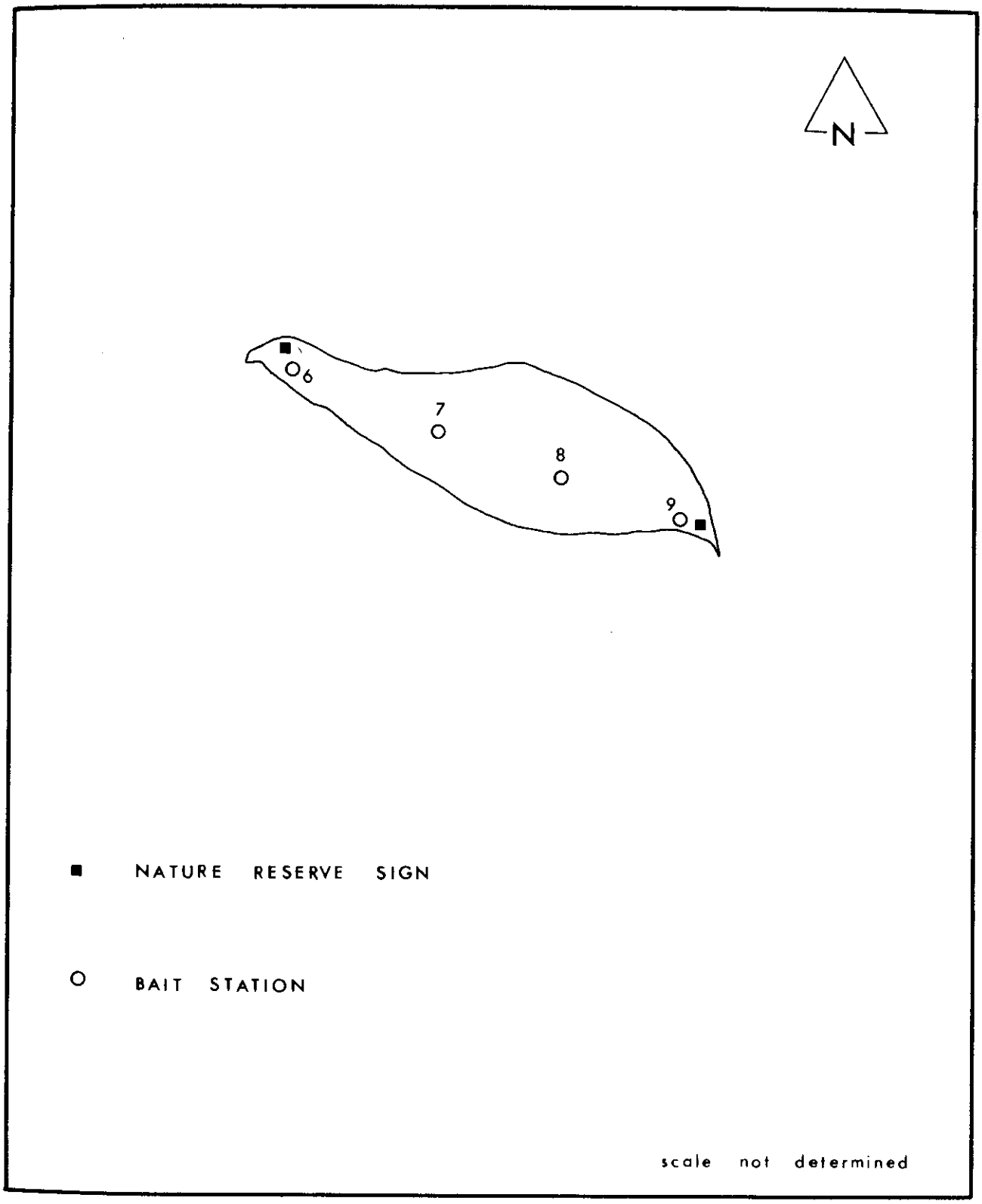


Figure 2. Middle Island : Locations of Nature Reserve Signs and Test Bait Stations.

Methodology:

On 5th July 1987 one bait station was established in the Spinifex grassland to test for rat presence. When the island was revisited on 7th July a second bait station was placed in the more open Ipomoea habitat (Fig. 3). Both were set out in the 40 metre x 40 metre grid pattern. There was no evidence of rats on the island. The baits were not touched.

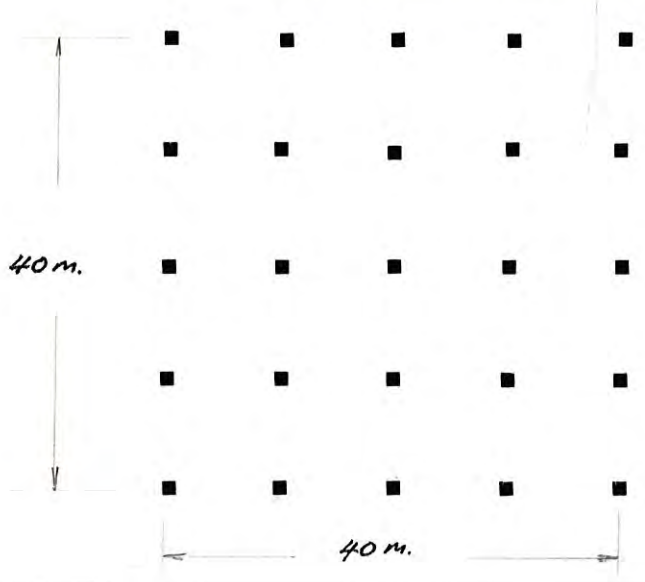
Sandy Island Test Bait Stations

Bait Station	Habitat	Baiting Pattern	Baits
No 5	Spinifex Grassland	40 m x 40 m grid square	25
No 12	Open Ipomoea	40 m x 40 m grid square	25

SUMMARY

Twelve Test Bait Stations were established on the Lacepede Islands in an attempt to determine the effectiveness of a rat poisoning exercise carried out in 1986. The sites chosen on each island were in areas where rats were previously known to have occurred in very high numbers. In most cases the Bait Stations were set out in grid squares measuring 40 metres x 40 metres. Twenty five individual baits were laid within each grid.

Diagram of Grid Bait Pattern



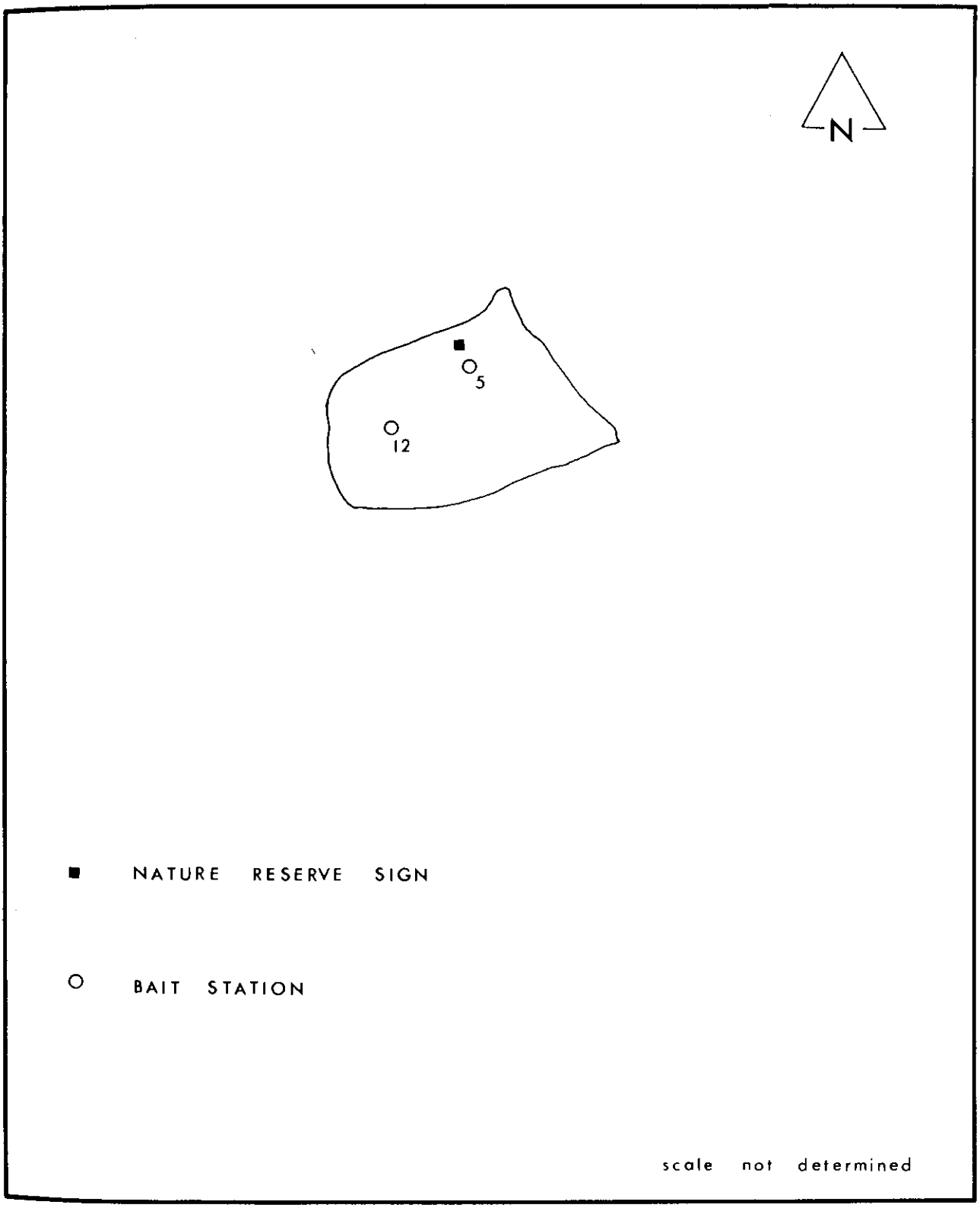


Figure 3. Sandy Island : Locations of Nature Reserve Signs and Test Bait Stations.

Where the habitat was limited in area or narrow in configuration, baits were laid 10 metres apart in a single long line to maximise their effectiveness.

A total of 290 baits were laid, 140 on West Island, 100 on Middle Island and 50 on Sandy Island. These proportions roughly correspond to the sizes of the islands.

CONCLUSIONS

Rats are now almost certainly absent from Sandy Island. On West Island we found no evidence of rats, but the large size of the island and the relatively small areas sampled mean that we can not rule out the possibility that they may be present in very small numbers. On Middle Island rats may still be present in very small numbers. One bait pack had a possible rodent chew-hole. However there was no sign of husking.

The situation should be further monitored when the CALM turtle tagging team returns to the Lacepedes in November 1987.

II SIGNPOSTING ISLANDS

Five wooden routed nature reserve signs, conforming to the standard specifications for Department of Conservation and Land Management nature reserve signs, were transported from Perth to Broome and then on to the Lacepede Islands.

Two signs were erected on West Island, two on Middle Island and one on Sandy Island (Fig. 1, 2 and 3). Each sign, comprising two uprights and three boards, identified the islands as being part of the "Lacepede Islands Nature Reserve" and also identified each island by name (see photographs - this report).

When erecting the signs the uprights were sunk as deep as possible and their bases set in cement. Considerable difficulty was encountered with the sign on Sandy Island and the one at the eastern end of West Island where the sand was so dry that constant cave-ins made it difficult to excavate suitable holes.

All signs were placed in strategic positions where craft might be expected to land. They are clearly visible from the water.

III NESTING SEABIRDS

(a) Brown Boobies

As was the case in 1982 nesting was well advanced with only a few birds on eggs. Most chicks were still covered in white down, and some were as large as the adults. At this stage they had become highly mobile. Their nest scrapes were largely obscured and could not be counted satisfactorily.

Time constraints did not allow for a complete count of individual booby nests on either West or Middle Island. Their major nesting areas were therefore identified and in each of these habitats occupied nests (sitting adults), and chicks were counted in random sample quadrats. From these counts estimates of nesting pairs may be calculated. It is important to stress however that the number of chicks counted does not necessarily equate with nest numbers as most nests would have had two eggs and might therefore be expected to produce more than one young. Judging from the numbers of dead chicks observed, chick mortality was low, possible 10-20%.

Following are details of the Brown Booby nesting counts.

Nesting Brown Booby Counts

Site No. 1

Island:	West Island
Habitat:	Spinifex grassland
Quadrat Location:	Eastern end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	19
Sitting Adults:	2

Site No. 2

Island:	West Island
Habitat:	Spinifex grassland
Quadrat Location:	North of narrow tidal inlet
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	26
Sitting Adults:	1

Site No. 3

Island:	West Island
Habitat:	Low dense ground cover
Quadrat Location:	Edge of tidal inlet
Quadrat Size:	25 metres x 100 metres (2 500 m^2)
Total Chicks:	27
Sitting Adults:	1

Site No. 4

Island:	West Island
Habitat:	Guano cleared area - very sparse annuals
Quadrat Location:	300 metres west of tidal inlet tip
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	51
Sitting Adults:	10

Site No. 5

Island:	West Island
Habitat:	Guano cleared area - no vegetation
Quadrat Location:	Near western end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	50
Sitting Adults:	0

Site No. 6

Island:	Middle Island
Habitat:	Spinifex grassland*
Quadrat Location:	Western end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	39
Sitting Adults:	0

*Note: this site includes 50% open ground in which a higher proportion of Booby chicks were observed (i.e. 10 birds in Spinifex, 29 birds in open area).

Site No. 7

Island:	Middle Island
Habitat:	Guano cleared area - very sparse annuals
Quadrat Location:	West - central part of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	66
Sitting Adults:	2

Site No. 8

Island:	Middle Island
Habitat:	Guano cleared area - very sparse annuals
Quadrat Location:	Centre of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	68
Sitting Adults:	2

Site No. 9

Island:	West Island
Habitat:	Guano cleared area - no vegetation
Quadrat Location:	Extreme western end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	72
Sitting Adults:	2

Site No. 10

Island:	West Island
Habitat:	Guano cleared area - very sparse dead annuals
Quadrat Location:	Western end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	77
Sitting Adults:	0

Site No. 11

Island:	Middle Island
Habitat:	Spinifex grassland
Quadrat Location:	Eastern end of island
Quadrat Size:	50 metres x 50 metres (2 500 m^2)
Total Chicks:	25
Sitting Adults:	1

Site No. 12

Island:	Sandy Island
Habitat:	Open sand - sparse Ipomoea pes-caprae
Quadrat Location:	Western side of island
Quadrat Size:	200 metres x 100 metres (2 ha)
Total Chicks:	33
Sitting Adults:	11

In July 1982 a single Brown Booby was recorded on an exposed tidal reef near Sandy Island. None were recorded in 1986.

Since the island was systematically baited a small breeding colony has become established on the west side of the island, in an area devoid of Spinifex and characterised by Ipomoea pes-caprae creepers and very sparse annuals. The breeding site covers an area of ca. 2 ha and may have been affected by past cyclonic flooding. The chicks were at the same stage as those on Middle and West Island.

(b) Lesser Frigatebirds

Lesser Frigatebirds were only found nesting on West Island. The colony was distributed patchily along the southern side of the western half of the island where nests were always built up among spinifex tussocks. A rapid count produced a total of 1 210 active nests either with eggs or young. Specimens of ticks found on the Frigatebird chicks were collected for identification.

(c) Pied Cormorants

Only one small nesting colony of Pied Cormorants was observed. It was located near the eastern tip of Middle Island, the nests placed on Spinifex tussocks. Mainly well-developed young but some nests contained eggs which were taken by invading Silver Gulls. No attempt was made to count nest numbers due to the risk of inducing gull predation.

(d) Caspian Terns

One small breeding colony of Caspian Terns were observed just above the high water mark on the southern side of the tidal inlet. Fourteen adults and four

on West Island

large runners were counted. The species was breeding at the same site in 1982 (P.J. Fuller).

Bird Species Recorded - July 1987

West Island

Brown Booby - *Sula leucogaster*	Abundant (see nesting report)
Pied Cormorant - *Phalacrocorax varius*	Two on beach - east end of island
Lesser Frigatebird - *Fregata ariel*	*ca.* 1200 breeding pairs (see nesting report)
Reef Heron - *Egretta sacra*	Six individuals seen on beaches and intertidal mud flats
Marsh Harrier - *Circus aeruginosus*	Two flushed from spinifex near western end of island
Pied Oystercatcher - *Haematopus longirostris*	Four pairs seen on beaches and mud flats
Sooty Oystercatcher - *Haematopus fuliginosus*	5 - on beaches and mud flats (two pairs and a single bird)
Grey Plover - *Pluvialis squatarola*	7 - Intertidal mudflats
Large Sand Plover - *Charadrius leschenaultii*	10 - Intertidal mudflats
Red-capped Plover - *Charadrius ruficapillus*	15 - Intertidal mudflats
Ruddy Turnstone - *Arenaria interpres*	7 - Intertidal mudflats
Grey-tailed Tattler - *Tringa brevipes*	13 - Intertidal mudflats
Greenshank - *Tringa nebularia*	4 - Intertidal mudflats
Terek Sandpiper - *Tringa terek*	1 - Intertidal mudflats
Bar-tailed Godwit - *Limosa lapponica*	80 - In one large flock on intertidal mudflats
Red Knot - *Calidris canutus*	10 - Intertidal mudflats (three birds in full summer plumage)
Great Knot - *Calidris tenuirostris*	8 - Intertidal mudflats (two birds in full summer plumage)

Red-necked Stint - Calidris ruficollis	9 - Intertidal mudflats
Curlew Sandpiper - Calidris ferruginea	1 - Intertidal mudflats
Australian Courser - Stiltia isabella	Single bird on bare rocky ground near western tip of island - among nesting Brown Boobies
Silver Gull - Larus novaehollandiae	Several hundred all over island. On beaches and around nesting Brown Boobies. Several young birds seen.
Gull-billed Tern - Gelochelidon nilotica	1 - Intertidal mudflats
Caspian Tern - Hydroprogne caspia	Small colony near tidal inlet (see nesting report)
Little Tern - Sterna albifrons	450 to 500 birds on exposed intertidal mudflats
Crested Tern - Sterna bergii	3 - Intertidal mudflats
Olive-backed Oriole - Oriolus sagittatus	One dead bird picked up in Spinifex grassland on West Island.

Bird Species Recorded - July 1987

Middle Island

Australian Pelican - *Pelicanus conspicillatus*	Four adult birds on beach at eastern end of island
Brown Booby - *Sula leucogaster*	Abundant (see nesting report)
Pied Cormorant - *Phalacrocorax varius*	Small breeding colony - east end of island (see nesting report)
Reef Heron - *Egretta sacra*	Three on beaches and rocky shoreline
Sooty Oystercatcher - *Haematopus fuliginosus*	Pair on south side rocky shoreline
Silver Gull - *Larus novaehollandiae*	Several hundred - along beaches and around Brown Booby colonies.
Common Noddy - *Anous stolidus*	Four birds tentatively identified as Common Noddy observed by M. Osborne flying over Middle Island.

Bird Species Recorded - July 1987

Sandy Island

Brown Booby - *Sula leucogaster*	Small new breeding colony established on island (see nesting report)
Reef Heron - *Egretta sacra*	Four birds on beach
Sooty Oystercatcher - *Haematopus fuliginosus*	Pair seen on beach
Ruddy Turnstone - *Arenaria interpres*	Two seen on shoreline

IV GREEN TURTLE ACTIVITY

Sandy beaches on West, Middle and Sandy Island were monitored for signs of Green Turtle nesting activity. On West Island, from 5th to 9th July, two to four sets of fresh tracks were recorded early each morning. Examination of the beaches on Middle and Sandy Island showed similar numbers of fresh tracks. On 5th July a nesting female was measured and tagged on West Island.

Hatchling Green Turtles were also recorded. At 20:00 hrs on 5th July the camp on West Island was invaded by ca. 24 hatchlings, apparently attracted to the camp light. All were rounded up and taken to the sea and released. On 9th July at 13:30 hrs ca. eight to ten Green Turtle hatchlings emerged from the sand near the eastern end of West Island. A flock of attendant Silver Gulls and two Pied Cormorants ate all but two of the hatchlings, which were saved from this fate and released in the sea after dark.

On 7th July en route to Sandy Island, six immature Green Turtles were captured by Mike Osborne, Steve Story and myself in the shallow channel along the southern side of Middle Island. They were caught just after low tide and were measured, tagged and then

released. The following day several more were caught on a rising tide in the same location. On 9th July, having checked the Middle Island bait stations, Mike Osborne and Steve Story caught and tagged more immature turtles at low tide in sheltered bays near the western tip of West Island. A total of 26 turtles were tagged. Only one of these was an adult nesting female. The rest were immature and sub-adults.

V SEAGRASS COLLECTION

Seagrass specimens were collected from exposed intertidal mudflats and the shallow channel on the southern side of Middle Island. The two or possibly three species collected have been sent to Dr Diana Walker, University of Western Australia, for identification.

Reptile Sightings

Gilberts Dragon Gemmatophora gilberti. Common on West Island and Middle Island, both in Spinifex grassland and the exposed guano mined areas. Approximately 50% of animals seen were immatures.


LACEPEDE ISLANDS
NATURE RESERVE
WEST ISLAND


LACEPEDE ISLANDS
NATURE RESERVE
WEST ISLAND


LACEPEDE ISLANDS
NATURE RESERVE
MIDDLE ISLAND


LACEPEDE ISLANDS
NATURE RESERVE
MIDDLE ISLAND


LACEPEDE ISLANDS
NATURE RESERVE
SANDY ISLAND

Mammal Sightings

One adult Dugong was sighted at the entrance to Beagle Bay at ca. 12:00 hrs on 10th July 1987.

ANDREW WILLIAMS
WILDLIFE RESEARCH CENTRE
WOODVALE

28th July, 1987

Future CALM Expeditions to the Lacepedes

The logistical problems involved in transporting personnel and equipment from Perth to the Lacepede Islands are quite considerable.

Inexpensive, reliable boat transportation can now be arranged through Steve Arrow, Barrow Pearling Co., PO Box 1236, Broome. He has two work boats stationed at Beagle Bay. His pearling base at Beagle Bay has just been connected by phone. This means that he can easily be contacted from the islands either through the Flying Doctor, or direct on the CALM radio frequency.

Alternative boat transport to the islands either from Broome or Beagle Bay can be arranged through Ian Fanning, PO Box 604, Broome. Phone - work 921876: Home 922-443. He runs a 48 foot crayboat - "Michelle II", and works up in the Lacepede region every two weeks or thereabouts (collecting aquarium marine reef fish). "Michelle II" has extensive deck space available and is ideal for the purpose. This boat is very suitable for carrying heavy loads such as 200 litre drums of drinking water.

The Aboriginal members of the CALM turtle tagging team demonstrated considerable seamanship qualities in 1986.

They are competent to run their own boat transport from One Arm Point to the Lacepedes. Indeed, they must be encouraged to operate independently with little supervision if they are to really take on a managerial role in the future.

Costs incurred in July 1987 are as follows:

2 charter trips to the Lacepedes	
Hire of one aluminium dinghy for 7 days	
Outboard engine fuel provided	$885.00

Andrew Williams

ANDREW WILLIAMS

28th July 1987