



Assessing the potential for a **Commercial Camel Industry in Western Australia**

**A report for the Rural Industries Research
and Development Corporation**

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August 2000

RIRDC Publication No: 00/123
RIRDC Project No DAW-92A

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ISBN 0 642 58153 3
ISSN 1440-6845

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Published in August 2000
Printed on environmentally friendly paper by Canprint

Foreword

The aim of this project was to develop the camel industry in Western Australia in conjunction with the Northern Territory and Queensland. The project was to act as an information point for interested persons and companies, to develop and facilitate a camel industry and to conduct a pilot kill of camels in a Western Australian abattoir.

Western Australia contains half of the approximate 200,000 population of feral camels in Australia - possibly in excess of 100,000.

The project follows previous work conducted (RIRDC Publication No. 99/118) which surveyed the distribution of camels in Western Australia and the interest in establishing a camel industry by pastoralists.

This report covers initial desktop market research, the development of a steering committee, work towards a pilot kill of camels in Western Australia and the future direction required to get a camel industry established in Western Australia.

This project was funded from RIRDC Core Funds which are provided by the Federal Government.

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Acknowledgments

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Executive summary

The aim of this project was to further investigate the potential for a camel industry in Western Australia, to build on already completed work and identify any significant barriers to progress. The project also aimed to work with and build on relationships in the collaborating agencies in the Northern Territory and Queensland. A Western Australian camel steering committee was established and also a pilot kill was planned for a Western Australian Abattoir.

The project found that Western Australia could be enthusiastic about a strong camel industry developing from its extensive existing feral herd stocks. Western Australia also has strong trading relationships with Middle Eastern and Asian countries, which are the potential customers of camel meat. The State also has well developed international ports to export from.

The northern part of the State has a strong export cattle industry. The required infrastructure for camels is similar, so yarding facilities and some transport can be utilised. Some pastoral leases are very close to export ports such as Port Hedland and this would greatly reduce restrictive transport costs.

It is unlikely that a domestic meat market would be sustainable in Western Australia alone, the population is too small it would be difficult for camel to compete with the many different types of meats available on the market already. The financial input to educate and market camels for the domestic market would not be cost effective. The Central Australian Camel Industry Association already supplies the major supermarket chains in Western Australia and the market is not large enough to compete domestically with another supplier. The future lies with export markets and international alliances.

Recently requests from London, Hong Kong, Israel, and Egypt have been received. Potential customers are requesting prices and availability of camel meat and also live camels. This is encouragement to investigate further and locate a strong trading partner who will help drive the industry.

There is a lack of confidence found through out all production chain members in the camel industry currently and this stems from a lack export information. There is superficial evidence that markets exist for camel meat and live exports but insufficient work has been done in Western Australia. There is also a lack of cohesiveness within the States of Australia and unless an approach of cooperation occurs the industry will not thrive.

Once a camel industry is established, the pay off for Western Australia could be enormous. Camels co-graze effectively with cattle and are quite comfortable in a mixed herd with cattle. The degree of crossover in fodder shrubs selection is low. Adding camels to an existing pastoral cattle lease would involve limited additional costs. Initial trial work in Northern Territory has even shown a slight increase in weight for cattle which have been co-grazed with camels over the control group which had no camels in the paddock.

More work must be done establishing export markets but once this is done and a new trade partnership and alliances has been established the industry will move forward creating export opportunities for Western Australia and Australia.

1. Introduction

Camels were initially introduced to Australia as stock to transport goods through the remote parts of the country. With the development of the motor vehicle many of these camels were released into the wild. Recently there has been considerable interest in developing a camel industry in Australia. Agriculture Western Australia has been involved with the camel industry in since 1993. The number of camels in Australia has been estimated to be approximately 200,000 with around half of these in Western Australia. This project was proposed to further the goal of developing the camel industry in Western Australia.

1.1 Objectives

The objectives of the project were:

- To continue the development of work undertaken during 1997/98 to establish a network of information through the use of a 'Steering Committee' with the aid of Agriculture Western Australia and local development commissions in Western Australia.
- Provide private individuals, companies or research organisations with relevant and accurate information relating to camel production in order to allow them to develop research or business plans.
- Assist in the development of research projects relating to camel production in Western Australia.
- Identify and report specific areas of development, which could be used to ensure the long-term sustainability of the Western Australian camel industry.
- Work closely with representatives from other States to promote effective development of the camel industry within Australia and to overseas markets.

1.2 Background

Worldwide the camel is used extensively for its meat, milk and hide products as well as for transportation. Production and consumption are centred in Northern Africa, the Middle East and the former Soviet Union. In Australia the camel was used extensively as a form of transport until trucks replaced them in the middle of the twentieth century when they were slaughtered or released to the wild. The current camel industry is built around the offspring of this original stock. These camels are highly adapted to life in the Australian pastoral and desert region and represent an opportunity for diversified farming for the pastoral regions of Australia with limited additional costs.

In 1993 an aerial survey of central Australia indicated the total feral camel population could be as high as 200,000. It was estimated that 50% of this population was located with the remote pastoral or desert regions of Western Australia. Within Western Australia camels have been declared vermin and periodically culled. No use has made of the carcass apart from occasional sale for pet meat.

Agriculture Western Australia (AGWEST) investigated the potential for development of a sustainable livestock industry utilising existing herds of feral camels within Western Australia (RIRDC Publication No. 99/118). This project was a joint initiative between AGWEST, the Northern Territory Department of Primary Industries and Queensland Department of Primary Industries together with the Central Australian Camel Industry Association (CACIA) and the Rural Industries Research and Development Corporation (RIRDC).

2. Methodology

The project was organised into four segments:

1. Desktop camel research.
2. The development of a steering committee.
3. The establishment of camel processing options.
4. An assessment of industry needs for the future.

Each of these will be outlined below.

2.1 Desktop and contact research

Plan strategies for development

The work done previously by Kevin Ellard in 1998 investigated the distribution of camels and the interest from pastoral land holders in camels. Contact was made with the 20 most interested camel industry enthusiasts along the camel process chain. A steering committee for camels in Western Australia was formed from this to develop the camel industry further

The need for further research on camels was identified, particularly in the area of market development and access. The project began a desktop study of camels and began to document the state of the camel industry worldwide.

2.2 Development of steering committee

Liaison with industry members

Large cross sections of potential camel industry members were consulted. Within Western Australia, most of the people interested in camels had pastoral leases but some had tourist camel farms.

A steering committee of people interested in developing the camel industry was formed. The group had representatives of the entire camel processing chain from pastoral suppliers to abattoirs. The early stage of the camel industry in Western Australia meant that a single camel development group representing the entire State was formed. This group met initially in Kalgoorlie, with further meetings planned for the north of the State.

The objectives of the steering committee were to help disseminate information, deal with industry issues such as changing legislation and to lead the industry.

2.3 Establishment of camel processing opportunities

Investigations of Port Hedland as a suitable live export camel facility

Port Hedland was investigated as to its suitability for an export location for the live camel trade and scope for a meat processing facility. Port Hedland has been used as a base for live export of cattle to markets including, Indonesia and the Middle East countries. The region was visited and contact was made with health officials and exporters.

The strongest supporter of the industry for a number of years was the Western Desert Aboriginal Corporation who hold a number of leases in the Pilbara area and were looking to expand their enterprise into commercial camel farming. The corporation had received ATSIC funding to develop their camel interests. They were situated in Port Hedland and contact was established.

Abattoirs and meat processors interested in processing camel in Western Australia investigated with the goal of having a pilot kill

Investigations were made into two methods of processing camels:

1. Using a mobile harvester and processor that would be able to travel out to the pastoral leases to process onsite, for both human consumption and pet meat. This method of processing would be similar to that currently used for the game meats. Issues including health restrictions and the need for effective traceback of camel products were examined, and
2. The use of existing abattoirs, processing camels as an adjunct to their existing operations was examined. Pilot processing of camels in a Western Australian abattoir was proposed and an analysis was made of the issues that would be needed to encourage the industry to be established in Western Australia.

2.4 Assessment of industry needs

The project investigated the issues that were holding back the industry and made suggestions on going forward for the industry. A number of areas were identified that had been addressed within the camel industry over the last year. At the same time, the need for further research requirements were identified and outlined.

3. Results and Discussion

The project was designed to increase the level of confidence and involvement in the camel industry in Western Australia. Previous work (RIRDC Publication No. 99/118) had indicated a willingness on the part of pastoralists to be involved in the camel industry, if it was viable. The initial plan for the project was to establish a steering committee to identify the issues being faced by a camel industry and drive the necessary legislative changes through parliament. At the same time an initial camel processing would be undertaken.

As the project progressed, it became apparent that the initial plan required some improvement and the level of confidence in the camel industry was not high enough for the industry to start yet. Before the level of confidence in the industry could be raised, further information on camel markets and financial analysis would be needed.

Each of these issues will be discussed below.

3.1 Desktop camel research

There is limited information on the camel industry and its markets in Australia. This has resulted in a low level of confidence in the camel industry. Specific questions exist around camel markets and the financial returns to camel producers. Recognising this, the project began to investigate camel markets and their products

Internationally, Camel is produced in many countries for its meat and milk products. Table 1 documents the level of production for camel products worldwide, outlining the level countries producing camel products in 1996. As can be seen from Table 1, the Middle East and Northern Africa produce large quantities of commercial camel products.

Neil Buchanan of Meat and Livestock Australia in Bahrain was asked to analyse the potential for export of camel products to the Middle East. Neils comments are given below:

Saudi Arabia:

Import 12-15,000 camels from Somalia each year at the cost of SR600-700/head which is US\$160-185/head. These are all young camels that are mainly sent to traditional heartlands of Saudi Arabia where camel meat is the preferred diet. For example, at the town of Buraidya, the slaughterhouse kills 60 camels a day, 50 cattle and 20 sheep. This is in complete contrast to Kuwait or the lower Gulf where 90% of the animals slaughtered are sheep or goats. The other comment is that these animals appear ridiculously cheap and I believe will be very difficult to compete with. As far as I can ascertain there is no demand for milking camels or racing camels in Saudi Arabia.

Egypt:

Import 15-20,000 camels per year mainly from Sudan. They are walked overland and are sold in Cairo markets for around US\$250/head, again I do not think we can be competitive with these prices. Also there is no demand for milking camels or racing camels in Egypt.

Kuwait:

As mentioned above Kuwaitis are mainly sheep meat eaters. They import about 3 million sheep per year for a population of about 1.4 million. Local camel consumption is restricted to locally produced camels. There is a small market for milking camels in Kuwait, although Australian recently domesticated wild camels are proving difficult to bring into production.

UAE:

There is a demand for fast racing camels in the UAE, with the emphasis being on the word fast. In the past some consignments of camels from Australia have been sent and proven to be very slow compared to the locally bred animals. There are two very high tech camel breeding projects in the UAE with vast funding designed to produce very fast racing camels. They appear to be doing this very successfully. There is a small camel milk industry in the UAE.

Bahrain/Oman/Qatar:

These small Emirates have very small camel herds, mainly owned by the extremely wealthy Royal families. Apart from the extremely wealthy, the average Arab living in these countries is not interested in or wealthy enough to purchase camels or camel meat or camel milk.

Jordan & the other levant countries:

These countries have very small camel populations and almost no intrinsic demand for camel meat, milk or racing camels.

In summary, there does not appear to be much of an opening for Australian camels to be exported to the region due to the low level of demand in most countries, and the cheapness of supply from the North African countries of Somalia and Sudan that appear to have abundant numbers (5-6 million camelseach) for the requirements of the Gulf region.

Table 1. Production data of camel meat and milk (MT) – 1996 (International Islamic University of Malaysia- Research Centre- 1999)

Country	Meat	Milk
Afghanistan	3,240	8,100
Algeria	1,550	5,400
Chad	1,044	16,600
Djibouti	600	5,300
Egypt	25,500	
Eritrea	660	4,692
Iran	1,300	
Iraq	2,275	1,005
Kuwait	343	
Libya	7,200	1,540
Mali	4,000	36,000
Mauritania	18,000	20,500
Morocco	3,800	33,000
Niger	4,118	10,000
Oman	4,494	
Qatar	1,070	12,500
Saudi Arabia	42,100	89,000
Senegal	112	
Somalia	34,850	860,000
Sudan	26,550	66,000
Syria	176	
Tunisia	1,400	1,000
Turkey	40	
United Arab Emirates	9,414	22,500
Yeman	2,610	8,300

3.2 Development of a Steering Committee for the Camel Industry in Western Australia

In Feb 1999 a steering committee was established for the Western Australian camel industry. Tasks such as attempting to change restrictive legislation were commenced by the committee. A request was sent to the 'zone 9' agriculture protection board which covers the Kalgoorlie area, dealing with issues concerning feral animals and legislative requirements. In Western Australia, the Agricultural Protection Board (APB) oversee agricultural protection legislation and a system of zones across the State works as a consultative mechanism for farmers and pastoralists feeding back to the main board.

The steering committee requested that the scheduling of feral camels be changed from the current status of A4, A5, and A6 to just A5, these changes would mean that camel farmers would no longer require a permit to keep feral camels nor would they require deer fencing to keep the feral camels secure which was the most restrictive part of the legislation. But the zone was not supportive of the idea and voted against it.

'Category A4 prohibits the introduction of feral camels into the State except in accordance with certain conditions and restrictions. Persons wishing to introduce feral camels from interstate must apply for a permit on a Form 2 at least 7 days prior to the proposed introduction. Subject to the Board's satisfaction or amendment a permit will be issued (Form 1). The Board also requires at least 24 hours notice of any animals arrival at the inspection point stipulated in the permit. Importers of restricted and declared animals, as with livestock, are required to provide particulars of stock being introduced and declarations related to stock diseases and freedom from weed material. Animals would also be expected to have been treated or tested for specified diseases, in the case of camels at least liver fluke and Johne's disease (Form AD1070). Australian Quarantine Inspection Service (AQIS) and Australian National Parks and Wildlife Service (ANPWS) conditions apply to overseas introductions.

The A4 categorisation also applies to movements of animals within the State - a permit to introduce (or move) the animals must be obtained by the person receiving the animals before they are moved (other arrangements are in place for movements of feral goats in the pastoral areas).

Category A5 enables the control of any animal through the destruction, prevention and eradication of the animal or by undertaking measures to reduce and restrict the number of those animals.

Category A6 forbids the keeping of feral camels unless in accordance with conditions and restrictions set by the Board. Application for a permit to keep feral camels is to be made on a Form 4 at least 7 days prior to the proposed acquisition. If to the Board's satisfaction, or subject to the Board's amendment, a permit (Form 3) will be issued. The Board must be satisfied that adequate enclosures and other safeguards are present to ensure the security of the animals relevant to the permit. Often this requires an inspection of the facilities to be undertaken. Such a permit applies in respect of descendants of the permitted animal(s) within any limits described in the permit' (Appendix 1).

Subsequently the steering committee and camel project commissioned a consultant from the Vertebrate Pest Research Unit (VPRU) (Appendix 1) of the Agriculture Protection Board. The VPRU are the government body, which make recommendations to the board and fulfil legislative requirements of relevant acts.

The consultant prepared a paper which was to gain a response in detail, as the zone had not formally responded, describing their arguments against the requested changes so the steering committee would know the areas of greatest opposition. The advice from the VPRU (Appendix 1) showed that changes to the existing camel regulations could be considered if the steering committee could gain support from the wider pastoral community.

The steering committee experienced logistical difficulties due to the size of the State. As there is interest in camel farming from Esperance in the south of the State to properties near Kununurra in the

North communication and interaction were difficult. It soon became clear that there would have to be two separate areas of representation. The north of the State around Port Hedland is best suited for live export as there is a large export cattle industry with an export infrastructure suitable for camels to adapt to. There is also a lack of meat processing facilities except for some smaller pet meat businesses.

In the South of the State in the Kalgoorlie area processing the meat seemed to be the most viable as there were abattoirs available to slaughter camels, although there were none who had made a firm commitment to this. The potential to export camels from the Esperance or Fremantle ports also existed if the opportunity arose.

Due to these logistical issues, a new smaller steering committee was formed. The new group consisted of an AGWEST representative, abattoir representative, a pastoralist and the vice president of the camel owners association of Western Australia. The intent was to represent the southern part of the State initially. It included a cross section of the production and process chain with the aim that if it was successful it could be built on with other representatives. The second group was much smaller, less formal and geographically closer. The focus of the steering committee was reduced to focus on the achievement of a limited outcome, the achievement of a pilot camel kill.

Once the pilot kill was completed it would reapproach all the zones with the VPRU paper and the evidence of a successful pilot kill and attempt as second time to gain support from the pastoralists for the required legislation changes.

3.3 Pilot Kill of Camels in Western Australia (a desktop study)

A pilot kill was planned in Western Australia at the Shark Lake Abattoir Esperance in the South of the State. The camels were sourced from Kybo Station at Eucla, the abattoir had agreed to the slaughtering and Peter Seidel of CACIA had agreed to be present to oversee the first kill and share his experience with the slaughter of camels. Transport had also been arranged on a single deck truck owned by Kybo Station.

Without a significant contract the abattoir was only verbally in agreement and could not justify the cost and effort for the processing of the pilot kill. The initial plan was to slaughter eight camels. Without a commitment to ongoing demand for processed camels, the abattoir found it difficult to commit to the extra effort that would be involved. Whilst not formally turning down the pilot kill, they adopted a wait and see attitude and would not commit a date for the kill. As a result the kill had not happened at the time of going to press. The potential to utilise this facility however remains, provided the level of confidence in the camel meat industry can be increased with the abattoir.

Camels sent to slaughter are ideally between 3 and 5 years of age and can range in body weight between 350 kg to over 650 kg. Camels can be processed in standard cattle facilities as long as there is enough height in the race, entrance and the processing rail. The minimum height for doorways is 2.7 m and the rail height is 2.8 meters. Minor modification to the Shark Lake abattoirs involved raising the door height and only accepting smaller camels. The chain was sufficiently high.

The abattoir had been required to modify the killing area, to raise the head room where the camels were killed to allow them to fit through. During the negotiations no other restrictions or barriers to the kill were identified except a lack of confidence and an unwillingness to invest time and effort in an unsubstantiated industry. More work must be done on gaining an export partner and making the effort put in by the abattoir worth while financially.

This assessment was supported by Harvey Jones in the pre-feasibility study (Appendix 2) which stated that no kill would occur without the justification of ongoing industry development. At this stage, ongoing demand has not been verified. There is a need for regular throughput to justify abattoir investment in process, boning skills and infrastructure. At least 100 animals per year would be needed to justify the investment in camels for an abattoir. Due to the increased costs associated with

changing from one species to another and additional fixed costs, low level processing of any type of animal is not cost effective. If the number of animals processed were to increase, the margins for camels rise substantially. The other factor that needs to be included is cost of transportation to the abattoir were camel transportation costs equate to approximately 16 cents per camel per transported kilometre. If the distance of transportation can be reduced, profitability will increase for the camel.

Even though the kill has not yet taken place the desk top organisation has shown that we could start slaughtering camels at Shark Lake if there was enough ongoing financial incentive.

The disrupted processing of other non-mainstream animals for the domestic market in Western Australia is also an issue for industries such as Buffalo, whose availability is unreliable to suppliers such as Ausmeat because they are not an abattoir priority (pers com). This occurs because the turn off is small, but not being able to fill orders because the meat cannot be processed is damaging to the domestic buffalo industry and will also be an issue for the camel industry when it commences unless the kill volume can be increased

The cost of processing is too high when only a small number of animals are slaughtered, this also can be corrected if the slaughter number is increased. An abattoir is likely to require a turnover of at least 100 animals annually with an assured supply for up to 10 years before it would be worthwhile to invest in a facility to slaughter camels. In the case that the supply could be guaranteed for only 5 years a minimum annual throughput of 170 animals would be required.

3.4 Alternative slaughtering systems not an option for Camel

The cost of transport in Western Australia and indeed in the whole of Australia is restrictive and cuts into profit, with transportation costs estimated to be in the order of 16-18 cents per live animal per kilometre. With a high turnover of animals this would be reduced. In the interim one alternative suggested by the camel steering committee was to have a mobile abattoir processing on the pastoral leases.

This option is however not acceptable, due to health concerns, which have come to the fore in recent years. Only game meat can be harvested using a portable abattoir and the camel is not currently considered to be game meat.

With few exceptions human consumption animal meats must be slaughtered in an abattoir. Additionally if the camel is to be exported then it must be slaughtered in an AQIS approved abattoir. As has been shown in a previous RIRDC report (RIRDC Publication No. 00/09) the level of domestic demand is not sufficient to justify a large-scale industry. Ideally any camel meat processors must slaughter for keymarkets export. For these reasons a portable abattoir at this stage is not considered to be viable. To be viable the abattoir will need export accreditation and that would be very difficult to achieve.

3.5 Legislative problems for the Western Australian camel industry

A number of legislative issues remain as challenges for the camel industry. The most import issue is the declared status of camels making it currently (June 2000) illegal to farm camels in Western Australia. Camels are seen as a threat to the States agriculture industry. Other issues include fencing regulations, which are prohibitively expensive to allow a profitable camel enterprise. As markets become established for camels, these issues will need to be resolved as a logical progression of a developing industry. The fact that camels are not prescribed as stock in Western Australia diminishes their credibility as a farm animal. Whilst this will not stop the industry from becoming established, it is something that will need to be addressed in the future. The changes will require support from industry and sound arguments from the Camel steering committee. Negotiations for changing the requirements for fencing are underway.

The Vertebrate pest Unit of Agriculture Western Australia has examined the minimum fencing requirements and the domestication protocol for feral camels. The regulations are outlined in Appendix 3 below. The regulations as they stand would make a commercial camel enterprise prohibitively expensive due to fencing costs. From an examination of camels in the pastoral region, it is apparent camels thrive there. Camels can be effectively cograzed with existing stock and do not increase the grazing pressure if managed effectively. Camels are easy to manage and have similar production issues to traditional stock. Accessing remote areas to capture camels can be difficult during wet times but management of mustering times and stock feedlot situations can aid in overcoming this problem.

3.5.1 Illegal to farm feral camels in Western Australia

Within the State of Western Australia it is illegal to farm feral camels under the ARPACT Act without a permit and without deer fencing. The current guidelines promote a cumbersome electric fencing system and this is not a cost-effective option in pastoral areas. The current domestication requirements which are included in Appendix 3 make severe financial barriers to the industry at this early stage of its development.

It is permitted for feral camels to be taken from their wild environment directly to slaughter.

One solution to this legislated problem would be to change the scheduling of feral camels as outlined in Appendix 1 below. This would only happen with strong support from pastoralists. If a clear profit margin and export market could be seen then opinions would change.

3.5.2 Camels not prescribed as stock

Camels are not prescribed as stock under the Western Australia Stock Identification and Movement Act 1970. Changing this status is not paramount to the initial success of the industry, but will need to occur to ensure continued access to markets as they adopt traceback procedures for stock.

An export analysis has been commissioned for the Middle East markets in order to gauge the market and establish trade relationships. At time of printing this report was not available.

3.6 Assessment of the progress of the industry in Western Australia

Progress, developmental needs and future strategies are described below.

3.6.1 Areas identified where progress had been achieved

These include -

- Low harvesting costs.
- Camels domesticate quickly and effectively.
- Descriptive language for live camels has been developed and published.
- Document available on capture and handling of camels for abattoirs.
- The States and the Commonwealth have an agreed code of practice for the welfare of camels.
- Document available on selected cuts of meat.
- Experience is available for the slaughtering and processing of camels (CACIA).
- Experience is available for exporting live animals (many States have this expertise to a variety of different countries).

- Good access to suitable stock with Western Australia holding approximately half the feral herds of camel in Australia, approximately 100,000 camels.
- Investors keen to look at the camels industry.
- International interest in camels.
- Support by RIRDC for R&D.
- State interaction between major players.

3.6.2 Areas identified where development is required

These include -

- Legislation and/or regulation requirements require amendments in Western Australia (Appendix 1).
- Government domestication procedures for feral camels inadequate (progress has been made in part here and it is hoped a suitable resolution will be achieved by the end of 2000).
- Government minimum fencing requirements inadequate. Progress has been made in part here and it is hoped a suitable resolution will be achieved by the end of 2000.
- Quality assurance. Current quality of camel cuts available on the domestic market is not consistent. Some restaurants that have had camel on the menu such as the 'All Seasons' motel in Port Hedland (pers comm) have subsequently dropped it from the menu because they could not guarantee it would be tender and customers were complaining.
- Require high kill volume to entice abattoir that there will be financial gain.
- Lack of significant interaction between major players in the industry- currently the States work separately with loyalty to their own State industries rather than within a national body making decisions for the good of the whole industry. While such fragmentation occurs an industry of the size of camels will not succeed on a significant basis. It is a positive step to inform the other States of events, which are occurring, but the second step is to develop a decision making forum so all the States can actively make the decisions, which will affect them in the long run. Even the States which farm more intensively such as Victoria and NSW could be involved. These States have much to offer in the area of intensive livestock farming which would complement the camel industries input and open the industry up to new ideas.
- A clear markets focus is needed for the industry to succeed. The market-based approach recognised the need to develop the markets as a first step to industry development.
- Abattoir facilities for non-mainstream meats are inadequate.

4. Implications for the camel industry

This project has identified several issues for the camel industry in Western Australia.

There is a large resource base for camels with approximately 100,000 camels in the State.

There is considerable interest from pastoralists in harvesting wild camels, provided they can be done in an economically justifiable manner.

Abattoirs are able to process camel, but will not progress further until the level of demand can be justified.

There is a limited market for camel meat and milk produced from Northern Africa and the Middle East. To be competitive, other markets such as Eastern Asia will need to be identified. Things that need to be answered for the industry to prove its viability:

1. Level of demand and potential prices into key markets;
2. Protocols for exports; and
3. Confidence along the processing chain to continue with the camel industry.

Once these additional areas have been analysed, the industry will be in a better position to decide on its viability for going forward. Without this increase in understanding the camel industry will continue to be a small niche industry.

5. Planning and strategies for the next two years put in place

1. Export market analysis for markets in Eastern Asia and other potential markets.
2. Ongoing developmental work with the production chain members. This will include the steering committee and wider industry members, processors interested parties and investors etc. Legislation and regulation issues developed further until the required result is obtained. The development of a web site and a quarterly newsletter for industry participants.
3. Ongoing development of export markets and a link or alliance created to facilitate exports.
4. Greater understanding of the customer and their requirements in order to have a marketable product.
5. Development of a National body - to combine the direction of all camel producers with more scope than an individual company can have.
6. Government to work with producer group to establish reasonable minimum requirements for the fencing and domestication process of feral camels.
7. New project to investigate the development of the best practice fencing systems for camels in pastoral regions.
8. Camel industry to work with the meat program of Agriculture Western Australia utilising their expertise in areas such as quality control and SQF 2000.
9. There is also a need for the camel industry to become involved with initiatives such as Stock Guard, which is an industry protection initiative for all types of stock, protecting the industries against potential disease incursions.
10. A practical process for implementation of the principles for management of camels in the rangelands needs to be developed in conjunction with the producer group as has been established for the goat industry. See appendix 4 Principles of management of goats in the rangelands.

5.1 Export market analysis needed for the camel industry to develop further

Strategy 1 - Investigation of a potential export partner

Western Australia has a number of countries that have shown interest in camel meat as a product, such as Egypt and Hong Kong. There is a need to gather information such as quantity, specifications and legal restrictions to import meat. The industry must identify any possible export barriers. Only after being armed with this information should the Industry approach producer groups and processors. There are potential profits, without a profit at the end of producer or processor effort we cannot encourage people to invest money with no return.

Strategy 2 - Development of a producer cooperative for camels

The Western Australian producers need to form a producer co-operative or producer alliance in order to be supply an internationally competitive market, Continuity of supply is paramount and only though cooperating with their fellow producers will a camel industry be viable. This also needs to extend to the other States. The industry is not significant enough to sustain itself without the major players working together. The development of a quarterly newsletter keeping all interested parties abreast of the issues and the changes as they take place would be beneficial.

Strategy 3 - Ongoing development of export markets and a link or alliance created to facilitate exports

Western Australia is well positioned to service the Asian and Middle East export markets. Western Australia also has strong trading partnerships with these countries. The State possesses a large proportion of the feral camel population and producer interest has already been illustrated. The infrastructure for live camel export is established and ships trading in live cattle exports have already paved the way for camels. There are regular enquires into the possibility of exporting live camels and camel meat to many different global destinations from Egypt to England.

Western Australia has the highest number of ports servicing export trade out of all the Australian States, with export ports in Kununurra, Broome, Port Hedland, Carnarvon, Geraldton, Fremantle, Albany and Esperance, and pastoral leases in some areas come right up to the ports. This coupled with the climate and the vegetation make some of the pastoral properties ideally suited to running camels. A feedlot approach in the agricultural areas is also an option.

Interaction between purchasers and producers needs to be further developed. Research needs to be developed into the countries which have the most potential for Australian export and relationships developed. There is a need for another project to investigate export opportunities.

All the States and NT need to work together in order to develop such a small industry in the global economy.

There is interest internationally in camel meat and this needs to be developed. The industry must find out exactly who the customer is and what they require before we start to develop the industry any further. There must be more concrete proof to producers that the industry will be viable if they invest. Western Australia has an abattoir very close to export accreditation but without a firm order will not continue, as it is not in its best interests to pursue an industry, which is at his stage not proven to be viable.

5.2 Benefits for Western Australia

Once a camel industry is established, the pay off for Western Australia could be enormous. Camels are far more environmentally friendly and cause less damage than cloven hoofed species, they also can co-graze with other stock.

Initial trial work in NT has even shown a slight increase in weight for cattle which have been co-grazed with camels over the control group which had no camels in the paddock.

A Camel industry will impact on the sustainability of the pastoral region of Western Australia, aiding in the economic growth of remote and rural communities. The camel industry could be developed into a thriving export opportunity.

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7. Appendices

APPENDIX 1. Advice on legislation changes for camels in Western Australia by Ken Rose

ADVICE TO CAMEL INDUSTRY STEERING COMMITTEE WESTERN AUSTRALIA

Prepared by Vertebrate Pest Research Services 10 May 1999

Introduction

For the past five decades camels have been recognised principally as an animal pest. Camels were first declared as vermin in Western Australia (in the Nullagine and Halls Creek areas) in 1949, although wandering camels were damaging the rabbit proof fences as early as 1908⁽¹⁾. Before then camels were commonly bred in Western Australia and South Australia primarily as draught animals. Since this use was superseded by motor vehicles in the 1920s and 1930s little interest had been shown in camels commercially until the 1980s.

During 1985 export of live camels commenced in the Northern Territory and later (in 1988) slaughter of camels for meat began⁽²⁾. Only small numbers of camels are managed as commercial enterprises but feral camels are preserved by many landholders for harvest currently or in the future. In 1997 the New Industries Program of Agriculture Western Australia (AGWEST) began an assessment of the viability of a camel industry based on utilising existing herds of feral camels. This was undertaken as part of a larger joint State and Territory project for the Rural Industries Research and Development Corporation (RIRDC) to develop a sustainable camel industry⁽³⁾.

Harvesting feral camels is still seen by the industry as an important source of supply for any live export or meat trade that is developed. In the past uncertainty about regulations related to the holding and transport of declared animals has been identified as an impediment to initiating an industry heavily reliant on harvesting operations. Likewise the establishment of camel enterprises on pastoral properties as an alternative or complement to other stock is seen to be discouraged by the prospect of costly requirements being placed on keeping camels.

Any review of the current status of camels must consider that the industry may grow beyond the present objectives of live export and meat, and may expand beyond the pastoral areas and the present range of the camel. Camels are used for milk production overseas, and other by-products e.g. wool are of commercial value. Ellard⁽²⁾ describes characteristics of camel milk which suggest it could develop a niche market. He also suggests the possibility that camels may utilise degraded (salt-affected) areas more efficiently than conventional stock. Even if the industry remained entirely oriented to live export and meat, enterprises would inevitably be established closer to abattoirs and ports as the industry developed.

The Camel Industry Steering Committee Western Australia (CISCWA) proposes that to facilitate the development of a camel industry the declaration status of camels be changed from A4, A5, A6 to A5. Previous approaches to the Agriculture Protection Board on some of the problems seen as forestalling a camel industry have been rejected. Currently, submissions to government bodies need to be initiated by the industry and proposals need to have the general support of the vast majority of members. This expectation has not previously been met in the Board's view. At least some of the

approaches have not shown any consideration of agriculture protection concerns thus failing to counter current opinions for maintaining the status quo.

There does appear to be reasonable support for at least investigating the potential of a camel industry in Western Australia (Ellard ⁽²⁾, pers. comm. various field staff). However in many cases this is only passive support, a 'wait-and-see' approach. Others who are not interested in developing a camel industry will naturally have a more conservative opinion of any relaxation in the restrictions applying to camels. It should be remembered that feral animals are descendants of escaped or deliberately released animals and non-stakeholders may see no reason to risk the problem being transferred to new areas.

Traditionally the feral camel has been regarded as a low impact pest, more of the nature of an occasional nuisance. Nothing much has been reported from limited studies recently which would greatly alter this assessment. Selective grazing of some rare plant species occurs ⁽⁴⁾ that would need to be addressed on properties grazing camels.

This advice aims to explain the attitude to camels from an agriculture protection perspective so that arguments can be offered by Industry to parties regulating the keeping of camels.

Reasons for pest status

Though camels have been regarded as of low impact economically and ecologically, various problems have been attributed to them:

- Damage to fencing, water troughs and tanks.
- Deleterious effects on vegetation.
- Competition with domestic stock.
- Exotic disease risk.

Damage to fencing is the most frequent problem attributed to feral camels⁽¹⁾. Damage to water troughs and tanks have also been reported. A study from the Northern Territory over 3 years⁽⁹⁾ failed to show any destructive behaviour to watering troughs and yards but damage did occur to fencing. Fences were broken most frequently by males during the rutting season but damage was sustained at other times of the year too. Corners and older fences overgrown with bushes were susceptible to damage. Standards of fencing adequate to inhibit escapes by camels must be considered in any re-appraisal of the declaration status of camels.

Because of the grazing patterns of camels it has generally been considered that their impact on vegetation has been slight. Their larger, softer hooves are also considered to reduce the effect of trampling on plants and soil structure. Doerges and Heucke⁽⁴⁾ found in fact that while camels ate 80% of the species available they did exhibit a preference for some plants. Where these happened to be rarely occurring species then there was an inordinate impact on them. Preferred species with relatively small distributions e.g. on the edge of salt lakes may also be vulnerable. So grazing enterprises must consider protecting rare plants and fragile systems by exclusion and/or vegetation monitoring.

Camels occasionally feed heavily on particular shrubs causing much damage. Doerges and Heucke⁽⁴⁾ observed this with frequently utilised species but only in extreme drought and at high camel densities (2 camels per km²). These plants did recover with the return of favourable conditions. Quandongs are often eaten heavily but this may not be serious, assisting in the spread of seeds.

Overall the above study concluded that degradation of rangeland habitat by camels was unlikely. At densities as high as 0.3 camels per km² no indication of damage was observed. Camels mostly feed on the freshest and most common plants, usually feed apart from their companions and range widely

while selecting only parts of the plants to eat. They are largely independent of water so do not overgraze the areas closest to water points.

Competition between camels and stock occur but may be due to seasonal manifestations. Reports^(10,11) of serious aggressive behaviour toward stock might involve periods when resources are particularly scarce or the activity of aggressive male camels. Innate animosity between camels and cattle has been reported⁽¹²⁾ but Doerges and Heucke⁽⁹⁾ observed no antagonistic behaviour between camels and either cattle or horses.

Competition for grazing is probably not significant, and seasonal where it occurs. Grasses usually represent 20-40% of the gut contents from camels but 70-90% from cattle⁽¹²⁾. However camels do eat perennial grasses preferentially after rain, until forbs respond to the moisture when they are eaten preferentially⁽⁴⁾. Shrubs and trees are eaten most frequently once the ground vegetation dries off or during their flowering-fruiting stage. Cattle and camels can in fact be beneficially co-grazed to promote understorey growth thus restoring the balance of traditionally stocked systems, and to reduce woody weeds⁽⁹⁾.

Claims that camels destroy shrubs which shelter sheep⁽¹¹⁾ and possibly reduce shelter for small desert mammals⁽¹⁵⁾ appear extreme. Competition with large macropods for food would only occur in times of drought⁽⁹⁾.

Feral camels in Australia are relatively disease free. Small samples of camels have been tested for tuberculosis and brucellosis in northern Australia and tested clear. Camels are susceptible to several exotic diseases: rabies, rinderpest, Rift valley fever (possible carrier), trichinosis, and surra^(12, 14). These two references differ as to whether camels are susceptible to foot and mouth disease and bluetongue. In any case it is agreed that the risk is insignificant because of the low density and remoteness of most camel populations⁽¹³⁾. Control of feral camels might be attempted in an outbreak of surra⁽¹²⁾.

Overall the available evidence seems to support the traditional view that any damage attributable to camels is slight.

Camels rank very low as a pastoral pest species. No prescribed control programs are undertaken and no funding allocated specifically to camel control. Camels are sometimes shot during aerial culls of donkeys and goats but even this is often only done if requested by the landholder. Requests for assistance to control camels are extremely rare although some control might occasionally be done by landholders themselves. The fact that complaints are so rarely received by Agency staff together with the desire of many landholders to preserve camels during aerial culling operations suggests camels are generally not regarded as a serious threat (Pers. comms., various field staff).

Pest potential

From the discussion above there are two specific issues of pest potential requiring resolution. They are the protection of rare plants that may be preferred food of camels and the provision of adequate fencing to inhibit escape by camels.

An overriding consideration is the possible risk of camels becoming established in areas outside their present range. Recent history has shown some new industries fail to realise expectations and disposal of animals becomes an issue. In Queensland, one case of camels agisted on a property next to a National Park being abandoned and becoming feral has been recorded (C. McGraw, pers. comm).

Whether camels now occupy all of the range suited to them is doubtful. Camel populations and distribution are reported to have receded in the face of encroaching human activity after World War 2⁽¹¹⁾. They have such a catholic diet including eucalypts, melaleucas, acacias and the seeds of hard spinifex⁽⁴⁾ that food types hardly appear limiting.

Ellard⁽³⁾ suggests the current distribution of camels is determined by the physical environment and control by man. Wilson⁽¹⁶⁾ describes their original distribution in North Africa and western Asia as confined to areas of low rainfall, usually in a short period, followed by extended dry, hot periods. He further states they do not favour stony and wet or swampy areas. Perhaps access to a high-salt diet is also a limiting factor.

Even if feral camels should begin to establish in new areas numbers would not increase as rapidly as other feral herbivores. Doerges and Hencke⁽⁴⁾ estimated a population growth rate of 7.1 to 12.3 per cent per annum during good seasons. This compares to 15-20 per cent in horses⁽¹⁷⁾, 23-28 per cent in donkeys⁽¹⁸⁾ and up to 42% for goats⁽¹⁹⁾; all these measures recorded under good seasonal conditions.

Camels generally avoid heavily vegetated areas⁽⁴⁾ and field staff report they are easy to shoot during aerial culls. During early periods of dingo baiting, camels were eagerly sought and shot for bait material. Though camels are often tolerant of plants poisonous to cattle and horses⁽⁴⁾, they are susceptible to *Gastrolobium grandiflorum* (toxic component 1080)⁽²⁰⁾.

In summary, although camels may incompletely occupy areas suitable to them at present, establishment in new areas would be slow and control probably reasonably easy.

Current distribution

Allowing for the different survey methodologies employed, a succession of surveys since 1969 culminating in an extensive aerial survey in 1988⁽²¹⁾ indicated a consistent distribution of camels throughout Australia. Estimated populations varied but up to 50% or at least 17,000 were thought to be in Western Australia in 1988. An indirect estimate extrapolated from survey results in the Northern Territory in 1994 put the Western Australian population at about 100,000 camels (D. Wurst, pers. comm.).

Camels in Western Australia are found in the eastern pastoral areas stretching from inland of Port Hedland to the Nullarbor, and in the desert areas further east. They also extend into the eastern Kimberley adjacent to the Northern Territory border. Small remnant populations still occur around Mt Phillip and Mardathuna stations in the Gascoyne, and possibly near Coolamia south of Shark Bay.

Ellard⁽³⁾ confirmed the distribution of camels in a postal survey of pastoral properties in August 1997. Some stations had small sedentary herds but much larger numbers moved onto the peripheral stations from desert areas during dry periods to access water.

Current regulations (Western Australia)

The main legislation relating to the management of declared animals is *the Western Australian Agriculture and Related Resources Protection Act 1976 and the Agriculture and Related Resources Protection (Declared Animals) Amendment Regulations 1985* made under this Act.

The term 'declared animal' is used to describe classes of animals that are *declared* by the Agriculture Protection Board because they are, or have the potential to become, pests of agriculture and related resources. Camels are presently declared as A4, A5, A6 for the whole of the State of Western Australia. This means restrictions apply to the introduction and keeping of camels and that populations may be reduced or controlled.

Category A4 prohibits the introduction of feral camels into the State except in accordance with certain conditions and restrictions. Persons wishing to introduce feral camels from interstate must apply for a permit on a Form 2⁽⁵⁾ at least 7 days prior to the proposed introduction. Subject to the Board's satisfaction or amendment a permit will be issued (Form 1). The Board also requires at least 24 hours notice of any animals arrival at the inspection point stipulated in the permit. Importers of restricted and declared animals, as with livestock, are required to provide particulars of stock being introduced and declarations related to stock diseases and freedom from weed material. Animals would also be

expected to have been treated or tested for specified diseases, in the case of camels at least liver fluke and Johne's disease (Form AD1070). Australian Quarantine Inspection Service (AQIS) and Australian National Parks and Wildlife Service (ANPWS) conditions apply to overseas introductions.

The A4 categorisation also applies to movements of animals within the State - a permit to introduce (or move) the animals must be obtained by the person receiving the animals before they are moved (other arrangements are in place for movements of feral goats in the pastoral areas).

Category A5 enables the control of any animal through the destruction, prevention and eradication of the animal or by undertaking measures to reduce and restrict the number of those animals.

Category A6 forbids the keeping of feral camels unless in accordance with conditions and restrictions set by the Board. Application for a permit to keep feral camels is to be made on a Form 4 at least 7 days prior to the proposed acquisition. If to the Board's satisfaction, or subject to the Board's amendment, a permit (Form 3) will be issued. The Board must be satisfied that adequate enclosures and other safeguards are present to ensure the security of the animals relevant to the permit. Often this requires an inspection of the facilities to be undertaken. Such a permit applies in respect of descendants of the permitted animal(s) within any limits described in the permit.

Camels, along with other animals which are domestic pets or livestock, are exempt from declaration under the *Agriculture and Related Resources Protection Act 1976-1980*⁽⁶⁾. Dromedaries are not classed as camelids under the *Stock (Identification and Movement) Act 1970* and so are neither stock nor a restricted animal according to the terms of that Act⁽⁷⁾. However the *Land Administration Act 1997* (L.A.A.) includes as stock any mammal that is farmed, kept, or managed⁽⁸⁾.

The latter definition is accepted by the Agriculture Protection Board as demonstrated by the recent issue of the domestication of feral goats. A similar interpretation would appear to apply to camels. Certainly the Pastoral Lands Board thinks so and in the future intends to formulate best practice guidelines for camels similar to those for domesticating feral goats (G. Crow pers. comm.).

There appears no requirement to dispose of abandoned animals (apart from declared animals) under the Land Administration Act 1997, though the PLB has the power to determine minimum and maximum numbers of stock and their distribution on the lease. However, Section 83 of the Agriculture and Related Resources Protection Act 1976-1980 (AARPA) prohibits the abandonment of declared animals. Declaration of some sort therefore would appear useful in the event of individual enterprises or any particular industry failing.

Some safeguards seem to be afforded by local government legislation^(22,23). Here camels are defined as cattle along with all other stock animals. Section 243 of the Local Government Act (LGA) allows councils to make by-laws prohibiting persons having custody of animals (other than a dog) and preventing animals from straying.

Section 210 of the same Act empowers councils to prescribe fences sufficient to resist trespass of cattle and vary the class of fence prescribed. Section 210 also allows for councils to determine the manner and materials of which such fences are constructed, and to enforce their maintenance

Sections 459 and 484 of these Acts cover the impounding and/or destruction of trespassing or straying animals.

The Department of Conservation and Land Management (CALM) has no policy regarding camels. Regional staff are expected to control situations where damage due to camels is occurring. CALM would probably not object to measures facilitating farming of camels, believing them to be less destructive than traditional stock (G. Wyre, pers. comm.).

Proposed regulation position

Easing the declaration of feral camels from A4, A5, A6 to A5 would remove administrative procedures associated with the issue and enforcement of permits. Also the APB would no longer have any power to impose conditions, e.g. fencing standards on the keeping of camels.

Removing feral camels from category A4 seems a reasonable proposition provided camels are also reclassified as stock or at least a restricted animal. This would legitimise the inspection and certification of animals being introduced. Consideration of the health and declared weed material status of introduced animals is obviously a responsible industry position.

Classifying camels as stock would usually require some form(s) of identification mark being applied. In the past there has been conflicting opinions within industry about the best method to use. Ellard⁽³⁾ discussed the merits of various methods. Microchips may be the superior option. Though fire-branding is not considered favourably on welfare grounds it is still currently legal. Freeze-branding using liquid nitrogen may not be convenient to pastoral situations but is functional. The efficacy of eartags is the subject of disputed opinions; Doerges and Hencke⁽⁴⁾ found them effective where camels were at moderate to high densities.

A review of certain parts of the Stock (Identification and Movement) Act has recently been requested by the Minister of Primary Industry. Parts of the Act to be reviewed are brands, rules of branding, straying and unbranded stock, and movement of stock.. Terms of reference to be considered are new technologies in branding, best practice branding for all livestock, and legislative recommendations. Submissions from the Camel Industry would appear appropriate. An approach to the Committee could be useful in reaching a mutually beneficial outcome to the present uncertain status of the camel.

Exempting camels from category A6 might not be so readily embraced. Though the provisions of the Local Government legislation appear to address the concerns underlying this category, the Board (APB) may fear policy will become too fragmented.

As stated before the APB has accepted the interpretation of the LAA that animals being farmed, kept, or managed are classed as stock. In the case of domesticating feral goats there are still special fencing standards applied. These are enforced under the Best Practice Guidelines of the PLB but they act on the advice of the APB in this regard.

The issue of domesticating feral goats will provide a precedent for keeping camels (G. Crow, pers. comm.). Best Practice Guidelines are to be drawn up for all types of stock grazed in pastoral areas. Graziers wishing to run specific types of livestock must seek approval from the PLB and submit plans to meet the terms of the guidelines. Permits are not issued but pastoral inspectors can enforce the guidelines under sections e.g. Section 108 of the LAA. These guidelines only have effect on pastoral leases. Any camel enterprises set up in agricultural areas would currently remain subject to the full terms of the A6 declaration.

While the objectives of the Industry are focused on pastoral operations, pro-active contact between the Industry and both the PLB and APB might be fruitful. Industry input to formulating best practice guidelines would be to its undoubted advantage.

Maintaining camels as category A5 would allow control of truly feral animals or escapees. Clarification of the difference between definitions of Feral (animal) e.g. camel, donkey and (Animal), run wild, feral or at large e.g. domestic dogs, ostrich might be useful. If Camels were classified similarly to the latter it might distinguish kept and unmanaged animals more clearly.

Camels in other States of Australia

Apart from Western Australia feral camels occur in the Northern Territory, South Australia, Queensland and New South Wales. Numbers are very low in New South Wales but have probably been stable over recent years. Populations in Queensland and South Australia are not accurately known but are considered to be low. There is no indication that numbers are increasing in either State. Only in the Northern Territory do numbers appear to be increasing along with an expansion in their former range. Camels appear to be spreading into pastoral land where they have not been present in the past and are becoming resident in these new areas (G. Edwards, D. Wurst, pers. comms.).

Across the other States feral camels are considered only a low impact, low priority pest. In the Northern Territory the Parks and Wildlife Commission are concerned that the impact of camels may be underestimated and also by the apparent increase in populations (G. Edwards, pers. comm.). However they still rate them as a lesser priority than donkeys, horses and rabbits. No prescribed control programs are undertaken in any of the States though feral camels are generally subject to categories requiring control. National Parks staff shoot camels in the Northern Territory where they are causing damage and also in some Parks in South Australia. These operations are only undertaken during culls of other higher priority pests.

The status of camels in the Northern Territory, South Australia and Queensland is currently being reviewed by the relevant authorities in each State. At present in the Northern Territory camels are considered legitimate stock animals and are treated as for any other stock regarding movement regulations. South Australia treats camels as cattle for the purposes of movement with similar regulations as Western Australia. Declarations of health status etc. are required but no health certification is required of camels introduced from the Northern Territory, Queensland or Western Australia. However camels are otherwise not classified as stock in South Australia. In fact the harvesting of feral camels by some pastoralists and claiming them as stock is a contentious issue in the pastoral industry at present. Technically pastoralists in South Australia would need the permission of the Lands Board to keep camels as stock (M. Williams, pers. comm.). Camels in Queensland are not officially classed as stock but there is a relaxed attitude to keeping them (C. McGaw, pers. comm.).

In New South Wales there are restrictions on the keeping and introduction of camels similar to the situation in Western Australia. Permits are required which is not the case in other States (except Western Australia). Returns giving camel numbers being kept must be provided every 12 months. Landholders are not required to control camels on their property. Camels being kept are required to be secured but no specifications are set.

At present in all of the other States there is no requirement to mark camels in any fashion to identify them. Nor are any minimum fencing requirements in force.

Commercial farming of camels has not begun in any of the States except the Northern Territory. However there do not appear to be any serious concerns about that possibility in any of the States provided it is accepted by the grazing industry generally. Some camels have been slaughtered in Queensland but these have apparently come from harvested animals. The one attempt at initiating a commercial venture known to Queensland officials resulted in the abandonment of the animals adjacent to a National Park (C. McGaw, pers. comm.).

Harvesting feral populations

This report has deliberately avoided commenting on economic and production/management factors associated with the proposed industry. It is noted though that there is a prevailing doubt by many observers of the viability of a camel industry reliant on harvesting feral animals. Nor is harvesting of camels thought to offer an effective, efficient method of promoting feral camel control.

Outside of dry periods when animals concentrate around water points, harvesting costs will be high. In fact except in dry periods most camels in this State will be virtually inaccessible beyond the pastoral zone. This compromises continuity of supply.

Freight costs from these remote regions will be high especially because of the relatively low numbers of camels which can be transported in single deck trailers⁽²⁵⁾.

Extensive grazing systems incorporating best management practices (but requiring a reliable market) seems to offer a better outcome. However several precedents relevant to harvesting operations are noted:

- No licence is required to harvest feral animals in Western Australia but permits are required to transport and keep feral animals (K. Dean 26/7/96, APB file note).
- Feral goat holding facilities may be approved for holding (untrained) feral goats awaiting transport. These yards have a fabricated fence considered to be goat-proof⁽²⁶⁾. Similar yards for camels would need to be suitably modified.

Feral horses may be held for up to 30 days after mustering awaiting transportation to an abattoir for slaughter (without being branded)⁽⁷⁾.

Best management practice grazing systems

The following is based on the best management practice guidelines for managing goats on pastoral leases⁽²⁷⁾. It might be useful information for approaches to the PLB (and the APB) by Industry on future guidelines for camels. It addresses the two outstanding issues identified in the **Pest potential** section.

- (a) Grazing management/rangeland monitoring. Areas identified as sensitive to grazing or fragile systems should be fenced out of any grazing enterprise. Pastoralist Monitoring System (PMS) sites are to be installed in the major vegetation types in each paddock. Sites should be reviewed each season or at least annually. Entire paddocks should be assessed regularly. Particular attention should be given to areas being preferentially grazed.
- (b) Fencing. The external fence (the fence enclosing the whole grazing enterprise) is to be of a standard to contain the animal(s) being grazed. Electric fencing will probably be preferred as in the case of goats; designs similar to those described by Bertram⁽²⁸⁾ would be likely.

Barbed wire fences are apparently sufficient to hold camels trained to them (Bertram, op. cit.; P. Seidel, pers. comm.) so perhaps should be promoted by Industry. Holding yards for bulls and external fences where feral camels are present might additionally incorporate an outrigger electrified wire (to outside of external fences, inside of bull holding yards). The use of wooden posts would improve the resistance to pressure exerted by camels over suspension type cattle fences commonly found in pastoral areas.

Measures to increase the visibility of the fence and reduce the momentum of approaching camels (Bertram op. cit.) would be advisable.

- (c) Training enclosures. Training enclosures are comprised of 2 facets: an internal training fence to the standard of the specified fencing, and an outer fence of a type guaranteed to hold the animals being trained. In the case of camels the outer fence might need to be higher and incorporate blanking measures to be clearly visible. Existing cattle yards might be used or yards constructed as for fractious cattle⁽²⁹⁾. The inner fence would be barbed wire or electric as required.

Camels trained in such enclosures would be able to be grazed in agricultural areas using fencing of the minimum standard. However while a category A6 remains in force, feral camels transported directly to agricultural areas would need to be kept behind higher standard fencing

and/or trained before being released into normal paddocks. This is the case with feral goats being introduced into agricultural areas⁽³⁰⁾.

Summary of points

1. If camels were removed from categories A4 and A6 mechanisms are in place or could be instituted to meet the concerns underlying the present categorisation.
2. Camels should be reclassified as stock or confirmed as restricted animals if they are removed from category A4 so that introduced animals remain subject to disease and weed material provisions.
3. Removal of camels from category A6 may not be embraced readily by the APB. Reliance on local government statutes might result in fragmented regulation and ineffectual control of escaped camels.
4. In pastoral areas the enforcement of suitable management is the responsibility of the Pastoral Lands Board based on best management practice guidelines and backed by provisions of the Land Administration Act, rather than any adherence to the A6 categorisation. However these guidelines are generally based on recommendations of AGWEST or the Agriculture Protection Board.
5. Pro-active interaction by Industry with both the Pastoral Lands Board and the Agriculture Protection Board would be beneficial. Industry participation in the formulation of best practice guidelines would be to its advantage.
6. Approaches to either Board need to be seen as being initiated by Industry and enjoying the general support of those in the Industry.
7. Submissions to the Agriculture Protection Board need to address agriculture protection concerns.
8. The prevailing evidence is that camels are a low impact pest. Preferential grazing of rare plant species and damage to fencing are problems with wild populations that would require mitigating action in camel grazing enterprises.
9. The pest potential of camels does not appear high. Problems caused by camels can be remedied quite simply. Populations of feral camels only increase slowly and can be controlled efficiently.
10. The lack of prescribed control programs and the paucity of complaints received from landholders indicates camels are recognised as only a minor threat.
11. Extensive grazing systems with managed herds would be a sounder basis for the Industry than any reliance on the harvesting of feral animals. The logistics and costs of harvesting are onerous and the continuity and total numbers of animals uncertain.
12. Possible fencing requirements are of particular concern to Industry. Reasonable standard barb-wire fences will contain camels trained to them adequately. Industry should be promoting its own views on reasonable fencing standards.

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APPENDIX 2. by Harvey Jones

PRE-FEASIBILITY OF FERAL CAMEL MEAT INDUSTRY DEVELOPMENT IN WESTERN AUSTRALIA

BACKGROUND

Introduction

Feral camels mostly live in the arid and semi-arid areas of central Australia. They have been systematically exploited for meat production since 1988, with abattoir processing in Alice Springs and South Australia. However, approximately half the feral herd is located in Western Australia of which there has been no processing for human consumption. Since their use as a draft animal ceased in the early 1920s the principal economic use of camels in this State has been for tourism.

By nature camels are not a gregarious animal and thereby do not congregate in large herds. A bull will associate with a small group of cows only during a mating period.

Camels are generally browsers and thus do not compete with sheep and cattle for food. However, camels are extremely aggressive with other animals when competing for water have been known to foul water supplies. Feral camels are a wild animal and must be treated in the appropriate manner by yarding for a period before loading on trucks. A cooling off period is also recommended to relieve stress before killing at the abattoir.

Industry foundation

The Eastern States domestic market for camel meat is already established to a limited extent. Currently it is mainly confined to the major food retailers and restaurant trade. However, the Western Australian situation is much less advanced with so far very little product supplied due to limited promotion and the absence of a killing facility adapted to camel slaughter.

Due to the difficulties in surveying the vast central and eastern areas of Western Australia, population estimates of feral camels in Western Australia vary from 50,000 to 100,000. Observations from Agriculture Western Australia 'protection services' personnel indicate there may be around 35,000 on station leases. Trapping of the animals is seen to be much more feasible on the station country than in the much more remote desert areas.

Camel farming is mainly confined to small scale tourist venues. Therefore, in the near future the number of animals required to make marketing and adapting a killing facility viable propositions will rely on feral populations.

Camels can be slaughtered at abattoirs which currently handle cattle. However, these facilities need some modification as camels have a taller body frame than cattle. Also, the boning, grading and packaging requirements differ somewhat from standard cattle treatment. Thus, training of abattoir staff along with some additional packaging facilities are likely to be required to handle camel processing.

Expansion of the industry into export markets can of course only be done through abattoirs having a licence for export processing. However, in view of the costs to make an abattoir suitable for processing camels, an abattoir which made those investments needs assurance that it would be provided with a regular supply of animals. The facility(s) chosen for the initial industry development of the domestic market need some type of agreement ensuring maintenance of supply over a specified number of years. In the case of an abattoir which is licenced only for domestic slaughter (e.g. Shark Lake abattoir at Esperance) an assurance would be required that supply of animals for slaughter would be maintained even if export markets were subsequently developed.

Industry margins

As the meat camel industry is not yet established in Western Australia it is difficult to derive business performance estimates. However, approximations can be made from information sourced from relevant service providers. Accordingly, some costings were estimated following discussions with abattoir and transport industry representatives in the Esperance region.

Transport from where the animals are trapped to the eventual abattoir site is another major cost item for the feral camel industry. Due to their extra height over cattle the animals would need to be transported as a single level on the ground floor of double decker cattle units (single deck carry units are no longer commonly available). Also, as camels generally are safely transported over long distances while seated these animals can take up to 40% more space than cows. Therefore per trailer the capacity would be only about 18 to 20 adult camels. At around \$3/km for freight of live animals using cattle trucks the cost would amount to almost \$70 from Kalgoorlie or about \$110 per animal up to 650 km from Esperance.

Feral camels need to be yarded for up to a week after trapping to ensure meat quality is of a sufficiently good standard. This holding period helps to reduce bruising and stress which would otherwise lessen meat quality. Yarding near the trapping site enables easier drafting and loading onto trucks thus allowing a straight run through to the abattoir. Otherwise the animals need to be held at a staging facility or at the abattoir. Drafting enables removing bulls in rut, cows near term, animals older than 10 years and younger than 3 years. Also, animals travel better if they are of generally a relatively uniform size. For the analysis a dollar amount is incorporated to include feed, watering and management costs as well as an annual amount to cover the establishment of a yard facility.

Slaughtering and processing costs can be approximated at \$160 per animal to cover all stages from killing to freight into major population centres. This figure excludes any costs to adapt killing facilities, put in place yarding facilities and train labour. An approximation is given to these capital costs for completeness of the analysis. However, these would be specific to each abattoir and amortised over the existing operation.

The total processing costs would be charged to the owner of the camels at time of slaughter. Assuming regular supply is assured for 10 years only one shipment annually would increase slaughtering costs by nearly 50 per cent which is likely to meet market resistance. On the other hand 5 shipments each year would dilute capital costs required to handle camels and add less than 10% to slaughtering fees.

The live weight of camels is taken as 400 kg being an average of animals aged from 3 to 10 years. Camels dress out at around 50% with the average wholesale price at nearly the same as a beef.

Saleyard prices per kilogram of camel are approximately the same as cattle. Hence, from that revenue suppliers of animals need to cover costs of transport to the abattoir. In addition, the stock agent will in effect pass killing costs directly onto the supplier. After accounting for these costs the supplier's residual will need to compensate them for mustering, trapping and delivery to the transporter pick up point.

Based on the assumptions listed in Table 1 the margin for suppliers of feral camels is about \$80 to \$95 per animal for an enterprise delivering 90 to 100 animals annually. However, this amount is quite sensitive to average price received as a 10% variation in price produces a 40% change to industry margin. A similar degree of sensitivity to margins also results from varying average live weight of the animals. Increasing the contractor transport distance up to 800 km reduces the margin to almost \$75 per animal. From this amount the costs of capture and return to operator labour need to be netted out. This can be compared with net returns in the vicinity of \$60 per animal for beef and \$6 per sheep for wool production after accounting for all variable costs.

Table 1. Basic assumptions for feral camel margins

Item	Value
Live weight kg	400
Dressing %	50
Price gross \$/Dwt	2.00
Transport and handling \$/animal	147
Processing costs \$/animal	171

Note: Costs of trapping are not included.

Conclusions

The exploitation of feral camels for human consumption is at present not an established industry in Western Australia. From the aspects of marketing and production in the State there are many unknowns for potential industry participants that can only be addressed through trials. Camel numbers and population structure and distribution also need clarification to allow industry planning.

The absence of general consumer awareness and established retail outlet in Western Australia also need to be addressed. A promotional campaign would need to include identification and cooking requirements of the various cuts. The source of funds for these advertising expenses would need to be identified with eventually the industry itself bearing some of the cost. Although in the short term the product could be sold to the Eastern States through the Alice Springs based CACIA to the national retail chains. In the Eastern States at the retail markets quality standards are established and the product is recognised by a significant consumer base.

Delivery and slaughtering procedures are well known in the Northern Territory and South Australia. Therefore, experienced people from the trapping, penning, transport, slaughter, and retail sectors could provide the necessary advice required to begin the industry in Western Australia. An abattoir is likely to require a turnover of at least 100 animals annually with an assured supply for up to 10 years before it would be worthwhile to invest in a facility to slaughter camels. In the case that the supply could be guaranteed for only 5 years a minimum annual throughput of 170 animals would be required. With respect to a camel harvesting enterprise, 3 truckloads would likely be a minimum sized operation. At this level the returns without covering costs of capture are likely to be slightly greater than for a conventional pastoral enterprise.

However, net returns to producers and others in the industry are probably not greater than is already achievable in beef production where there already exists a full marketing, research and production infrastructure. Therefore, the feral camel industry is likely to fill a niche market and be profitable where pastoralists have animals of known and sufficient populations.

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APPENDIX 3. Agriculture Western Australia draft domestication procedure for feral camels

DOMESTICATION PROCEDURE FOR FERAL CAMELS

1. Identification

- 1.1 All domestic camels must be either ear tattooed, fire branded, or ear marked and ear tagged, with the owner's property brand registered under the Stock (Identification and Movement) Act within seven days of completing the domestication procedure. It is recommended that domestic camels be ear marked and ear tagged with the property registered brand.
- 1.2 On going re-registration of stock brands and ear marks will be expanded to include camels.

2. Domestication procedure

- 2.1 A domestication procedure is required for all camels that are introduced to a domestic camel grazing enterprise in the rangelands.
- 2.2 All feral or introduced camels must be transported in a vehicle from which they cannot escape.
- 2.3 All camels must be held; in an approved training enclosure for a minimum of 14 days, before release into an electrified grazing paddock, fenced in accordance with the standards under **Section 3b**.
- 2.4 The approved enclosure must be maintained and effective at all times.
- 2.5 The enclosure must be of sufficient size to allow animals to be unstressed, but still allow frequent exposure to surrounding training electric fence.
- 2.6 Any additional training or exposure to the electric fence should conform with appropriate humane and ethical standards.
- 2.7 Before release camels should be suitably trained to the electrified fence and untrained (rogue) camels removed.

3. Fencing specifications for training enclosure

Agriculture Western Australia (Industry Resource Protection) is the agency responsible for ensuring that the fencing specification are adhered to in the development and management of a domestic camel grazing enterprise on pastoral leasehold land.

A. Fabricated perimeter fence specifications

- 3.1 The perimeter fence must be kept clear of trees preventing damage to fence.
- 3.2 Strainer assemblies should be of box frame construction, and be adequately installed to permit fabricated wire and other wires to be strained to the manufacturer's specifications.
- 3.3 The overall fence height should be approximately 110 cm.
- 3.4 Line posts must be buried into the ground at not less than 45 cm.
- 3.5 All single wires should be tied or attached adequately to line posts.
- 3.6 All energised wires to be circuited and insulated in accordance with manufacturers specifications.

3.7 All fencing materials should be strained to the manufacturer's specifications.

B. Internal electrified training fence

3.11 The electrified training fence must be constructed at a distance of not less than 2 metres within the fabricated fence on **four** sides. The training area should be approximately one third of the entire training enclosure. The capture and return area should have a depth of not less than 20 metres.

3.12 Water should be provided in both training and capture and return areas.

3.13 The electrified training fence must be constructed to the same specifications as the external fence with the outrigger wire towards the animals being trained.

4. External fence specifications

The external fence means the fence that encloses the entire domestic camel grazing enterprise.

4.1 The external fence line must be kept clear of trees and regrowth so there is no danger of the fence being compromised.

4.2 Strainer assemblies should be box frame construction and in line strainers must be of adequate size and set at adequate intervals, to permit plain wires to be strained to the manufacturer's specifications.

4.3 The fence carries an 30 cm offset energised outrigger plain wire 75 cm from the ground on the pressure side of the fence. The fence is further modified so that the top plain wire is energised as is a third plain wire 37 cm from the ground.

4.4 The lowest voltage recording on any section of the external fence should be a minimum of 4,000 volts.

4.5 Line posts should be placed at intervals not exceeding 35 metres apart. On hilly or undulating country, line posts will need to be closer.

4.6 Where line posts intervals exceed 10 metres, insulated droppers should be attached at spacings not greater than 10 metres.

4.7 Line posts should be not less than 45 cm in the ground.

4.8 The clearing and maintenance of a corridor on each side of the fence adds greatly to its effectiveness. Externally (the side of maximum camel pressure) this clearing is 8 metres wide and has a ditch 30 cm deep and 60 cm from the fence with the excavated soil heaped in a wind-row 30 cm high. Internally the cleared path is 3 metres wide. It must be remembered that clearing and ditching will cause erosion in some situations. The sitting of the fenceline should take this into account.

Note: Existing internal fences must be upgraded and electrified but need not comply with the external fence specifications. Defunct fences must be completely removed.

New internal or paddock fencing must also be electrified but need not comply with the external fence specifications.

Where possible avoid having females being mated in a location adjacent to the bull camel enclosure where spare adult bull camels and immature males are kept. It is recommended that the bull camel enclosure is constructed in accordance with an external fence with the outrigger wire facing inward.

Appendix 4. Agriculture

GUIDING PRINCIPLES ON MANAGEMENT OF GOATS ON THE RANGELANDS

The primary focus for government involvement in the management of goats on the rangeland is:

- to ensure the long term ecological sustainability of the rangelands through the management of feral goat populations;
- to ensure the long term economic sustainability of the rangelands through the development of domestic goat enterprises.

The definition of a feral goat used in this policy is from the Macquarie Dictionary

“...wild, or existing in a state of nature; having reverted to the wild state, as from domestication”

The principles, which guide the involvement of Government agencies and authorities regarding goats in the rangelands, are:

- Government authorities/agencies with jurisdiction in relation to either rangelands or goats will apply the most appropriate advisory and regulatory processes to achieve the objectives of the government.
- All agencies and authorities will develop and implement common over-arching guiding principles and policies.
- There are adequate regulatory powers within existing Acts to manage the situation, and the most appropriate powers will be cost-effectively applied.
- Government will intervene when, and where, necessary to ensure long-term ecological sustainability of the rangelands.
- Un-managed grazing animals can seriously degrade the rangelands and the principle of Total grazing Management (TGM) is adopted.
- Control of goats, through fencing or other means, is an essential element of any goat management strategy.
- Escaped or uncontrolled domestic goats will be considered to be part of the feral population.
- The establishment of standards for rangeland condition and goat density is an essential component of sustainable goat management, and the techniques used to monitor performance against these standards are available and will be continuously improved.
- It is the statutory responsibility of the landholder (lessee) to ensure ecological sustainability of pastoral enterprises, including the maintenance of feral goat density below the established standards.
- Sustainability of natural resources will have precedence over individual business opportunity.
- Managed (domesticated) goats are a legitimate land use and the development of an export-focused goat industry will contribute to regional economic development.
- Voluntary or compulsory removal of feral goats from the rangelands should optimise economic returns.
- Benefits of improved supply chain management including pastoralist – processor/exporter alliance should be encouraged.
- The principle means of government intervention will be via research and development, information and advice, facilitation and promotion, standard setting and monitoring, and regulation.

Roles and Responsibilities of Government Authorities/Agencies

Pastoral Lands Board

The Pastoral Lands Board (PLB) has the primary responsibility to ensure the long term ecological sustainability of the rangelands. The functions of the Board include (Land Administration Act, Section 95);

- (c) to ensure that pastoral leases are managed on an ecologically sustainable basis;
- (h) to monitor the numbers and the effect of stock and feral animals on pastoral land;

These functions require the PLB to identify best practice management regimes, for both managed and unmanaged grazers on the rangeland, to ensure ecological sustainability. If the PLB believe this is being compromised, it can set appropriate targets and apply penalties under the Land Administration Act for non compliance. It can also request the Agriculture Protection Board (APB) or Commissioner for Soil Conservation to use their powers to support the achievement of sustainable pastoral land use.

Agriculture Protection Board

The Agriculture Protection Board (APB) has the primary responsibility to ensure that declared animals are controlled by landholders. The powers and duties of the Board include (Agriculture Protection Board Act Section 8).

- (a) Making investigations and enquiries into and formulating schemes for efficiently:
 - (i) controlling, and prohibiting and regulating the introduction of, declared plants;
 - (ii) controlling, and prohibiting and regulating the introduction and keeping of, declared animals;
- (b) Ensuring that the provisions of this Act and the Agriculture Protection Act (Agriculture and Related Resources Protection Act) are efficiently carried into effect throughout the State and coordinating the implementation, in the various zones and regions, of policies, schemes and programs formulated under this Act or that Act.

The Agriculture Protection Board (APB), through Agriculture Western Australia (Agriculture Protection Program), is implementing a Feral Goat Eradication Program. This program is being implemented at the request of industry, and should ensure that ecological sustainability is not compromised by the impact of feral goats.

The current objective of the Feral Goat Eradication Program is reduce feral goat populations to a level where they are causing minimal damage to the rangelands, and are manageable by the landholder/occupier.

Soil and Land Conservation Council

The Soil and Land Conservation Council (SLCC) has the primary responsibility to ensure that soil and land conservation is implemented by landholders. The duties of the Council include (Soil and Land Conservation Act Section 16).

- (c) Coordinate, monitor, and review soil and land conservation programs and activities.
- (e) Supervise soil and land conservation programs undertaken by the Government of the State.
- (g) Coordinate the establishment of, and activities within, land conservation districts.

- (h) To assist the Commissioner in the carrying out of his functions under this Act and to carry out such functions under this Act as the Commissioner or the Minister, respectively, may refer to the Council.

In practice, SLCC does not intervene directly in regulation of rangeland grazing, but works with the PLB, APB, Agriculture Western Australia and Land Conservation District Committees (LCDC) to ensure achievement of its objectives.

Agriculture Western Australia

Agriculture Western Australia has a primary role in provision of policy advice to Government, implementing the policies and regulations of the above authorities and also advising industry members on and conducting research and development for the development of domestic goat enterprises.

The Sustainable Rural Development Program implements the policies and regulations associated with the Pastoral Lands Board and the Soil and Land Conservation Council through the Commissioner for Soil Conservation.

The Agriculture Protection Program implements those associated with Agriculture Protection Board.

The Meat Program has a role in evaluating and promoting the development of sustainable domestic goat enterprises focusing on production, marketing (strategic alliances) and economic potentials. Current Meat Program funded activities with respect to goat industry development in the rangelands are; Winderie Goat Domestication Trial (\$24,000), Establishment of Goat Meat Alliances (\$27,000), Role of Boar Goat in the Australian Goat Industry (\$150,000), Live Export Enhancement (\$100,000).

Implementation of Principles

The following tables outline a practical process for implementation of the principles for management of goats in the rangelands.

Management of Feral Goat Populations

	Authority	Agency
Establishment of standards and assessment protocols	Pastoral Lands Board/ Agriculture Protection Board	AGWEST (SRD/APP)
Assessment of grazing pressure including feral goat populations on an individual pastoral lease is undertaken in association with the Pastoral Lease Reporting regime or Pre-sale Report.	Pastoral Lands Board/ Agriculture Protection Board	AGWEST (SRD/APP)
Assessment is evaluated and if grazing pressure including feral goat populations are deemed to be compromising sustainability, compliance target is determined	Pastoral Lands Board	AGWEST/SRD
Agriculture Protection Board is notified of the need to invoke the powers of the ARRPA to ensure goat population is reduced below the density level agreed by PLB and APB.	Pastoral Lands Board	
Directional Notice (Section 50) is issued to pastoral leesees identified by Pastoral Lands Board. Included on this notice is the density stipulated by PLB/APB, timeline for completion and actions if compliance not met.	Agriculture Protection Board	AGWEST (APP)
Directional Notice compliance is assessed and if compliance has not been met, action to contract a mustering team will be implemented		AGWEST (APP)
PLB and APB notified of any compliance problems and action implemented	Pastoral Lands Board/ Agriculture Protection Board	AGWEST (APP)

Management of Domestic Goats

	Authority	Agency
Pastoralist submits a development plan to the Pastoral Lands Board	Pastoral Lands Board	AGWEST (SRD)
Development plan is assessed for compliance with domestic goat requirements	Pastoral Lands Board/ Agriculture Protection Board	AGWEST (SRD/APP)
Pastoral Lands Board notifies pastoralist of outcome of submission assessment	Pastoral Lands Board	
Training of domestic goat requirement compliance is assessed and Pastoral Lands Board is notified	Agriculture Protection Board	AGWEST (APP)
Domesticated goat operation monitored	Pastoral Lands Board	AGWEST (SRD)

Under this approach, the PLB and APB would have the following complementary responsibilities which will result in effective, efficient implementation of a goat management program for the rangelands.

Pastoral Lands Board

Is responsible for:

- setting feral goat density levels on pastoral leases, at which ecological sustainability is compromised;
- establish standards for, and approve development plans for domestic goat enterprises;
- assessing grazing pressure including feral goat populations as part of normal pastoral lease reporting;
- monitor the impact of grazing on pastoral lands;
- taking action to deal with ongoing problems associated with pastoral lease management, including goat control.

Agriculture Protection Board

Is responsible for:

- contributing to assessment of feral goat population assessment;
- ensuring Directional Notices are issued and assessed where Agriculture Western Australia (acting for PLB and/or APB) has identified feral goat populations that compromise ecological sustainability;
- ensuring action is implemented where compliance with Directional Notice is not met (this will only involve Agriculture Western Australia contracting of a mustering team and will NOT involve any helicopter shooting);
- assessing compliance with training requirements for domestic goats.

Agriculture Western Australia

Would carry out the following functions:

- deliver agreed services to PLB including pastoral lease reporting and grazing density monitoring;
- deliver agreed services to the APB including assessment of feral goat populations and compliance programs;
- provide advice to the Minister, APB and PLB;
- facilitate the development of domesticated goat industry in the rangeland;

Relevant legislation

There are three Acts which deal with the management of feral goats in Western Australia.

Land Administration Act

The Land Administration Act (1998) is administered by the Minister of Lands. For Crown Land open for pastoral lease purposes, the functions and powers prescribed by this Act are undertaken by a Pastoral Lands Board.

Sections of this Act impacting on goat management include;

107. Development and maintenance of improvements

- (1) If the Board is of the opinion that the reasonable development of the land under the lease for pastoral purposes requires improvements to be made, it may require the lessee to submit a development plan, satisfactory to the Board, for the progressive achievement of those improvements to a specified timetable.
- (2) The lessee must make improvements to the land under the lease in accordance with any development plan approved by the Board.
- (3) The lessee must maintain in good condition, and if necessary restore, renew or replace, all lawful improvements to the lease, to the satisfaction of the Board.

108. Management of land under a pastoral lease

- (1) A pastoral lessee must, to the satisfaction of the Board, at all times manage and work the land under the lease to its best advantage as a pastoral property.
- (2) The lessee must use methods of best pastoral and environmental management practice, appropriate to the area where the land is situated, for the management of stock and for the management, conservation and regeneration of pasture for grazing.
- (3) Except with the written permission of the Board, the land under a pastoral lease must be worked as a single pastoral unit.
- (4) The lessee must maintain the indigenous pasture and other vegetation on the land under the lease to the satisfaction of the Board.
- (5) In satisfying itself for the purposes of subsection (4), the Board must seek and have regard to the advice and recommendations of the Commissioner on the matter.

111. *Stocking of a pastoral lease*

- (1) The Board may from time to time determine the minimum and maximum numbers and the distribution of stock to be carried on land under a pastoral lease, based on its assessment of the sustainable carrying capacity of the land and having regard to seasonal factors, and the pastoral lessee must comply with such a determination.
- (2) A pastoral lessee must not cause or allow the agistment on land of stock of any kind, except with the permission in writing of the Board.
Penalty: \$5,000, and a daily penalty of \$500.
- (3) A pastoral lessee must control declared animals and declared plants on the land under the lease in compliance with the *Agriculture and Related Resources Protection Act 1976* and to the satisfaction of the Board.

129. *Issue of default notice*

- (1) If a pastoral lessee fails to comply with:
 - (a) any provision of this Act;
 - (b) any provision of the lease;
 - (c) any condition set or determination made by the Board under this Part; or
 - (d) a soil conservation notice,

the Board may issue a default notice in accordance with this section, and the lessee must comply with the notice.

- (2) A default notice must:
 - (a) specify the provision, condition, determination or notice with which the lessee has failed to comply;
 - (b) if the notice relates to a failure to comply with a provision of this Act or the lease which specifies that anything is to be done to the satisfaction of the Board, specify the actions which the Board requires the lessee to take in order to satisfy it;
 - (c) require the lessee to comply forthwith;
 - (d) specify any action which the Board requires the lessee to take to remedy the effects of the failure to comply;
 - (e) specify a time or times by which any actions required under paragraph (d) are to be done; and
 - (f) inform the lessee that a failure to comply with the default notice could result in the forfeiture of the lessee's interest in the lease.

The Agriculture and Related Resources Protection Act (ARRPA)

The Agriculture and Related Resources Protection Act was proclaimed in 1976 after the Vermin Act (1918) was repealed. This Act provides for "... the management, control and prevention of certain plants and animals, for the prohibition and regulation of the introduction and spread of certain plants and of the introduction spread and keeping of certain animals, for the protection of agriculture and related resources generally." It is administered by the Agriculture Protection Board of Western Australia.

Under the ARRPA landholders and lessees are treated as owners of private land and therefore are subject to Division 4 (Private Land) of Part V - (Control of declared plants and declared animals).

The relevant Sections of this Act which relate to the responsibility of landholders for feral goat control are:

S49 Landholders required to control declared species on and in relation to their land

S50 Where the APB is satisfied that the landholder is not making all reasonable endeavours to control the pests it may direct by notice in writing that the landholder carry out the required control measures. The measures may be specified in the notice as a commencement and completion date.

A notice may be served on an individual or on any number of landholders via a notice in the Government Gazette and a local newspaper.

S51 A landholder that fails to comply with a notice to control declared species commits an offence.

S52 Where an APB officer is of the opinion that the landholder has not complied with a direction notice he may enter the property and carry out the requirements of the notice.

All expenses incurred plus interest shall be a debt due by the landholder which may be sued for and recovered in the local court.

S58 Where an APB officer is of the opinion that the landholder has not complied with a direction notice he may enter the property and carry out the requirements of the notice.

All expenses incurred can be debited to the Declared Plant and animal Control Fund (DPACF) or other funds at the disposal of the Protection Board.

S78 A person shall not move from one part of the State to another any A4 declared animal otherwise than in accordance with the regulations (Declared Animals Regulations 1985).

S81 A person shall not keep an A6 declared animal other than in accordance with the regulations (Declared Animals Regulations 1985).

S83 A person who a) liberates or attempts to liberate any declared animal (except an A7 animal) or b) abandons or permits or fails to take reasonable precautions to prevent the being 'at large' a declared animal, commits an offence.

This form of legislative control has only been used as a means of last resort when all other attempts to gain cooperation have failed.

Soil and Land Conservation Act (SLCA)

The use of this Act depends on the actions of the Commissioner of Soil and Land Conservation and the recommendations of the Soil and Land Conservation Council (SLCC). The Commissioner's role is to implement the provisions of the Act and a major role of the SLCC is to advise the Minister for Agriculture on policy and programs.

Since the Act was amended both the Council and the Commissioner have demonstrated their support for activities which encourage land managers to develop and apply land management practices that either reverse or avoid land degradation. The opportunity provided by the Act to compel the application of any management practice is only used when all means of encouragement have failed.

Section 32 of the Act allows the commissioner to issue a Soil Conservation Notice in writing to the occupier of land directing that person to “adopt or refrain from adopting any agricultural or pastoral methods specified in the Notice”.

The circumstances that allow for the issue of ‘notice in writing’ are also prescribed in Section 32 of the act as follows: “Whenever the Commissioner is of the opinion that as a result of:

1. (a) any agricultural or pastoral practices or methods, which have been or are likely to be adopted;
- (d) land degradation is occurring or is liable or likely to become liable to occur on that land or elsewhere

the Commission may:

- (e) by notice in writing direct one or more persons to adopt or refrain from adopting any agricultural or pastoral methods specified in the notice”.
2. (a) direct one or more persons to adopt or refrain from adopting any agricultural or pastoral methods specified in the notice.

In the event that a landholder failed to comply with a notice issued in relation to a LCDC’s feral goat program, that failure would be an offence which could attract a penalty not exceeding \$2000.

The Act also provides the Commissioner with the authority to carry out the activities specified in a notice when the person served with that notice fails to comply with it. Furthermore the Act provides for the Attorney General to recover the cost of this action in court.