WOYLIE MONITORING PROJECT

FINAL REPORT TO DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

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November 2nd, 1994

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Introduction

The Woylie (*Bettongia penicillata ogilbyi*) is the Western Australian form of a species which once occupied an extensive range covering most of Australia south of the tropics . However, the species now occurs naturally only in a few isolated reserves in Western Australia although there are five reintroduced populations surviving in South Australia. A species recovery plan for the woylie was prepared in 1990 (Hall, 1991) which was used as the basis for recovery work on the species in 1992 and 1993. During 1993 it became evident that the plan required revision for a number of reasons and a second edition of the recovery plan was completed in 1994 (Start, Burbidge and Armstrong, 1994). This second edition of the Woylie Recovery plan outlined five recovery objectives and four criteria by which the achievement of these objectives could be determined. The recovery objectives and criteria are as follows:

Objectives

1. Determine the current wild distribution of the Woylie in Western Australia.
2. Establish a population of Woylies on a mainland area in South Australia without using predator-proof fences.
3. Develop prescriptions for the maintenance and extension of Woylie populations in multiple-use forest in Western Australia.
4. Ensure that translocated Woylie populations maintain genetic variability.
5. Review the conservation status of the Woylie, using internationally accepted criteria and recommend changes if necessary.

Criteria

Western Australia

- Maintenance of at least six populations of Woylies, each extending over at least 1 500 ha at densities that, when trapped under standard techniques, provide a minimum 20% trap success rate.
- Clarification of the status of the Woylie in conservation reserves and State Forests of the south-west of WA.

- Establishment of experiments to determine the effects of timber harvesting (at Kingston Forest) and fuel-reduction prescribed burning (at Batalling Forest) on Woylies.
- Establishment of monitoring programs (to include genetic diversity) and action plans to address any adverse trends detected (Start *et al*, 1994).

Over the past four months permanent monitoring transects have been established at four nature reserves and surveys conducted in a number of forest blocks to address Objective 1 and work towards satisfying the first, second and fourth criteria. Blood samples for DNA analyses were also collected from populations at Dryandra, and Boyagin to work toward addressing the fourth criterion. The monitoring transects were established to satisfy the fourth criterion and to provide baseline data on the populations. Trapping will be repeated along these same transects at least annually.

Materials and Methods

Monitoring Sites

Ten kilometre monitoring transects were established in Dryandra Woodland, Boyagin Nature Reserve and Tutanning Nature Reserve. Two existing transects (a north-south and an east-west transect), both of about twelve kilometres, were utilised at Batalling Forest. The routes covered by the monitoring transects are shown in the maps attached to the monitoring protocols. Manjimup CALM Science and Information Division has plans underway to establish monitoring transects in Yendicup and Boyicup Blocks using the same methods as those used in the other areas (see attached protocol).

Surveys

Four surveys were conducted in forest blocks south and west of Lake Muir covering sections of Meribup, Tone, Talling, Stoate, Poorginup and Chitelup blocks. The routes covered by these surveys are shown in the maps attached to the survey reports.

Trapping Methods

Trapping methods were the same for all monitoring transects and surveys. Sheffield cage traps baited with peanut butter, rolled oats, sardines and sultanas were set at 200m intervals 10 to 15 metres off vehicle tracks through the reserves. Trapping was usually conducted over three nights, although the monitoring transect at Dryandra and the survey in Talling and Stoate Blocks were over only 2 nights and Batalling Transect 1 (the north-south transect) was conducted over 4 nights. All animals caught were ear-tagged, weighed and measurements taken of the head length and pes length. Pouches of females were checked for the presence of young or evidence of lactation. Males scrotal length and width were recorded as an indication of breeding condition.

Trap success

Previous trapping records for each area were also obtained and trap success rates determined. Percentage trap success is defined as the number of animals caught per 100 trap nights where a trap night is one trap set for one night.

Results

All data sheets completed in carrying out this work are held by Keith Morris, CALM Science and Information Division, Woodvale and copies have also been kept by the author.

1. Monitoring protocols

Monitoring protocols for Dryandra Woodland, Tutanning Nature Reserve, Boyagin Nature Reserve and Batalling Forest are attached.

2. Surveys

Results of surveys including trapping routes and fox control details are attached.

3. Other outcomes

The results of this survey work were presented at the Ecological Society of Australia Conference in Alice Springs, 27-30th September 1994. A scientific paper discussing this work and its management implications is in preparation with Mr. Keith Morris.

Discussion

Woylie Recovery Plan Objectives

The surveys and monitoring transects addressed the objective of determining the current wild distribution of the woylie in WA and the two criteria of clarifying the status of the woylie in reserves and forests and establishing monitoring programs. The distribution of woylies in the forest blocks surrounding Perup Nature reserve has been clarified and the populations of woylies in other reserves (especially Boyagin which had not been trapped since the woylies were introduced in 1992) assessed. Woylies are now known to occupy an extensive area of the southern Jarrah forest from Kingston and Warrup blocks in the west, south east to northern Tone block and east into Talling block. Sightings of woylies have been reported from the Lake Muir area but trapping both west and south of Lake Muir failed to catch any. There was not time to investigate reports of woylie sightings in the Dwellingup area, but other areas of potential woylie populations were surveyed. The first criterion requires maintenance of at least 6 populations of woylies, each extending over at least 1500 ha at densities that, when trapped under standard techniques provide a minimum 20% trap success rate. Currently the populations at Dryandra, Perup and probably Tutanning meet this criterion. The population at Boyagin is small but growing and more intensive monitoring is to be continued as part of another study. The population at Batalling appears to have stabilised at around 10% trap success, but with baiting being extended to the west we may expect some changes over the next few years. A sixth population is to be established at Julimar Conservation Park later this year. The fourth objective of ensuring that translocated woylie populations maintain genetic variability is being addressed by DNA analysis of all the known populations (both natural and translocated) to ensure that the translocated populations are not experiencing a significant loss of genetic variability compared to the parent populations.

Other research on woylies currently in progress include studies of the effect of fire and logging on woylie populations which addresses objective 3 and research on a newly translocated population to further address objective 4.

Taxonomic Considerations

Preliminary work by Dr. Ken Aplin (West Australian Museum) on the taxonomy of woylies suggests that there are significant differences in cranial size and proportion between northern and southern populations within W.A. These differences are enough to suggest that populations from Dryandra and Perup should be kept separate until further work can be conducted to clarify the exact nature of the differences. DNA analyses of individuals from Dryandra and Kingston are in process, as are analyses of cranial length and body weights from field data gathered from the two populations.

Acknowledgments

Thanks to all the CALM , University and Perth Zoo staff, students and volunteers who provided field assistance during this study - Graham Hall (Perth Zoo), Stephanie Haigh (CALM), Pam Courtenay, Eddie van Etten (ECU), Lisa Edwards (ECU), Melissa Campbell (UWA), Alan Needham (ECU), Rob Brazell (CALM), Natasha Boczocha (CALM), Peter Orell (CALM) and Brian Whittred (CALM). A special thank you to Keith Morris for his help and advice throughout the project.

References

Hall, G., Nelson, L., Storr, R. and Robinson, A.C. 1991 *Recovery Plan for the Brush-Tailed Bettong or Woylie* (Bettongia penicillata). Unpublished Report to ANPWS Endangered Species Program (Project 149).

Start, A., Burbidge, A. and Armstrong, D. 1994 *Woylie Recovery Plan* (2nd edition). Unpublished Department of Conservation and Land Management Wildlife Management Program No 16

MONITORING PROTOCOLS

WOYLIE MONITORING PROGRAM

1. **LOCATION:** Batalling Nature Reserve

2. **# OF TRAPS:** **Transect 1** - Varis Rd: 61 Sheffield cage traps
Transect 2 - Steed Rd/Ernie Rd: 63 Sheffield cage traps

3. **SPACING OF TRAPS:** 200 m

4. **NAMING OF POINTS:** Transect 1: V1-V61
Transect 2: EW1-19, S1-44

5. **START POINT:** **Transect 1:** Varis Rd 200m from junction with Summer Rd.
AMG Reference: 309 450 N, 449 950 E

Transect 2: Steed Rd 200m west of junction with Varis Rd
AMG Reference: 316 550 N, 452 600 E

6. **FINISH POINT:** **Transect 1:** Varis Rd at junction with Dons Rd
AMG Reference: 315 360 N, 452 700 E
Transect 2: Western end of Ernie Rd about 200m east of railway line.
AMG Reference: 319 150 N, 442 050 E

7. **ROUTE FOLLOWED:** **Transect 1**
Traps 1-61 set along Varis Rd between Summer and Don Rd
Transect 2
Traps 1-44 set along Steed Rd travelling west from Don Rd.
Traps 45-63 (numbered EW 19-1) set along Ernie Rd travelling west from junction with Steed Rd.
SEE ATTACHED MAPS

8. FOX BAITING REGIME:

Transect 1:

Ground Baiting

Commenced: February 1991 (2400 ha east of Dons Rd.). Jan 1992 this area was increased to 10000 ha and used 445 baits. In July 1994 aerial baiting commenced (see below) and ground baiting is now limited to the western boundary of the reserve.

# of baits: 96

Baiting Route: See Attached Map for baiting route immediately before aerial baiting commenced and current route.

Distance between baits: 250m

Baiting frequency: Quarterly

Other comments:

Aerial Baiting

Commenced: July 1994

# of baits:

Baiting Route: Flight paths are at 1km intervals flying north south parallel to the Reserve Boundary/Batalling Rd. Baits are dropped at a rate of 5 per 1km flying.

Distance between baits: 200m

Baiting frequency: Quarterly

Transect 2:

Baiting commenced in this area west of Dons Rd with the onset of aerial baiting in July 1994.

9. RESPONSIBLE STAFF: District

10. SUMMARY OF PREVIOUS TRAP SUCCESS RATES:

Transect 1

	% trap success	
July 1992	7.4%	(Morris, unpublished)
August 1992	7.4%	(Morris, unpublished)

10. SUMMARY OF PREVIOUS TRAP SUCCESS RATES: (contd)

Transect 1 (contd)

	% trap success	
October 1992	7.4%	(Morris, unpublished)
February 1993	8.6%	(Morris, unpublished)
Apr 1993 (Traps 22-50 only)	22.4%	(Morris, unpublished)
July 1994	10.1%	(This study)

Transect 2

	% trap success	
Oct 1992	0.8%	(Morris, unpublished)
3/8/94-5/8/94	0.5%	(This study)

11. OTHER SPECIES:

Transect 1

		% trap success	
July 1992	Brushtail Possum	6.1%	
	Chuditch	4.5%	
	Mardo	0.4%	
			(Morris, unpublished)
Aug 1992	Brushtail Possum	4.5%	
	Chuditch	3.3%	
	Mardo	0.4%	
			(Morris, unpublished)
Oct 1992	Brushtail Possum	7.4%	
	Chuditch	2.9%	
	Bobtail Skink	1.2%	
	Blue Tongue Lizard	0.8%	
	Varanus gouldi	0.4%	
	Raven	0.4%	
			(Morris, unpublished)
Feb 1993	Brushtail Possum	8.6%	
	Chuditch	6.6%	
	Mardo	1.2%	
	Bobtail Skink	0.4%	
	Varanus rosenbergi	0.8%	
			(Morris, unpublished)
Apr 1993	Brushtail Possum	15.5%	
	Chuditch	6.9%	
			(Morris, unpublished)

11. OTHER SPECIES: (contd)

July 1994	Brushtail Possum	13.0%
	Chuditch	7.1%
	Quenda	0.8%

(This study)

Transect 2

		% trap success
Oct 1992	Brushtail Possum	0.4%
	Chuditch	1.2%
	Bobtail Skink	3.6%
	Blue Tongue Lizard	0.8%
	Varanus sp	0.4%

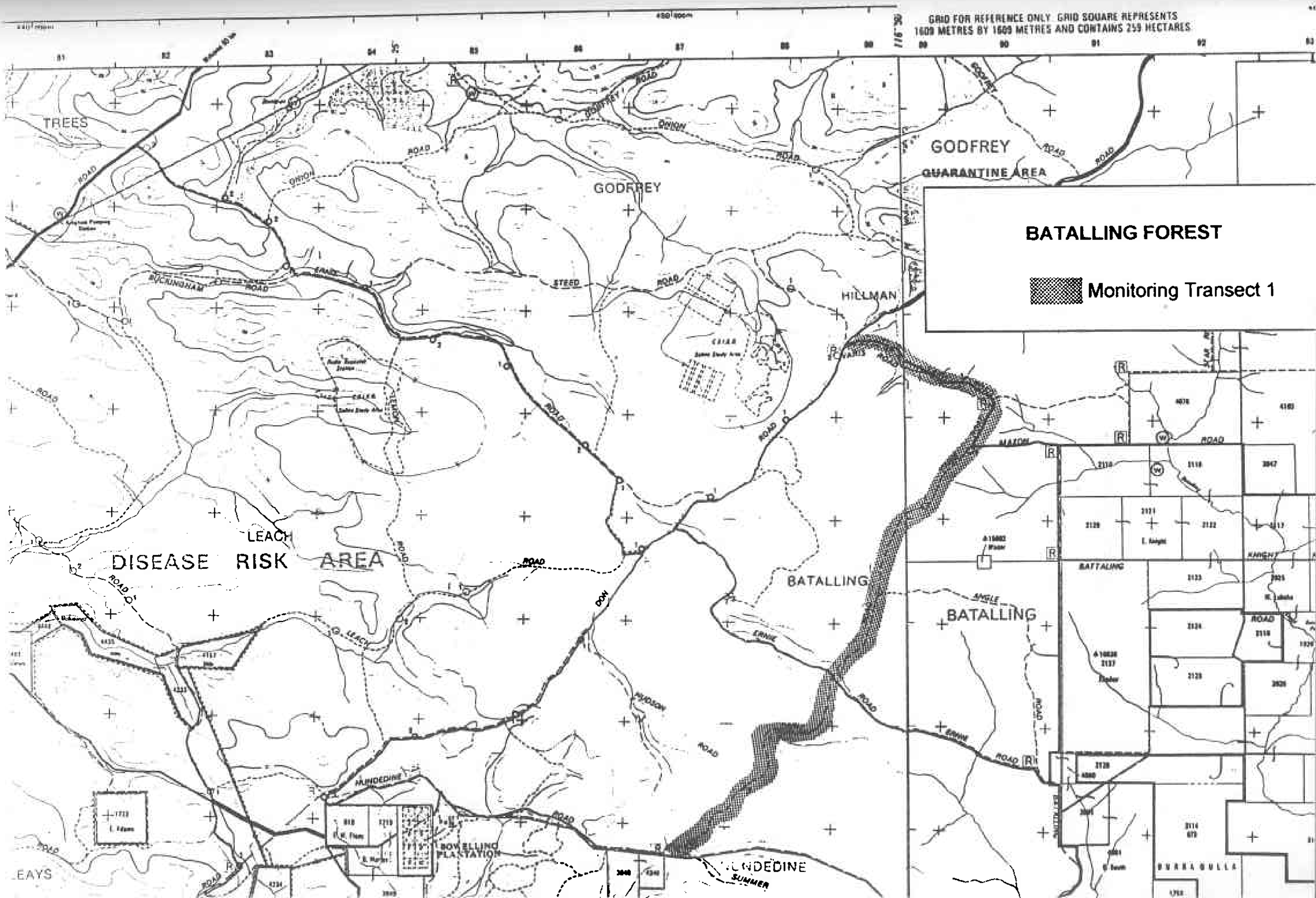
(Morris, unpublished data)

Aug. 1994	Brushtail Possum	1.6%
	Chuditch	1.1%
	Mardo	1.6%
	Quenda	2.6%

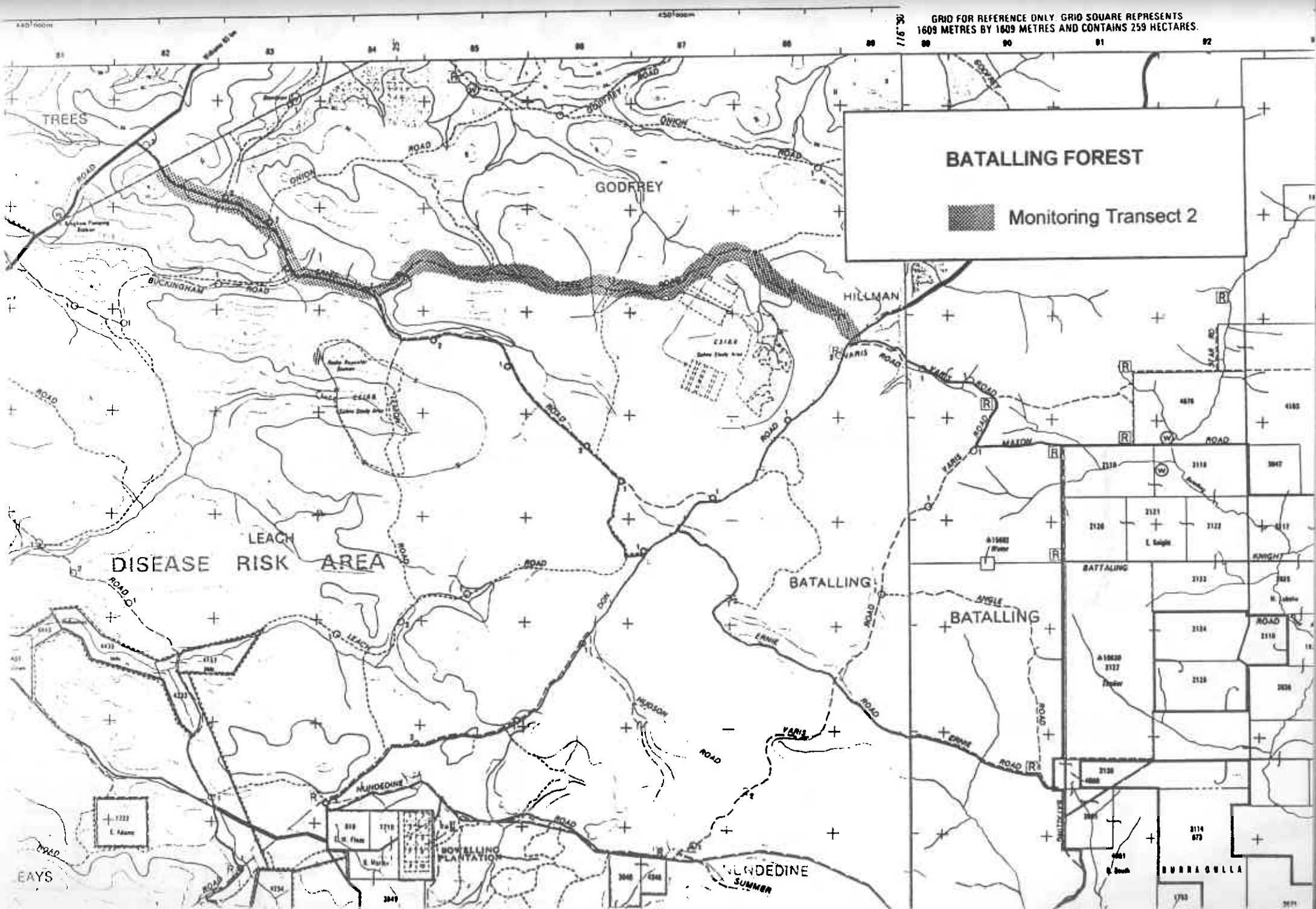
(This study)

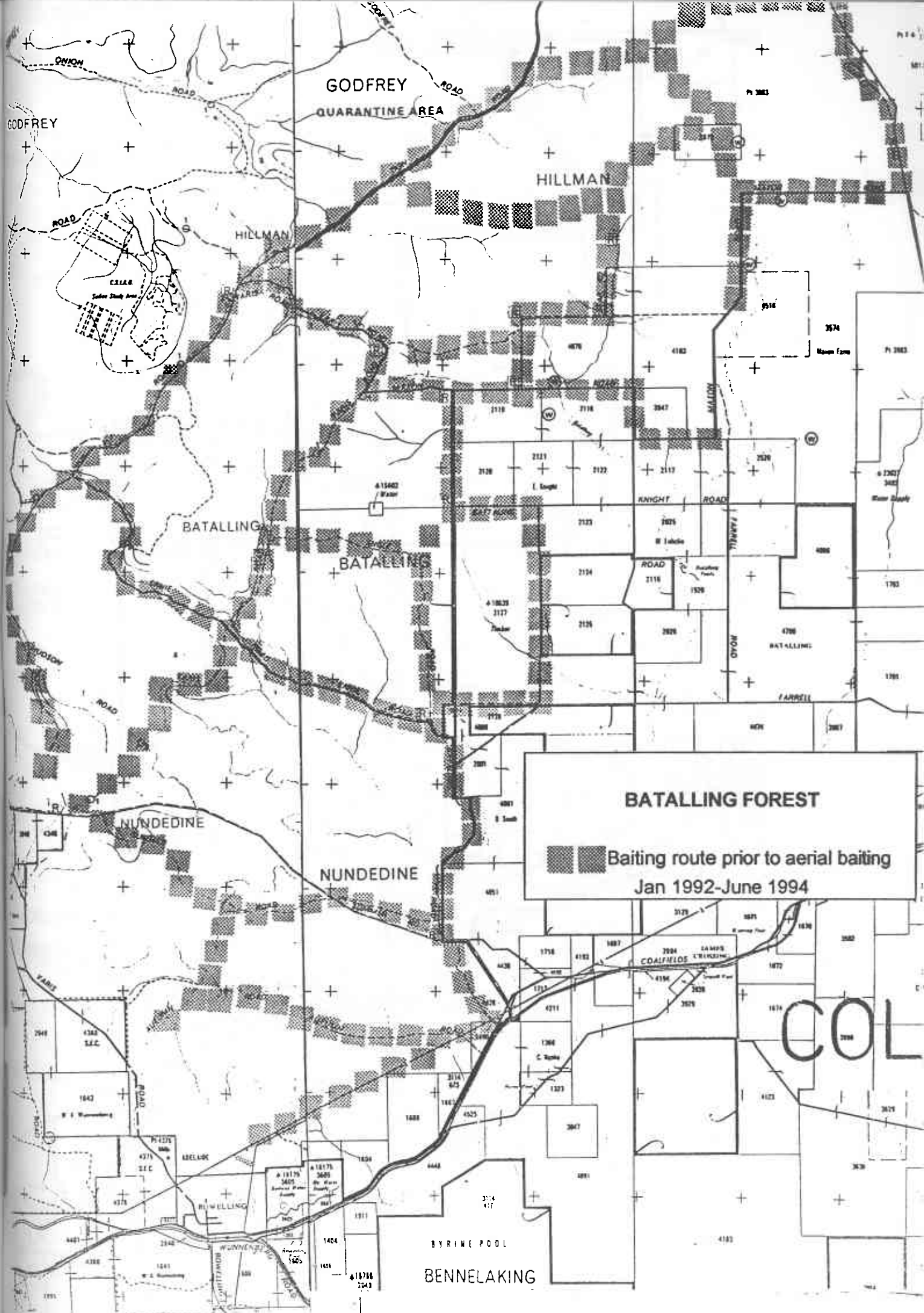
12. ATTACHMENTS:

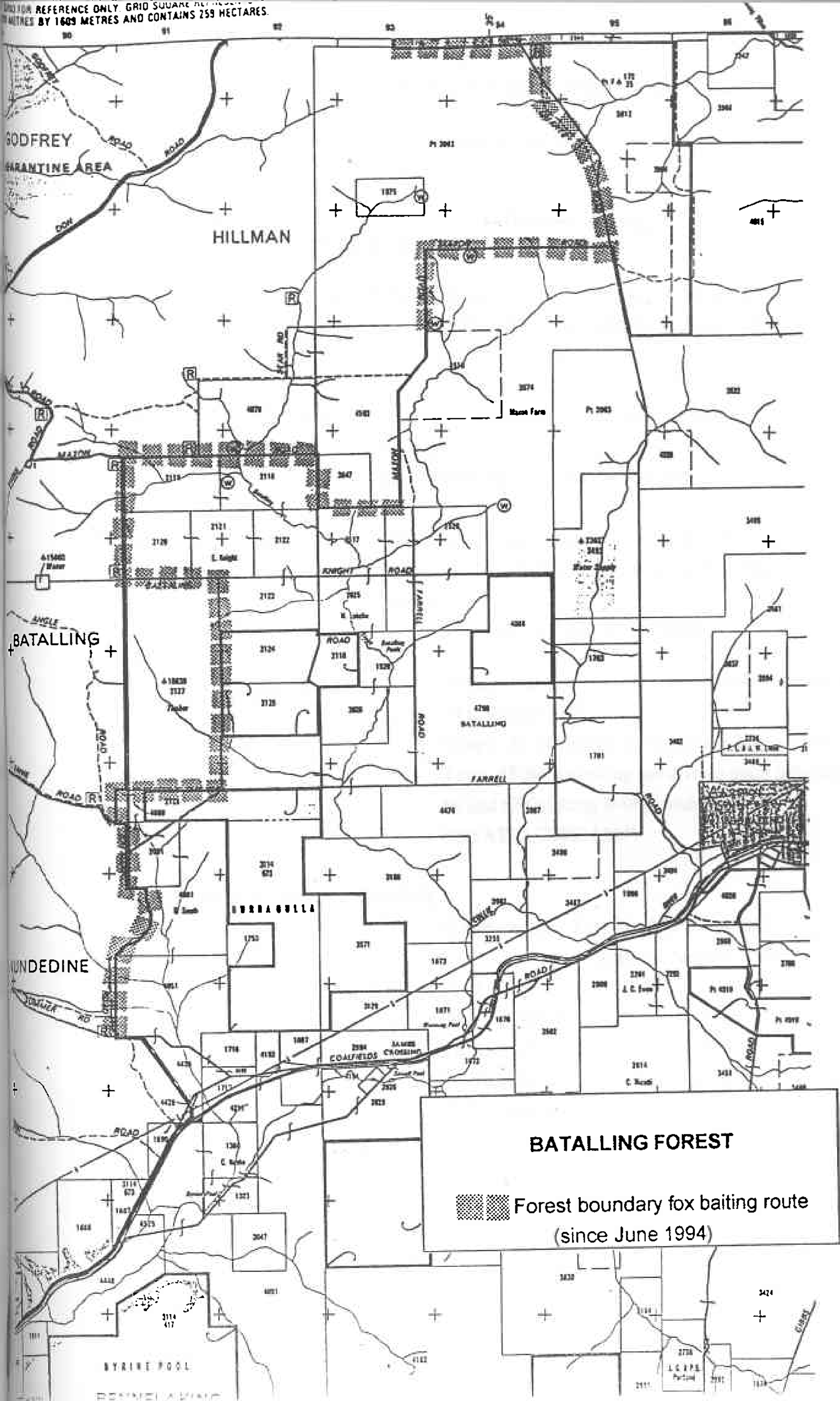
A. Maps of trapping routes
B. Maps of fox baiting routes



GRID FOR REFERENCE ONLY. GRID SQUARE REPRESENTS
1609 METRES BY 1609 METRES AND CONTAINS 259 HECTARES
BATALLING FOREST
Monitoring Transect 1
GODFREY
QUARANTINE AREA
GODFREY
HILLMAN
TREES
BUCKINGHAM
ROAD
STEED
ERNIE
BATALLING
BATALLING
DISEASE RISK AREA
LEACH
DON
HUDSON
MUNDEDINE
BOWELLING PLANTATION
SUMMER
EAYS


GRID FOR REFERENCE ONLY. GRID SQUARE REPRESENTS
1609 METRES BY 1609 METRES AND CONTAINS 259 HECTARES.
BATALLING FOREST
Monitoring Transect 2
TREES
GODFREY
HILLMAN
BATALLING
LEACH
DISEASE RISK AREA
HUNDEDINE
BOWELLING PLANTATION
EAYS
DURRA GULLA
ROAD


GODFREY
QUARANTINE AREA
GODFREY
HILLMAN
HILLMAN
BATALLING
BATALLING
NUNDEDINE
NUNDEDINE
KNIGHT ROAD
BATALLING FOREST
Baiting route prior to aerial baiting
Jan 1992-June 1994
BYRIME POOL
BENNELAKING


FOR REFERENCE ONLY. GRID SQUARE
METRES BY 1609 METRES AND CONTAINS 259 HECTARES.
GODFREY
QUARANTINE AREA
HILLMAN
BATALLING
MUNDEDINE
KNIGHT ROAD
FARRELL ROAD
BATALLING
COALFIELDS
JAMES CROSSING
BATALLING FOREST
Forest boundary fox baiting route
(since June 1994)

WOYLIE MONITORING PROGRAM

1. **LOCATION:** Boyagin Nature Reserve

2. **# OF TRAPS:** 50

3. **SPACING OF TRAPS:** 200 m

4. **NAMING OF POINTS:** Points marked with orange flagging tape (numbered 1-50) and dropper posts with orange tops labelled BOY1-BOY50

5. **START POINT:** Junction of south bound road with northern boundary of West Block of reserve.
   AMG Reference: 410 606 N, 488 152 E

6. **FINISH POINT:** On south east road about 1 km north of southern boundary of reserve, near south eastern corner of West block of reserve.
   AMG Reference: 403 000 N, 488 682 E

7. **ROUTE FOLLOWED:** **Traps 1-28** travelling south from point 18 through 74 to Boyagin Rd.
   Traps 29-34 travelling east along Boyagin Rd
   Trap 35-50 travelling south from point 5 through 66 and 63 finishing 600m south of 63
   SEE ATTACHED MAP

8. **FOX BAITING REGIME:**
   Commenced: East Block October 1985
   West Block January 1989
   # of baits:
   Baiting Route: See Attached Map
   Distance between baits: 100m
   Baiting frequency: Every 4 weeks
   Other comments:

9. RESPONSIBLE STAFF: District

10. SUMMARY OF PREVIOUS TRAP SUCCESS RATES:

1975 0% trap success (Kinnear, unpublished data)

1989 0% trap success (Kinnear, unpublished data)

1992 Total of 40 animals released into Reserve. 14 females and 6 males into each block (East and West) (Kinnear, unpublished data)

18.5.94-20.5.94 7.3% trap success (5 males, 6 females). 1 retrap and 4 recaptures of previously marked animals (original releases) (This study)

11. OTHER SPECIES:

1989 Brushtail Possum: 1.2% trap success in West block (no fox control), 12% trap success in East Block (with fox control) (Kinnear, unpublished data)

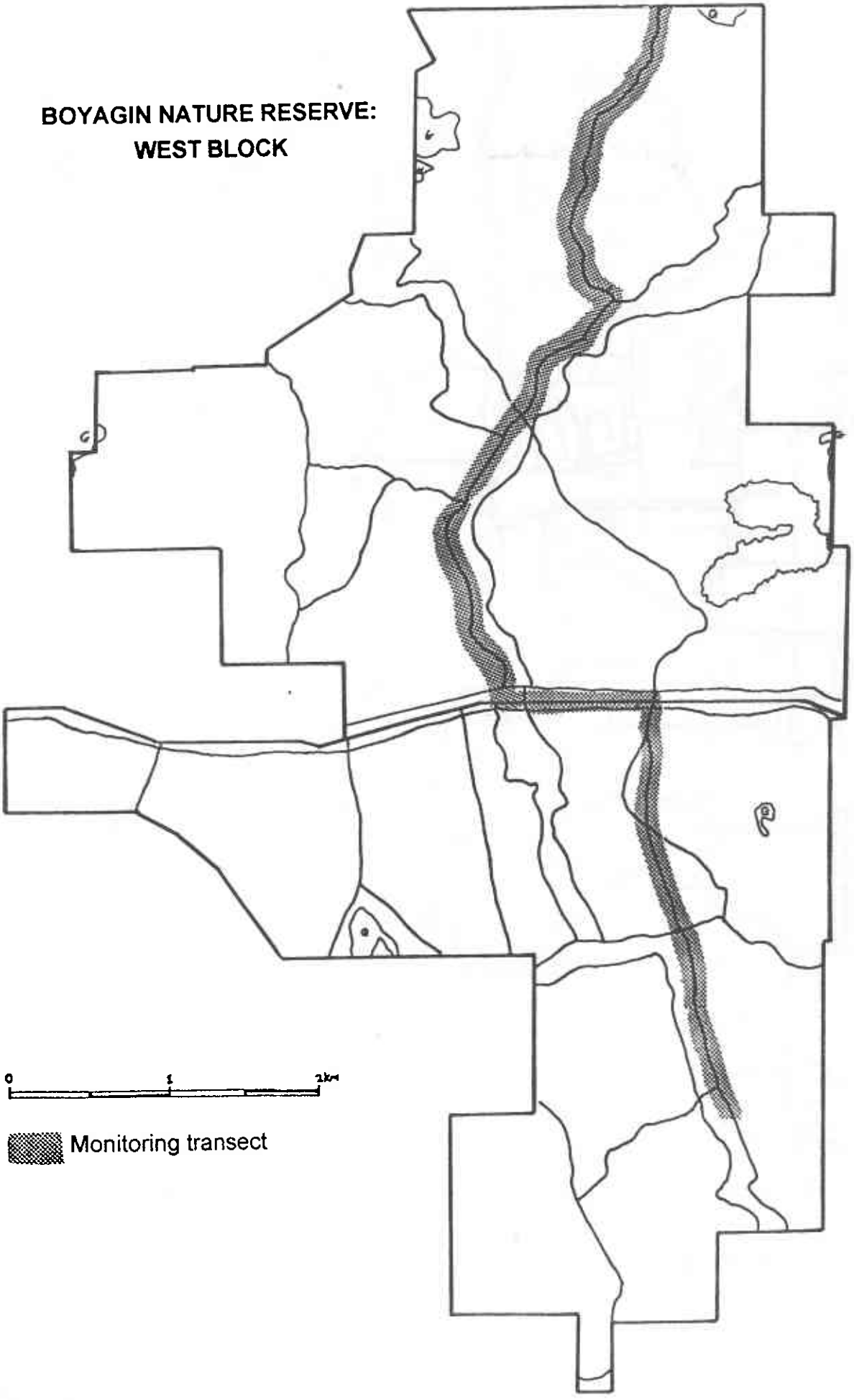
1992 Brushtail Possum: 1.2% trap success in West block (no fox control), 16.3% trap success in East block (with fox control) (Kinnear, unpublished)

18.5.94-20.5.94 Brushtail Possum: 5.3% trap success in West block (with fox control) (This study)

12. ATTACHMENTS:

A. Map of trapping routes
B. Map of fox baiting routes

BOYAGIN NATURE RESERVE:
WEST BLOCK



SPECIAL TREATMENT ZONE (only to be baited with owners con

~~Baits to be~~ laid at numbered stations, residue to be picked up within 24hrs.

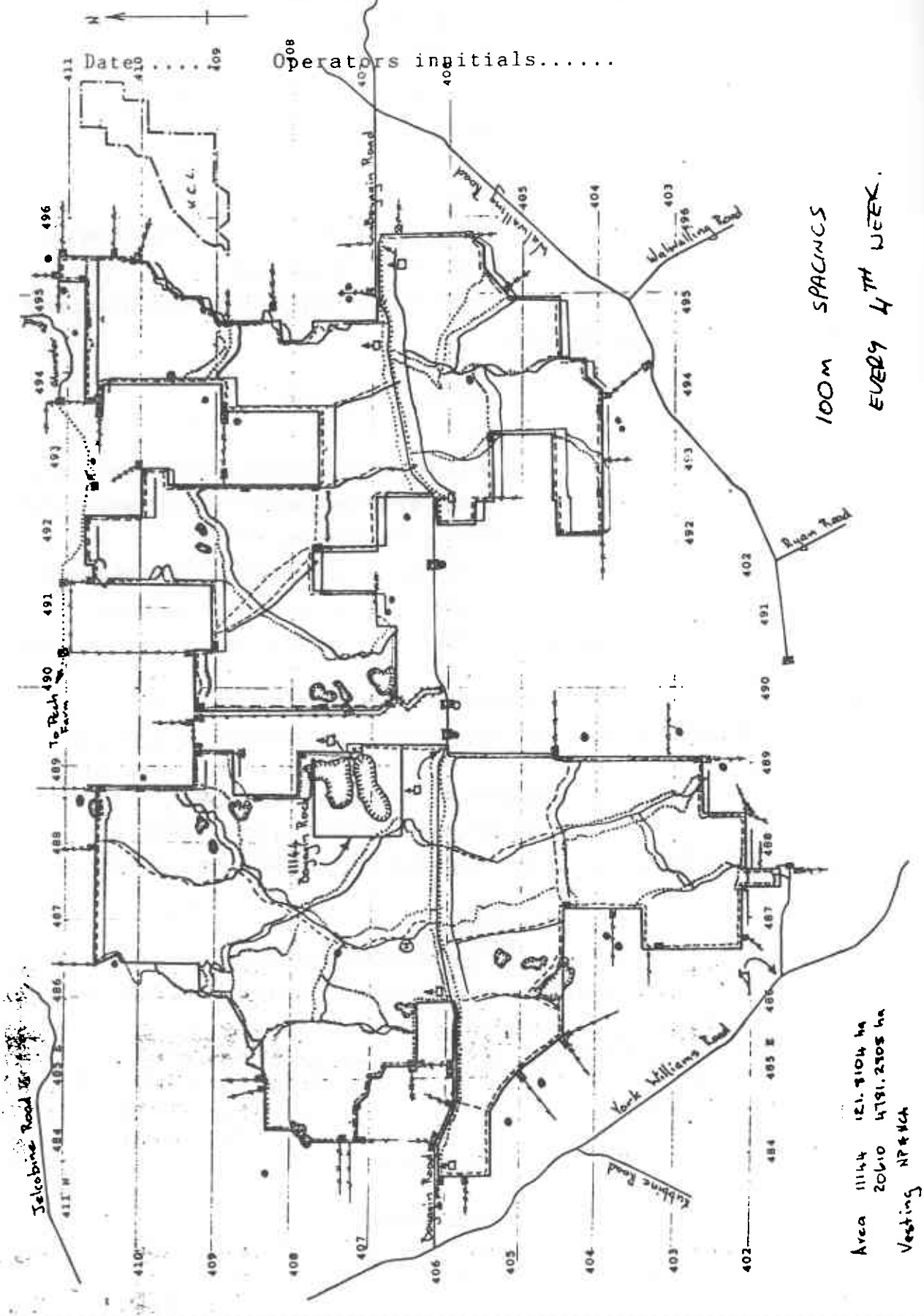
Circle station numbers where baits have disappeared.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

19 20 21 22 23 24 25 26

Date..... Operators initials.....

BOYAGIN FOX BAITING ROUTE



WOYLIE MONITORING PROGRAM

1. **LOCATION:** Dryandra Woodland

2. **# OF TRAPS:** 50

3. **SPACING OF TRAPS:** 200 m

4. **NAMING OF POINTS:** Points marked with orange flagging tape (numbered 1-50) and dropper posts with orange tops labelled DRY1-DRY50

5. **START POINT:** 100m east of junction of Patonga Rd and unnamed track which runs between Patonga Rd and Tomingley Rd
AMG Reference: 369 000 N, 492 950 E

6. **FINISH POINT:** 200m west of junction of unnamed road and Newell Rd
AMG Reference: 374 100 N, 494 950 E

7. **ROUTE FOLLOWED:** **Traps 1-10** set along the unnamed track west from start point near the junction with Patonga Rd.
Traps 11-40 set along Gura Rd heading north to junction with unnamed road.
Traps 41-50 set along the unnamed road travelling east finishing 200m west of the junction with Newell Rd
SEE ATTACHED MAP

8. **FOX BAITING REGIME:**
Commenced: 2000 ha in northern section of main block commenced Sept 1982
Current baiting regime (see map) commenced Jan. 1989
# of baits:
Baiting Route: See Attached Map
Distance between baits: 100m
Baiting frequency: Every 4 weeks
Other comments:

9. **RESPONSIBLE STAFF:** District

10. **SUMMARY OF PREVIOUS TRAP SUCCESS RATES:**

1975 0% trap success (Kinnear, unpublished data)

1984 Trap success varied from 0%-23% in various areas of the park. In unbaited areas (south and western areas of the park), trap success varied from 0%-8% (mean =3.3%). In baited areas (northern section) success varied from 10-23% (mean =15%) (Kinnear, unpublished data)

1989 Trap success varied from 0-42%. In unbaited areas (as above) trap success varied from 0-42% (mean=8.5%, 42% trap success was achieved in an unbaited area close to the southern edge of the baited area). In baited areas success varied from 10%-22% (mean=16%) (Kinnear, unpublished data)

1993 Trap success varied from 30-45% (mean=29%) in unbaited areas in the western part of the reserve and 30-70% (mean=48.5%) in the eastern part of the reserve (not previously trapped).

7.3.94 74.5% trap success. Traps set along part of the above monitoring route (Morris, unpublished data).

6.5.94 58% trap success (23 individuals) from 40 traps set at 100m intervals along the final section (points 30-50) of the above monitoring route (15 along northern section of Gura Rd and 25 along the unnamed track to junction with Newell Rd). 20 individuals (10 male, 10 female) removed for translocation to South Australia) (Courtenay and Morris, unpublished data)

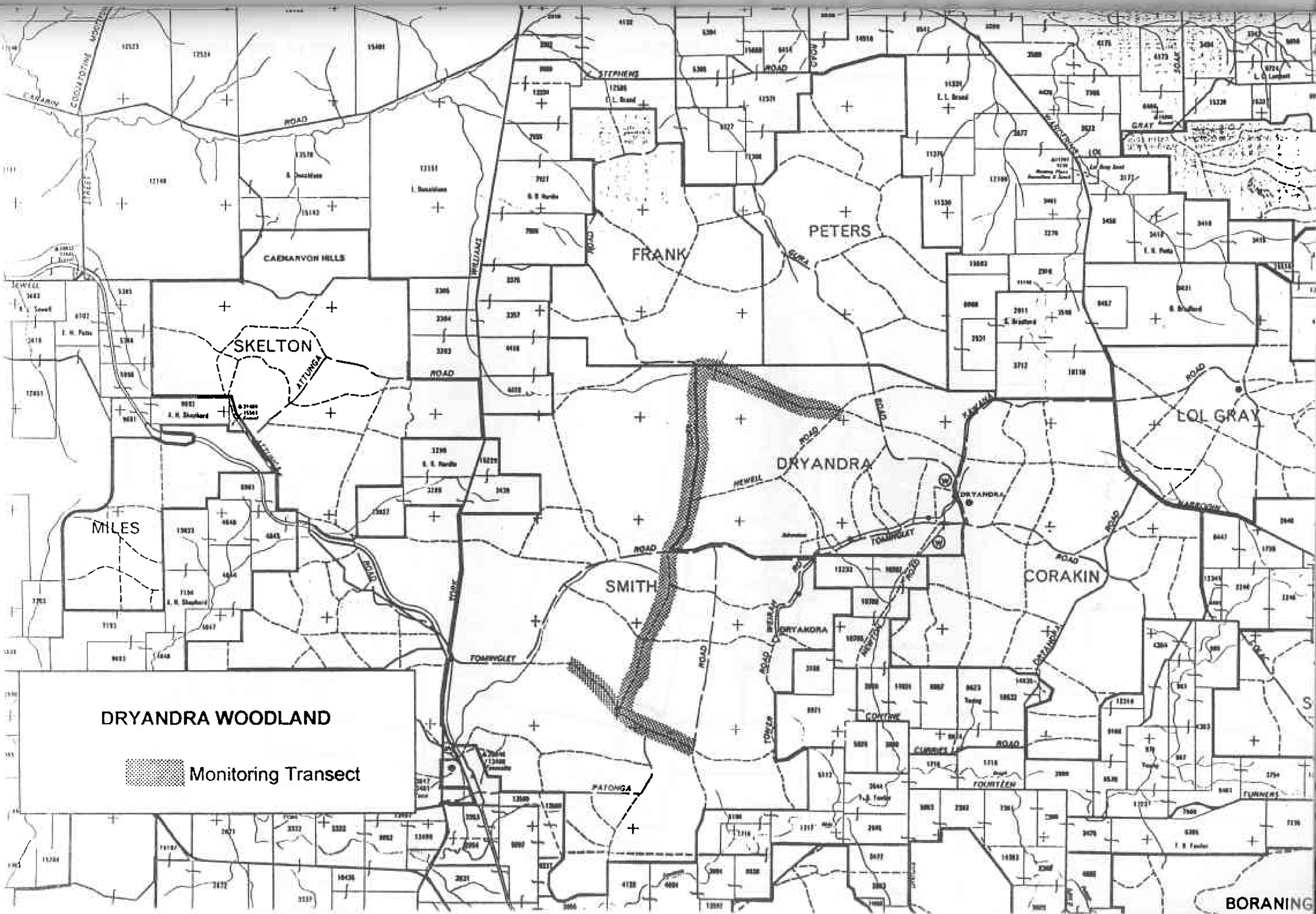
18.5.94-20.5.94 47% trap success (32 males, 14 females). No retraps. Blood samples collected from 6 males and 6 females. (This study)

11. OTHER SPECIES:

		% trap success
6.5.94	Brushtail Possum	2.5%
		(Courtenay and Morris, unpublished data)
18.5.94-20.5.94	Brushtail Possum	9.0%
		(This study)

12. ATTACHMENTS:

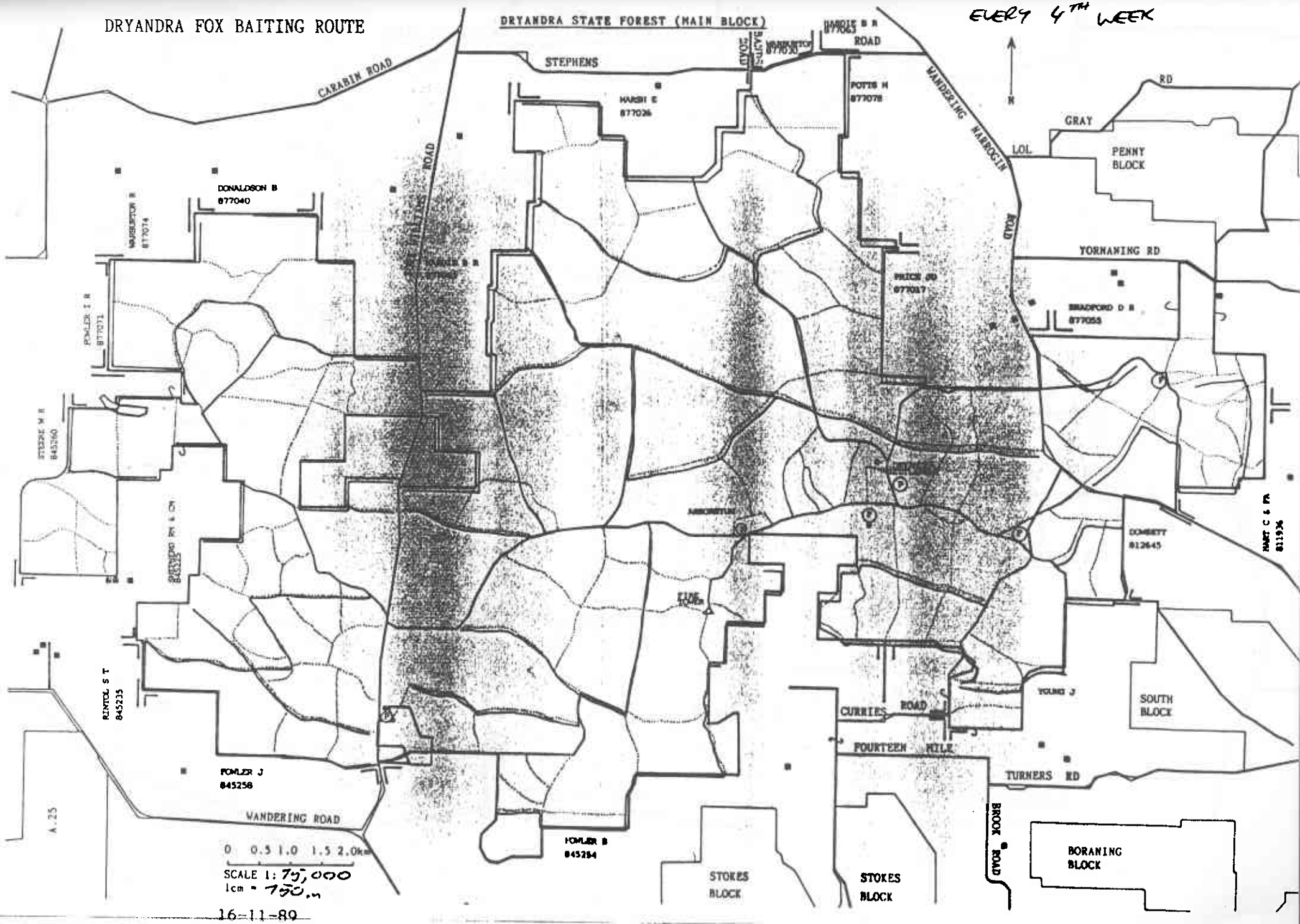
A. Map of trapping routes
B. Map of fox baiting routes


DRYANDRA WOODLAND
Monitoring Transect
SKELTON
MILES
FRANK
PETERS
SMITH
DRYANDRA
CORAKIN
LOL GRAY
CAERNARVON HILLS
BORANING
ATTUNGA
PATONGA
TOMINGLEY
HEWEIL
STEPHENS
FOURTEEN
TURNERS
ROAD
YORK
WILLIAMS
WEIRAN
TOWER
CONTINE

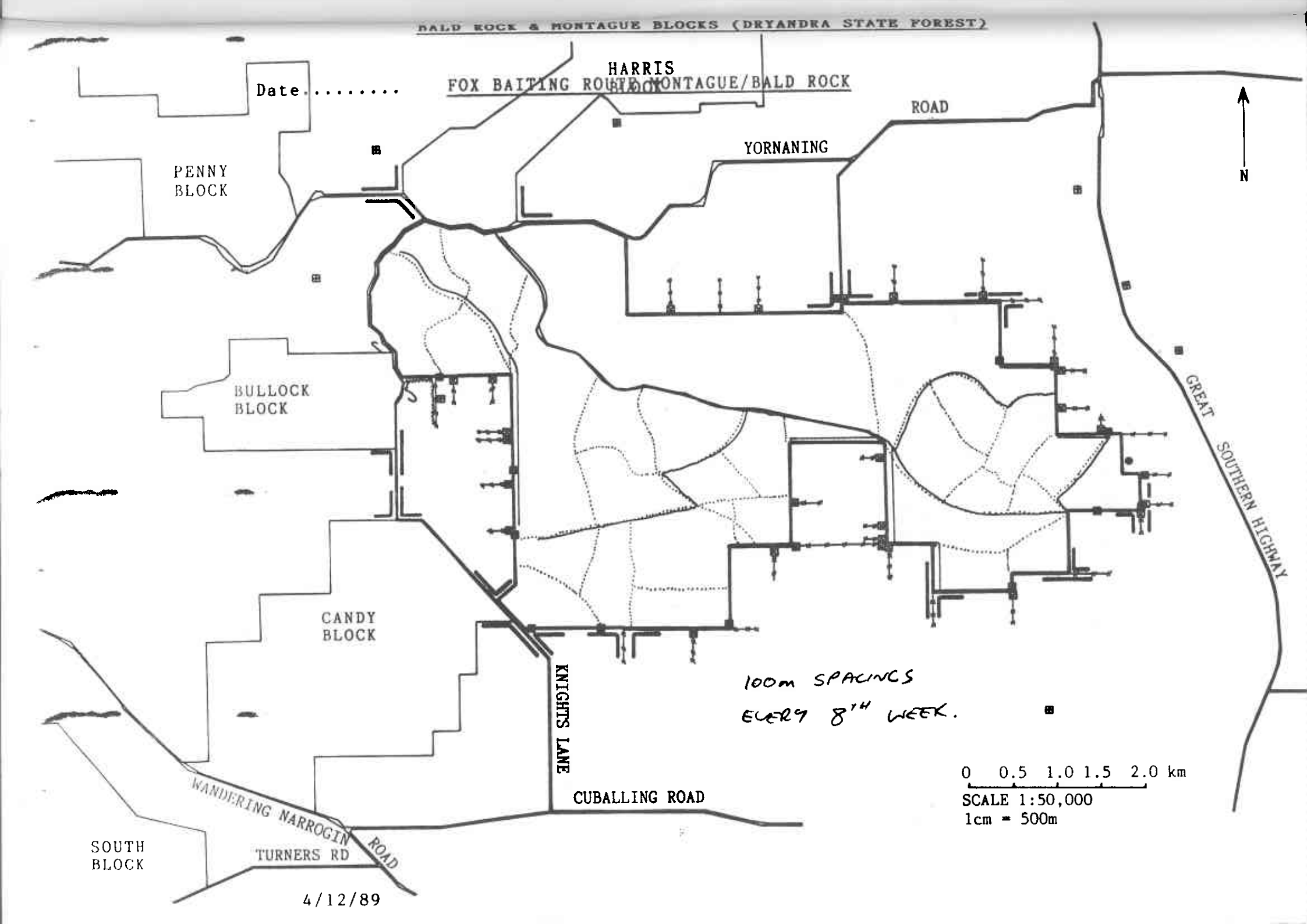
100m SPACING

EVERY 4TH WEEK

DRYANDRA FOX BAITING ROUTE



16-11-89


BALD ROCK & MONTAGUE BLOCKS (DRYANDRA STATE FOREST)
Date.....
HARRIS
FOX BAITING ROUTE MONTAGUE/BALD ROCK
BLOCK
ROAD
YORNANING
PENNY
BLOCK
N
BULLOCK
BLOCK
GREAT SOUTHERN HIGHWAY
CANDY
BLOCK
KNIGHTS LANE
100m SPACINGS
EVERY 8TH WEEK.
0 0.5 1.0 1.5 2.0 km
SCALE 1:50,000
1cm = 500m
CUBALLING ROAD
WANDERING NARROGIN ROAD
TURNERS RD
SOUTH
BLOCK
4/12/89

WOYLIE MONITORING PROGRAM

1. **LOCATION:** Tutanning Nature Reserve

2. **# OF TRAPS:** 50

3. **SPACING OF TRAPS:** 200 m

4. **NAMING OF POINTS:** Points marked with orange flagging tape (numbered 1-50) and dropper posts with orange tops labelled TUT1-TUT50

5. **START POINT:** Corner of Mallet Rd and Wattle Rd
   AMG Reference: 398 938 N, 527 313 E

6. **FINISH POINT:** On Echidna Rd about 10m from junction with Possum and Numbat Rds.
   AMG Reference: 398 188 N, 531 062 E

7. **ROUTE FOLLOWED:** **Traps 1-6** on Mallet Rd beginning at junction with Wattle Rd.
   Traps 7-10 on Goanna Rd between Mallet and Eagle Rds
   Trap 11 between Eagle and Nuytsia Rds
   Traps 12-17 on Nuytsia Rd between Eagle and Whistler Rds.
   Traps 18-21 on Whistler Rd between Nuytsia and White Gum Rds.
   Traps 22-30 on White Gum Rd between Whistler and Bee Eater Rds.
   Traps 31-35 on Bee Eater between White Gum and Tammar Rds.
   Traps 36-46 on Tammar between Bee Eater and Echidna Rds.
   Traps 47-50 pm Echidna between Tammar and Possum Rds
   SEE ATTACHED MAP

8. FOX BAITING REGIME:

Commenced: 1984
# of baits:
Baiting Route: See Attached Map
Distance between baits: 100m
Baiting frequency: Every 4 weeks
Other comments:

9. RESPONSIBLE STAFF: District

10. SUMMARY OF PREVIOUS TRAP SUCCESS RATES:

1984 Trap success in various areas of the reserve ranged from 0%-6% (mean =2.7%) (Kinnear, unpublished data)

1989 Trap success varied from 3-55% (mean=21.5%) (Kinnear, unpublished data)

27.7.92-31.7.92 32% trap success. 28 set along sections of the above monitoring route. Blood samples taken from 30 individuals (Hall, unpublished data).

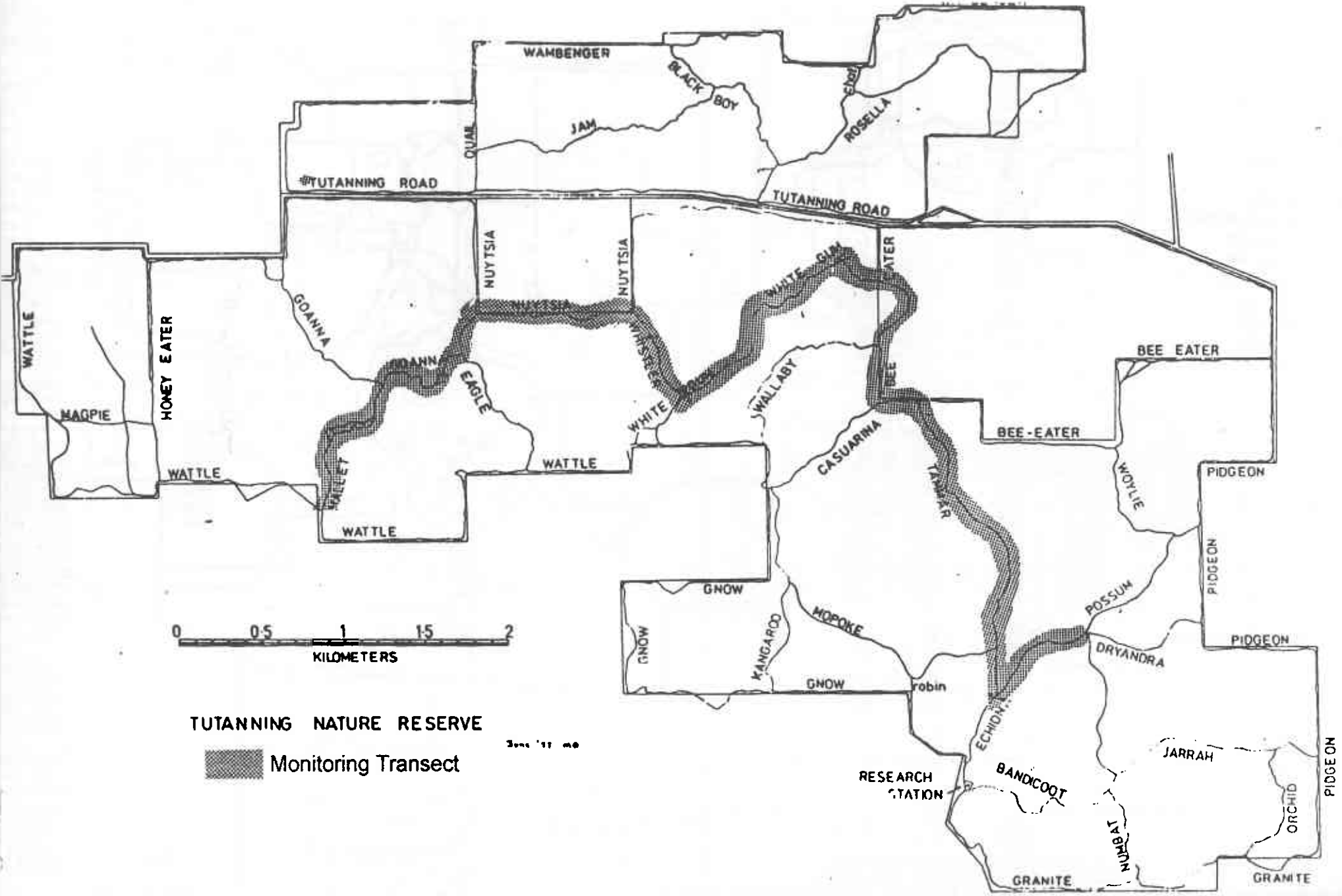
31.5.94-3.6.94 18% trap success (13 males, 13 females). 9 retraps (This study)

11. OTHER SPECIES:

		% trap success	
27.7.92-31.7.92	Brushtail Possum	7.0%	
	Quenda	1.5%	
			(Hall, unpublished)
31.5.94-3.6.94	Brushtail Possum	17.5%	
	Quenda		
			(This study)

12. ATTACHMENTS:

A. Map of trapping routes
B. Map of fox baiting routes



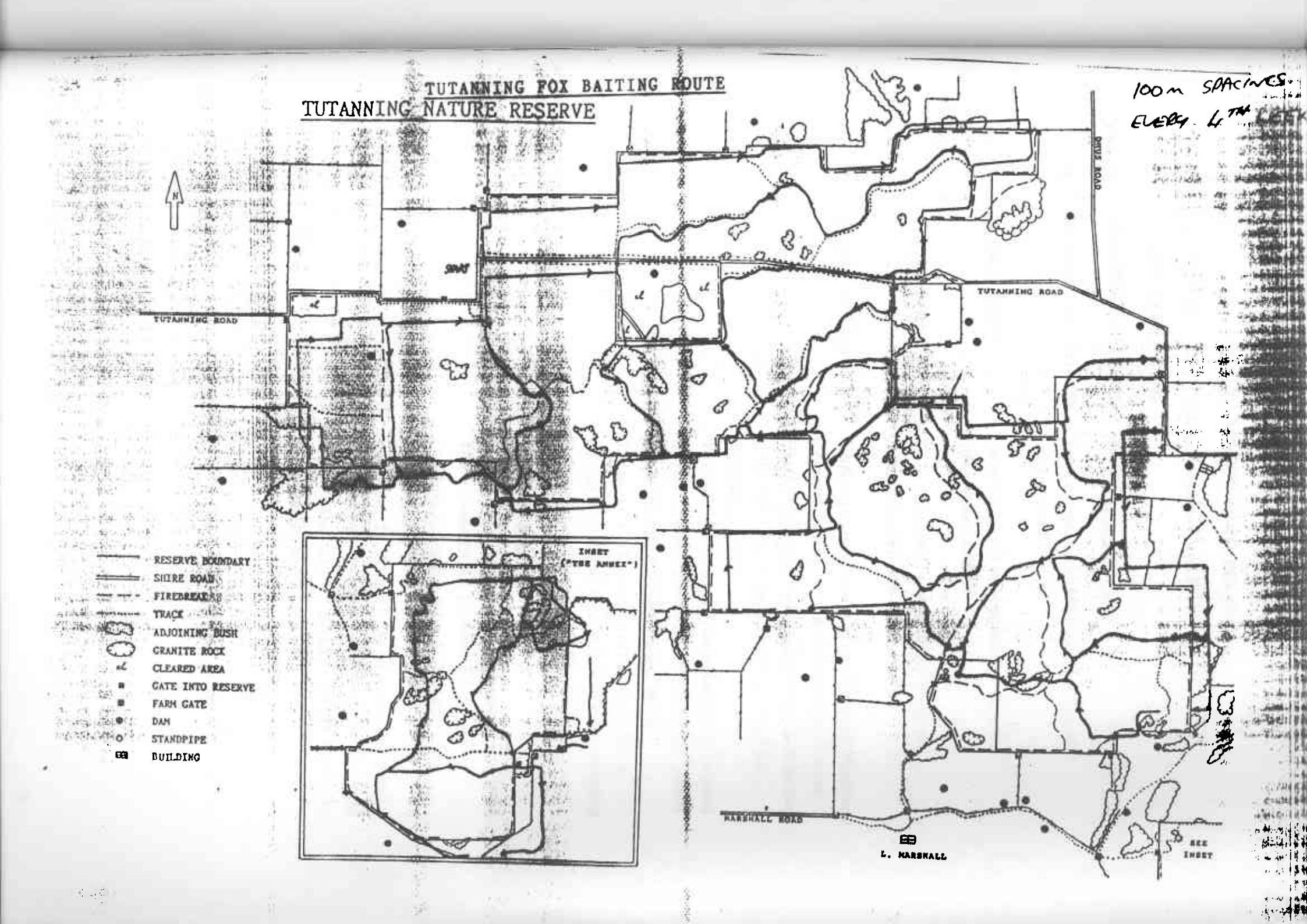
TUTANNING NATURE RESERVE

Monitoring Transect

TUTANNING FOX BAITING ROUTE

TUTANNING NATURE RESERVE

100 m SPACINGS
EVERY 4TH LINE



WOYLIE MONITORING PROGRAM

1. **LOCATION:** Yendicup/Boyicup Forest Blocks

2. **# OF TRAPS:** 50

3. **SPACING OF TRAPS:** 200 m

4. **NAMING OF POINTS:** To be completed by Manjimup Science and Information Division

5. **START POINT:** To be completed by Manjimup Science and Information Division

6. **FINISH POINT:** To be completed by Manjimup Science and Information Division

7. **ROUTE FOLLOWED:** Trapping transects are to be established by Manjimup Research Staff, Science and information Division Exact routes are yet to be decided but will be located in the following areas: (Lidelow, pers. comm)

Yendicup Block

Transect 1: 25 traps in the unburnt area bordered by Heartleaf Rd, Stretch Rd, Spencer Rd, Chuditch Rd and Eastern Rd (See Attached Map).

Transect 2: 25 traps set in the adjacent area subject to rotational burning, probably incorporating Balbanup Rd. (See Attached Map).

Boyicup Block

Transect 1: 25 traps in the unburnt area bordered by De Landrafft Rd, Glendale Rd, Boyicup 3, Glendale 2, Boyicup Rd and Glendale 3 (See Attached Map)

Transect 2: 25 traps in the adjacent area subject to rotational burning bordered by Northern Rd, Dugite Rd, De Landgrafft Rd, Glendale Rd and Woylie Rd. (See Attached Map).

8. **FOX BAITING REGIME:**

Commenced: 1990

# of baits:

Baiting Route: See Attached Map

Distance between baits: 300-400m depending on terrain and vegetation cover

Baiting frequency: 6 monthly

Other comments: Maps showing all baiting routes for the Perup area are held at CALM District Office, Manjimup with copies at CALM Science and Information Division, Woodvale.

9. **RESPONSIBLE STAFF:** Manjimup Science and Information Division

10. **SUMMARY OF PREVIOUS TRAP SUCCESS RATES:**

Yendicup Block (exact trapping routes unavailable).

	% trap success	
Jul 1989	32.0%	(Burrows, unpublished)
Dec 1989	39.5%	(Burrows, unpublished)
Apr 1990	62.0%	(Burrows, unpublished)
Feb 1994	35.4%	(Burrows, unpublished)

Boyicup Block (exact trapping routes unavailable). Traps set at 100m intervals. All data from Christensen (unpublished and 1980)

	% trap success
May 1974	3.0%
Jun 1974 (Cage and Funnel Traps)	6.9%
Jul 1974 (Cage and Funnel Traps)	3.8%
Aug 1974 (Cage and Funnel Traps)	9.4%
Sep 1974 (Cage only)	10.0%
Nov 1974 (Cage only)	9.3%
Nov 1974 (Funnel only)	10.7%
Dec 1974 (Funnel only)	14.0%
Dec 1974 (Cage only)	2.6%
Feb 1975 (Funnel only)	25.0%
Feb 1975 (Cage and Funnel)	6.9%
Mar 1975-1 (Funnel only)	21.6%
Mar 1975-2 (Cage and Funnel)	14.8%
Mar 1975-3 (Cage and Funnel)	1.3%

Boyicup Block (continued)

	% trap success
Mar 1975-4 (Cage and Funnel)	5.7%
Apr 1975-1 (Funnel only)	13.2%
Apr 1975-2 (191 cage, 4 funnel)	6.2%
Jun 1975 (Funnel only)	15.5%
Aug 1975 (Cage and Funnel)	10.2%
Oct 1975 (Cage and Funnel)	8.8%
Nov 1975 (Funnel only)	31.3%
Dec 1975 (Cage and Funnel)	14.6%
Jan 1976-1 (Cage and Funnel)	15.8%
Jan 1976-2 (Cage and Funnel)	15.2%
Feb 1976-1 (Cage and Funnel)	13.8%
Feb 1976-2 (Cage and Funnel)	18.9%
Mar 1976 (Cage and Funnel)	4.9%
Apr 1976-1 (Cage and Funnel)	8.7%
Apr 1976-2 (Cage and Funnel)	11.4%
Jun 1976 (Cage and Funnel)	7.2%
Aug 1976 (Cage and Funnel)	9.0%
Dec 1976 (Cage and Funnel)	7.9%
May 1977 (Cage and Funnel)	5.9%
Apr 1978 (Cage and Funnel)	2.6%
May 1978 (Cage and Funnel)	8.6%
Oct 1978 (Cage and Funnel)	11.2%
Oct 1980 (Cage and Funnel)	24.8%
Feb 1981 (Cage and Funnel)	21.1%

11. OTHER SPECIES:

Yendicup Block (All data from Burrows, unpublished)

		% trap success
Jul 1989	Brushtail Possum	2.0%
	Chuditch	1.0%
	Quenda	0.5%
Dec 1989	Brushtail Possum	1.3%
	Quenda	1.3%
Apr 1990	Brushtail Possum	0.5%
	Chuditch	0.5%
	Quenda	0.5%
Feb 1994	Brushtail Possum	2.0%

11. OTHER SPECIES (continued):

Boyicup Block

		% trap success
May 1974	Chuditch	0.5%
	Quenda	1.0%
Jun 1974	Chuditch	0.6%
	Tammar	0.6%
Jul 1974	Chuditch	0.3%
	Quenda	1.2%
	Tammar	5.0%
	Other	0.3%
Sep 1974	Brushtail Possum	0.2%
	Quenda	0.5%
	Ringtail Possum	0.2%
Nov 1974-1	Brushtail Possum	0.5%
	Chuditch	0.2%
	Ringtail Possum	0.5%
	Other	0.2%
Nov 1974-2	Tammar	35.7%
Dec 1974-1	Tammar	8.4%
Dec 1974-2	Brushtail Possum	0.2%
	Chuditch	0.2%
	Quenda	0.2%
Feb 1975-1	Tammar	14.1%
Feb 1975-2	Tammar	7.6%
Mar 1975-1	Tammar	31.1%
Mar 1975-2	Tammar	5.6%
Mar 1975-3	Quenda	0.9%
	Tammar	2.5%
Mar 1975-4	Quenda	0.6%
	Tammar	7.5%
Apr 1975-1	Quenda	1.3%
	Tammar	29.0%
	Quail	4.0%
Apr 1975-2	Chuditch	0.5%
	Quenda	0.5%
	Tammar	1.0%
May 1975	Quenda	1.3%
	Tammar	18.6%
Jun 1975	Quenda	2.4%
	Tammar	10.7%

(All above data from Christensen, unpublished)

11. OTHER SPECIES (continued):

Boyicup Block (continued)

		% trap success
Aug 1975	Chuditch	0.5%
	Quenda	0.2%
	Tammar	5.9%
Oct 1975	Quenda	0.3%
	Ringtail Possum	0.3%
	Tammar	3.8%
Nov 1975	Brushtail Possum	0.7%
Dec 1975	Brushtail Possum	0.3%
	Quenda	0.3%
	Tammar	0.5%
	Lizards	0.8%
Jan 1976-1	Brushtail Possum	0.6%
	Tammar	2.1%
Jan 1976-2	Brushtail Possum	1.6%
	Tammar	1.1%
	Birds	0.5%
	Lizards	0.9%
Feb 1976-1	Brushtail Possum	1.4%
	Brush Wallaby	0.5%
	Chuditch	0.5%
	Quenda	0.5%
	Tammar	3.6%
Feb 1976-2	Brushtail Possum	2.8%
	Tammar	1.9%
Mar 1976	Brushtail Possum	1.8%
	Chuditch	0.3%
	Quenda	1.8%
	Tammar	4.3%
	Birds	3.7%
Apr 1976-1	Tammar	9.7%
	Bird	1.0%
Apr 1976-2	Brushtail Possum	0.9%
	Quenda	0.3%
	Tammar	4.4%
Jun 1976	Brushtail Possum	0.9%
	Quenda	0.9%
	Tammar	2.3%
	Birds	0.5%
Aug 1976	Brushtail Possum	2.6%
	Quenda	1.4%
	Tammar	1.9%

(All above data from Christensen, unpublished)

11. OTHER SPECIES (continued)

Boyicup Block (continued)

		% trap success
Dec 1976	Brushtail Possum	0.5%
	Tammar	2.2%
	Varanus gouldi	0.2%
May 1977	Brushtail Possum	1.1%
	Quenda	0.2%
	Tammar	5.0%
	Bird	0.2%
Apr 1978	Brushtail Possum	1.8%
	Tammar	3.5%
May 1978	Brushtail Possum	5.3%
	Quenda	0.7%
	Tammar	0.9%
	Birds	0.4%
Oct 1978	Brushtail Possum	2.0%
	Quenda	0.2%
	Tammar	1.5%
	Birds	0.7%
	Lizards	0.4%
Oct 1980	Brushtail Possum	6.6%
	Quenda	2.6%
	Tammar	1.7%
	Lizard	0.2%
Feb 1981	Brushtail Possum	6.0%
	Quenda	0.6%
	Tammar	1.2%
	Reptiles	1.5%

(All above data from Christensen, unpublished)

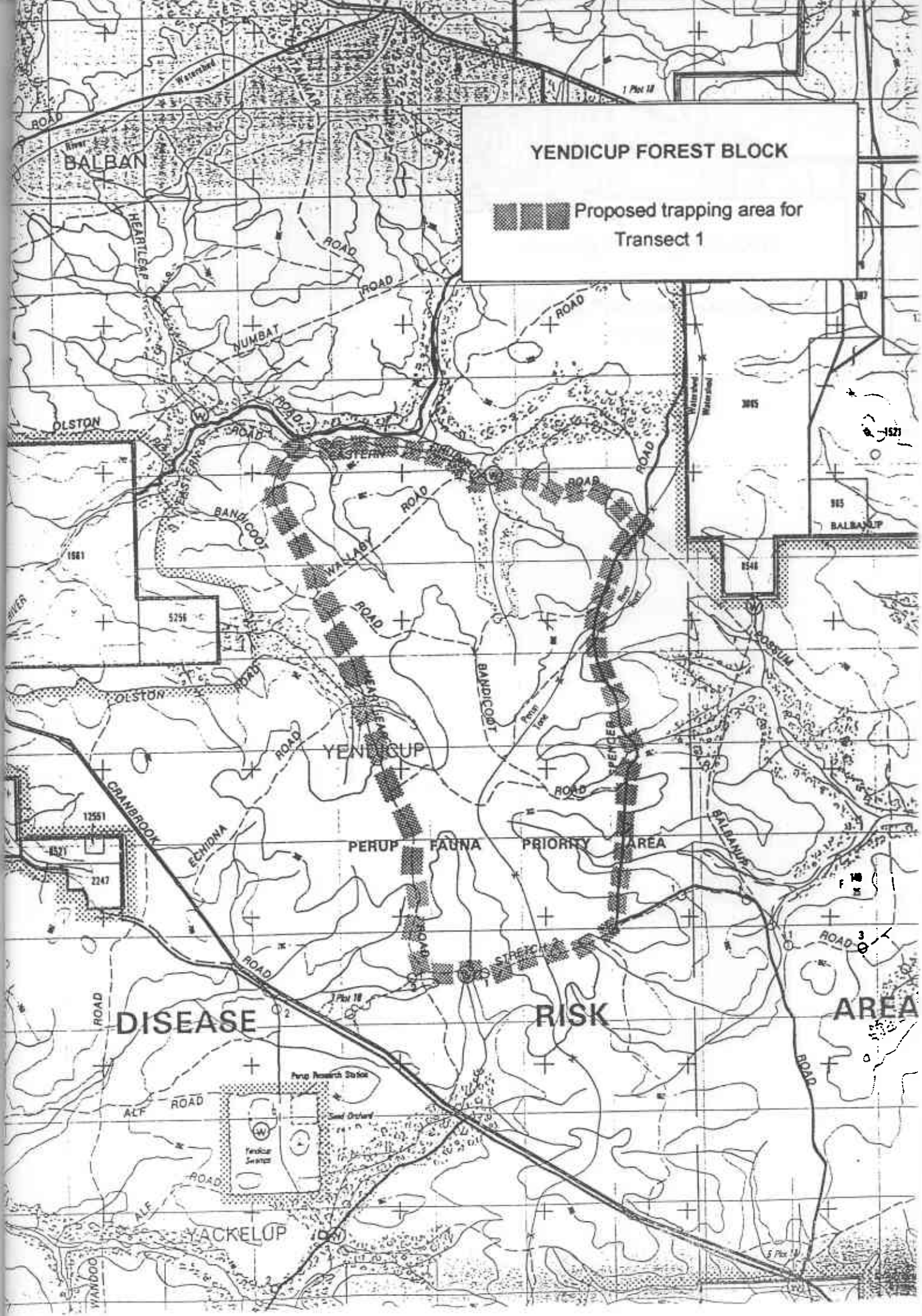
12. ATTACHMENTS:

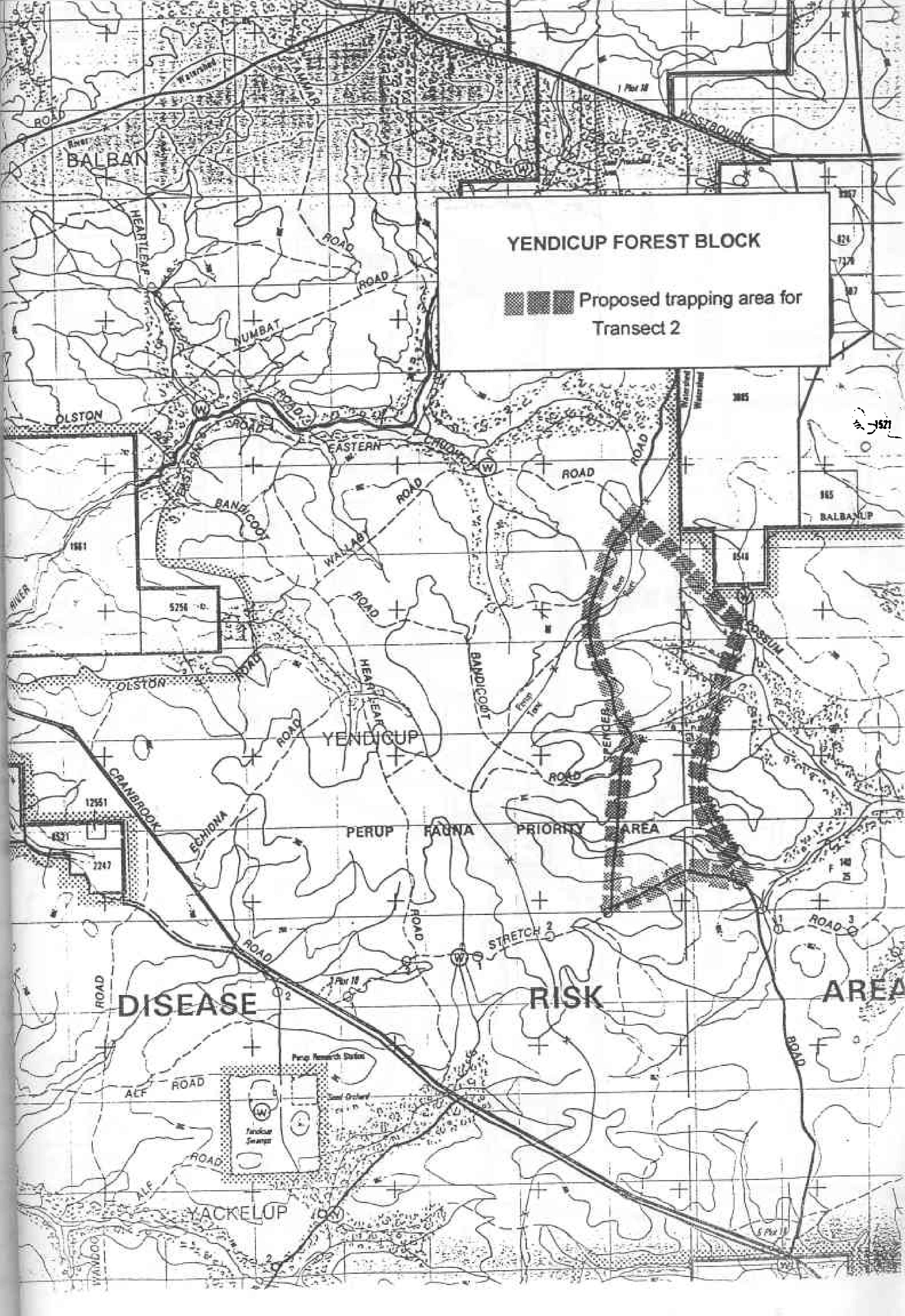
A. Maps of proposed trapping areas

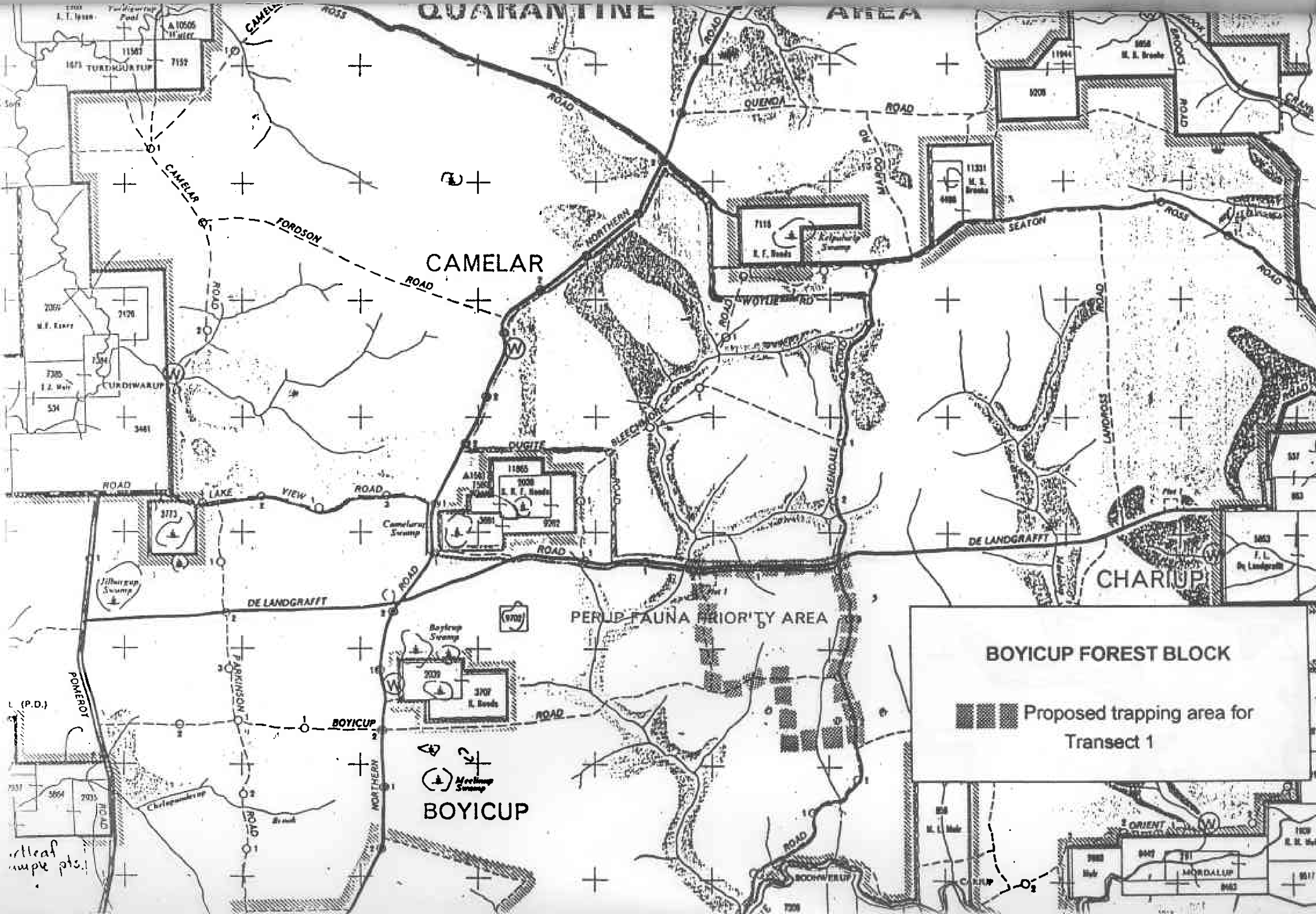
B. Maps of fox baiting routes

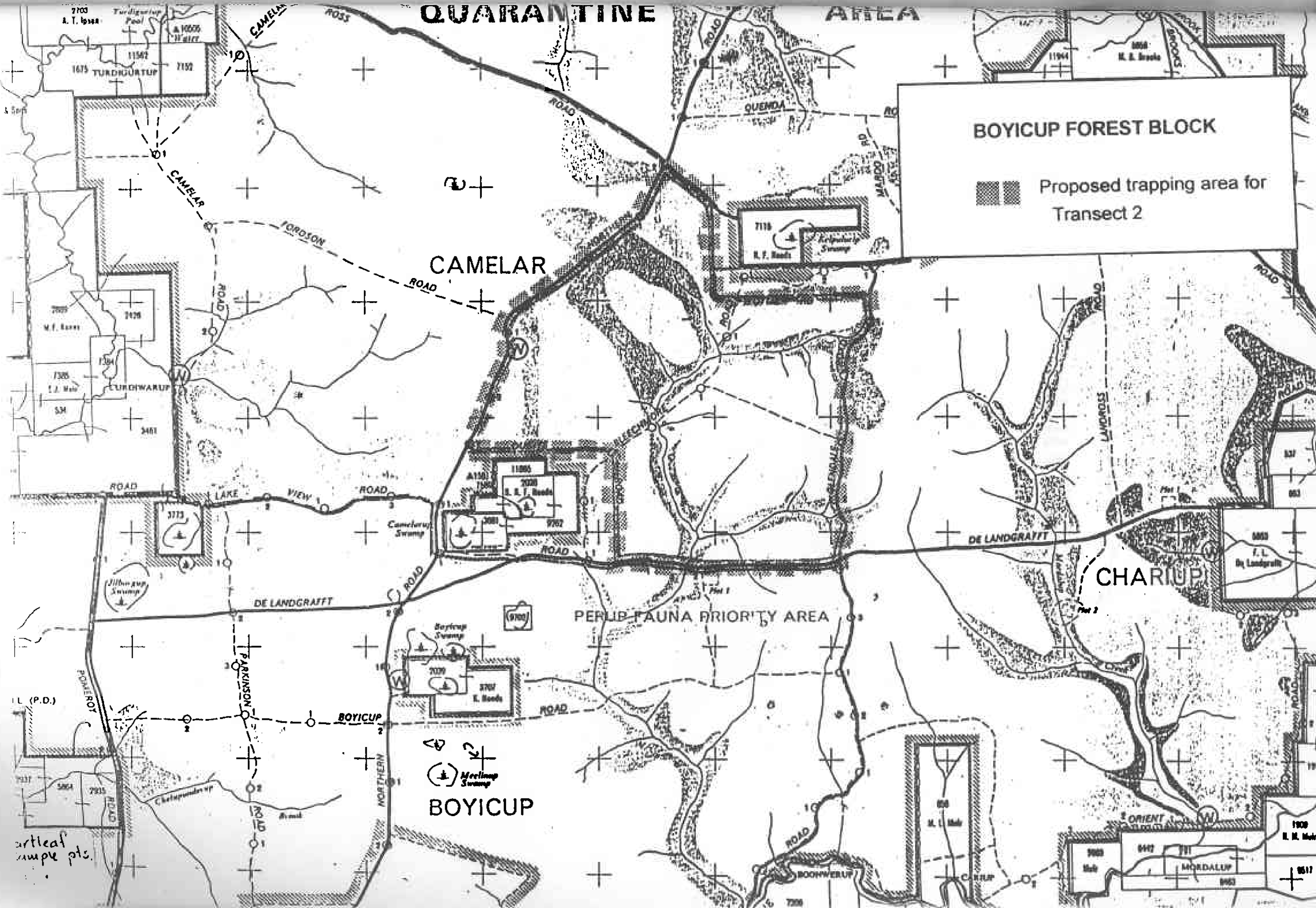
REFERENCE

Christensen, P.E.S. 1980 The Biology of *Bettongiapenicillata* Gray, 1837, and *Macropus eugenii* (Desmarest, 1817) in Relation to Fire. Forests Department of Western Australia, Bulletin 91.


YENDICUP FOREST BLOCK
Proposed trapping area for Transect 1
BALBAN
HEARTLEAF
ROAD
WUMBAT
OLSTON
EASTERN
BANDICOOT
WALLABY
YENDICUP
CRANBROOK
ECHIDNA
PERUP FAUNA PRIORITY AREA
DISEASE RISK AREA
ALF
YACKELUP
BALBANUP
POSSUM


YENDICUP FOREST BLOCK
Proposed trapping area for Transect 2
BALBAN
HEARTLEAF
NUMBAT
ROAD
OLSTON
EASTERN
BANDICOOT
WALLABY
CHUDITCH
POSSUM
BALBANUP
YENDICUP
PERUP FAUNA PRIORITY AREA
SPENCER
ECHIDNA
CRANBROOK
STRETCH
DISEASE
RISK
AREA
ALF ROAD
YACKELUP
WESTBOURNE
GAMMAR
WANDOO
RIVER


QUARANTINE AREA
CAMELAR
BOYICUP
CHARIUP
PERUP FAUNA PRIORITY AREA
BOYICUP FOREST BLOCK
Proposed trapping area for Transect 1
ROSS ROAD
NORTHERN
SEATON
QUENDA ROAD
FORDSON ROAD
CAMELAR
LAKE VIEW ROAD
DE LANDGRAFFT
DE LANDGRAFFT ROAD
PARKINSON ROAD
BOYICUP
POMEROY
GLENDALE
DUGITE
LANDROSE
WOYLIE RD
CURDIWARUP
TURDIGURTUP
ORIENT
MORDALUP
BOONWERUP
Camelar Swamp
Boyicup Swamp
Meelinup Swamp



BOYICUP FOREST BLOCK
Proposed trapping area for Transect 2
QUARANTINE
AREA
CAMELAR
CHARIUP
BOYICUP
PERUP FAUNA PRIORITY AREA
DE LANDGRAFFT ROAD
LAKE VIEW ROAD
FORDSON ROAD
CAMELAR
ROSS ROAD
QUENDA
LANDROSS
PARKINSON
BOYICUP
NORTHERN
POMEROY
ORIENT
MORDALUP
TURDIWARUP
TURDIGURTUP
Camelarup Swamp
Boyicup Swamp
Meelinup Swamp
Plot 1
Plot 2

SURVEYS

WOYLIE SURVEYS

SURVEY 1: Meribup/Northern Tone Blocks 29/6/94-1/7/94

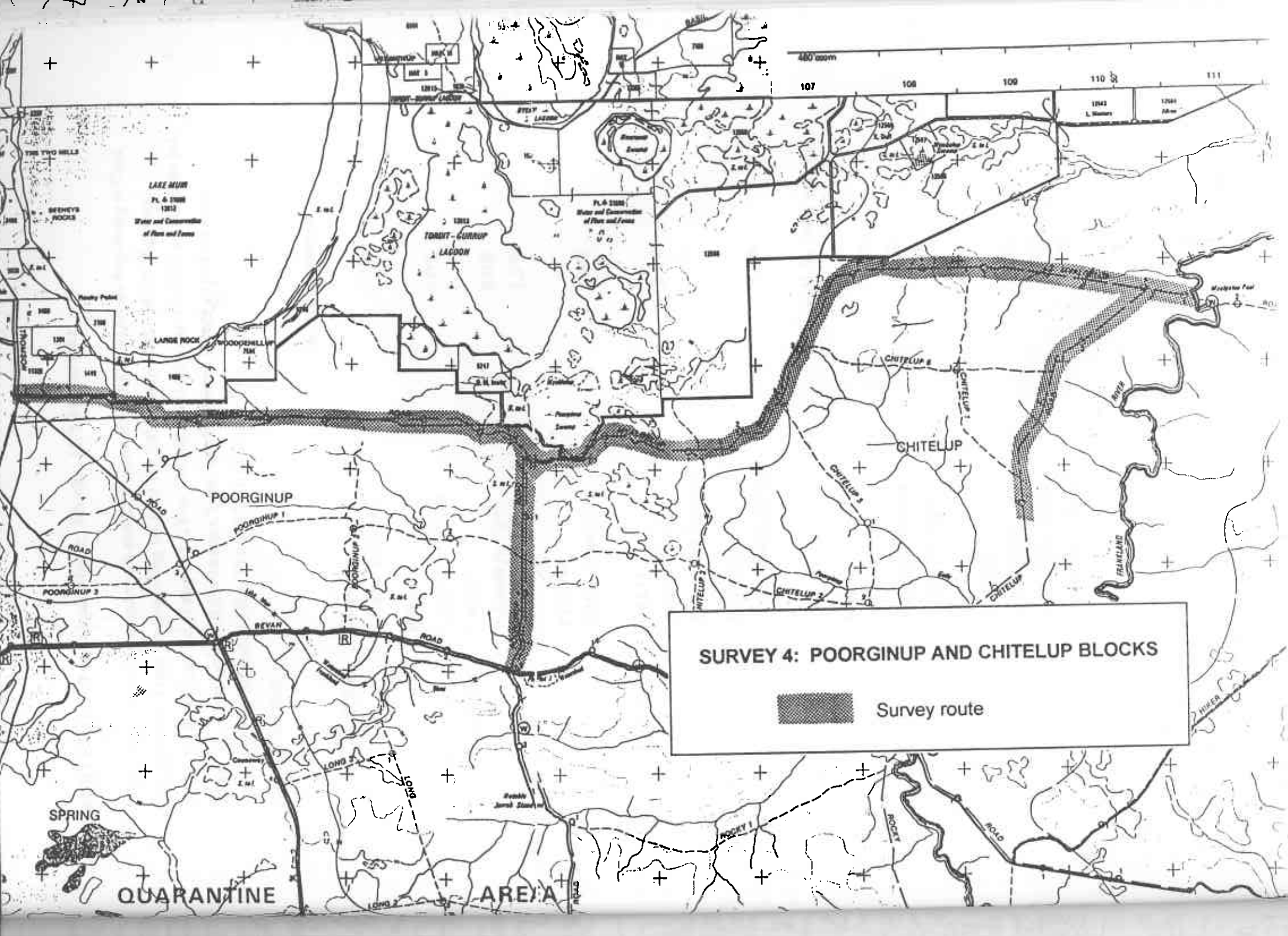
50 cage traps set at 200m intervals on Cup Rd travelling south from Mordalup Rd to 1km south of Muirs Highway. See attached map.

		% trap success
29.6.94	All traps empty and undisturbed.	
30.6.94	1 Woylie (Trap #19)	2%
	1 Brushtail Possum	2%
	1 *Rattus fuscipes*	2%
1.7.94	1 Woylie (Trap #47)	2%

Trap #19 was located on Cup Rd 3.8km south of Mordalup Rd in Meribup block. Trap #47 was located on Cup Rd 250m south of the Muirs Highway.

	Overall % trap success
All animals	2.7%
Woylies	1.3%
Brushtail possum	0.7%
Rattus fuscipes	0.7%


SURVEY 1: MERIBUP AND TONE BLOCKS
Survey route
MERIBUP
TALLING
TONE
STOATE
C.S.I.R.O. RESEARCH PLOT
ARBORETUM
HIGHWAY

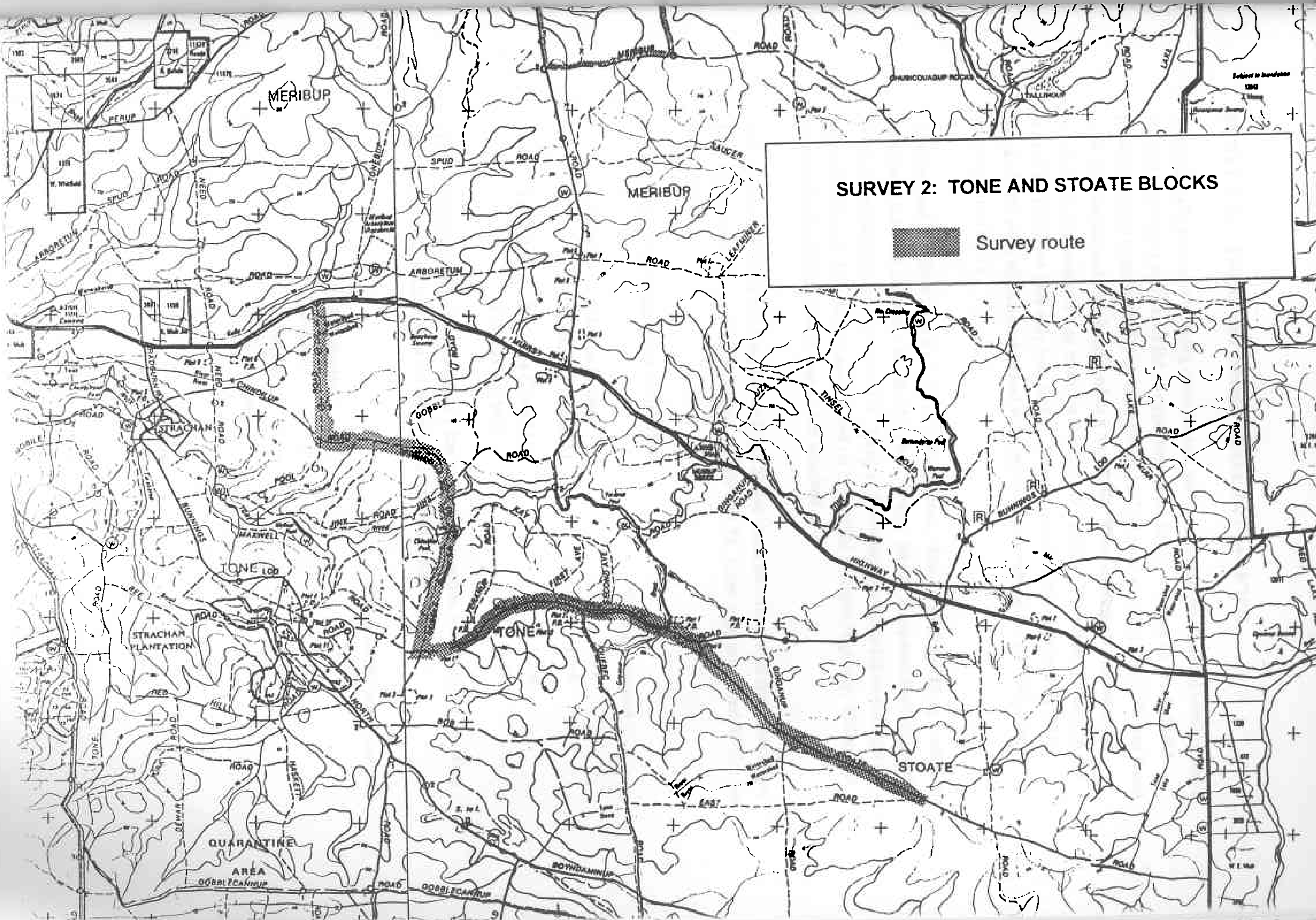

SURVEY 4: POORGINUP AND CHITELUP BLOCKS
Survey route
POORGINUP
CHITELUP
QUARANTINE AREA
SPRING
LAKE MUIR
TORBIT - GURRUP LAGOON
BEVAN ROAD
POORGINUP ROAD
CHITELUP ROAD
ROCKY ROAD
LONG ROAD
480 000mN
107
108
109
110
111

SURVEY 2: Tone and Stoate Blocks 13/7/94-15/7/94

75 cage traps set at 200m intervals and 25 Elliotts set at 600m intervals beginning at Cage trap point #3. Traps set beginning on Pool Rd 200m south of the Muirs Highway. **Trap 1-10** on Pool Rd, **Trap 11-27** on Chindilup Rd between Pool Rd and Gobble Rd, **Trap 28-42** on Gobble Rd between Chindilup and Ireland Rds, **Trap 43-60** on Bunnings Log Rd/Ireland Rd, **Trap 61-75** on Stoate Rd.
See attached map.

		% trap success
13.7.94	**Cages**	
	3 *Rattus fuscipes*	4.0%
	Elliotts	
	1 *Mus domesticus*	4.0%
14.7.94	**Cages**	
	6 *Rattus fuscipes*	8.0%
	1 Brushtail Possum	1.3%
	Elliotts	
	1 *Mus domesticus*	4.0%
15.7.94	**Cages**	
	2 *Rattus fuscipes*	2.6%
	2 Brushtail Possums	2.6%
	Elliotts	
	1 *Antechinus flavipes*	4.0%

	Overall % trap success
Cages	
All animals	6.2%
Brushtail Possum	1.3%
Rattus fuscipes	4.9%
Elliotts	
All animals	4.0%
Mus domesticus	2.7%
Antechinus flavipes	1.3%


SURVEY 2: TONE AND STOATE BLOCKS
Survey route
MERIBUP
TONE
STOATE
STRACHAN
STRACHAN PLANTATION
QUARANTINE AREA
HIGHWAY
ARBORETUM
TINSEL
GOBBLE
SPUD
PERUP
CHISOLUP
BUNNINGS
MAXWELL
QUEBEC
GINGANUP
BOYNDAMINUP
HASKETT
EAST
ROAD

SURVEY 3: Talling and Stoate Blocks 14/7/94-15/7/94

The originally proposed trapping route for this survey included Winfield Rd between Stoate Rd and Bunnings Log/Ireland Rd. 5 cage traps and 1 Elliott were set on Winfield Rd travelling north from Staote Rd on the night of 12/7/94 after which Winfield Rd was found to be impassable and was abandoned as a trap route. Time constraints prevented the selection of an alternative trap route for the night of 12/7/94. The survey in these blocks was thus conducted over only two nights. The 6 traps set on the night of 12/7/94 on Winfield Rd were all undisturbed and were removed and reset on the 13/7/94 along the route outlined below.

55 cages and 18 Elliott traps were set in Talling Block. **Traps 1-19** travelling south along Mingerup Rd from junction with Meribup Rd. **Traps 20-28** along road travelling east connecting Mingerup to Lake Muir Rd. **Traps 29-34** on Lake Muir Rd travelling south to Ireland/Bunnings Log Rd. **Traps 35-54** on Ireland Rd to Muirs Highway. Elliotts set every 600m beginning at cage trap 3. See attached map.

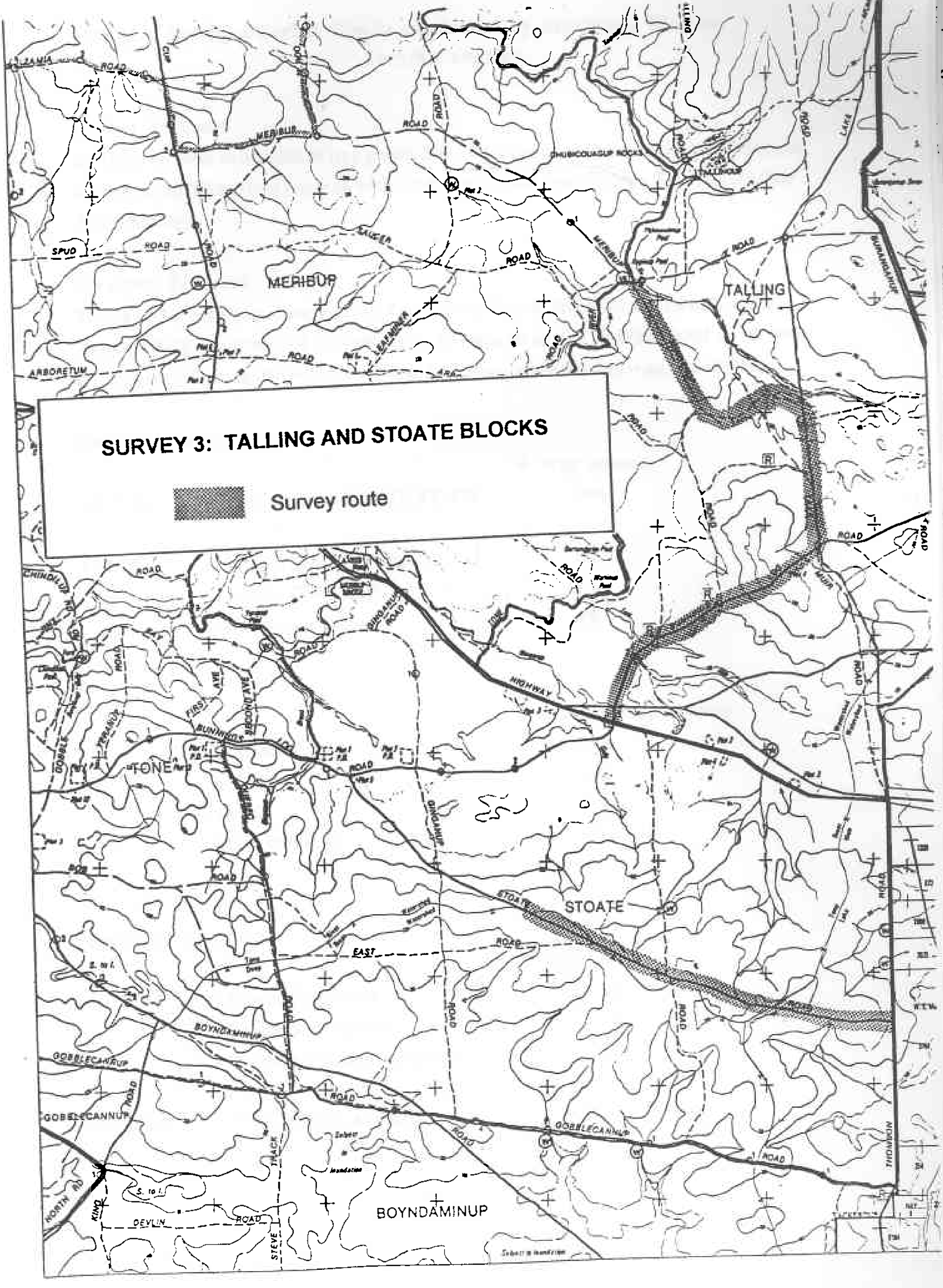
27 cages and 6 Elliotts set along Stoate Rd in Stoate block travelling west from Thompson Rd. Elliotts set at trap points 57, 60, 63, 66, 69 and 72. Cage traps numbered 55-82. See attached map.

All Elliott traps were empty and undisturbed.

		% trap success
14.7.94	3 *Rattus fuscipes*	3.7%
	1 Quenda (Trap #31)	1.2%
15.7.94	1 Woylie (Trap #5)	1.2%
	2 *Rattus fuscipes*	2.4%

Trap #5 was located on Mingerup Rd 1 km south of its junction with Meribup Rd. Trap #31was located on Lake Muir Rd 600m north of Ireland Rd.

	Overall % trap success
All animals	4.2%
Woylies	0.6%
Quendas	0.6%
Rattus fuscipes	3.0%


SURVEY 3: TALLING AND STOATE BLOCKS
Survey route
MERIBUP
TALLING
TONE
STOATE
BOYNDAMINUP
ZAMIA ROAD
MERIBUP ROAD
SPUD ROAD
SAUCER ROAD
ARBORETUM ROAD
CHUBICOUADUP ROCKS
HIGHWAY
STOATE ROAD
EAST ROAD
BOYNDAMINUP
GOBBLECANNUP ROAD
GOBBLECANNUP
DEVLIN ROAD
STEVE
THACK
KING
NORTH RD
FIRST AVE
SECOND AVE
BUNNINGS
DINGANUP ROAD

SURVEY Dwalgan/Corbal Blocks conducted by Manjimup District
18/3/94-19/3/94

Corbal Transect

25 Traps set over two nights at trap points **26-50** (200m intervals) running east along Lea Rd beginning 200m from junction with Corbalup Rd and then north on Simcock Rd (See Attached Map)

Dwalgan Transect

Traps 1-12 set along unnamed thru Rd between Boyup Brook Rd and Distributor Rd.
Traps 13-25 set along Old Wheatley Rd. 13 traps set along Old WheatleRd on 18/3/94, 25 traps set (13 along Old Wheatley Rd and 12 along unnamed thru road) on 19/3/94.

Corbal Transect

		% trap success
18/3/94	4 Woylies (Trap #26, 27, 37, 47)	16%
19/3/94	2 Woylies (Trap # 37 & 47)	8%
	1 Quenda (Trap #43)	4%
	1 *Mus domesticus*	4%

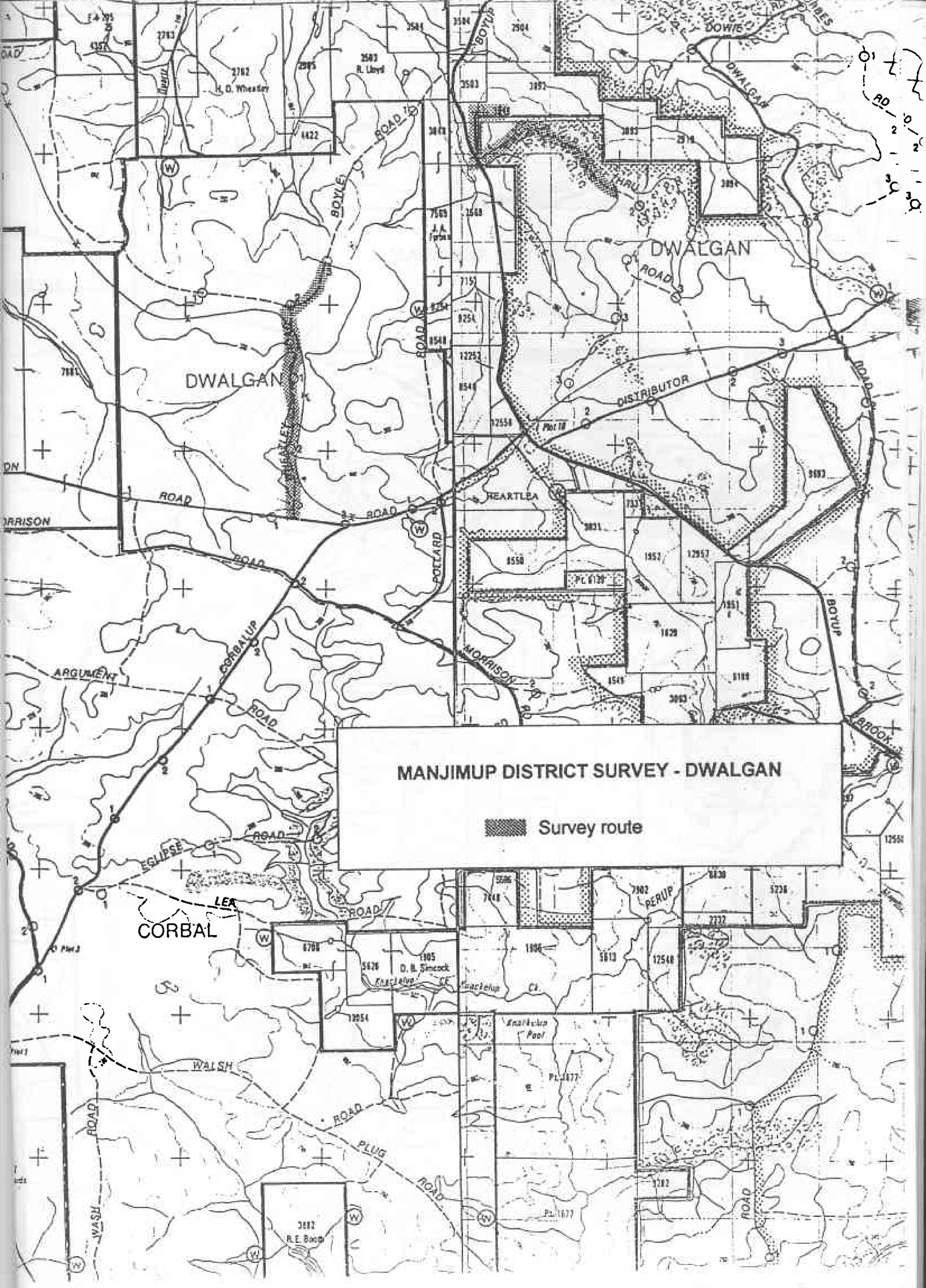
	Overall % trap success
All animals	16%
Woylies	12%
Quenda	2%
Mus domesticus	2%

Dwalgan Transect

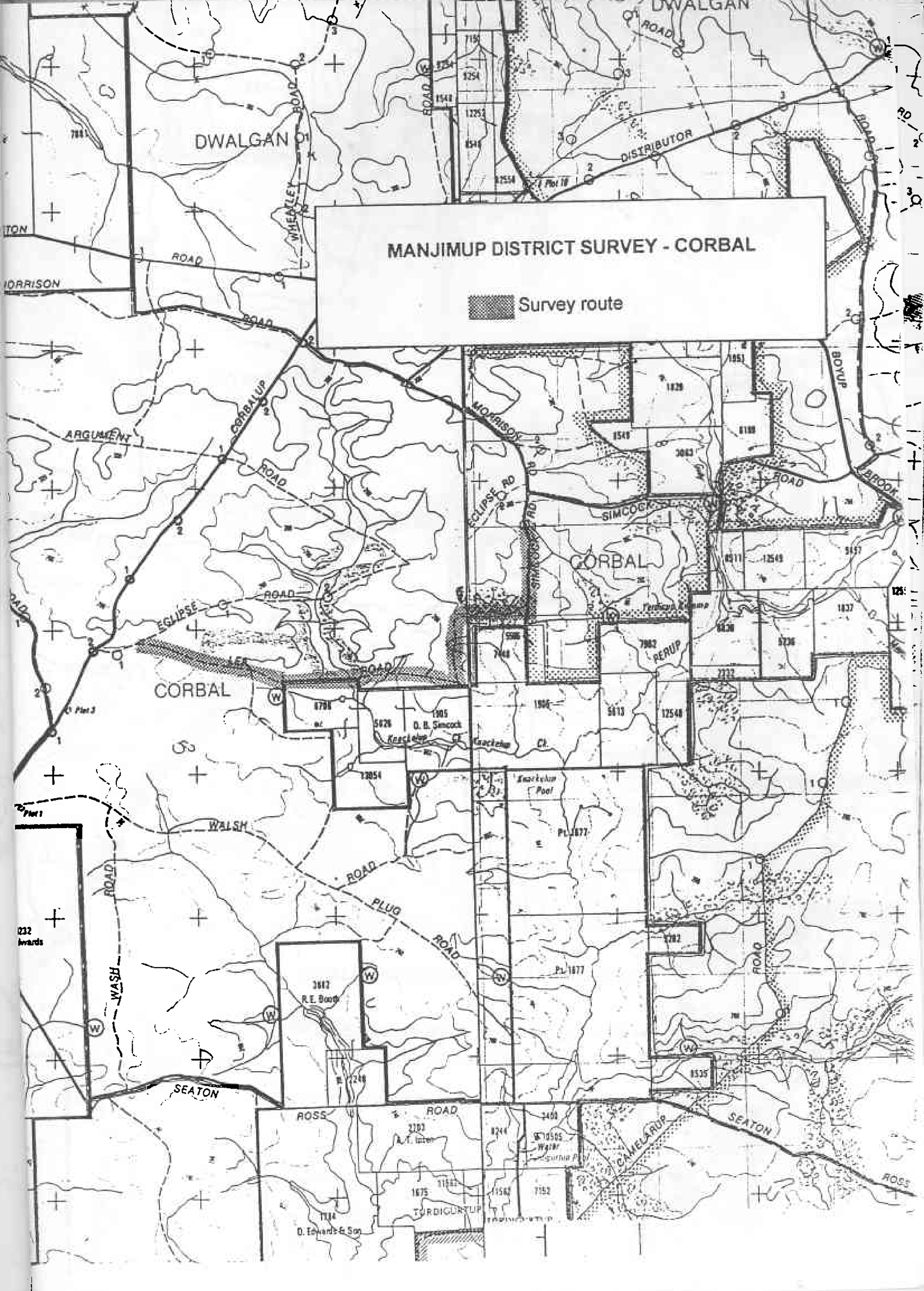
		% trap success
18/3/94	1 Woylie (Trap #18)	7.7%
	1 Chuditch (Trap #20)	7.7%
	1 Brushtail Possum (Trap #13)	7.7%
19/3/94	2 Woylies (Trap #15 & 19)	4%

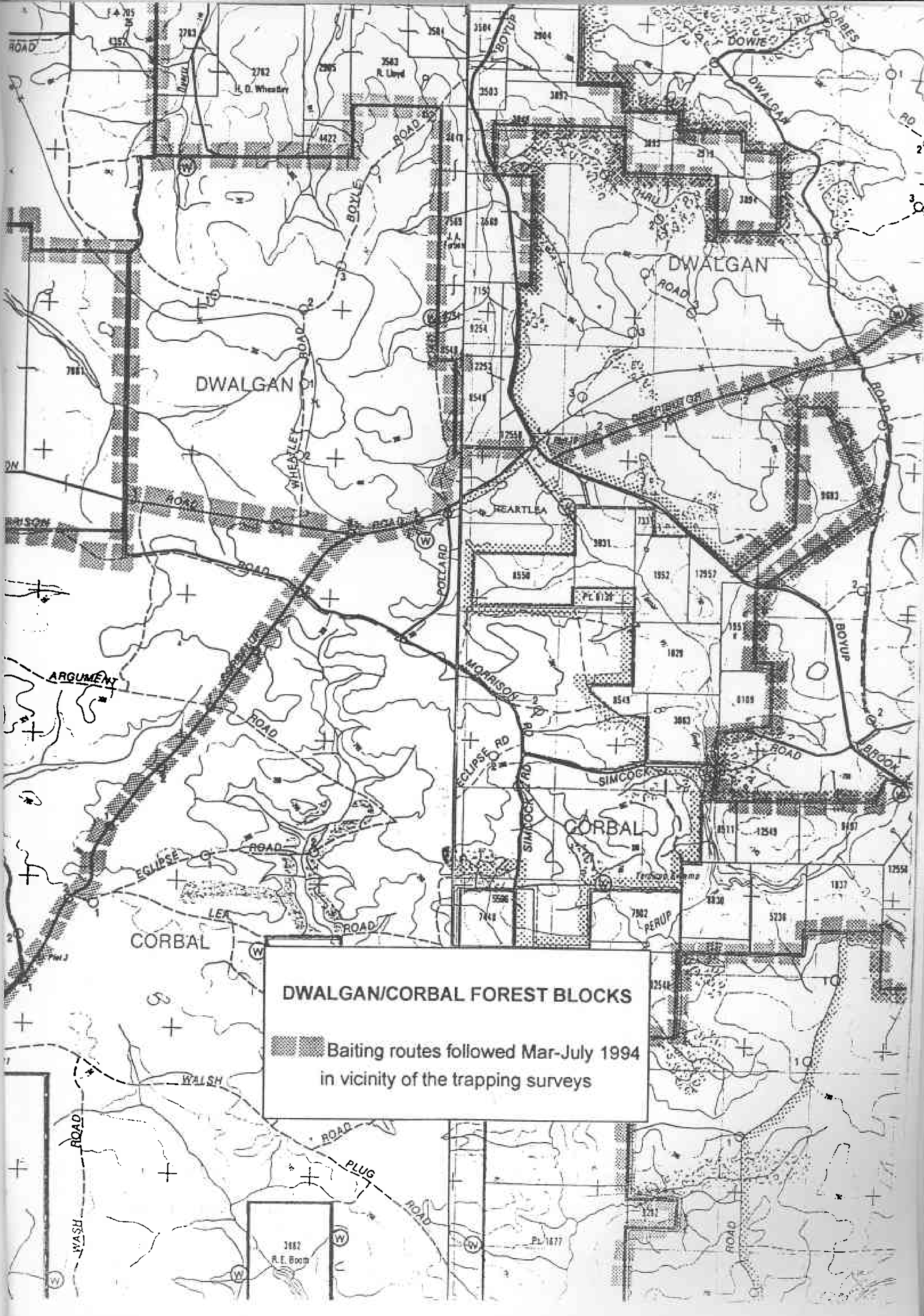
Dwalgan Transect (contd)

	Overall % trap success
All animals	13.2%
Woylies	7.9%
Chuditch	2.6%
Brushtail Possum	2.6%



MANJIMUP DISTRICT SURVEY - DWALGAN
Survey route
DWALGAN
DWALGAN
CORBAL
BOYLE ROAD
BOYUP ROAD
DWALGAN ROAD
DISTRIBUTOR
HEARTLEA
POLLARD
MORRISON ROAD
CORBALUP
ARGUMENT ROAD
ECLIPSE ROAD
PERUP
WALSH ROAD
PLUG ROAD
WASH ROAD
BROOK
H. D. Wheatley
R. Lloyd
D. B. Simcock
R. E. Booth


MANJIMUP DISTRICT SURVEY - CORBAL
Survey route
DWALGAN
CORBAL
DWALGAN ROAD
DISTRIBUTOR ROAD
WHEATLEY ROAD
MORRISON ROAD
CORBALUP ROAD
ARGUMENT ROAD
ECLIPSE ROAD
LEE ROAD
SIMCOCK ROAD
PERUP
BOYUP BROOK ROAD
WALSH ROAD
PLUG ROAD
WASH ROAD
SEATON ROSS ROAD
CAMELARUP
TURDICURTUP
D. B. Simcock
R.E. Booth
D. Edwards & Son
Plot 1
Plot 3
Plot 18


DWALGAN/CORBAL FOREST BLOCKS
Baiting routes followed Mar-July 1994
in vicinity of the trapping surveys
DWALGAN
DWALGAN
CORBAL
CORBAL
HEARTLEA
BOYUP
BOYLE ROAD
WHEATLEY ROAD
MORRISON ROAD
POLLARD RD
ECLIPSE RD
ECLIPSE ROAD
SIMCOCK RD
PERUP
LEE ROAD
ARGUMENT
WALSH
WASH ROAD
PLUG ROAD
DOWIE RD
FORBES
DWALGAN RD
BOYUP ROAD
BROOK RD