

# Outcomes of the Australian Feral Camel Management Project and the future of feral camel management in Australia

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## Overview

The 2010 Special Issue of The Rangeland Journal 'Managing the impacts of feral camels' (Vol. 32(1)) reported on the outcomes of Desert Knowledge Cooperative Research Centre (DKCRC) work. These outcomes included information on feral camel demography, distribution and impacts, land manager attitudes to feral camel impacts and management, relevant legislation and policy, control options and the economics and trade-offs of different management strategies. Importantly, the DKCRC work provided specific recommendations about management strategy and feral camel density targets to reduce impacts to specific levels. The rigor and comprehensiveness of the DKCRC project report, 'Managing the impacts of feral camels in Australia: a new way of doing business' (Edwards *et al.* 2008), was acknowledged by the Australian Government with key recommendations of the report being accounted for in the 2008–09 Caring for our Country Business Plan (Commonwealth of Australia 2008).

The DKCRC work emphasised the importance of collaboration across industry sectors, land tenures and even jurisdictions to effectively manage a species as mobile as feral camels. Recognising this, Ninti One Ltd (a national not-for-profit company that builds opportunities for people in remote Australia through research, innovation and community development, Ninti One Limited 2016) developed a national feral camel management project proposal with 18 original collaborating organisations (which became 19 collaborating organisations later in the project). The collaboration estimated that \$56 million over eight years was required to reduce the feral camel population to an acceptable level. The eventual level of core Australian Government funding that was allocated to the revised project was \$19 million over four years. The project became known as the Australian Feral Camel Management Project (AFCMP) and ran from 2009 to 2013. This Special Issue documents the achievements of the AFCMP.

These two Special Issues provide an excellent example of the value of applied research driving policy and funding allocation and guiding management. In turn, comprehensive management-based monitoring undertaken during the AFCMP

has improved our level of knowledge and this will play an important role in future feral camel management.

The first ten papers in this Special Issue are grouped into three themes: (i) AFCMP establishment and engagement, (ii) Feral camel removal, and (iii) Feral camel impacts. The final paper summarises the outcomes of the AFCMP and considers the future of feral camel management in the absence of a coordinated national project.

## AFCMP establishment and engagement

The first four papers are related to the important foundational issues of establishing the rationale for such a large project, developing national collaboration and governance and engaging with key land managers.

Woolnough *et al.* (2016) summarise some of the DKCRC work that made the case for urgent nationally-coordinated action to halt and reverse the increasing feral camel population trajectory in the Australian rangelands. They outline relevant national strategies and plans that further supported the justification for the AFCMP. The Australian Pest Animal Strategy (2007) included an action to develop management plans for Established Pest Animals of National Significance (EPANS) and this helped provide the impetus for the development of the National Feral Camel Action Plan (NFCAP) (Australian Government, Department of Sustainability, Environment, Water, Population and Communities 2010). Although the NFCAP was unfunded, the AFCMP incidentally addressed many of its objectives, notwithstanding that some of the objectives (e.g. mitigation of feral camel impacts) will require ongoing attention beyond the AFCMP.

Hart and Bubb (2016) describe the diverse collaboration under the AFCMP and the importance of providing avenues for formal and informal contact and as much face-to-face contact as project budgets allow. Under the AFCMP, it was important to establish forums for intra-jurisdiction as well as inter-jurisdiction discussion. It was important to involve project collaborators in decision-making rather than just consulting them. Clear investment guidelines avoided ongoing debate about what could

and couldn't be funded under the project. The involvement of the main project funder (the Australian Government) in the governance structure circumvented miscommunication about contractual obligations and gave it a better appreciation of the operational challenges of such a project.

Kaethner *et al.* (2016) discuss the different perspectives of Aboriginal land owners about feral camel management. In 2009, most Aboriginal communities were becoming increasingly concerned about the impact of feral camels on wetlands, road and airstrip safety and even community infrastructure when mobs of camels occasionally congregated at artificial water sources near buildings. While there was generally an initial preference to remove feral camels in a way that didn't waste the resource, commercial use was neither logistically nor economically viable in some areas and/or wouldn't have achieved an adequate level of population reduction. The options for feral camel management were discussed with individuals and communities in a series of formal and informal discussions. This process can take a long time and needs to be accounted for in project proposals.

Digby *et al.* (2016) report that there was a relatively consistent view about feral camel management among pastoralist land managers, with the majority supporting aerial culling as a way to achieve a rapid reduction in population across a large area. Although it is difficult to place a value on competition for feed between livestock and feral camels, mobs of camels moving through a pastoral property can result in a large infrastructure repair bill with damage to fences and waterpoints. Pastoralist engagement included representation on intra- and inter-jurisdictional forums as well as direct contact with pastoralists that had a significant feral camel problem. Pastoralist intelligence about feral camel numbers and movements was important in guiding removal operations and pastoralists provided important ground support for aerial operations.

### Feral camel removal

Commercial use is an important component of an integrated approach to feral camel management and was the form of management (due to landholder preferences) for a large part of the Surveyor Generals Corner region (around the junction of Western Australia, South Australia and the Northern Territory) under the AFCMP. However, it has some major logistical and economic challenges and is not suitable for all areas of the feral camel distribution. Virtue *et al.* (2016) discuss some of the issues around the commercial use removal option, and outline the 'removal assistance' model that aimed to maximise the rate of commercial removal under the AFCMP, particularly in areas where landholders did not consent to aerial culling.

Although around 25 000 feral camels were removed through commercial use under the AFCMP, the majority (around 130 000) were removed through aerial culling. Unlike commercial use, aerial culling has the advantage of being able to cover large areas quickly and being able to remove all sighted animals, regardless of their body condition. It is not as infrastructure dependent as commercial use which requires access to yards, loading ramps, trucks and good roads. Edwards *et al.* (2016) describe some of the key considerations in planning and conducting aerial culling operations and explain how the AFCMP provided a valuable

opportunity to test and refine equipment and methods which will benefit future management of all large feral herbivores in the Australian rangelands.

Pest animal management needs to be increasingly justified on animal welfare grounds. Although aerial shooting is considered to be one of the most humane control methods, it was important for the AFCMP to demonstrate this through a series of independent veterinary assessments. There was also one veterinary assessment of a commercial use operation. Hampton *et al.* (2016) present the results of these assessments and discuss the lessons learned about the respective removal methods as well as about the assessment approach itself.

The main contracted performance indicator for the AFCMP was the achievement of feral camel density targets around nominated environmental assets. The verification process for this was through aerial surveys. While this is not an exact method, Lethbridge *et al.* (2016) report on a reasonable level of agreement between pre- and post-AFCMP aerial surveys versus known numbers of feral camels removed between the surveys. Nonetheless, the paper discusses a range of ways that the accuracy and precision of aerial surveys and density assessment could be improved.

### Feral camel impacts

Land manager surveys conducted under the DKCRC work (Edwards *et al.* 2008) provided a rough estimate of some of the economic costs (mainly infrastructure damage and control costs) of feral camels. However, the focus of the AFCMP was on reducing the environmental impact of feral camels and to assess this, intensive pre- and post-removal monitoring was undertaken for remote woody vegetation and waterholes that were likely to be impacted by feral camels. To avoid adverse impacts on woody plant populations, Brim Box *et al.* (2016a) suggest that camel densities should be maintained at 0.25 camels km<sup>-2</sup> or less over as much of inland Australia as possible.

Deriving a density threshold to avoid unacceptable feral camel impact on remote waterholes is complicated by the fact that even in regions of relatively low feral camel density, feral camels can congregate in large numbers around remaining water sources during dry conditions. Brim Box *et al.* (2016b) document the range of ways in which feral camels impact on rangelands waterholes. While they do not propose a feral camel density threshold to minimise such impacts, it would be prudent to aim for the density target of 0.1–0.2 camels km<sup>-2</sup> proposed by Edwards *et al.* (2008) to reduce the frequency and intensity of potentially damaging feral camel congregations.

### AFCMP outcomes and the future of feral camel management

The final paper (Hart and Edwards 2016) in this Special Issue highlights the key achievements of the AFCMP, with more detail being provided in the project final report (Ninti One Ltd 2013). Importantly, the comprehensive management-based monitoring that was in place throughout the project has advanced our knowledge of feral camel impacts and management significantly from where it was at the time that the 2010 Special Issue on feral camels was published.

The AFCMP developed improved capacity for all forms of feral camel management and the 2015 snapshot of feral camel management in relevant jurisdictions (Hart and Edwards 2016) indicates that governments and land managers are keen to maintain at least some of the momentum of the original project – which was only ever intended to be the first step in a more coordinated and intensive approach to feral camel management.

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