

From pest to resource: the prospects for financial returns to landholders from commercial kangaroo harvest

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Contents

Abstract. Australia's larger species of kangaroos are a resource of significant value to remote and rural Australia. The wild harvest of kangaroos for meat and skin markets contributes to the sustainability of rangeland landscapes and communities. The potential of kangaroo harvest to contribute to improved land condition through lowered stocking rates of domestic livestock and reliance on the harvest of kangaroos as on-farm income has been argued in the literature for nearly two decades but not taken up by landholders. During qualitative research exploring the social issues and institutions of the kangaroo industry in South Australia, we sought landholder views on kangaroo management and the potential for kangaroos to provide financial returns. In contrast to prevalent misconceptions within the industry that landholders view kangaroos as a pest and that the industry is doing them a favour, we found that landholders value kangaroos as a resource and are interested in developing options for securing financial return from commercial kangaroo harvest. There are a number of practical issues to be addressed before utilising kangaroos as an income source for pastoral enterprises becomes reality including securing property rights and increasing the value of kangaroo products.

Keywords: commercial kangaroo harvest, grazing pressure, pastoral enterprise, financial returns

Introduction

Kangaroos are harvested commercially for meat and skin markets across much of Australia's rangelands where livestock grazing is the main land use. The harvest originated in response to excessive grazing pressure exerted by escalating populations of the larger species of kangaroos, beneficiaries of the introduction of multiple water points for livestock in a previously dry landscape and dingo control measures (Shepherd and Caughley 1987; Calaby and Grigg 1989). Developing from its earliest conception as a pest control program (Kirkpatrick and Amos 1985), the commercial kangaroo harvest is now a significant rangelands industry that directly employs approximately 4 000 people and contributes over $200 million per year to the Australian economy (Kelly 2005). With few alternative economic opportunities other than livestock grazing, and to a lesser extent tourism, present in the rangelands, the ongoing activities of the kangaroo industry are important to the sustainability of the rangeland communities.

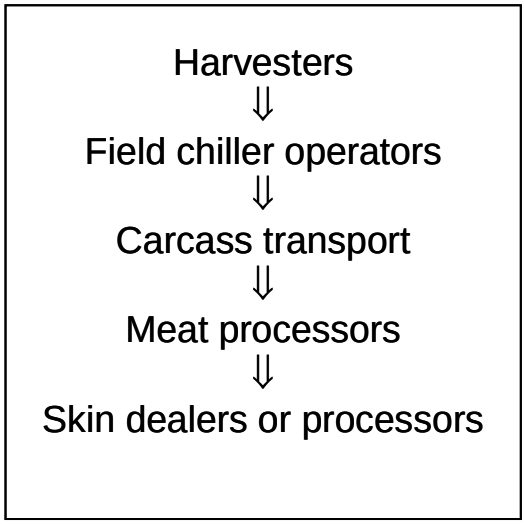
Like other native species, kangaroos are under the protection and management of State Governments with varying functions and responsibilities between different States according to legislation. Despite some differences in State legislation, all States that include commercial harvest as part of their kangaroo management strategy1 utilise a quota system to regulate the number of kangaroos harvested annually. Harvest quota allocations are based primarily on kangaroo population estimates, determined by annual aerial survey, and are usually set at between 15% and 20% of the estimated population depending on the particular species (SA DEH 2002). The management system for the harvest, is 'user pays' in that it is funded by royalty payments to the State Government regulatory body collected through the sale of 'sealed tags'. In South Australia individual landholders are allocated species specific quotas for their properties based on population estimates and land systems

[1] Queensland, New South Wales, South Australia, Western Australia and Tasmania are the Australian States that include commercial harvest in kangaroo management strategies.

information, but the tags are purchased by meat processors who then supply the tags to kangaroo harvesters. The numbered tags that must be attached to each harvested kangaroo are specific to species and property where the kangaroo was harvested (SA DEH 2002). The tag system identifies that kangaroos have been legally harvested and is important to the ability of the commercial kangaroo industry to demonstrate maintenance of sustainable harvest levels.

Landholders are arguably the most important stakeholders in the kangaroo industry. They are at the very base of the industry supply chain. It is the continued activities of landholders that maintain the suitable habitat and access to water that supports high kangaroo populations across much of the rangelands. However, landholders are not currently valued industry stakeholders. The Kangaroo Industry Strategic Plan 2005-2010 (Kelly 2005) does not include landholders in the description of the structure of the industry or the product flow chart (reproduced below, Figure 1).

Figure 1. Kangaroo industry product flow chart



The research [2] being reported on in this manuscript has explored the social and institutional factors that impact on the commercial kangaroo industry in South Australia. The aim of this research was to improve understanding of the range of issues that encompass the social, cultural and economic parameters that affect harvest decisions and contribute to the sustainable development of the commercial kangaroo industry. This paper reports specifically on landholder engagement with the kangaroo industry.

Methods

Our research examined social and institutional aspects of the commercial kangaroo harvest using data collected in three case study regions that reflect geographic factors and social issues that may impact on kangaroo harvest activities. The three case study regions (see Map 1) are described below:

1. Port Augusta region: Inside the dog fence (that excludes wild dogs from sheep grazing country), close proximity to a major regional centre, mostly small to medium sized pastoral leases ranging from 337km2 to 2304 km2.

2. Northern Flinders Ranges region: Inside the dog fence, sheep grazing country with some cattle grazing, intermediate distance from a major regional centre, mix of large and small pastoral leases ranging in size from 178km2 to 4144km2.

3. Marla/Oodnadatta region: Outside the dog fence, cattle grazing country, long distance from a major regional centre, large pastoral leases ranging from 2349km2 to 7169km2.

The location of the study regions may be observed in Map 1 (Appendix).

In-depth, semi-structured interviews were conducted with landholders from up to ten properties in each case study region, the kangaroo harvesters who conduct harvest activities on the properties and the kangaroo meat processors who receive the product from harvesters. The content of each interview varied according to the key kangaroo management issues individual research participants wished to bring forward. Topics of discussion generally included communication and relationship networks, decision-making processes, economic factors and the regulatory environment of the commercial harvest.

Managing total grazing impact

Total grazing impact is the combined effect of all herbivorous grazers, including livestock, native animals and feral animals. In the arid rangelands, kangaroos make a significant contribution to total grazing impact (McLeod 2004). A number of studies have examined the impact of kangaroo grazing on native vegetation regeneration (Gardiner 1986; Norbury and Norbury 1993; Norbury et al. 1993). Results show that sites protected from livestock and kangaroo grazing pressure contain greater species diversity and vegetative biomass than sites where livestock is excluded but kangaroo grazing occurs.

[2] This research was funded by the Rural Industries Research and Development Corporation under the Resilient Agricultural Systems program.

Page and Beeton's (2000) grazing trials in the mulga lands of south-west Queensland confirmed previous findings by showing that kangaroo grazing pressure limited regeneration of native grasses in areas excluded from livestock grazing.

Furthermore, Wilson (1991) points out that there is strong evidence to suggest that kangaroo grazing is usually concentrated in paddocks spelled from livestock. Nearly all landholders that participated in this study discussed the problem of kangaroos moving into spelled paddocks and the implications for management of total grazing pressure. Overall, the contribution of kangaroo grazing to total grazing pressure in Australia's rangelands provides a strong case for managing kangaroo abundance.

Landholders interviewed during this study stated that the commercial harvest of kangaroos is critical to their ability to manage total grazing impact on their properties, as illustrated by the following statement:

"The roo shooter keeps the numbers down to a certain level because otherwise overgrazing would be a big problem." Landholder

Landholders and rangeland experts (see for example, Cunningham 1981; Chapman 2003; Hercock and Tonts 2004) recognise that the commercial harvest of kangaroos, conducted by professional, licensed kangaroo harvesters, is the most effective and humane means of managing kangaroo grazing impact. Some commentators have argued that in the absence of a commercial kangaroo industry, landholders would choose cheap but effective methods for reducing local kangaroo populations which may not be the most humane or sustainable options (Cunningham 1981; Gibson and Young 1987). Our research supports this argument. Most landholders interviewed stated that if commercial harvest were discontinued for some reason, they would employ other methods to manage the grazing impact of kangaroos. One landholder explained in detail a cheap but effective method of poisoning large numbers of kangaroos at water points. Others stated that, in the absence of commercial harvest activities, they might invite recreational, amateur shooters to cull overabundant kangaroos. Such alternatives to commercial harvest are inhumane and non-selective. The commercial harvest utilises licensed and skilled marksmen who assess the sex, weight and age of potential targets prior to harvesting selected animals by a single shot to the head from a high-powered rifle. The current system of regulated commercial harvest remains the most humane method of managing kangaroo populations while making important contributions to rural communities.

Industry contributions to sustainable rangeland environments and communities

It has been argued that the kangaroo industry has strong support in rural and remote Australia (Kelly 2003) which is not surprising given the significant social, ecological and economic contributions that the industry makes to rangeland communities and environments. Research participants described how the industry contributes to the viability of rural and regional areas, as summarised below:

1. Human and social capital. Some landholders and harvesters pointed out that skilled labour is a scarce resource in the rangelands. Harvesters often contribute to property operations by checking water supplies and fences. Harvesters are often also skilled in other trades as electricians, welders, plumbers or station hands. They make significant contribution to the human capital available in rural and regional communities. Some harvesters raise their families in the rural area where they conduct harvest activities and the presence of these families can help the community in many ways. For example, boosting pupil numbers at the local school may ensure a rural school remains open.

"*The industry does put extra people into the bush that wouldn't be there if there was no kangaroo industry. The most valuable resource on pastoral properties is manpower. And it can bring women and children out here too."* Harvester

2. Economic impacts. The kangaroo industry contributes to the economic capital of rural areas through the local purchase of fuel, food and other consumables by harvesters and transport companies. The revenue injected into rural communities can have a significant impact on small business operators who rely on local trade to keep their business afloat (Gerlach 2003). Some small towns in western Queensland and western New South Wales attribute their continued social and economic viability to the commercial kangaroo industry (Wilkie 2003). Informal contact with small business operators during field work suggest that economic activity of the kangaroo industry is similarly important to South Australian rural and remote towns.

"Take the roo shooters out of Lyndhurst and that would have a big impact on the community. The kangaroo industry is significant for Lyndhurst and other rural

towns in South Australia, like Port Augusta." Landholder

3. Ecological importance. Research participants said that the kangaroo industry has environmental benefits through contributions to good land condition. As we have discussed in the previous section, this view is supported by research. Landholders said that kangaroo harvest assists the management of total grazing impact in two main ways. Firstly, when localised rain results in new plant growth, or 'green pick', that attracts an influx of kangaroos, the kangaroo harvester is able to respond to that situation promptly and significantly reduce the impact of short-term kangaroo overabundance.

"After a thunderstorm, roos can be a big problem. If the shooter doesn't come in straight away then they'll just eat the area out and leave no feed for stock." Landholder

Secondly, commercial kangaroo harvest is a mechanism that acts to reduce the impact of the boom and bust nature of kangaroo populations (Hacker et al 2004). Research participants said that in harvested populations there are fewer kangaroos die during times of hardship and at times of resource abundance the population is less inclined to become superabundant.

"My personal attitude is that I would never like to see [kangaroos] disappear but I would like to see them in conservative numbers so the species is protected and is healthy, but the boom bust situation is not good." Landholder

Landholder values

We challenge the frequently iterated and commonly held belief that landholders consider kangaroos are pests (Hornadge 1972; Shepherd 1983; Cairns and Kingsford 1995; Grigg 2002). This was true in the past, when large scale kangaroo hunts were an ugly reality (Hornadge 1972). However, our research suggests that the attitude of landholders towards kangaroos are now different, at least in our study regions. Of twenty-one landholders interviewed for this study, only one classified kangaroos as a pest and six stressed that kangaroos are not a pest at all. Most landholders (14 of 21) conceded that kangaroos can be a 'pest' at times, but also stated that this is only when populations are overabundant. It was more common for landholders to use words such as 'nuisance' or 'problem' to describe kangaroos. These words were almost always accompanied by the clarifier 'at times'. The following quote typifies the view of the majority of landholders interviewed:

"At times kangaroos are a problem, when they come in big mobs because they can do a lot of damage, like knock down fences and make it impossible to conserve feed." Landholder

We have found that landholders generally do not consider kangaroos a pest because they can manage the impacts of overabundant kangaroos through commercial harvest. Landholders believe that kangaroos have economic value and they value the fact that kangaroos allow a second party to make a living from the pastoral lease.

Landholders discussed the value that they attribute to kangaroos. Almost all landholders acknowledged both the instrumental value of kangaroos (for producing meat and leather) and intrinsic value (their 'right to exist'). An illustration of the value landholders place on kangaroos is in the dismay expressed by landholders who manage properties located close to the Flinders Ranges National Park where the South Australian Department for Environment and Heritage periodically culls large numbers of kangaroos without utilisation of the carcasses. They, and many other research participants, particularly Aboriginal people and harvesters, feel that culling kangaroos is a waste of a valuable natural resource (Thomsen and Davies 2005). We conclude that landholders value kangaroos as a resource, rather than seeing them as a pest.

Kangaroo harvest as an income source for pastoral enterprises

In the current economic climate of low financial returns to primary producers, land managers in the rangelands are advised to diversify their business operations in order to spread their risk and increase opportunities for financial gain (Cock 1992; ANZECC and ARMCANZ 1999; Hunt 2003). However, they face the challenge of finding ways to use the land that increase the potential for economic return while remaining within the ecological limits of the rangelands and within the conditions of the pastoral lease. For example, ecotourism is a diversification option that meets these criteria and has been employed with some success in regions such as the Flinders Ranges where there is consumer demand for the product. In more remote areas where tourism is less likely to bring significant financial returns, the commercial harvest of kangaroos has the potential to deliver financial supplement to pastoral operations (Choquenot et al 1998).

The commercial harvest of kangaroos has long been proposed as an opportunity for landholders in Australian rangelands to realise value form wildlife. Gordon Grigg of

the University of Queensland has been the prominent advocate. Grigg (1987) argued that overgrazing by domestic stock has proved detrimental to the long-term ecological health of the rangelands. He encouraged landholders to value and commercially exploit the kangaroo as 'sheep replacement therapy for rangelands'. Grigg (2002) continues to argue that significant financial returns for landholders from the commercial harvest of kangaroos will result in greater emphasis being placed on providing suitable habitat for kangaroos, a reduction in sheep stocking rates and benefits for the land.

However, after nearly two decades of writing on the topic Grigg's (1987; 1995; 2002) proposal for improvements to the sustainable management the rangelands is yet to be embraced by landholders and land managers. We asked landholders why kangaroos have not yet replaced domestic livestock as the main income source for pastoral enterprises. Landholders see that there are potential environmental benefits. However, they identified two main practical impediments to replacing the income stream from sheep with kangaroo harvest: the question of property rights in kangaroos and the potential for kangaroos to provide significant monetary returns.

Property rights in kangaroos

The need to address the issue of property rights in kangaroos has also been raised in the literature (see for example Wilson 1996, McCallum 1995, Grigg 1995, Chapman 2003). The reason for landholder concern about secure property rights from an economist's perspective is that economic value comes from the ability to exclude others from use (Tisdell 1995). Kangaroos are harvested for the commercial market from wild populations that are mobile across a region and it is the mobility of kangaroos that compounds the problem of excludability.

"How do you control them? You might have this nice mob of roos that are going really well then you have a thunderstorm 150 miles away then they're gone." Landholder

Grigg (1995) gave some consideration to the issue of property rights in kangaroos. He acknowledged that some conservation groups are opposed to ownership of wildlife being transferred to individuals and that landholders are reluctant to base a significant portion of their earning capacity on a wild animal that they do not own (see also Chapman 2003). Grigg (1991; 1995) suggested that the tag system may provide the answer to the concerns of both groups. He proposed that tag allocation to individual properties based on localised population density would afford landholders greater scope to make decisions about how the quota allocated to their property is accessed. The basic idea addresses the problem of transferability because in theory landholders could employ kangaroo harvesters, sell their tags to kangaroo harvesters or meat processors, or enter in to contractual arrangements with industry operators.

South Australia reformed its kangaroo management program in the mid 1990s. From 1996 it began to allocate quota at the property level along the lines that Grigg (1991; 1995) advocated (Alexander 1997). South Australia remains the only State that allocates quota to individual properties. The reforms aimed to promote an enhanced role for landholders in kangaroo management and introduced the notion of trading harvest rights. The option of trading was effectively a market based instrument that gave landholders who had little or no need for commercial harvest on their properties the option to sell quota to those who needed to harvest more. However, trading of kangaroo quota never became established amongst landholders. This is not surprising since landholders did not know much about it and there was no mechanism, or 'market place', for trading. Furthermore, a representative of the Attorney-General's Department told the 2002 Annual Kangaroo Management Meeting held in Port Augusta that under South Australian law it is not legal to transfer kangaroo tags between different parties. The property level quota allocation in South Australia was not well designed or implemented and it failed to provide landholders with the ability to trade quota or to realise significant financial returns from kangaroo harvest.

Financial returns possible from kangaroo harvest

Landholders also discussed the financial return possible from kangaroos. We found that they need to be sure of financial returns equivalent to their current sheep or cattle production systems if they are to change them. They pointed out that sheep have dual income generating capacity – meat and wool. This contributes to the financial return from one sheep is being far greater than potential returns for one kangaroo. Based on current prices paid to kangaroo harvesters, one harvested kangaroo returns a gross margin to the harvester of approximately $16.00[3].

[3] Based on 20kg average weight and average SA price of 80c per kg.

"You've got to look at the situation right now, where a merino ewe is probably worth $100. OK, she'll produce a lamb, she'll cut a clip worth $40. So kangaroos have really got to be worth that at least, otherwise, why? You wouldn't do it." Landholder

In South Australia, there are a few harvesters and meat processors who make payments to landholders for access to kangaroos of typically $1.00. This return to landholders is not significant given an average annual harvest quota at the property level will be between 500 and 8,000 kangaroos depending on property size. Kangaroo harvesters stated that they are not able to make large payments to landholders based on their current costs and returns. Figure 2 shows the gross profit for a sample of harvesters using figures provided by harvesters during interviews. The mean gross profit for this sample is approximately $47,000 per annum (See Figure 2 – Appendix).

Landholders had mixed views on whether payments should be made to them for kangaroos harvested from their properties. Only five (of 21) said that no payment should be made to landholders. Others (9 of 21) stated that they would like a financial benefit should the industry be in a position to provide it. But some (7 of 21) strongly held the view that there they should receive financial returns. The reasons that they use to justify this view include the maintenance of healthy habitat through the provision of water and feed. This view is in direct contrast to the position of meat processors and some harvesters who state that they are doing landholders a favour by removing overabundant kangaroos. This view suggests that landholders are undervalued by industry operators when in fact it is a situation of mutual need and benefit. Kangaroo harvesters and meat processors derive financial gain from the harvest of kangaroos on pastoral properties in the rangelands, while landholders benefit through the reduction in total grazing pressure on the property.

Although most landholders support the concept of receiving payment for kangaroos harvested from their properties, there is a realisation that such payments will come from the pockets of kangaroo harvesters, the stakeholder with least power and tight economic margins. In South Australia, where there is one kangaroo harvester per property, close relationships develop between landholders and harvesters. Our research shows that landholder concern for the ongoing economic viability of individual harvester enterprises make it unlikely that the majority of landholders will seek financial returns in the short term. This finding is consistent with the findings of research conducted in Queensland by Chapman (2003) who concluded that although landholders believe that they should receive financial return for kangaroos harvested from their properties, they also believe that kangaroo harvesters cannot afford to pay.

Markets for kangaroo products

Grigg (2002) adds another perspective to the issue of securing financial returns for landholders. He argued that the low price of kangaroo meat is a significant hurdle. With up to 70 per cent of harvested kangaroo products used only for pet food (Kelly 2005) there is a need for greater utilisation of kangaroo meat for human consumption. Consumer acceptance of kangaroo as a healthy and tasty product is gradually gaining momentum, evident in the twenty year average growth rate of 7% per annum (Kelly 2005). This is at least in part due to the health benefits of eating kangaroo meat receiving positive media attention in recent years by highlighting the high levels of protein, iron, zinc and healthy fats in comparison with other red meats (Domico 2000; CSIRO 2004). Furthermore, there is growing demand for gourmet products internationally. Kangaroo meat is currently exported to over 55 countries with the major export markets being Europe and Russia (Commonwealth of Australia 2005). While kangaroo products remain underpriced on global markets in comparison with beef and lamb, kangaroo is a growing niche market (Hercock and Tonts 2004). A shift from pet food trade to majority human consumption could go some way towards rectifying low product value of kangaroo (Kelly 2003). Whether increased financial returns for meat processors and wholesalers actually results in increased returns for harvesters and financial return to landholders remains to be seen.

Securing financial returns from wildlife for landholders

Several southern African states have been encouraging sustainable commercial use of wildlife for some 40 years. In Zimbabwe, South Africa, Namibia and Botswana landholders have rights to use wildlife on their land for the production of wild game meats, safari hunting and other tourism activities (Muir-Leresche & Nelson 2001). In South Africa once private land is fenced with game-proof fencing the animals within the fence become the private property of the landholder. This requires 10 foot high fences made of 12 strands of high-tensile wire (Anderson 2004).

African experience is that when wildlife began to be privatised its economic value to landholders became clear. Benefits for wildlife conservation followed with increases in diversity and abundance of wildlife on private lands (see for example, Barrow et al 2000; Abbot et al 2000). Cattle ranching, an economically marginal activity in the southern African rangelands, has also benefited from the increased profitability in ranches that have established mixed cattle-wildlife enterprises (Muir-Leresche & Nelson 2001).

We found that no participants in this study were interested in establishing complete private ownership of kangaroos such as would enable them to ranch or farm kangaroos. But it could be implemented in Australia in a similar way to game ranching in some African countries. This would require landholders to invest in high-cost kangaroo proof fencing that contains populations on their properties. Commercial opportunities from kangaroo farming are likely to be more constrained than those from game ranching in eastern and southern African rangelands. This is because African rangelands support a diverse suite of large mammal species that allow landholders to sell a range of meat products, tourism and recreational hunting experiences. Landholders' return on investments in kangaroo-proof fencing would almost certainly be lower than that from fencing African game ranches because of the more limited range of products, if not also because of the lower productivity of Australian rangeland ecosystems. The prospect of kangaroo farming also raises a suite of other issues that are outside the scope of this paper. These include the impact on kangaroo population genetics of isolating a kangaroo population on a farm, and the impact of fencing on mobility of populations of kangaroos outside the farm. Prior to embracing the South African example there is a need to carefully examine costs and returns and give consideration to the factors listed above.

In the absence of a private property regime for kangaroos as occurs in South Africa, there are other ways that landholders can realise financial returns from kangaroos. This could happen by landholders themselves working as harvesters. However landholders we interviewed do not see this as a realistic option because there are high set-up costs and harvest activities are conducted during night hours which makes them unavailable for work on the property during the day.

One South Australian landholder, whose pastoral enterprise is located in prime kangaroo country, believes that it is possible to tender access to his property for harvest to the highest bidder. By tendering access rights to harvest on a particular property rather than attempting to sell the tags allocated to the property the problem of non-transferability of tags is overcome. This option has potential for landholders who have large holdings and it could also be applied to smaller properties where landholders are willing to work together to form cooperatives. The essential element is in delivering bargaining power to landholders through holding significant kangaroo grazing country where kangaroo harvesters find relatively easy access to harvestable kangaroos. In this way the maintenance of suitable habitat for kangaroos becomes an important part of on-farm management and benefits for land condition and biodiversity conservation may also be realised.

There is also potential for landholders to seek financial equity from the kangaroo industry by becoming involved in paddock to plate processing of harvested kangaroos. For example, the Mutooroo Pastoral Company established a processing works in Adelaide to process, market and distribute products from kangaroos harvested on properties owned by the company (Hoy 2001). A similar venture was also trialled by a consortium of landholders in western New South Wales near Tilpa (Ampt 2005 pers comm). Although both of these schemes have since ceased to operate, current work from the FATE (Future of Australia's Threatened Ecosystems) program is exploring ways to deliver financial returns to landholders from kangaroo harvest. FATE is currently working with landholder groups in two areas of New South Wales to develop more strategic and profitable landholder engagement with the kangaroo industry. These trials could pave the way for other landholder groups interested in financial benefits from participation in the kangaroo industry.

Conclusions

Securing financial returns to landholders from the commercial harvest of kangaroos is not currently possible given the absence of private property rights to the resource and low financial returns in comparison with domesticated livestock. Landholders participating in this study certainly value kangaroos as a resource, challenging the common misconception that landholders view kangaroos as a pest. The view of some harvesters and meat processors that 'we're doing them a favour' is constraining attempts to secure financial returns. The true situation is one of mutual need- the kangaroo industry needs landholders and landholders need the kangaroo industry. However landholder

participation in the industry is currently undervalued. There is a need for landholders in Australia's rangelands to be accepted as a participant of value and importance in the kangaroo industry. This could help pave the way for significant financial returns to landholders from kangaroos, particularly as the industry is experiencing continued growth that can be expected to be increased or at least maintained.

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Appendix:

Map 1 Areas where this study was conducted

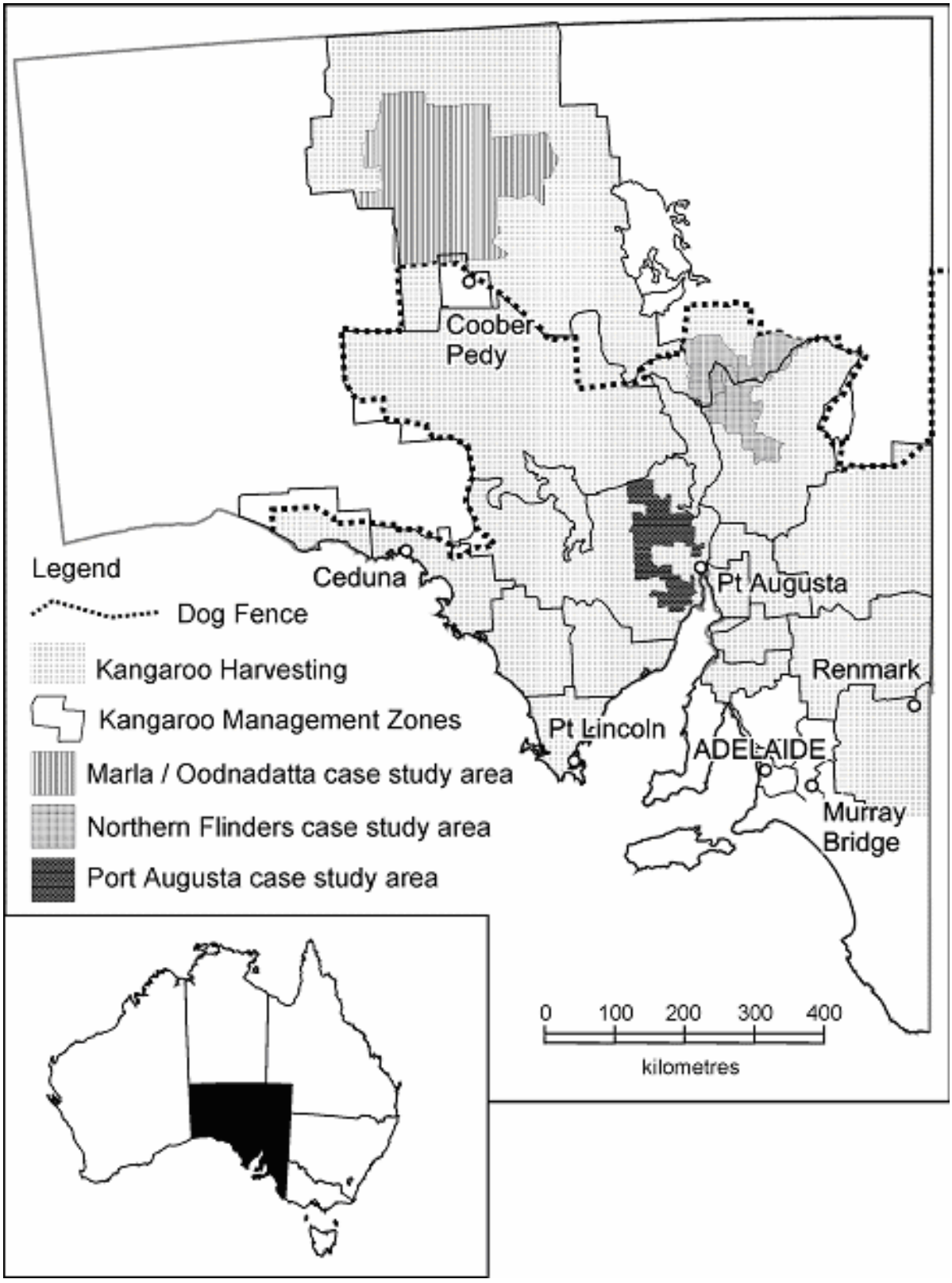
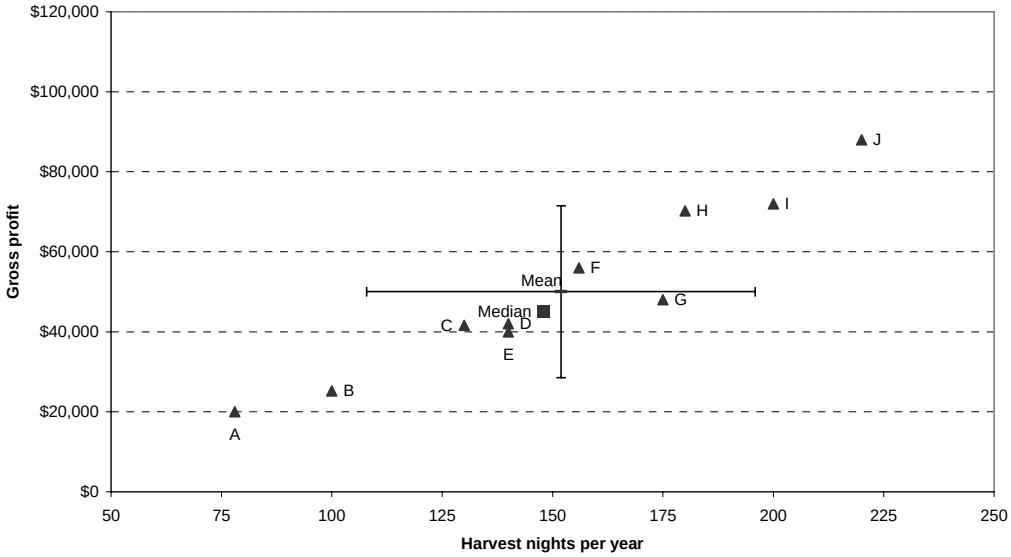


Figure 2 Mean gross profit for a sample of kangaroo harvesters



Calculated from data provided by 10 harvesters. For this sample the average number of kangaroos harvested per year was approximately 6,000 and the average cost to harvest each kangaroo was approximately $8.00. Sales = 80c per kg x 20 kg average carcass weight.