FERAL PIG COMMITTEE

POSITION PAPER ON FERAL PIGS IN THE SOUTHWEST OF WESTERN AUSTRALIA

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PREPARED BY DR.D.KING ON BEHALF OT THE FERAL PIG CONTROL COMMITTEE COMPRISING REPRESENTATIVES OF:

FOREST DEPARTMENT
METROPOLITAN WATER AUTHORITY
PUBLIC WORKS DEPARTMENT
DEPARTMENT FISHERIES & WILDLIFE
AGRICULTURE PROTECTION BOARD

OCTOBER 1984

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1. Current Distribution and Numbers.

The current distribution of feral pigs in the state forests in the southwest is shown (Map 1). No information is available on their distribution in farming areas, but those areas are generally considered to be free of feral pigs although some are known to occur on private land near Gidgegannup. There were estimated to be 30-40 pigs in that area in 1974 and their numbers are believed to have grown to approximately 150 in 1984, despite recreational hunting.

Pigs seem to be spreading both north and south in the state forests. In the 1960's, the Albany Highway and Serpentine Dam were considered to be the northern limit of their distribution. They now occur within the Mundaring area and have apparently reached there within the past 5 years.

Pigs were first reported in the Kirup area in the 1960's, and have arrived in the Donnybrook sunklands since 1977. They were common in coastal areas west of Harvey and Waroona in the 1940's but appear to have disappeared in those areas by the 1960's, but the reasons for their disappearance are not known.

There is no obvious reason why feral pigs will not spread further in the southwest if they are not controlled. Pigs had spread throughout most of New South Wales by 1977 (Hone and Waithman 1979) and are believed to be increasing their distribution in the A.C.T. (McIlroy, pers. comm.).

No estimate of pig numbers in state forests has been made since that by Masters (1979) who estimated that the total population was below 10,000.

Feral pigs also occur in other areas of the state, and are considered to be causing problems in Kalbarri National Park and on the Fitzroy River.

2. Problems posed by feral pigs.

No quantitative assessments of the problems caused by feral pigs in state forests have been made. The extent to which pigs damage the flora and fauna of the forests is not known. The role of pigs in spreading the causative organism of Jarrah dieback (*Phytophthora cinnamoni*) or in producing more favourable conditions for the spread is unknown, but is regarded as a potential problem by the Forests Department. Pigs pose a low level of threat, from attacks, to Forests Department officers and others in the state forests, and could be involved in the transmission of exotic diseases of livestock if they are introduced into the southwest. Their effect on the watersheds is also unknown, although there is potential for transmission of diseases and increased turbidity.

The different densities of feral pigs in the southwest necessitate the use of different control strategies. At high densities, poisoning appears to be the most cost-effective technique, whereas at lower densities such as in isolated pockets or on farms adjacent to the forest a mixture of techniques should be used to maximise the reduction of pig numbers.

3. Action Taken to Date.

The distribution of feral pigs in the southwest has been determined (see part 1), basic biological data have been gathered (part 5), some control has been done and the results assessed (part 4 and Appendix 1).

4. Available Control Techniques.

(a) Poisoning. Rapid and substantial reductions of feral pig numbers have been achieved using 1080 poison in New South Wales (Hone 1983). Warfarin has also been shown to be toxic to pigs (McIlroy 1983, Hone and Kleba 1984) and to reduce their numbers in the southwest of Western Australia (Masters 1979). Assessing the effect of these toxins to free-living pigs in the southwest is difficult however, as direct counts in thick vegetation is not possible and assessment has relied upon determining bait take and track counts. Neither of these methods is able to provide reliable estimates of mortality as the effects of numbers and activity levels cannot be separated, and the number of sites which can be monitored is too small to give reliable data. The reductions estimated from track counts by Schmidt (1982) from the 1080 poisoning programs in 1981 (49%) and 1982 (38%) were both below the level (70%) suggested by Hone (1983) as necessary to effectively reduce the population over a 12-month period.

(b) Trapping. This method has been used in metropolitan water catchments due to the Water Authority's prohibition on the use of poisons in these areas. Trapping in the forests or on farm lands is viable but erecting and tending traps can involve high labour costs. While trapping can be effective in some circumstances (Waithman 1982) there are relatively little data on the effectiveness of this technique in the southwest, or on factors such as the optimal spacing or design of traps.

(c) Hunting. Pigs are hunted in the southwest for recreation and to reduce their numbers. Masters (1979) estimated the annual kill at about 2,000 but suggested that the higher proportion of non-adult to adult pigs in hunted areas than in forest quarantine areas indicated that the inverse effect of density on breeding activity and/or juvenile survival tended to offset any reduction in numbers caused by hunting. The probability of hunting causing a 70% reduction of pig numbers in any large forested areas is very low, as hunter enthusiasm is likely to wane well before that figure is reached. It is believed that some of the recent spread of pigs in the southwest is the result of the deliberate release of pigs by hunters.

A scheme to encourage hunting of pigs has apparently begun recently in New South Wales, whereby carcasses are purchased for $1.30 per kg and exported to West Germany for the game meat market. Such a program might provide an adequate incentive to make hunting a more effective means of control, although other factors such as Public Health Regulations on slaughter conditions or possible 1080 residues, Forests Department Restrictions on access to quarantine areas or use of firearms in forest areas might limit its value. Hunters have been employed to control pigs in the southwest but they have not been successful; the topography and the density of vegetation in many forested areas and the behaviour of the pigs makes it highly unlikely that hunting would be cost-effective on a broad scale.

(d) Fencing. Work in New South Wales by Hone and Atkinson (1983) found that most fence designs tested (with and without electrification) were not pig-proof, although electrification of fences did reduce the numbers of feral pigs crossing them. They found that the best results in terms of pig control and economics can be achieved by constructing new fences rather than modifying existing ones. A choice then has to be made between constructing an expensive, pig-proof (unelectrified) fence and a cheaper electrified fence which is almost pig-proof. That will, of course, depend on the value of what is being protected by the fence. Fencing to exclude pigs has not been tried in Western Australia.

5. Basic Biological Data.

The only data on feral pigs in the southwest are those of Masters (1979). His study includes data on body weights, seasonal changes in condition, coat colour, movements (from tagging and limited telemetry studies), reproduction, population structure and dynamics, social behaviour, diet, and disease and parasites. Studies on the biology of feral pigs have been done in the Northern Territory and New Zealand and are currently underway in New South Wales and north Queensland. The direct relevance of this research to the problem in the southwest is not yet clear.

Additional funds for research on the control of feral pigs in New South Wales and Queensland have been provided in the 1984 Federal budget. Additional research work in eastern Australia is being considered by the CSIRO Division of Wildlife Research and Rangeland Management.

6. Objectives in Feral Pig Control.

A number of departments have objectives in feral pig control. These are listed separately:-

Forests Department. Control pig numbers :
(a) Because of their possible role in spreading Jarrah dieback disease;
(b) For the safety of forest users;

(c) To reduce movement of pigs from forest areas onto private land;
(d) To reduce environmental damage;
(e) To maintain water quality (see Appendix 2).

Agriculture Protection Board. Protect horticulture, pasture, crops, and livestock from damage by pigs. (see Appendix 3).

Agriculture Department. Obtain information on survey and eradication techniques for use during exotic disease outbreaks. (see Appendix 4).

Metropolitan Water Authority. Restrict numbers and distribution in catchment areas to protect water quality. (see Appendix 5).

Public Works Department. As for Metropolitan Water Authority (see Appendix 6).

National Parks Authority. Reduce pig numbers in National Parks for protection of native flora and fauna (see Appendix 7).

Department of Fisheries & Wildlife. To reduce the detrimental effects of pigs on the flora and fauna (see Appendix 8).

7. Priorities.

The areas in which control of feral pigs has the highest priority for several authorities are shown on maps 2-5.

While eradication of feral pigs from the southwest is desirable it is not considered to be achievable, and the main priority is the reduction of numbers and distribution of feral pigs as much as is possible.

8. Problems in Pig Control and Population Assessment.

Problems in pig control have been outlined in section 4. Techniques such as trapping, shooting and fencing all have a high labour cost compared with poisoning, and thus require more staff and higher costs than poisoning. The use of 1080 poison for pig control in the southwest is likely to be the most acceptable toxin on environmental grounds. Most native fauna in the southwest have high levels of tolerance to 1080, which is thought to be the result of co-evolution between the fauna and plants of the genera Oxylobium and Gastrolobium which contain high levels of fluoroacetate, which is the toxic principle of 1080 poison (King et al, 1978).

The high tolerances of native fauna to the toxin will thus minimise the risk to non-target species which might feed on

baits. There would be no accumulation of the toxin in the soil, as it has been shown in New Zealand that soil microflora detoxify fluoroacetate quickly. Large amounts of naturally occurring fluoroacetate must enter the soil in the forest areas from the plants occurring there and if that was not detoxified the forests (and water catchments) would be very hazardous to humans and introduced animals.

There are no data available on the susceptibility of native fauna to warfarin, but there are some data on the toxicity of another anticoagulant (Pindone) to several species of native fauna. Pindone is highly toxic to macropods. If warfarin is of the same order of toxicity to them, it would cause substantial mortality in any macropod species which ate the baits.

If 1080 poisoning can give the results obtained with this toxin in New South Wales (Hone 1983) it is likely to be the most effective and economical control method for pigs in the southwest. An assessment of its efficacy should be made. Assessing the effectiveness of pig control techniques has been difficult because of the lack of a suitable technique for determining pig numbers before or after a control program. This made it impossible to compare the results obtained using different methods or to determine the cost-effectiveness of any method. Direct counting of pigs in an area is not possible from the air or from the ground in forested areas of the southwest due to the density of the vegetation, terrain and access. Assessment by means of bait take, track counts or extent of disturbance is not adequate for determining the efficacy of control techniques.

It is proposed that a study be carried out using telemetry equipment to determine the effectiveness of a 1080 pig poisoning program. This technique has been used successfully to determine the success of baiting trials for rabbits (Robinson and Wheeler 1983) and dingoes (Thomson, in prep.) in Western Australia. It would be necessary to catch and instrument up to 30 pigs in an area with telemetry collars for such a trial, and to track them for approximately 1 week before baiting and several weeks after baiting to determine the mortality from the baiting. Similar assessments could be made for other control techniques, but the cost advantages and safety of 1080 poisoning with regard to native fauna suggest that it should be tested first.

In order to make such an assessment, it would require 3 technical staff for a minimum period of 6-8 weeks and the acquisition of 30 radio-telemetry collars, one receiver and a directional antenna as well as materials required for trapping pigs. Costs of this material are listed below:-

	$	
Transmitters	7,700	($259 each)
Receiver	1,299	OK
Antenna	129	OK ?
Trap material	1,000	
Total cost (30 Transmitters)	$10,128	

Most transmitters should be recovered at the end of the trial and could be used in subsequent trials. It would be very desirable to determine the effectiveness of summer and winter poisoning programs with trials conducted in February-March and June-July in one area. Each trial would take a minimum of 6-8 weeks to carry out.

Additional data on pig movements would also be obtained during these trials.

The main deficiency in our knowledge about feral pig control is the lack of sound information on the efficacy of control techniques. This proposal would provide data on the technique most likely to prove cost-effective as a control method in the southwest. It could be carried out as a joint project utilizing staff and equipment provided by several departments and would be an important first step in any further investigations which may be necessary.

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APPENDIX 1.

FERAL PIG CONTROL PROGRAMS CARRIED OUT IN THE SOUTH-WEST OF WESTERN AUSTRALIA FROM 1979 TO 1984

1979

K. MASTERS AND M. AITKEN

1. Lowden - Grimwade

Baits - half apples - dyed purple - buried

Poison - Warfarin (technical) 1.5 g per half apple 1080 (7.5 mg per oat) 52.5 mg per half apple

Acute lethal doses worked on
Warfarin 30 mg/kg
1080 2 mg/kg

Format - 2 weeks free feeding
1 week poisoning
2 weeks free feeding
1 week poisoning
2 weeks free feeding

Timing - Mid February to mid April 1979

Sites -	First poisoning	Second poisoning
	10 Warfarin	5 Warfarin
	11 Control	5 1080
		6 Control

Poison Taken - (Sufficient to kill - 50 kg pigs)

1st poisoning Warfarin	198 pig doses
2nd poisoning Warfarin	42 pig doses
2nd poisoning 1080	2 pig doses

2. Serpentine Pipehead Dam

Baits, Format, Poison and Timing as above

Sites -	First poisoning	Second poisoning
	6 Warfarin	4 Warfarin
	1 Control	4 1080
		1 Control

Poison Taken - (Sufficient to kill - 50 kg pigs)

1st poisoning Warfarin	216 pig doses
2nd poisoning Warfarin	60 pig doses
2nd poisoning 1080	11 pig doses

Whilst there was a decline in quantity of bait taken and general activity in both areas following poisoning (particularly at Serpentine) very few dead pigs were found. This was believed to be at least partly due to the slow acting nature of the main poison used - Warfarin; the dense bush associated with much of the area poisoned in each case probably also contributed.

The overall effect in reducing pig numbers using this method was, nevertheless, considered to be satisfactory.

A good comparison of the two poisons could not be made because of the limited use of 1080 in the present study. However, 1080 was applied during April 1979 using the "apple method" with excellent results on a farm at Lowden where pigs were ruining a potato crop. Both poisons appear to be very effective.

1980

K. MASTERS AND A. McKENZIE

This program was originally intended to be carried out in three areas -

A) Murray Catchment

B) North Dandalup Catchment

C) Grimwade Forest area

Misinformed publicity and public interference forced abandonment of the program at North Dandalup and wet weather caused the cessation of the Grimwade program, therefore the eventual program was restricted to the Murray Catchment.

FERAL PIG CONTROL PROGRAM 1980

SUMMARY

1. During the period February-April 1980 a program of feral pig poisoning was conducted in the Murray Catchment area.

2. Throughout the period the changes in pig populations resident on 19 waterholes in the area were monitored by the use of sand pads.

3. Trials with 3 bait types - dog baits, oats and apples suggested dog baits to be most suitable for poisoning.

4. Following various free-feeding periods 1080 was fed to pigs in the form of buried, factory-manufactured dog baits containing 4.5 mg each.

5. The quantity of 1080 consumed was shown to be unrelated to the period of initial free-feeding.

6. Estimates of activity and bait take changes indicated a 60% reduction in pig numbers at sites poisoned once, a 78% reduction at sites poisoned twice, and no detectable change at control sites.

7. Where traps were also located, the change in catch/unit effort indicated a 54% reduction of pigs at poison sites and a 9% increase at control sites.

8. the probability of carcass retrieval, based on 17 carcasses that were found was estimated at 12%.

9. Carcass searches and pen trials on 1080 suggested that juveniles exhibit a greater susceptibility to 1080 than adults; particularly adult sows.

10. Pen trials indicated that Warfarin administered to two sows at 6.6 and 3.8 times the suggested acute lethal dose was without affect after 16 days.

11. Trapping results indicated that the use of weldmesh coil traps may represent a viable possible alternative method of pig control.

During the winter of 1980 follow-up work by M. Aitken showed presence of feral pigs on 8 out of 27 farms surveyed in the Kirup-Balingup-Greenbushes-Wilga-Boyup Brook-Noggerup-Lowden and Dardanup areas. Five of the eight properties were baited using 1080 dog baits but with little success. Then in August the baits were changed to 1080 impregnated apples. It appeared that once the bait was changed to apples pig activity ceased in all areas.

1981

K. CARPENTER - K. MASTERS

Ken Carpenter was accompanied by Forests Dept. personnel Gavin Wall, Kirup - Forest Guard, Collie - Wolf Tiderman, Harvey - Jim Warren, Dwellingup.

Sites

22 waterholes - Northern Section

65 waterholes - Southern Section

This was the first program where large quantities (initially 10 stations at each site with 100 baits in each station) of bait were used (1080 dog baits).

Assessment of this program by Kim Masters in the Dwellingup area where 57 poisoned plots were used are summarised below.

He found that there was an increase of 56.9% in activity in the unpoisoned area. This meant that the figures from the poisoned area had been influenced by things other than poisoning and this meant that a correlation factor was needed. He used the wrong correlation factor and this led to an underestimate of the percent reduction of pig activity in the poisoned area. The actual overall reduction was 49%, not 30.4% over the area that was poisoned.

	Before	After	Difference	% Difference
Unpoisoned Area	.0919	.1442	+ 0.0523	+ 56.9
Poisoned Area	0.1306	0.1052 Adjusted 0.067	0.636	- 49%

TABLE 1. Summarised results of 1981 poisoning program.

Subjective assessment based on the minor number of reports of damage on farms in the Kirup-Greenbushes area indicated a fair reduction in feral pigs in that area.

1982

F. HEARN, D. DEVLIN AND L. SCHMIDT (DWELLINGUP)

PLUS BAIT PREPARATION

During this program, carried out in February-March 1982, a total of 18,000 baits were laid at 15 sites (200 taken) in a 200 square kilometres area south-east of Dwellingup. The baits consisted of half apples impregnated with 1080 oats.

Assessment of the program by L. Schmidt indicated a reduction of 37.9% in feral pigs in poisoned areas. This compared to a 49% reduction in 1981. However, the summer of 1982 saw an abundance of rain during January and, in addition, temperatures were quite mild, thus the pigs were possibly less dependent on water and did not congregate at waterholes as they would in a hot, dry summer.

Mr Schmidt, in his report, discussed the sand trap method of assessment.

"The method used to assess the changes in pig activity is an effective method but its accuracy is influenced by several factors. The low frequency (less than 1 in 30 plots worked per day in the poisoned area) (Table 3) and high variability in the number of tracks recorded each day means that a larger number of plots should also be used and that the assessment should be carried out over a long period.

The short period of assessment before poisoning commenced this year (7 days) and the short periods of assessment before and after poisoning in 1981 (9 days and 6 days respectively) were not sufficiently long as random fluctuations would have a greater effect over these short periods.

In general, this is an excellent method of assessing the effectiveness of a poisoning program, as it is simple and particularly suited to conditions where pigs are difficult to count directly. However, the constraints referred to above must be observed in order to get maximum accuracy from it."

M. AITKEN AND G. WALL - (KIRUP)

(PLUS BAIT PREPARATION)

This program also carried out in February-March 1982 consisted of laying approximately 20,000 baits (half apples impregnated with 1080 "One Shot" oats) at 79 sites in the Kirup forest district.

No assessment of this program was undertaken; however, Mr Sparrow made the following comments in the final report:-

"Pig numbers appeared much lower than suggested by monitoring after the 80-81 program. This could have been caused by one of four factors -

1. Pig moved out of region (unlikely).
2. Monitoring was inaccurate after the 80-81 program.
3. Present estimate is inaccurate.
4. Far more pigs than estimated have been killed this year.

However, the assessment made independently by people involved or associated with this year's work put pig numbers at the commencement at 100-150 and on completion at 40-50.

Present Situation:

The numbers are low, but the period when pigs are most active on farms (4-6 weeks after the season's break) is yet to come and because of the volume of damage one or two pigs can do, there will probably be the superficial appearance of a rapid build-up. The 16 found dead have risen since Mr Aitken wrote the report, to 21 with the finding of a further 5 on a farm adjacent to forest. From work in the eastern states it is to be expected that this number only represents a small proportion of pigs actually killed. This is even more likely as bait stations were in forestry country with only some of them near farm land.

1984

B. JARVENS AND G. WALL - (KIRUP)

(PLUS BAIT PREPARATION)

This program was carried out as a follow-up to the poisoning programs conducted in the Kirup Forests Division in 1981 and 1982.

BAITING SITES AND STATIONS:

117 bait sites were found, an average of 3 stations were put out at each site. On some stations baits were taken repeatedly up to 9 times at one station. This led to concern over bait poison content. In all, 120 station replenishments were made. Each station replenishment contained enough poison to kill 4 large 60 kg pigs.

RESULTS

To date, 41 kills have been definitely confirmed. This is by sightings of carcasses. The estimated number of kills would be in the vicinity of 150. This estimate has been arrived at from the number of poisoned baits taken.

Confirmed kills by block are:-

Warner block	3	Wilga	10
Noggerup	11	Donnybrook	5
Preston	2	Catterick	6
Grimwade Pines	1	Towers	3
Total:-	41		

REASONS FOR FERAL PIG CONTROL ON STATE FOREST

The Forests Department sees the control of feral pigs on State Forest as desirable for a variety of reasons.

Dieback

Feral pigs are regarded as a possible vector in the spread of jarrah dieback disease. Samples of material taken from the bodies and digestive systems of some pigs have proved negative and there is no other positive proof of such a role. However, their habit of wallowing in wet low-lying areas and then moving to upland sites, together with their feeding on vegetative material from some susceptive plants, infers that they could act as a disease vector. Some new upland infections cannot be explained by any other means.

Safety of Forest Users

There is no known example of direct threats to the safety of forest users by feral pigs. However, the removal of pigs would not only reduce this threat, but also the more real possibility of conflict between illegal hunters and legitimate forest users.

Invasion of Adjacent Land

Control of feral pigs in State Forest would decrease antagonism towards the Forests Department felt by neighbouring private land-holders, whose properties are invaded by pigs from surrounding forest areas.

Environmental Damage

Feral pigs cause environmental problems, damaging vegetation and affecting native fauna through competition or alteration of habitat. Whilst the extent of these effects is not accurately known, there is no doubt that pig control would be beneficial to environmental values.

Water Quality

The Forests Department has a responsibility for water quality in catchment areas and feral pig activity would be capable of increasing water turbidity in localised situations in streams and dams.

FERAL PIG CONTROL IN STATE FOREST

Priorities for control of feral pigs in State Forest will be as follows:

Priority 1 Areas of particular importance or value to the Department; including research and forest sanctuary priority areas, pipehead catchments and recreational areas.

1.1 Adjacent to private property and likely to affect it.

1.2 Not adjacent to private property.

Priority 2 Areas where control will prevent spread beyond their present distribution.

2.1 Isolated pockets of infestation.

2.1.1 Adjacent to private property and likely to affect it.

2.1.1 Not adjacent to private property.

2.2 Extremities of main distribution.

2.2.1 Adjacent to private property and likely to affect it.

2.2.2 Not adjacent to private property.

Priority 3 Remaining areas of State Forest within the main distribution area of feral pigs.

3.1 Adjacent to private property and likely to affect it.

3.2 Not adjacent to private property.

Ag Protection

Present and possible problems associated with feral pigs in Western Australia

1. A threat to livestock through (a) direct attack, (b) competition for feed or (c) through the transmission of infectious diseases (the latter already presented by Mr D Harris (Principal Vet/Officer Disease Control Department of Agriculture

1a. Direct Attack - Significant adverse effects have occurred on lambing percentages. Trials in N.S.W. in the early 1970's indicated a 135% lambing (117% marking) in a protected paddock compared with 58% - 85% marking percentages in three other unprotected paddocks (500 ewes each paddock). A recent report from Jurien Bay (May 1984) indicates a 180 lamb loss (550 ewes) from one paddock attributed to feral pig predation.

1b. Competition for Feed - The only possible effect on cattle production is a degree of competition for food. Cattle and pigs eat basically the same food when pastures are good. However, the real effect on domestic stock becomes apparent when pastures are rooted up destroying feed in the process. A recent occurrence at Collie (July 1984) had ruined in excess of 20 ha on one property.

2. A threat to (a) Crops, (b) Pastures, (c) Fences and (d) Farm Water Supplies

2a. Crops - The only reported damage to crops in W.A. have been to potatoes (Preston Valley 1979) and hay (paddocks shut up in Spring for hay production) most years. However, reports from the Eastern States have established reduction in production as a result to feral pig activity on,

1. Summer crops (Grain Sorghum) in N.S.W. and Queensland - Consumption of grain and foliage plus damage to plants on tracks and camps.

2. Sugar - For all sugar areas in Queensland, the overall damage figures were 0.04% in 1971, rising to 0.1% in 1974. The overall net income loss for all districts varied from $57 000 in 1971 to $435 000 in 1974.

2b. Pastures - Already mentioned above - Collie (1984) in excess of 20 ha damaged on one property.

2c. Fences - Very few fences are pig proof and in the majority of areas where feral pigs are present there is fence damage to some degree.

2d. Farm Water Supplies - Two types of damage have been noted:
1. Damage to dam walls and surrounds caused by wallowing and paddling in the mud.

2. Damage to the catchments by pig rooting in the moist conditions usually found leading into the dam.

(Eastern States figures taken from the Standing Committee on Agriculture - Report of Working Party on Feral Pigs, 1976)

The report of the Joint Working Party on Wildlife and Exotic Diseases (May 1984) identifies the feral pig as the most important wildlife species likely to be involved in an exotic disease outbreak. They are susceptible to more exotic diseases than any other species and could be a significant reservoir of infection for many of these exotic diseases.

Feral pigs could have a significant vector role in the following diseases:

- Foot and Mouth Disease
  Swine Fever
  African Swine Fever
  Swine Vesicular Disease
  Vesicular Exanthema
  Aujeszky's Disease

In a field situation the most likely mode of spread of the vesicular diseases to a feral pig population would be as a result of contact with contaminated materials eg foodstuffs, water, contaminated surfaces etc. Airborne spread is a possibility and may result in infection 'jumping' distances. It is unlikely that airborne spread would play a significant role in spread to feral pigs in Western Australia.

In an outbreak situation response activities in relation to feral pigs would depend on:

- their presence in a defined risk area
- their population density in that area, and
- an assessment of the probability of direct or indirect contact with infected stock.

In view of the importance of feral pigs as potential vectors of major exotic diseases it is important that contingency plans should include control strategies and that research and trials in relation to survey and eradication techniques should be recognised as a high priority in exotic disease preparedness.

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METROPOLITAN WATER AUTHORITY
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Agricultural Protection Board
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Dear Sir

FERAL PIG CONTROL COMMITTEE

I refer to a letter dated August 23 1984 from the Chairman Feral Pig Control Committee requesting that we supply you with particular information relating to the Feral Pig problem and our requirements on control.

The following comments are supplied in response to the request:

The existence of the Feral Pig in MWA catchments is undesirable in that they -

- Are potential rapid disseminators of exotic diseases. It is already known that Feral Pigs can harbour human pathogens and while recent investigations have indicated that the existing pig populations are relatively free of these the potential for rapid spread remains should pathogen introduction occur.

- Cause substantial destruction of the vegetation when digging for roots. This is of particular concern where groups of pigs are active close to streams. The resultant turbidity can be substantial and sustained.

- Invite, by their existence, hunters into the catchments. Hunting in the catchments is undesirable due to the difficulty of control, the large unbounded area of access required and the safety of other catchment and forest users.

- The MWA's main aim in controlling the population of these animals is to restrict their numbers and concentration. We do not believe eradication is possible in forested catchments considering all the social and environmental constraints hence we must determine the degree to which we can live with the problem. From the Water Authority's viewpoint this means restricting the concentrations thus reducing the risk of disease spread and turbidity and making hunting much less attractive.

..../

continued.....

. Our priorities for feral pig control would be those catchments having little storage and with direct supply to the public. Our priorities in descending order would be:

1 Victoria; Serpentine PH; North Dandalup.
2 Canning; Wungong; Serpentine Main Dam; Churchmans Brook; South Dandalup.
3 Kangaroo Gully.
4 Lower Canning.
5 Bickley (upper and lower); Gooralong; Dirk Brook; Conjurinup Creek; Murray River Water Reserves.

A plan indicating these catchment areas is enclosed.

Should you require any additional information please contact the Engineer Headworks Mr P Moore on 420 2555.

Yours faithfully

D PUNCH

A/CHIEF WATER SUPPLY ENGINEER
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PUBLIC WORKS DEPARTMENT
WESTERN AUSTRALIA
P.W.10

Your Ref. 72-78

Our Ref. PWWS 2130/81

Enquiries Mr Cornish (Ext 2540)

Address all letters to the "Under Secretary"

Mr D G Gooding
Chairman
Feral Pig Committee
c/o Agricultural Protection Board of WA
Jarrah Road
SOUTH PERTH WA 6151

FERAL PIG CONTROL (SOUTHERN FORESTS)

Your letter of August 23, 1984 refers.

1. The Public Works Department is committed to supplying to consumers water conforming with the requirements of the document "Desirable Quality for Drinking Water in Australia" being guidelines jointly prepared by the Australian Water Resources Council and the National Health and Medical Research Council and published by A G P S Canberra in 1980 (ISBN 0 642 057257).

2. This Department believes that

   2.1 Feral pigs have the potential to affect water supplies by introducing pathogens and by increasing turbidity and to overcome these problems will necessitate increasing the degree of treatment of water with consequent higher costs to consumers;

   2.2 To date the number of feral pigs in its Catchments is insufficient to have created palpable problems in either of these domains.

3. The objective of control is to reduce the numbers and distribution of feral pigs progressively until they are eradicated.

4. Geographical areas for control, in order of priority, are Helena (Mundaring) Catchment, Wellington Catchment and then Kirup, Dumpling Gully, Balingup and Tanjannerup Catchments.

B. Cornish

B CORNISH
PWD MEMBER
FERAL PIG CONTROL COMMITTEE

September 11, 1984

cc Dr Dennis King
APB, Bougainvillea Avenue, Forrestfield

NATIONAL PARKS AUTHORITY OF WESTERN AUSTRALIA

HEAD OFFICE:
HACKETT DRIVE,
NEDLANDS. 6009
PHONE: 09 386 8811

REGIONAL SUPERINTENDENT – NORTH
P.O. BOX 119
KARRATHA. 6714
PHONE: 091 86 8291

REGIONAL SUPERINTENDENT – SOUTH
CAMPION HOUSE
63 SERPENTINE ROAD
ALBANY. 6330
PHONE: 098 41 4088

Mr. D. King
Agricultural Protection Board
Bouganvillea Avenue
FORRESTFIELD W.A. 6058

NPA ref: 177 BGM:SO

FERAL PIGS IN NATIONAL PARKS

Dear Sir

With regard to your enquiry about pigs in National Parks, may I offer the following information.

1. Kalbarri National Park: quite severe problems on the southern boundary adjacent to farmland. Occur mainly in wooded areas where they dig up the soil.

2. Walyunga National Park: occasionally along river. Believed to enter from adjacent forest or along river.

3. Serpentine National Park: occasionally found on eastern side. All enter park from adjacent Forest Department land.

Ultimate objective of the Authority is eradication, but with the exception of Kalbarri, none are resident but enter the parks from adjacent areas. Poisoning (1080 apples) has been done in Serpentine. Control in the other parks is by opportunistic shooting or trapping. Both methods have a very low level of success.

In terms of priority for control I would put Kalbarri at top of the list, then Serpentine.

Yours faithfully

B.G. Muir
Ecologist

29th August 1984

DEPARTMENT OF FISHERIES AND WILDLIFE

Western Australian Wildlife Research Centre

Ocean Reef Road, Woodvale, Western Australia

Postal Address: P.O. Box
Wanneroo, W.A. 6065
Phone (09) 405 1555
Telex: AA 93832

Your Ref:
Our Ref:

POSITION STATEMENT - FERAL PIGS IN THE SOUTHWEST OF W.A.

The impact of the feral pig on wildlife in the southwest has not been studied, and so it is not possible to cite evidence which indicates that the feral pig is having a detrimental effect on the flora and fauna of the region. Such information would support a policy advocating control, but obtaining such information would be very demanding on resources.

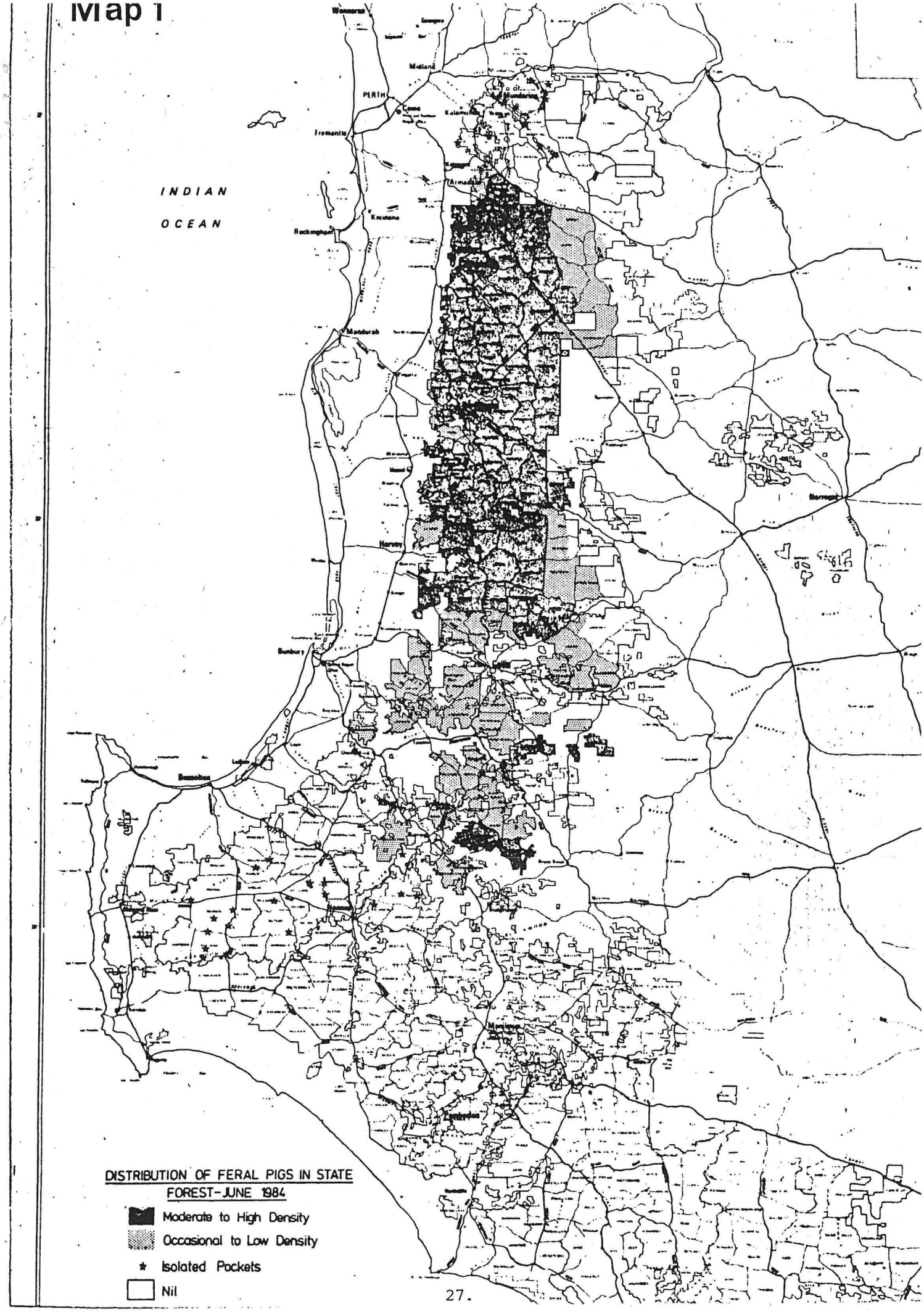
On general ecological principles, this Department deplores the presence of large populations of feral pigs and holds the view that control is highly desirable. The Australian fauna has never evolved a species equivalent to the pig, and it is therefore highly probable that the pig is affecting community links and relationships.

In summary, this Department believes that the presence of sizable populations of feral pigs in the southwest of W.A. will inevitably lead to environmental degradation in the long term. This Department therefore endorses and recommends that an ongoing control program be implemented.

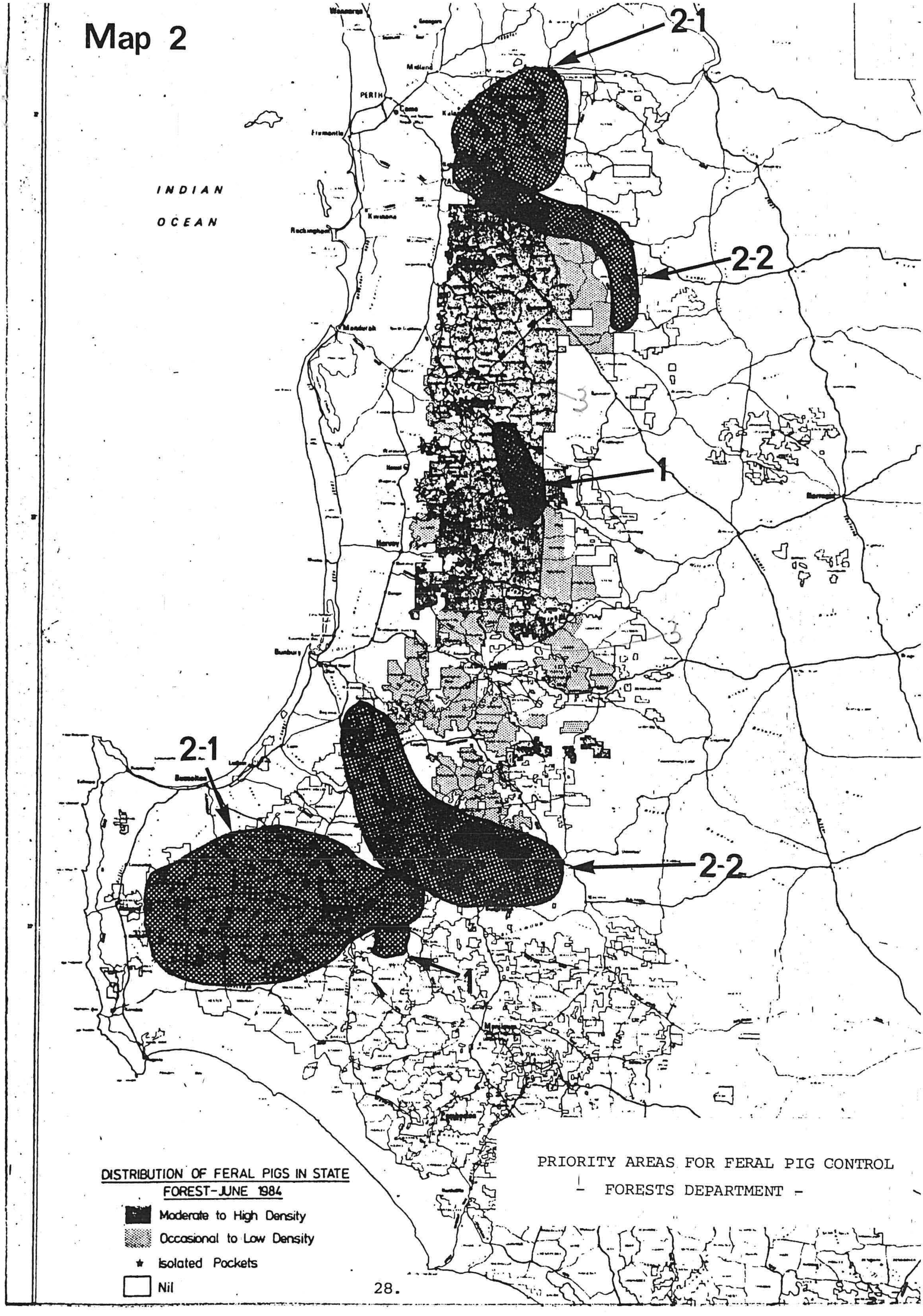
J.E. KINNEAR, Ph.D.
Acting Chief Research Officer

September 24 1984

Map 1


INDIAN
OCEAN
PERTH
Fremantle
Rockingham
Mandurah
Harvey
Bunbury
Busselton
Manjimup
Albany
Esperance
Merredin
DISTRIBUTION OF FERAL PIGS IN STATE FOREST - JUNE 1984
Moderate to High Density
Occasional to Low Density
Isolated Pockets
Nil

Map 2



2-1
2-2
1
2-1
2-2
1
INDIAN
OCEAN
PERTH
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Moderate to High Density
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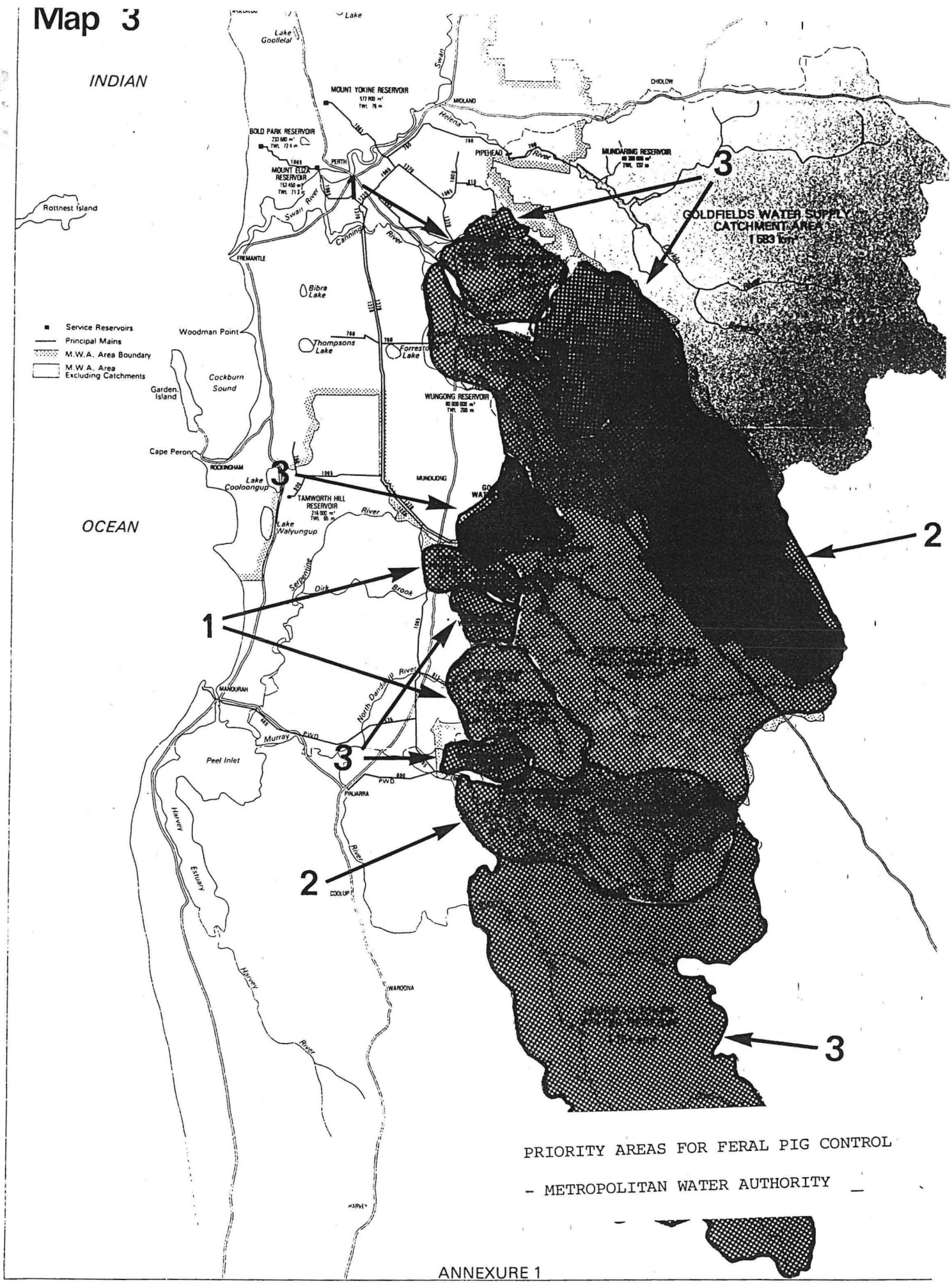
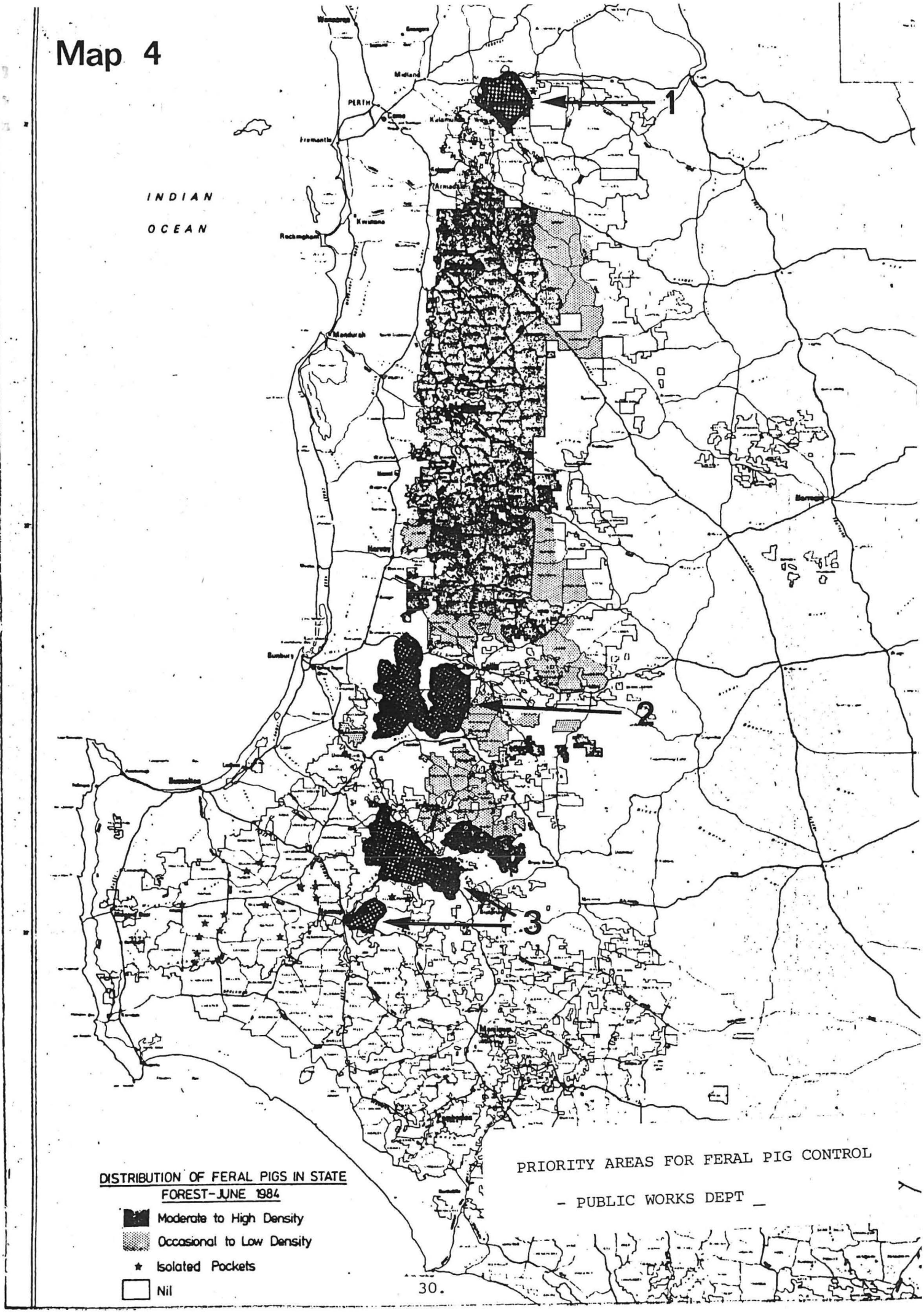
PRIORITY AREAS FOR FERAL PIG CONTROL
- FORESTS DEPARTMENT -


Map 3
INDIAN
OCEAN
Lake Goollelal
MOUNT YOKINE RESERVOIR
BOLD PARK RESERVOIR
MOUNT LAWLEY RESERVOIR
PERTH
Swan River
Canning River
Rottnest Island
FREMANTLE
Bibra Lake
Woodman Point
Thompsons Lake
Forrestdale Lake
Cockburn Sound
Garden Island
Cape Peron
ROCKINGHAM
Lake Cooloongup
Lake Walyungup
TAMWORTH HILL RESERVOIR
MUNDIJONG
WUNGONG RESERVOIR
MUNDARING RESERVOIR
PIPEHEAD
MIDLAND
DIDLOW
Helena River
Serpentine
Dirk Brook
North Dandalup River
MANDURAH
Murray
PWD
Peel Inlet
PINJARRA
Harvey Estuary
Harvey River
COOLUP
WARDONA
HARVEY
Service Reservoirs
Principal Mains
M.W.A. Area Boundary
M.W.A. Area Excluding Catchments
GOLDFIELDS WATER SUPPLY CATCHMENT AREA
1 583 km²
1
2
3
PRIORITY AREAS FOR FERAL PIG CONTROL
- METROPOLITAN WATER AUTHORITY _

ANNEXURE 1

Map 4


INDIAN
OCEAN
PERTH
Fremantle
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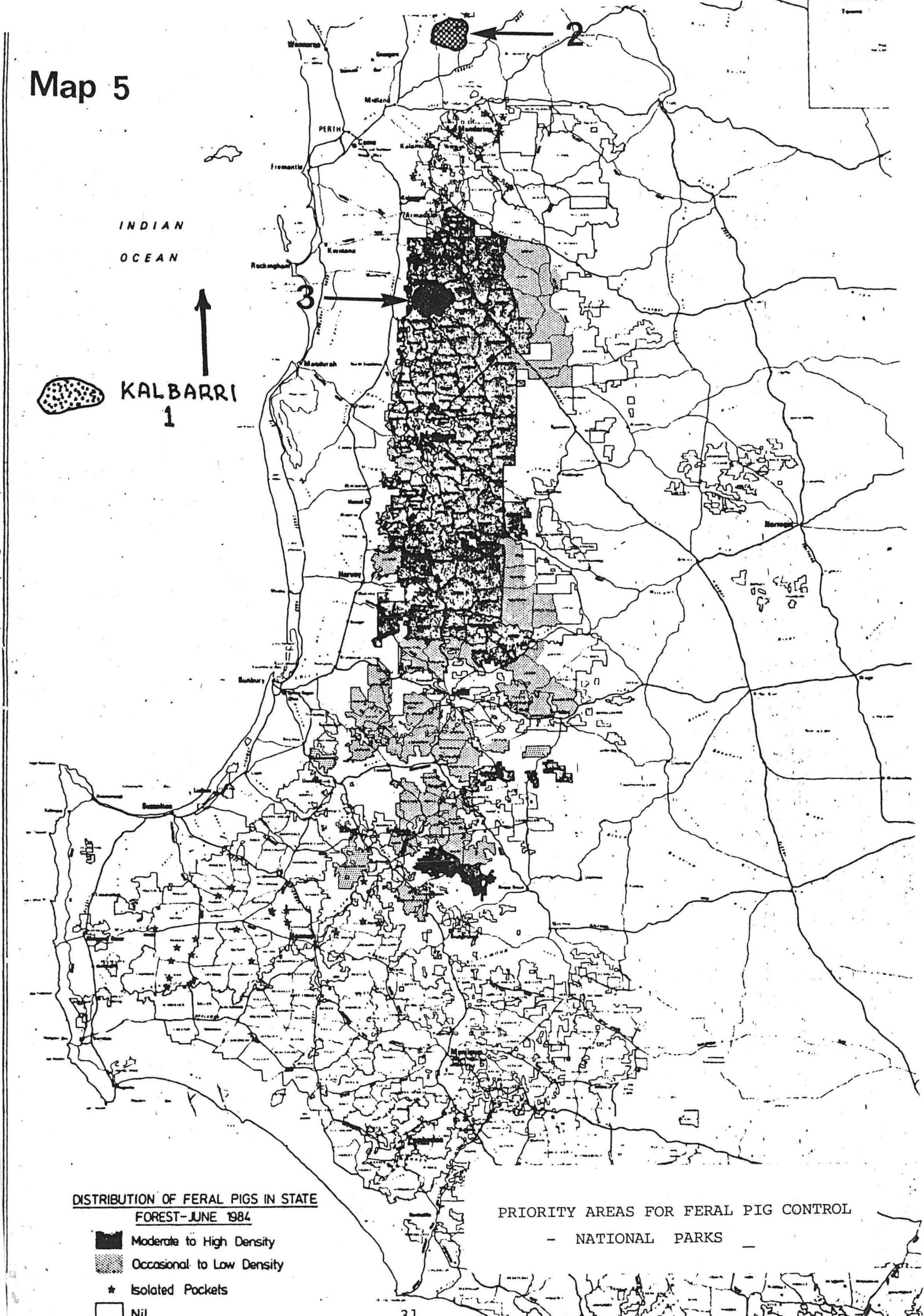
Midland
Kalamunda
Armadale
Kwinana
Harvey
Boyup Brook
Narrogin
Merredin
1
2
3
DISTRIBUTION OF FERAL PIGS IN STATE FOREST - JUNE 1984
Moderate to High Density
Occasional to Low Density
Isolated Pockets
Nil
PRIORITY AREAS FOR FERAL PIG CONTROL
- PUBLIC WORKS DEPT -

Map 5



PRIORITY AREAS FOR FERAL PIG CONTROL

- NATIONAL PARKS