

Trial use of 1080 to control feral goats in Western Australia

Agricultural Protection Board

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin 719
November 1993**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WESTERN AUSTRALIA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 25th November 1993. 2/12/93

Environmental Impact Assessment (EIA)

Process Timeline for this document in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
14.6.93	Proponent Document Released for Public Comment	
9.8.93	Public Comment Period Closed	10
13.8.93	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	1
10.9.93	Proponent response to the issues raised received	4
11.11.93	EPA reported to the Minister for the Environment	4

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Summary and recommendations

The Agricultural Protection Board has been undertaking shooting and mustering control of feral goats in accordance with the Feral Goat Eradication Programme. This programme is run in conjunction with Local Conservation District Committees (LCDCs). While this operation has been successful in some areas, the Western Australian goat population has the potential to increase at a rate of up to 70% per annum. In addition, a different approach is required to control goats in areas where terrain or financial constraints prevent the use of conventional control methods.

The Agricultural Protection Board has developed a control programme which is proposed to be used in conjunction with the established control methods, utilising the chemical sodium monofluoroacetate, widely known as 1080. This assessment report deals with the proposal to incorporate the use of 1080 in the Feral Goat Eradication Programme.

The proposal was referred to the Environmental Protection Authority in August 1992. In view of the potential environmental impacts associated with the poisoning operation, the Authority determined that it should be subject to formal assessment under Part IV of the Environmental Protection Act as a Public Environmental Review (PER). The resultant Public Environmental Review document was clear and concise, and the officers who prepared this document are to be complimented. The Authority found it most encouraging to have a document released for public review which is so well set out and understandable.

Feral goats depend upon artificial water supplies on pastoral stations during dry periods of the year. During these periods, the Agricultural Protection Board proposes to temporarily poison drinking water in troughs provided specifically for use by feral goats. The feral goats will be directed to the modified poisoned troughs through the use of one way gates which exclude livestock and most ground dwelling native animals. Modifications to the structure of the poisoning troughs will minimise access by birds. These troughs will be poisoned for restricted hours to maximise exclusion of other species, and then the troughs emptied and refilled with fresh water. The poisoning operations will occur over a period of four days in each location.

The Agricultural Protection Board has undertaken 16 environmental management commitments (Appendix 1) for the use of 1080 to control feral goats. These are designed to protect public health, native wildlife and pastoral stock.

Several issues were raised by the public, involved government agencies and the Environmental Protection Authority following an eight week review of the proposal as described within the Public Environmental Review document.

These issues, the proponent's response to them and the Authority's evaluation of this response is summarised as follows:

- ***Impact of feral goats on arid shrublands***

The Agricultural Protection Board recognised that in order to reduce degradation of the arid rangelands of Western Australia, the number of feral goats must be decreased and appropriate management practices introduced.

The Authority considers that this programme could lead to an improvement in the condition of the arid shrublands, but total grazing pressure is an important issue to be considered.

- ***Secondary poisoning***

The Agricultural Protection Board has addressed in detail the anticipated level of secondary poisoning of species feeding on poisoned carcasses, and concludes that the potential impact of 1080 is negligible.

The Authority considers the Agricultural Protection Board's response to this issue is adequate, however monitoring of areas subject to poisoning is necessary to confirm the expected low levels of secondary poisoning.

- *Impacts on non-target species*

The Agricultural Protection Board has undertaken a number of commitments to utilise a variety of techniques to minimise risk to other species, such as poisoning at restricted times of day, providing unpoisoned water for birds and directing goats to poisoned troughs via gates which exclude sheep, kangaroos and other animals.

The Authority considers these measures adequate, however, it is important to monitor the impact of poisoning on non-target species to ensure protection of native fauna.

- *Public safety*

The apparent inadequacy of the public education programme was an issue raised by the Authority subsequent to the Agricultural Protection Board's response to public submissions. The Authority notes that the proponent has provided a commitment to notify the Commissioner of the Aboriginal Affairs Planning Authority of the timing and location of any poisoning site as would be gazetted in the Government Gazette. However, the Aboriginal Affairs Planning Authority considers this commitment to be insufficient and would want the Agricultural Protection Board to communicate directly with the relevant Aboriginal communities.

Following consideration of these issues and the proponent's response to them, the Authority has concluded that the proposal as described is environmentally acceptable, subject to the following recommendations.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed 'Use of 1080 to Control Feral Goats in Western Australia', is environmentally acceptable. In reaching this conclusion, the Environmental Protection Authority identified the main issues as:

- **impact of feral goats on arid scrublands;**
- **poisoning of non-target species;**
- **secondary poisoning from consumption of poisoned carcasses; and**
- **public safety.**

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the implementation of the proponent's commitments listed in Appendix 4 and the Authority's recommendations in this report.

The Authority notes that the proponent has determined a number of strategies to minimise the impact of the poisoning programme on other species, however, the Authority considers that it is important to monitor any non-target and secondary poisoning.

Recommendation 2

The Environmental Protection Authority recommends that prior to commencement of poisoning operations, the proponent prepare and subsequently implement a monitoring programme which evaluates the degree of, and impacts of, non-target and secondary poisoning, to the requirements of the Environmental Protection Authority on advice from the Department of Conservation and Land Management.

The Environmental Protection Authority recommends that the results of the monitoring programme be made available to the public and the Authority.

The Aboriginal Affairs Planning Authority believes that the proponent should extend the proposed public education programme to ensure the local Aboriginal community is aware that poisoning operations are occurring in the vicinity. To achieve this, the Agricultural Protection

Board should interact with the Aboriginal Affairs Planning Authority to develop a suitable education package for the Aboriginal communities, and inform the five Regional Councils in the target area of the poisoning operations at least two months prior to commencement.

The Environmental Protection Authority believes that prior to commencement of poisoning operations, the Agricultural Protection Board and the Aboriginal Affairs Planning Authority should come to an agreement on the proposed education programme for Aboriginal communities.

Due to the significance of the issues required to be monitored and the need to respond to any concerns revealed by monitoring, the Authority considers that the extension of an approval of this proposal beyond an initial period of two years should follow a review of monitoring results by the Authority and subsequent modifications of techniques by the Agricultural Protection Board as appropriate.

Recommendation 3

The Environmental Protection Authority recommends that approval for this proposal should be limited to two years. Following this period, monitoring results of the programmes success should be reviewed by the Authority in consultation with the Department of Conservation and Land Management, to determine the effectiveness of the programme and the level of impact on native animals, before an extension to the programme is granted.

1. Introduction

Goats were introduced into Western Australia more than 100 years ago. The arid shrublands in the Pilbara, Gascoyne, and Murchison (Figure 1) provided an ideal habitat for goats and the success of these animals has been enhanced by the provision of watering points for managed stock. The goat population is currently considered to be in excess of one million in the area shown on Figure 1.

In comparison with sheep, goats maintain their condition even when the food source is low and will overgraze shrubs until the shrub and goats' death. The loss of perennial shrubs is a major process of ecological degradation.

In 1991 pastoralists in the arid shrublands of Western Australia requested the Western Australian Government initiate a programme to help them eradicate goats from the region, to reduce environmental degradation and competition between managed stock and the feral goats for food. The result was the development of the Feral Goat Eradication Program which is coordinated by the Agricultural Protection Board (APB). The current control techniques include:

1. mustering for sale when large commercial mobs exist; and
2. shooting, from helicopter when and where appropriate (for example where the scrub is too thick for mustering).

Although the Agricultural Protection Board considers this programme generally successful, it considers that additional controls are required in some areas. These areas include regions which are distant from markets, where mustering for sale is not economic and regions where rugged terrain restricts the use or effectiveness of other forms of control.

To address these problems, the Agricultural Protection Board and Department of Agriculture of Western Australia have investigated the use of 1080 poison to control feral goats.

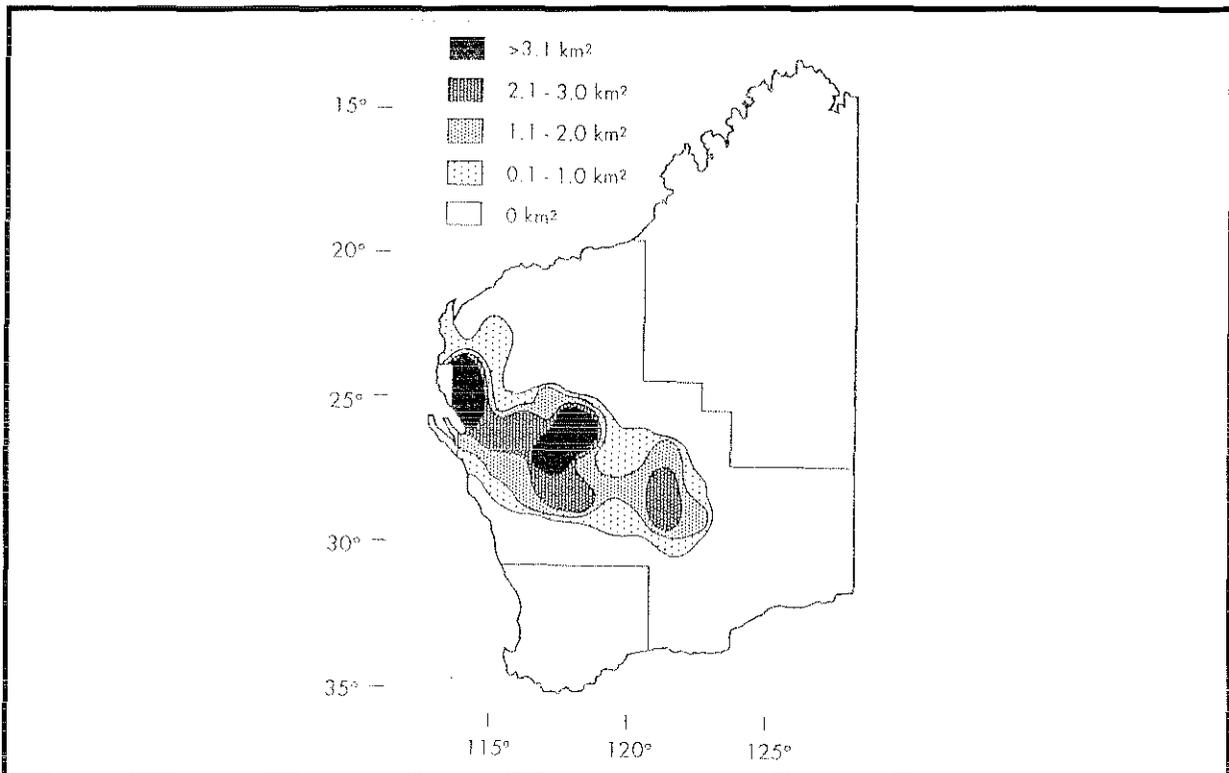


Figure 1. Distribution and density of feral goats in Western Australia in 1990 (number per km²) (Southwell and Pickles, in press).

2. The proposal

The proponent proposes to use the poison sodium monofluoroacetate (1080) to assist in the control of feral goats in the rangelands of Western Australia.

Feral goats depend upon artificial water supplies on pastoral stations during dry periods of the year between April and September. During these periods, the Agricultural Protection Board proposes to temporarily poison drinking water in modified poisoning troughs installed specifically for this operation. Trials have shown that four days of 1080 poisoning will reduce feral goat populations around water points by 70%. A poisoning technique has been developed which the Agricultural Protection Board considers would limit the potential hazard to people, native wildlife and pastoral stock.

The proponent proposes to minimise potential impacts in the following ways:

- A week prior to the poisoning operation, the target station and all surrounding stations would be gazetted in the Government Gazette to inform the public of the poisoning, a public notice would be advertised in "The West Australian" newspaper and in a local newspaper, and prominent signs will be erected on roads passing through the gazetted station.
- An Agricultural Protection Board officer would install poison stations within sheep proof trap yards, activate them for use between 7.00 am and 2.00 pm to exclude native animals, deactivate the troughs by draining the poisoned water and re-filling the troughs with fresh water. The modified troughs will be removed at completion of the poisoning operation.
- The poisoned water emptied from the troughs will be spread out to maximise the rate of evaporation, and an Agricultural Protection Board officer will remain at the station until all of the water infiltrates the soil. During this time the Agricultural Protection Board officer will chase non-target animals away from the water.
- To provide safe drinking water for birds when poisoning is underway, one of the station's normal troughs is proposed to be used as a bird trough. The poisoned trough is designed to be unfamiliar to birds so as to discourage them drinking from it. If more than one watering trough is present, the remaining troughs will be turned off.

Control of the feral goat population is anticipated to reduce the grazing pressure on rangeland vegetation and reduce soil erosion.

2.1 Public submissions

The proponent prepared a Public Environmental Review (PER) document in accordance with Guidelines issued by the EPA. This document was released for an eight week public review in May 1993. Six Government submissions and 12 private submissions were received by the Authority.

The main issues of concern identified in the public submissions were:

- Impact of goats and the pastoral industry on rangelands;
- Inadequate evaluation of alternative methods of control;
- Impact on non-target species, particularly secondary poisoning;
- Public safety; and
- Animal welfare.

A list of individuals and organisations who forwarded submissions to the Authority on the Public Environmental Review document is included in Appendix 1. A detailed list of issues raised in the submissions is included in Appendix 2. The proponent's response to these issues is included in Appendix 3.

3. Environmental issues and their management

Several environmental issues were identified by the Environmental Protection Authority and submissions. A summary of these issues, the proponent's response to them and the Authority's assessment of the issues is detailed in this Section.

Following consideration of these issues and the proponent's response to them, the Authority has concluded that the proposal as described is environmentally acceptable.

Recommendation 1

The Environmental Protection Authority has concluded that the proposed use of 1080 to control feral goats in Western Australia, is environmentally acceptable. In reaching this conclusion, the Environmental Protection Authority identified the main issues as:

- **impact of feral goats on arid scrublands;**
- **poisoning of non-target species;**
- **secondary poisoning from consumption of poisoned carcasses; and**
- **public safety.**

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's commitments listed in Appendix 4 and the Authority's recommendations in this report.

3.1 Rangeland management

Issue:

As a result of current rangeland management practices and the impact of feral and native herbivores on rangeland ecosystems, much of the State has become significantly degraded. This is of concern to the Authority. This issue was also raised in several submissions. It was suggested that these management practices threaten the viability of the pastoral industry (Appendix 2).

Land degradation is caused by the overgrazing. Goats and kangaroos are considered to be the two major unmanaged herbivores in the arid shrublands contributing to this land management problem. According to the Agricultural Protection Board, these two herbivores are estimated to constitute 54% of the grazing pressure in the southern pastoral region (goats 20% and kangaroos 34%). The managed herbivore, sheep, impose 46% of the grazing pressure.

The population of feral goats in the arid shrublands is estimated to be one million. They are presently unmanaged other than by shooting and by mustering for sale when their accessibility and the market price of goats makes the operation commercially viable.

In comparison with sheep, goats maintain their condition even when the food source is low and will overgraze shrubs until the shrub and goats' death. The loss of perennial shrubs through this overgrazing is a major process of ecological degradation.

Proponent's response:

In response to issues raised in the public submissions, the proponent has recognised that in order to reduce degradation of rangeland ecosystems, the number of feral goats must be decreased and appropriate rangeland management practices must be employed.

The proponent further noted that managing the pastoral industry is not the responsibility of the Agricultural Protection Board.

EPA's evaluation:

The Authority acknowledges the proponent's response and considers that control of feral goats is environmentally desirable.

3.2 Secondary poisoning

Issue:

Secondary poisoning may occur if susceptible species feed on the carcasses of poisoned goats and are killed by the residual level of 1080 in the carcass. Secondary poisoning is recognised as an important issue in this proposal by the Authority and was raised in a number of public submissions, as the level of 1080 remaining in the feral goats carcasses will be significant for some species.

It is considered that carrion eaters may be at risk from the residual poison as well as animals which eat some of the multitude of insects which feed on carrion. These insects were not assessed for secondary poisoning in the Public Environmental Review document and there is concern that animals including birds, lizards and insect-eating small mammals which feed on the insects may be poisoned. Many of these species are known to have low tolerance to 1080.

Further concerns raised in public submissions was the effect of having a large number of carcasses in restricted areas. Several submissions suggested removing or burying the carcasses.

Proponent's response:

In response to this issue, the proponent reiterated that the areas where this method of control will be employed are generally distant from places frequented by people other than the lessees of the station and therefore aesthetics are of minimal importance. Other animals which die in the bush are not removed.

Further the Agricultural Protection Board suggested that the only species at substantial risk are introduced mammals such as foxes and cats, which are regarded as pests.

EPA's evaluation:

While removal or burial of goat carcasses would reduce the potential for secondary poisoning and offensive odours the Authority recognises that it will be extremely difficult to locate and bury carcasses.

Further the Authority believes that in addition to poisoning of introduced animals such as foxes and feral cats, dingos and some indigenous raptors including wedge-tailed eagles may also be at risk. The concentration of 1080 in the gut of the carcasses could be as high as 7 mg/kg which is potentially lethal to a variety of mammals particularly native rats and quolls. Further, animals which feed on invertebrates which may have fed upon the carcasses may be at risk.

The Authority notes the Agricultural Protection Board's claim that these risks are not significant, nevertheless, the Authority considers that monitoring would be appropriate to confirm this (refer to Recommendation 2 below).

3.3 Impact on non-target species

Issue:

Concern was expressed in some submissions that if the measures for ensuring only goats have access to the poisoned water are inadequate, some non-target species may drink the poisoned water and die. The impact on non-target species was covered in Chapter 5 of the Public Environmental Review, however, there was general concern in submissions that it may not be possible to prevent non-target species being poisoned.

There is a high proportion of introduced species such as wild dogs, foxes and cats which could potentially be killed directly by drinking the poisoned water. As these animals are pests in Western Australia, their removal would be beneficial in conserving native wildlife.

Proponent's response:

The proponent has responded by clarifying that risk to non-target species has been minimised by:

- Restricting the hours when the water is poisoned. These poisoning periods correspond with hours during which kangaroos do not drink;
- Fencing-off an unpoisoned water trough which is only accessible by birds and excludes stock and goats; and
- Installing new troughs to fill with poisoned water which are only accessible to goats.

EPA's evaluation:

The Authority acknowledges that 1080 is a naturally occurring substance in a number of species of plants in the genera *Gastrolobium* and *Oxylobium* which are widely distributed throughout Western Australia. A number of species of widely distributed soil bacteria and fungi rapidly detoxify 1080. Most native fauna have high levels of tolerance to the toxin.

The proposed measures are considered to be acceptable, however the Authority considers that some ongoing monitoring of non-target species is appropriate.

Recommendation 2

The Environmental Protection Authority recommends that prior to commencement of poisoning operations, the proponent prepare and then subsequently implement a monitoring programme which evaluates the degree of, and impacts of, non-target and secondary poisoning, to the requirements of the Environmental Protection Authority on advice of the Department of Conservation and Land Management.

The Environmental Protection Authority recommends that the results of the monitoring programme be made available to the public and the Authority.

3.4 Public safety

Issue:

Two submissions requested that poisoning occur away from townships and be administered by Agricultural Protection Board officers only. The Authority raised the concern that the public education programme may not adequately address the need to inform Aboriginal people in the area. It is considered that the proponent should ensure that Aboriginal and other isolated people

are informed of the poisoning and of the dangers associated with consuming poisoned water or carcasses.

Proponent's response:

In response, the proponent confirmed that only Agricultural Protection Board officers will administer poison and poisoning will be remote from townships. Further, the proponent indicated that use of the poison will be in accordance with guidelines set by the Public Health Department.

The proponent responded to this concern about inadequately informing Aboriginal and other isolated people, by reiterating that the poisoning operations would be advertised in the Government Gazette one week prior to commencement of poisoning, and the Commissioner for Aboriginal Affairs Planning Authority could then notify the respective communities directly.

EPA's evaluation:

The Authority considers the proponent's undertakings to only allow Agricultural Protection Board officers to administer poison, in locations distant from townships, are sufficient to that component of the public safety issue. However, the proponent's response to the issue of informing the Aboriginal and other isolated people in the region is inadequate.

The Authority considers that the proponent should work with the Aboriginal Affairs Planning Authority to ensure the Aboriginal communities and other isolated people are aware that poisoning operations will be occurring in the vicinity. To achieve this, the Agricultural Protection Board should work with the Aboriginal Affairs Planning Authority to develop a suitable education package for all Aboriginal communities and other isolated people within the target area. Further, the Authority considers it important that the proponent accept responsibility for informing the appropriate Regional Councils at least two months prior to the commencement of operations.

The Environmental Protection Authority believes that prior to commencement of poisoning operations, the Agricultural Protection Board and the Aboriginal Affairs Planning Authority should come to an agreement on the proposed education programme for Aboriginal communities.

3.5 Alternative methods of control

Issue:

Concerns were raised in several submissions that the alternatives to poisoning were not fully explored in the Public Environmental Review document and fertility control methods should be the preferred option. Suggestions included the introduction of various methods to encourage pastoralists to be more accountable for removing a greater proportion of goats.

Submissions identified two methods of controlling feral animals. The first is the conventional method (involving shooting and mustering) and the second is biological control.

While mustering and shooting have removed 60 000 - 245 000 goats annually, goat numbers are still increasing. The rate of removal is not considered sufficient to counteract the high fecundity of feral goats (1.4% per annum). Many submissions supported shooting as the preferred reactive solution as it is considered more humane than poisoning.

Biological methods are those pre-emptive controls which exploit biological aspects of the pest species to control their populations, for example, manipulation of predator-prey relationships or the use of parasite or disease organisms.

These are not short term options as they require extensive research programmes such as that being conducted by the Cooperative Research Centres for rabbit and fox control.

Some goats are of commercial value, such as cashmere and dairy goats, and therefore are non-target animals. There is potential for commercial animals to be affected if a biological control agent is introduced. The non-specificity of these techniques could jeopardise the goat based industries of Western Australia.

Proponent's response:

The proponent reiterated that alternative methods of control were covered within the Public Environmental Review report (Section 3.2). Additional information was also provided in response to public submissions in Appendix 3.

The proponent expressed the view that research is an expensive, long term option and would require at least 8 - 10 years before results are available.

Pastoralists are legally responsible for controlling feral goats and other pest species on their land under a number of Acts including Soil and Land Conservation Act (1945). Furthermore the provisions of these Acts require that pastoralists must refrain from actions which may cause land degradation.

EPA's evaluation:

The EPA considers that the proponent has adequately described currently available alternatives, and notes that 1080 can be used to control feral goats as part of a suite of methods including shooting and mustering.

3.6 Other matters raised

3.6.1 Animal welfare

The EPA considers that animal welfare is not an environmental issue. However, a number of submissions expressed concern over the possible suffering of offspring. The proponent's response was that suffering is minimised because kids would either drink the poisoned water or receive lethal doses in their mothers milk and not suffer a lingering death.

4. Conclusion

In the past, removal of goats through mustering and sale by pastoralists for commercial sale, has not effectively controlled goat numbers and associated degradation of the rangelands. The Agricultural Protection Board has utilised a number of methods to reduce goat numbers with the aim of more effectively controlling goat populations. Poisoning using 1080 is one of these methods and is proposed to be used in limited circumstances where goats are inaccessible because for example, of rugged terrain such as breakaways and cliff edges.

The Environmental Protection Authority concludes that the proposal is environmentally acceptable provided the proponent's commitments and the recommendations of this report are implemented.

The Authority has established an implementation and auditing system which requires the proponent to advise the Authority on how it would meet the requirements of the environmental conditions and commitments of the Project. The proponent would be required to develop a Progress and Compliance report for this project as a section of the recommended audit programmes.

The Authority's experience is that it is common for details of the proposal to alter through the detailed design and construction phase. In many cases alterations are not environmentally significant or have positive effects on the environmental performance of the project. The Authority believes that such non-substantial changes, and especially those which improve the environmental performance and protection, should be provided for.

Due to the significance of the issues required to be monitored and the need to respond to any concerns revealed by monitoring, the Authority considers that the extension of an approval of this proposal beyond an initial period of two years should follow a review of monitoring results by the Authority and subsequent modifications of techniques by the Agricultural Protection Board as appropriate.

Recommendation 3

The Environmental Protection Authority recommends that approval for this proposal should be limited to two years. Following this period, monitoring results of the programmes success should be reviewed by the Authority in consultation with the Department of Conservation and Land Management, to determine the effectiveness of the programme and the level of impact on native animals, before an extension to the programme is granted.

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

5. Recommended environmental conditions

Based on the assessment of this proposal and recommendations in this report, the Environmental Protection Authority considers that the following recommended environmental conditions are appropriate.

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Public Environmental Review and in response to issues raised following public submissions. These commitments are consolidated in Environmental Protection Authority Bulletin 719 as Appendix 4. (A copy of the commitments is attached.)

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Proponent

These conditions legally apply to the nominated proponent.

- 3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the

Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Monitoring of herbivores and non-target animals

- 4-1 The proponent shall ensure the poisoning operations have minimal impact on native animals.
- 4-2 Prior to initiation of the poisoning operations, the proponent shall prepare a monitoring programme in consultation with CALM to determine impacts of the poisoning operations in terms of non-target and secondary poisoning deaths.
- 4-3 The proponent shall submit monitoring programme details to the requirements of the Environmental Protection Agency to achieve the objectives of Condition 4-1.
- 4-4 The proponent shall implement the monitoring programme.

5 Sunset Clause

The environmental approval for the proposal is limited to two years subject to analysis of monitoring results to determine whether the level of impact on non-target fauna is environmentally acceptable.

6 Time Limit on Approval

The environmental approval for this proposal is limited.

- 6-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

7 Compliance Auditing

In order to ensure that environmental conditions and commitments are met, an audit system is required.

- 7-1 The proponent shall prepare periodic "Progress and Compliance Reports" and provide results of the monitoring programmes, to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

Procedure

The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

6. References

Agricultural Protection Board (1993) 'The proposed use of 1080 to control feral goats in Western Australia Public Environmental Review'. Assessment Report No 752.

Appendix 1

List of individuals and organisations who forwarded a submission during public review of the Public Environmental Review document.

Animal Liberation

Astrid Herlihy

Australian and New Zealand Federation of Animal Societies Inc.

Australian Conservation Foundation

Christine Heal

Department of Conservation and Land Management

Department of Occupational Health, Safety and Welfare of Western Australia

Doorawarrah Pastoral Co.

Lyndon Land Conservation District Committee

Manager Williambury Station

Meekatharra Land Conservation District Committee

Peter Curry

Royal Australasian Ornithologists Union

Shire of Murchison

The Australian Rangeland Society

The Pastoralists and Graziers Association of WA Inc.

The Shire of Shark Bay

Upper Gascoyne Land Conservation District Committee

Appendix 2

Issues raised by public submissions and the Environmental Protection Authority following public review of the Public Environmental Review document.



Chief Executive Officer
Agriculture Protection Board
Baron Hay Court
South Perth WA 6151

Attention: Greg Pickles

Your ref:

Our ref: 78-92
138/92

Enquiries: Ms Helen Allison

PROPOSED USE OF 1080 TO CONTROL FERAL GOATS IN WESTERN AUSTRALIA (ASSESSMENT 752)

Following the public release of your PER document, the submission period closed on Monday August 9 1993. Some 16 submissions were received, with over half of them being in support of your proposal, although some correspondents indicated some additional concerns or questions. In addition, there were some submitters who did not support your proposal, or who raised further issues. I include, therefore, a list of questions and issues raised for your response.

A copy of these questions and your responses will be appendicised in the Environmental Protection Authority's assessment report. The Authority will, if necessary, include specific comments on issues with potential environmental impacts which are not adequately covered by your response.

Under the Environmental Protection Act 1986, the Authority's report is subject to a 14 day appeal period. During this period the public may appeal the Authority's Report and Recommendations. An incomplete answer to any of the attached questions could cause the public to appeal and this would delay the setting of Ministerial conditions. Accordingly, please ensure that you give a full and reasoned answer to each question.

The general issues of concern in the submissions include:

1. Alternatives

The alternatives have not been fully explored. The use of 1080 has not been fully justified as there are alternatives which have not been fully explored. Among those suggested were

- i) use of more humane methods, for example fertility control, as for rabbits.
- ii) making pastoralists more accountable for their lease. This could include a quota system which each property would have fill. It was suggested that pastoralists could either shoot the goats themselves, or utilise recreational shooters. It was suggested that some leases with high density of goats do not allow recreational shooters because of a belief that the goats will be a valuable resource at some time in the future.
- iii) Live goat sale enhancement to make trapping more profitable.

iv) A bounty on goats. One suggestion was that no bounty would be available for live goats, but would go towards the enhancement program.

v) Utilisation of shooting organisations for government co-ordinated shoots.

vi) One-way trap yards and then shoot the goats.

vii) closing down of the pastoral industry, with a gradual reduction of made waters as a form of biological control.

2. Use of toxic chemicals

The use of any toxic chemicals was questioned on environmental grounds.

3 Disposal of carcasses

Some submitters were concerned that the carcasses should be removed from an aesthetic viewpoint, as well as so as not to risk secondary poisoning of non-target species.

4 Risks to non-target species

Some concerns were expressed that it would not be possible to prevent non-target species also being poisoned. This referred both to native and introduced species. In particular reference was made to the concern that failure of the exclusion devices to maintain safety, could result in the extinction of one or more species.

5 Goat numbers

The extensive distribution of feral goats, and the apparent variation in densities was queried. It was submitted that much environmental information related to the large area under discussion was unknown. It was suggested that an understanding of the factors, including possible poor management practices, may lead to better controls of feral goats without recourse to culling. More research was believed to be needed before embarking on the poisoning campaign.

6 Future of the pastoral industry/Rangeland management

It was variously submitted that the pastoral industry was itself to blame for environmental degradation. If the feral goats were eradicated, would there be a corresponding increase in sheep numbers? And would it be better, in the light of poor wool prices, to farm the feral goats instead?

Further, the use of 1080 to eradicate goats to protect a small part of the sheep industry was questioned, and it was suggested that cost/benefit studies related to the viability of the sheep industry in the region needed to be undertaken.

7 Animal Welfare considerations

Concern was expressed regarding the use of 1080 as an inhumane method of eradication. Bleating in goats was referred to as indicating pain and the use of 1080 thus condemned. Concern was also expressed for the fate of kids at foot, and the comment made that the fate and possible suffering of offspring must be addressed.

8 Public safety issues

It was re-emphasised by submitters that poisoning should not be undertaken in the close vicinity of any township, and that the public should be informed of the intent of the poisoning, including the erection of signs.

A further concern was expressed that pastoralists rather than APB officers would undertake the poisoning, with a consequent lessening of safety standards, and a relaxation of protocols.

9 Other

Comments from other submitters included acknowledgment of the protocols which have been developed, and support for their implementation; support for the proposal as but one aspect of a wider goat eradication campaign; and concerns about bird safety which was felt to have been addressed by the proposed protocols.

It is understood that some of the matters raised in submissions may have already been addressed to some extent in the PER documentation. However, as they have been raised as issues of concern, your response to the matters listed above would be appreciated.

The Authority looks forward to an early response so that it can finalise its assessment.

Should you have any queries about the issues raised, please contact Helen Allison on 222 7084

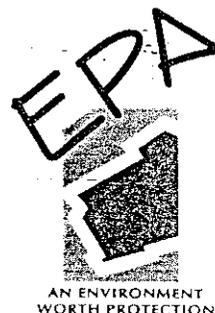
ELE BUNBY

for
R A D Sippe
DIRECTOR
EVALUATION DIVISION

13 August 1993

feralissues130893kwi

(F)



Chief Executive Officer
Agriculture Protection Board of Western Australia
Baron-Hay Court
South Perth WA 6151

Your ref: 78-92
Our ref: 138/92
Enquiries: Nicole Siemon

Attention: Greg Pickles

PROPOSED USE OF 1080 TO CONTROL FERAL GOATS IN WESTERN AUSTRALIA (ASSESSMENT 752)

Further to the concerns raised in the public submissions, the Authority has been made aware that the Aboriginal people in the area may not be adequately informed about the poisoning operations and risks associated with consuming poisoned goats or animals poisoned secondarily.

While the PER document comprehensively details the strategy to warn people in the area of the poisoning operations, the Authority understands that it is not directed at Aboriginal people in the area who may be unable to read, may not have a favourable rapport with station owners or are nomadic. These people in remote communities are the most likely to kill a goat or secondarily poisoned carrion eater for human consumption, and are the least likely to be informed by the current proposed public education program.

The Authority considers that the APB should extend the public education program to Aboriginal people and liaise with the Aboriginal Affairs Planning Authority to establish the most effective method of informing the Aboriginal community. Your comments, or a commitment to this effect would be welcomed.

A prompt reply would be appreciated as the Authority is finalising the assessment report for release.

C H Welker 
DEPUTY CHAIRMAN

21 October 1993

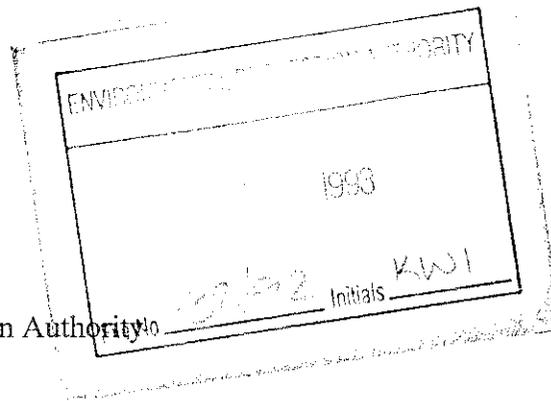
APB safety letter

Appendix 3

**Proponent's response to issues raised by the Environmental
Protection Authority and in public submissions**



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APB
**AGRICULTURE
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Our ref: 78-92
Enquiries: Pickles
Date: 10/06/93

Proposed Use of 1080 to Control Feral Goats in Western Australia (Assessment 752)

Further to your correspondence (13/08/93) documenting questions and issues raised from the public submissions, the following responses by the Agriculture Protection Board (APB) are supplied.

1. The general issue of concern that alternative methods of control have not been fully explored was addressed on pages 11 to 17 of the PER document. We will, however attempt to answer in greater depth the specific issues which were raised.

(i) Use of fertility control as for rabbits. There is no successful mechanism available at present for causing fertility control of rabbits on large scale. The APB is one organisation among several currently involved in investigating the possible development of a virally-vectored immunocontraception program for rabbits and foxes, but the experimental work involved is expected to take 8 to 10 more years and there is no certainty that the technique will prove to be successful. The total budgeted research costs of this rabbit and fox study exceed \$50,000,000. No work has yet begun to determine whether such a technique would be successful for controlling feral goats. If the technique was applicable to feral goats, further specific research would need to be done on that species, and all domestic goats would need to be vaccinated against the technique, which would impose considerable extra cost on keepers of domestic goats.

In a recent review of the management of feral horses (Dobbie and Berman 1992), a number of disadvantages of fertility control of horses were identified, which also apply to feral goats. These include.

- (a) Fertility control is not practical for large scale control where animals are widely scattered and difficult to approach.
- (b) Animals would need to be treated with the fertility control drug annually.
- (c) A means of delivering the drug automatically and cheaply is not currently available.
- (d) As horses are relatively long-lived, the birth rate would not decrease for 10 -to 15 years (nor would it for feral goats for 8 to 12 years).
- (e) Delivery of a fertility control drug in a dart could injure an animal.
- (f) The cost of a sterilisation program would be extremely high and ineffective.

(ii) With regard to making pastoralists accountable for their lease, under several act (Agriculture and Related Resources Protection Act 1976, Soil and Land Conservation Act 1945, Land Act 1933) pastoralists are now responsible for controlling feral goats and other pest species on their land, refraining from actions that may cause land degradation and following the terms of use set out by the Pastoral Board. Allocating a quota of feral goats to be removed from a property would necessitate determining the number of feral goats present on the property, which would be difficult and very costly. Although land holders are encouraged to use all effective control methods to control feral goat numbers, utilising recreational shooters to attempt to control them could exacerbate the difficulties of control greatly. Untrained and unsupervised shooters could well fail to kill the majority of feral goats, particularly when they were present in high numbers or were in large groups, and could disturb surviving feral goats so as to make them wary of any future attempts at control. Virtually all previous attempts to utilise recreational shooters in this way have proved to be unsuccessful.

(iii) The WA Agriculture Department and some meat processors have been attempting to enhance the value of feral goats for a number of years. This activity is outside the charter of the APB and the content of the PER.

(iv) Bounties on feral goats have previously been paid in Western Australia, from 1977 to 1985. The payments were discontinued after over 120,000 bounties were paid and it had become apparent that the scheme was of doubtful value. Whitehouse (1976) examined the value of bounty systems and found that if the aim is to alleviate the problem, the bounty system is counter-productive and as a means of rural subsidy, bounties are illogical.

(v) The utilisation of shooting organisations for co-ordinated shoots has seldom proved to be of value. Successful control by shooting requires great

persistence over a long period, and most recreational shooters are not sufficiently motivated to continue shooting when feral goat numbers are very low. Shooters who are not properly controlled and those who, particularly when shooting at groups containing large numbers of feral goats, do not kill all animals in the group can exacerbate control problems by increasing the wariness of survivors. Considerable use of helicopters as shooting platforms for trained marksmen operating in co-ordinated control programs is already occurring.

(vi) Trapping feral goats and shooting them already occurs, but it poses several problems. Most trap yards are not large enough to contain substantial numbers of feral goats and while shooting and trapping is occurring, feral goats may be placed under considerable stress if large numbers are held in a trap. Problems also occur with the disposal of carcasses. The potential for pollution of the groundwater is great if they are buried and the additional time and cost of disposal by any means is substantial.

(vii) Closing down the pastoral industry is beyond the charter of the APB and the content of the PER.

2. The question of the use of 1080 on environmental grounds is extensively discussed on p 32 of the PER and in Appendix 2 (King 1990). In summary, 1080 is a naturally occurring substance in a number of species of plants in the genus *Gastrolobium* which are distributed widely throughout Western Australia. A number of species of widely distributed soil bacteria and fungi rapidly detoxify 1080. Most native fauna have high levels of tolerance to the toxin.
3. The risk of secondary poisoning to non-target fauna feeding on carcasses is extensively discussed on pages 29, 30 and 31 of the PER. The only species at substantial risk of poisoning are introduced species of mammals which are regarded as pests. Concern for the aesthetic viewpoint is difficult to imagine when consideration is given to the fact that warning signs are to be posted around the area prior to poisoning and few people are likely to want to visit a poisoning site, and to the additional fact that control will be carried out largely on stations too far from potential markets to transport feral goats to abattoirs. In addition, no arrangement for removing the carcasses of feral goats, sheep, kangaroos etc which die in these areas from natural causes has apparently been proposed yet.
4. The method for excluding non-target species from water was fully explained in the PER. It consists of using a newly-installed trough accessible to the feral goats and forcing them to use it by fencing off the normal trough from feral goats but allowing non-target (bird) species access to it. Kangaroos are prevented from drinking poisoned water because of the restricted hours when the water is poisoned, which do not correspond with the hours during which kangaroos use the water points.

Extinction of any species of bird which might visit the watering points is not a major concern as no birds drank from new troughs during the trials as shown in the PER document on pages 26 and 27, none of the rangeland species which might be

liable to drink from the troughs is on CALMs list of rare or endangered species, and all species have wide distributions throughout the pastoral areas.

5. Goats are widely distributed, at varying densities, in many of the arid and semi-arid regions of the world. They have behavioural and physiological characteristics which enable them to be very successful in dry pastoral regions. Feral goats are problem animals in many parts of the world because of their ability to thrive in dry areas and management practices in WA pastoral zone probably have little influence upon them because of their mobility and ability to cope with low forage availability and nutrient levels. No specific suggestions on necessary research which was needed in this context were provided.
6. There are numerous causes for environmental degradation of the range lands and the solutions to those are outside the charter of the APB and the content of the PER. Total grazing pressure is thought to be a major cause and the unmanaged grazing of several herbivores is a significant factor in rangeland degradation. Reduction in numbers of feral goats, along with appropriate stock management, will aid in improving the quality for the rangelands. Studies by the Agriculture Department (Fletcher 1991) have shown that it is uneconomic to farm feral goats for either meat or fibre in the pastoral areas.

Cost/benefit studies of the sheep industry in the pastoral region are also outside the charter of the APB and the content of the PER.

7. The use of 1080 for the control of a wide range of animals has been approved by the appropriate regulatory and animal ethics bodies. There is no evidence that feral goats should be considered to be a special case.

It is not possible to measure the amount of pain which poisoning causes an animal. Humans who have survived poisoning with near-lethal doses of 1080, and who displayed symptoms which suggested they were suffering considerable pain, had no recollection of pain when they recovered. The disruption of the central nervous system by 1080 may prevent nervous transmission of sensations of pain to the brain.

If kids at foot are still suckling, they will receive sufficient 1080 to kill them in their mother's milk, assuming the mother has ingested a lethal dose (McIlroy 1981), or from drinking water from the trough themselves. The kids will therefore not suffer a lingering death if their mothers are poisoned.

8. The proposed requirements for prevention of public health hazards (including erection of signs and publication of warnings) were clearly stated on pages 37 and 38 in the PER and appropriate conditions and restriction would be set for the use of 1080 by the Public Health Department before this use of 1080 is registered for use. At no time was it suggested that pastoralists would be allowed to undertake poisoning. The appropriate sentence is contained on page 38 of the PER and states "1080 feral goat operations are to be conducted only by certified Agriculture Protection Board poisoning officers." The use of 1080 in Western Australia is

highly regulated and it is not available to pastoralists in the form to be used for poisoning feral goats.

9. The APB has agreed to abide by all the stated protocols, intends to use the proposed technique only as one of several potential methods of control feral goats where and when it is suitable, and is concerned to minimise risks to all non-target animals by the proposed techniques.

References

Dobbie, W R and Berman, D M (1992). Feral horses: a national management strategy. Report to the Conservation Commission of the Northern Territory.

Fletcher, W J (1991). Impact and production of feral goats in an arid mulga shrubland. M.Sc. Thesis, University of WA

King, D R (1990). 1080 and Australian Fauna. Agriculture Protection Board Technical Series No 8.

McIlroy, J C (1981). The sensitivity of Australian animals to 1080 poison I. Intraspecific variation and factors affecting acute toxicity. Australian Wildlife Research 8, 369-383.

Whitehouse, S J O (1976). Bounty systems in vermin control. J Agric WA 17, 1-5.

If further information or clarification is required on the above responses, please contact Greg Pickles on 09 3683323.

Your sincerely



A W Hogstrom
Chief Executive Officer



AGRICULTURE
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Your ref: 138-92
Our ref: 90-93
Enquiries: Pickles
Date: 28/10/93

Attention: Nicole Siemon

Proposed Use of 1080 to Control Feral Goats in Western Australia (Assessment 752)

Further to your correspondence (21/10/93) documenting further issues raised subsequent to those associated with the public submissions, the following response by the Agriculture Protection Board (APB) is supplied.

As indicated on pages 35 and 36 of the PER, the hazards to humans consuming poisoned feral goats is minimal, as it would be extremely difficult to ingest an LD₅₀ dose. As muscle tissue has very low concentrations of 1080 (see table 5.5), the consumption of this type of tissue would not posed any poisoning risk. Even if raw offal was consumed, a 70 kilogram person would need to eat 20 kilograms of this to receive an LD₅₀ dose. With regards to the consumption of secondary poisoned animals, a similar situation exists.

The APB appreciates that some members of the remote Aboriginal communities may be unable to read. Although the risk to these people will be minimal, as highlighted above, the APB will make a commitment to notify the Commissioner of Aboriginal Affairs Planning Authority of the timing and location of any poisoning site as would be gazetted in the Government Gazette (see Management Commitments; Protocol 1, page 37). This will allow the Authority to notify the respective communities directly.

If further information or clarification is required on the above response, please contact Greg Pickles on 09 3683323.

Your sincerely

AW Hogstrom
Chief Executive Officer

Appendix 4

Proponent's list of environmental commitments

PROPOSED USE OF OF 1080 TO CONTROL FERAL GOATS IN WESTERN AUSTRALIA
AGRICULTURAL PROTECTION BOARD

PREVENTION OF PUBLIC HEALTH HAZARDS

- Protocol 1** Pastoral properties on which 1080 feral goat control poisoning operations are carried out, and adjacent pastoral properties, are to be gazetted in the Government Gazette as properties from which goats may not be taken for the duration of the poisoning operations and for one week after the completion of the poisoning operations.
- Protocol 2** One week before poisoning operations commence public notices are to be printed in 'The West Australian' newspaper and in a newspaper local to the area of the poisoning operations. These public notices are to advertise the prohibition of removing, or consuming, feral goats from the gazetted pastoral properties for the duration of the poisoning operations, and for one week thereafter. These public notices are also to explain the hazards of contravening the prohibition.
- Protocol 3** Prominent warning signs are to be placed on all public roads leading into gazetted pastoral properties at least one day before commencement of poisoning operations. These signs are to advertise the prohibition of removing, or consuming, feral goats from the gazetted pastoral properties and are to also explain hazards of contravening the prohibition.
- Protocol 4** The transportable poison water tanks and poison troughs used for 1080 feral goat control are to be clearly labelled stating that they contain the 1080 poisoned water and explain the health hazards of consuming 1080 poisoned water. This label will include the 'skull and crossbones' symbol to inform illiterate people of the poison hazard.

PROTECTION OF NATIVE WILDLIFE

- Protocol 5** The concentration of sodium monofluoroacetate used in the 1080 feral goat control is to be 7 milligrams per litre of water, with variance not greater than 0.25 milligrams per litres.
- Protocol 6** Activation period of 1080 feral goat control poison stations is to be no greater than 5 hours and 30 minutes per day.
- Protocol 7** Activation of 1080 feral goat control poison stations for morning poisoning operations is to be limited to the hours of 7:00 a.m. to 2:00 p.m.
- Protocol 8** An introduced (*unfamiliar*) trough only is to be used as the feral goat poisoning trough at poison stations.
- Protocol 9** A non-poisoned water trough is to be available for birds to drink from while poisoning stations are activated.
- Protocol 10** A permanent trough only is to be used as the bird watering trough at poison stations.
- Protocol 11** Agriculture Protection Board poisoning officers are to remain present at deactivated poison stations until all poisoned water emptied out of poisoning troughs and poison water tanks has completely infiltrated into the soil and no free standing poisoned water is present.
- Protocol 12** 1080 feral goat control poison stations activated for afternoon poisoning operations are to be deactivated no later than sunset.

Protocol 13 All 1080 feral goat control poison stations activated for afternoon poisoning operations are to be monitored by an Agricultural Protection Board poisoning officer.

Protocol 14 Any native fauna being at risk of being poisoned at a poison station, which is activated during an afternoon poisoning operation are to be scared away by the Agricultural Protection Board poisoning officer monitoring the poison station so they are not poisoned.

ADHERENCE AND ACCOUNTABILITY OF POISONING OPERATIONS

Protocol 15 1080 feral goat control operations are to be conducted only by certified Agriculture Protection Board poisoning officers. 1080 Feral Goat Control certification is to be gained only by Agriculture Protection Board officers who have successfully completed the 1080 Feral Goat Control training course.

Protocol 16 Agriculture Protection Board poisoning officers are to maintain a log of all 1080 feral goat control operations. This log will record the location, date and activation hours of all poisoning stations. The log will also record the volume of 1080 poison and water used to fill the poison water tanks and will record the volume of poisoned water remaining in the poisoned water tanks at the time of poison station deactivation.