



Chapter 1: Background to the project

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List of shortened forms

APY	Anangu Pitjantjatjara Yankunytjatjara
DKCRC	Desert Knowledge Cooperative Research Centre
NRETAS	Natural Resources, Environment, The Arts and Sport (NT Government Department)
NRM	Natural resource management

Acknowledgements

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Chapter 1: Background to the project

1. Why manage feral camels?

Because they are established and widespread, feral camels are one of the 73 or so species of introduced vertebrates occurring on mainland Australia that do not meet the criteria to justify eradication effort. For such species, the management options are containment, control, or no management (*Australian Pest Animal Strategy* 2007). We need to manage feral camels in Australia because the deleterious impacts of the species on pastoral production, the environment, and on social and cultural values are evident at current population densities over many parts of the camel's range (see Edwards et al. 2008). Furthermore, the current estimated population of about one million feral camels is doubling every 8–10 years (Edwards et al. 2004, Saalfeld & Edwards 2008) and it is presumed that impacts will increase along with the population (Edwards et al. 2008).

2. Why a national approach?

Management of the impacts of pest animals should be informed by a risk management approach and be strategic in determining where management should occur, at what time, and what techniques should be used (*Australian Pest Animal Strategy* 2007). It requires coordination at the appropriate scale among all levels of government in partnership with industry, land managers, and the community (*Australian Pest Animal Strategy* 2007).

The current management of feral camels, being largely ad hoc (Edwards et al. 2004), fails to adequately meet any of these criteria.

If we are to develop a strategic, coordinated risk management approach to mitigating the impacts of feral camels, it must be done at the national scale because:

- There is a large population of camels occurring over a large area which includes parts of Western Australia (WA), South Australia (SA), Queensland (Qld), and the Northern Territory (NT) (see Saalfeld & Edwards 2008).
- Camels are very mobile animals that can move over large distances in relatively short time periods (see Saalfeld & Edwards 2008).
- Many camels occur in very remote areas that are sparsely populated by people (see Saalfeld & Edwards 2008, Saalfeld et al. 2008).
- There are differing perceptions on feral camels and their impacts (Zeng & Edwards 2008a, Zeng & Edwards 2008b, Vaarzon-Morel 2008).
- Camels are considered both a pest and a resource (Edwards et al. 2008), which can lead to conflicting goals between the various stakeholders in respect of their management.

3. First steps: the Camel Action Plan Workshop

In 2004, the NT Department of Infrastructure, Planning and Environment applied for funding through the National Feral Animal Control Program to conduct a workshop focusing on developing a coordinated and strategic program to manage the impacts of feral camels. The application was supported by the SA Department of Environment and Heritage, the Qld Department of Natural Resources and Mines, and the WA Department of Agriculture. The application was successful.

The workshop was held on 13–14 April 2005 and was attended by a small but representative group of stakeholders with an interest in the management of feral camels (including government land management agencies, relevant non-government organisations, and land managers).

There was general consensus among the workshop participants that the key to successfully managing the impacts of feral camels lay in the implementation of the following recommendations:

Recommendation 1. Development of an integrated national approach to feral camel management involving collaboration and promoting attitudinal changes. This would require coordination across various jurisdictions and stakeholder groups.

Recommendation 2. Identification and protection of key assets currently or likely to be affected by feral camels (species/sites/infrastructure).

Recommendation 3. Clarification of environmentally ‘acceptable’ camel population levels across a range of situations.

Recommendation 4. Clarification of how and where the camel ‘industry’ can contribute to feral camel management.

4. Cross-jurisdictional management of feral camels to protect NRM and cultural values project

4.1 Development of the project proposal

In February 2005 the Desert Knowledge Cooperative Research Centre (DKCRC) submitted a project proposal titled ‘Cross-jurisdictional management of feral camels to protect NRM and cultural values’ to the Australian Government. The project bid was successful, and funding was announced in June 2005. The contract between the DKCRC and the Australian Government was signed in February 2006.

4.2 Aims and objectives of the project

Edwards et al. (2004) noted that to date the management of feral camels has been ad hoc, with little impact on existing populations. It is this issue that this project aimed to address through a collaborative, cross-jurisdictional approach that would meet the following objectives:

1. Identify the issues surrounding the management options relating to the management of camels.
2. Prioritise these issues for their potential ability to deliver significant NRM outcomes, taking into account economic, environmental, and social (including cultural) criteria.
3. Develop focused applied research to address the issues identified.
4. Establish pilot field projects and monitoring and evaluation programs for existing field-based projects, to establish the impact of harvest and culling actions on camel populations and camel impacts on natural and cultural heritage.

4.3 Project administration and delivery

As a key partner in the DKCRC, the NT Department of Natural Resources, Environment, The Arts and Sport (NRETAS) offered to lead the project. A steering group was formed to oversee delivery of the project. The Steering Committee was established, and individuals were invited to become members of the committee on the basis of the skills they brought to the project rather than a representative structure.

The Steering Committee is currently comprised of 12 members from different jurisdictions (Commonwealth, NT, SA, WA, and Qld), drawn from a range of different stakeholders (Government, NRM managers, Aboriginal communities, the pastoralist industry, the camel industry, and the DKCRC). The current membership of the Steering Committee is shown in Table 1.1. Within NRETAS, the project work was coordinated and implemented by the project leader, the project officer, and the project support officer (Figure 1.1). Components of the project were delivered through research teams external to NRETAS through contracts with external organisations arranged through the DKCRC (Figure 1.1).

Table 1.1: Past and present membership of the Steering Committee

Name	Title and Affiliation	Membership period
Andrew Drenen	Regional Land Management Officer, Central Land Council (CLC), NT	Since December 2005
Frank Keenan	Acting Manager (Land Protection Policy, BioSecurity Queensland), Department of Primary Industries and Fisheries, Qld	Since January 2008
Glenn Edwards (Project leader)	Principal Scientist (Biodiversity Conservation), Northern Territory Department of Natural Resources, Environment, The Arts and Sport (NRETAS)	Since December 2005
John Gavin (Chairman)	General Manager, South Australia Arid Lands Natural Resources Management Board, SA	Since December 2005
Lorraine Rosenberg	General Manager, Alinytjara Wilurara Natural Resources Management (AWNRM) Board, SA	Since December 2005
Murray McGregor	General Manager (Research), DKCRC	Since December 2005
Neil Burrows	Principal Scientist, Western Australia Department of Environment and Conservation, WA	Since December 2005
Peter Seidel	Executive Officer, Central Australian Camel Industry Association, NT	Since December 2005
Phil Gee	Senior Consultant (Animal & Plant Control – Large Feral Herbivores), Rural Solutions, SA	Since September 2007
Quentin Hart	Acting Program Leader (Biosecurity and Statistical Sciences), Bureau of Rural Sciences, ACT	Since December 2005
Robin Mills	Pastoralist, Warragarine Station, WA	Since March 2007
Tony Pople	Acting Manager (Emerging Environmental Pests, Invasive Plants and Animals, Biosecurity Queensland), Department of Primary Industries and Fisheries, Qld	September–December 2007
Troy Coe	Livestock and Pastoral Officer, APY Land Management Council	Since May 2008

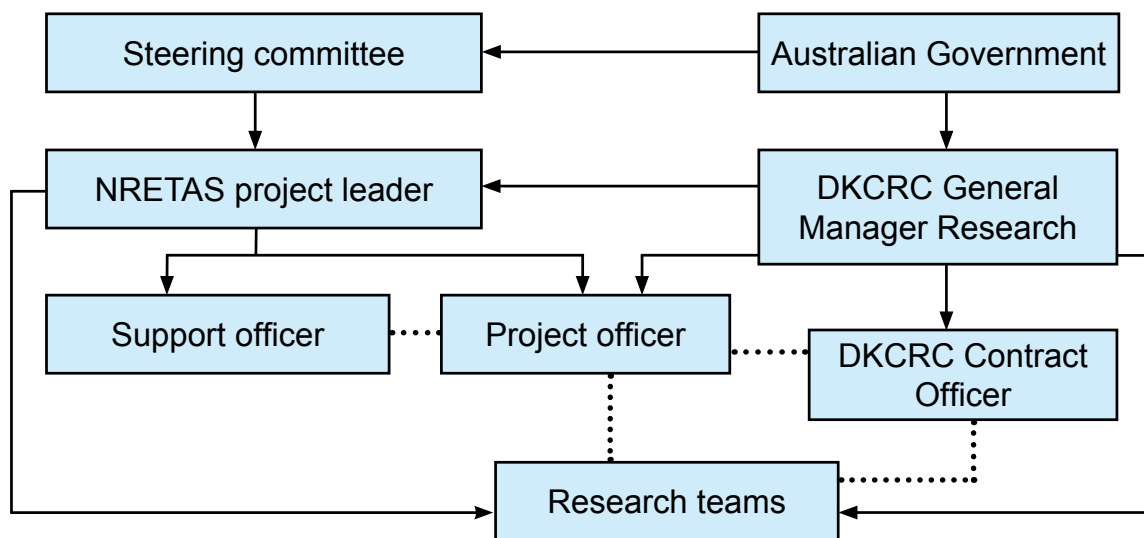


Figure 1.1: Schematic diagram showing how the project was administered and delivered

4.4 Components of the project

The research aims and objectives set for the project were achieved through a group of well-integrated sub-projects, based on a collaboration between different stakeholder groups, in a range of jurisdictions, working on a series of related projects across the country. The project had five core sub-projects:

1. Evaluation of key stakeholder perceptions: This work focused on Aboriginal, conservation, and pastoral land owners and managers within the camel's range.

2. Evaluation of the impacts of feral camels: This work adopted a triple bottom line approach in considering economic, environmental, and social (including cultural) criteria.
3. Evaluation of commercial approaches that could assist in the management of feral camels: This work considered aspects such as the live export of camels and the use of camels for pet meat and for human consumption.
4. Evaluation of the non-commercial approaches that are or could be used to manage feral camels: This work considered aspects such as aerial culling, ground culling, and fencing. A review of possible chemical, biological, and fertility control options for managing camels was also conducted by a research team based at the Invasive Animals Cooperative Research Centre.
5. Development of a framework for the cross-jurisdictional management of feral camels: In developing the framework, the following tasks were undertaken: (a) the compilation of spatial data relevant to the management of feral camels, and (b) development of a Multiple Criteria Decision Support system based on a Geographic Information System (GIS) for the cross-jurisdictional management of feral camels.

The following additional work was undertaken for the project:

1. A review of legislation to identify possible barriers to the cross-jurisdictional management of feral camels: Stephen Garnett, based at Charles Darwin University, led this research team.
2. Modelling of management options for management of feral camels in central Australia: Stephen McLeod, from New South Wales Department of Primary Industries, and Anthony Pople, from Queensland Department of Primary Industries and Fisheries, undertook this work.
3. An economic analysis of camel control in the central region of the Northern Territory: Adam Drucker, from Charles Darwin University, undertook this work.

6. Products of the project

This report brings together all of the elements of the research undertaken. The report has the following structure:

Chapter	Author
1. Background to the project	GP Edwards
2. Ecology of feral camels in Australia	WK Saalfeld and GP Edwards
3. Key stakeholder perceptions of feral camels: pastoralist survey	B Zeng and GP Edwards
4. Key stakeholder perceptions of feral camels: conservation manager survey	B Zeng and GP Edwards
5. Key stakeholder perceptions of feral camels: Aboriginal community survey (abridged)	P Vaarzon-Morel
6. Review of legislation and regulations relating to feral camel management (summary)	R Carey, M O'Donnell, G Ainsworth, S Garnett, H Haritos, G Williams, GP Edwards, M McGregor, and B Zeng
7. Evaluation of the impacts of feral camels	GP Edwards, B Zeng, and WK Saalfeld
8. Review of non-commercial control methods for feral camels in Australia	WK Saalfeld and B Zeng
9. Review of commercial options for management of feral camels	B Zeng and M McGregor
10. Economics of feral camel control in the central region of the Northern Territory (summary)	AG Drucker
11. A Multiple Criteria Decision Support Tool for feral camel management	WK Saalfeld, GP Edwards, B Zeng, and D Lamb
12. Synthesis and key recommendations	GP Edwards, M McGregor, B Zeng, WK Saalfeld, P Vaarzon-Morel, and M Duffy

In addition, the following research reports support the findings presented in this report:

McLeod SR and Pople AR. 2008. *Modelling management options for management of feral camels in central Australia*, DKCRC Research Report 48. Desert Knowledge CRC, Alice Springs.

Vaarzon-Morel P. 2008. *Key stakeholder perceptions of feral camels: Aboriginal community survey*, DKCRC Research Report 49. Desert Knowledge CRC, Alice Springs.

Carey R, O'Donnell M, Ainsworth G, Garnett S, Haritos H and Williams G. 2008. *Review of legislation and regulations relating to feral camel management*, DKCRC Research Report 50. Desert Knowledge CRC, Alice Springs.

Lapidge SJ, Eason CT and Humphrys ST. 2008. *A review of chemical, biological and fertility control options for the camel in Australia*, DKCRC Research Report 51. Desert Knowledge CRC, Alice Springs.

Drucker AG. 2008. *Economics of camel control in the central region of the Northern Territory*, DKCRC Research Report 52. Desert Knowledge CRC, Alice Springs.

Lamb D and Saalfeld K. 2008. *A multiple criteria decision support framework for the management of feral camels*, DKCRC Research Report 53. Desert Knowledge CRC, Alice Springs.

The following report was produced to provide an overview of the project:

Edwards GP, Zeng B, Saalfeld WK, Vaarzon-Morel P and McGregor M (Eds). 2008. *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>

The following publication was produced by the project and used extensively during the evaluation of stakeholder perceptions, particularly in respect of Aboriginal stakeholders:

Tangentyere Landcare. 2006. *The Camel Book*, Reprinted by the DKCRC 'Cross-jurisdictional Management of Feral Camels' project, with support from the Australian Government.

5. References

Australian Pest Animal Strategy: a national strategy for the management of vertebrate pest animals in Australia. 2007. Natural Resources Ministerial Council, Canberra.

Edwards GP, Saalfeld K and Clifford B. 2004. Population trend of feral camels in the Northern Territory, Australia, *Wildlife Research* 31, 509–17.

Edwards GP, Zeng B and Saalfeld WK. 2008. Evaluation of the impacts of feral camels. In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 133–182. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>

Saalfeld WK and Edwards GP. 2008. Ecology of feral camels in Australia. In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 9–34. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>

Saalfeld WK, Edwards GP, Zeng B and Lamb D. 2008. A Multiple Criteria Decision Support Tool for feral camel management. In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 287–330. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>

Vaarzon-Morel P. 2008. Key stakeholder perceptions of feral camels: Aboriginal community survey (abridged). In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 79–124. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>

- Zeng B and Edwards GP. 2008a. Key stakeholder perceptions of feral camels: pastoralist survey. In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 35–62. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>
- Zeng B and Edwards GP. 2008b. Key stakeholder perceptions of feral camels: Conservation manager survey. In: GP Edwards et al. (Eds), *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC Report 47. Desert Knowledge Cooperative Research Centre, Alice Springs. pp 63–78. Available at <http://www.desertknowledgecrc.com.au/publications/contractresearch.html>