

Integrated management of feral camels in Ngaanyatjarra Aboriginal Lands, Australia

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Introduction The Ngaanyatjarra Lands comprise about 250,000 km² of Western Australia's arid zone and are home to approximately 2,000 people across 12 communities, with cohesive cultural indigenous practices and lifestyles meeting western issues, influences and values.

Feral camels *Camelus dromedarius* in Western Australia's arid zone are estimated to number 50,000 (Lethbridge 2007); in the Ngaanyatjarra lands, this translates to about 18,000 camels. The population increases by about 10% each year.

Ecological impacts of camels include depletion and contamination of natural water points (rock holes, rivers and lakes), competition with native fauna for water and fodder and denuding of specific flora, notably some "bush tucker" species.

Economic impacts are considerable as camels destroy infrastructure in search of water. Outstation bores are damaged at the rate of approximately 20 per year and community comes under pressure during the driest times.

Public safety is at continual risk as camels often severely degrade the surface of otherwise high quality, unsealed roads, by creating pits to lie in the cool dust under shady trees. There is also substantial risk of vehicles striking camels at high speed. Health of residents is affected by faecal pollution of pools of water in which children play.

Materials and methods A variety of camel mitigation methods is being employed. These include limiting access to water holes and water points as well as conversion of outstation bores to hand pumps, so that water is only present when it is required. Camels are provided with water to divert them away from more areas of more sensitive ecology and infrastructure. Active camel control methods are two-fold: local consumption and bulk export for pet food.

For local consumption, young, mature bulls and cows are shot. Legs and fillets are removed *in situ* and taken to a refrigerated storage/work room, where they are skinned and hung, then butchered into final product. This facility is not commercially certified, so the meat cannot be sold; instead it is distributed among community residents free of charge. This operation always involves the employment of indigenous community residents at every step in the process.

The pet food harvest is a private operation, taking about 100 camels per week. Legs and necks are taken to refrigerated storage until each load is freighted to Perth, WA. Unused portions of carcasses are left *in situ*. Potential adverse effects of this process, eg smells, fly, fox, wild dog and feral cat outbreaks have not yet, nor are likely to occur, due to the low density and frequency of animals killed. Further, any burial or removal of carcasses may drive operating costs to uneconomically viable levels and would provide ingress of weeds to this pristine desert habitat. The community is paid a commission of 5c per kg and at least indigenous community resident is offered full time employment at any time.

Results and discussion Actions to mitigate camel impacts by manipulating access to water do work, but merely shift impacts to other areas and delay the inevitable issues that will come with the constant, exponential growth in the camel population. Real solutions to economic, social and ecological problems lie in methods that lead to a significant reduction in camel numbers.

The program is removing camels at about 4,000-5,000 per annum. This rate could see camels reduced to background levels within about five years, although it will inevitably take longer, dependent on other regions developing complementary programs. Involvement of indigenous community residents in both harvesting programs generates employment, improves peoples' skill bases and demonstrates the advantages of enterprising behaviour, adding to employment options for Australia's indigenous desert people.

Conclusions The current operation will continue until camel numbers dwindle to the point where it becomes unsustainable. Beyond that, it is expected that background levels will remain so that camels can still be harvested for human consumption, perhaps somewhat ironically becoming included with other "bush tucker" that they currently threaten.

Reference

Lethbridge, M. J. 2007. *2007 Camel Survey of South Australia and Western Australia*. Flinders University, South Australia.