

# Kangaroo Harvesting and the Conservation of Arid and Semi-Arid Rangelands

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It may sound unlikely from a conservation-minded biologist, but since June 1987 I have been advocating a marketing drive to increase the selling price of meat from Australia's three large species of kangaroos. My argument is that, if this were to happen, there would be a revitalization of Australia's overgrazed semi-arid lands, less illegal killing of kangaroos by inexpert shooters, and, in the long term, improved conservation of kangaroos by conserving their prime habitat.

Australia needs new ideas to solve two major rural problems, land degradation and the kangaroo dilemma. The kangaroo harvesting idea offers some hope of solving both these problems, and the idea has been attracting a lot of favorable attention within Australia. It was recently the subject of a major conference sponsored by the Royal Zoological Society of New South Wales (Lunney & Grigg 1988).

Before expanding on the harvesting proposal, let me explain the two problems, land degradation and the kangaroo dilemma.

Land degradation is regarded as Australia's worst rural problem. According to a recent survey by the Commonwealth Scientific and Industrial Research Organization, Division of Soils, more than 25% ( $1.85 \times 10^6$  square kilometers) of the continent is degraded from overgrazing by domestic stock, particularly sheep. One quarter of that area (432,000 square kilometers) is at risk of becoming permanent desert. As 30% of Australia has an annual rainfall of less than 200 mm and can be recognized already as natural desert, more than one-third of the remainder is now threatened. Significantly, most of our large kangaroos live in these degraded grazing lands.

The kangaroo dilemma is complex. There is a problem because of the public conflicts that arise from the large kangaroos' being simultaneously perceived as both

sacred cult objects and serious pests to agriculture. Kangaroos are the symbol of Australia and therefore are of important totemic significance to Australians. Because of their beauty and elegance and, particularly, their spectacular hopping gait, they are among the world's most loved and admired animals. Yet they are regarded as pests whenever and wherever they occur in vast numbers, competing with domestic stock for food and water and damaging fences. A recent report estimates that, in some years, each kangaroo costs the landholder about \$20 in lost revenue. Hence, relevant Australian governments license the annual killing of about 3 million red, eastern gray, and western gray kangaroos, for pest control. This is undertaken by a restricted kangaroo industry that markets the hides and the meat, mainly for pet food, up to an annual quota, which is based on annual population surveys. Apart from kangaroos killed and taken by the industry, kangaroos outside the commercial zones are killed on "destruction permits" given to landholders to reduce their pest problem. These animals may not enter trade and are usually left to rot in the paddocks. Many more are killed without permits, and it is claimed that much of the illegal killing is carried out by inexpert shooters, often for "sport," posing an animal welfare problem.

Opponents of the kangaroo industry are vocal both nationally and internationally, mainly on ethical grounds, claiming that kangaroos may not be as serious a pest as graziers claim, that the industry is rife with cruelty to kangaroos, that it is morally wrong to have an industry based on native wildlife, and that the industry is not effective at pest control because it focuses on the larger, male animals. Some claim, despite all the evidence to the contrary, that the kangaroo industry is threatening kangaroos with extinction. The kangaroo

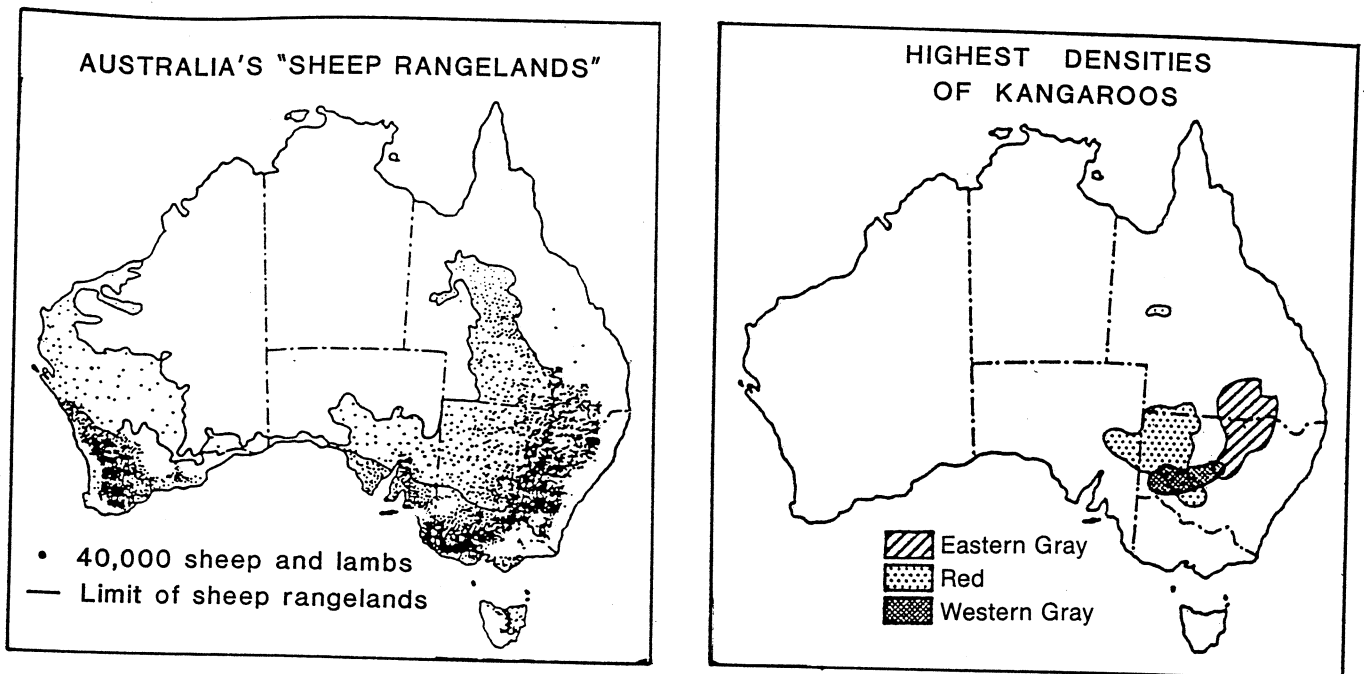


Figure 1. Australia's "sheep rangelands" (enclosed within the solid line) carry only 15% of the national sheep population, but more than half of the red, western gray, and eastern gray kangaroos. This article argues that a reduction in sheep numbers within the sheep rangelands would lead to an increase in kangaroos, improvement in the vegetation, and a reduction in soil erosion. An increase in the market value of kangaroo products would provide a mechanism for this, by making the replacement of sheep by kangaroos an economically attractive proposition, leading to environmental rehabilitation. Thus, a renewable resource (kangaroos) can be used to save a nonrenewable resource (the habitat). Source: Maps derived and modified from G.J. Caughley et al., 1987, "Kangaroos: their ecology and management in the sheep rangelands of Australia, Cambridge University Press.

debate is long running, always emotional, and often heated. The present status quo leaves a lot to be desired and we should be striving for an improved system of kangaroo management that enjoys consensus support and gives kangaroos a better deal.

Let us turn to the harvesting proposal. Since June 1987 I have been promoting this for public discussion because I think it addresses both land degradation and the kangaroo problem. In a nutshell, the idea is that we should undertake a marketing drive for kangaroo products, raising the price to such an extent that graziers will find it worthwhile to reduce their traditional hard-footed stock in favor of free-range kangaroos. I argue that this point of view deserves the support of conservation-minded people — not only because it offers the hope of rangeland revegetation and recovery, but also because it addresses all of the major problems perceived by opponents of the present kangaroo management practices, including the animal welfare concerns.

My interest stems from experience since 1975 in aerial surveys of the three species of large kangaroos. I began to get very restless in 1982 about the misinformation being spread by opponents of the kangaroo industry who claim that the big kangaroos are being threatened with extinction. We have plenty of informa-

tion showing how abundant all three species of large kangaroos are, and it was being (conveniently) ignored. So in 1984 I wrote an article in the Australian Museum's quarterly *Australian Natural History*, in which I presented the results of aerial surveys and reviewed the numerical and ethical aspects of the kangaroo debate (Grigg 1984). I also made then the rather tentative suggestion that we should be considering the idea of kangaroos as a resource rather than a pest. The article stirred up a bit of a hornet's nest in some quarters, but was well received for the most part. The aerial survey data got publicity in other ways too, and gradually it has become accepted in Australia that there really are plenty of kangaroos and that the populations are not threatened by harvesting. Overseas, however, organizations such as Greenpeace still trumpet the myth that kangaroos are threatened with extinction, choosing to ignore the facts because it suits them. I think Greenpeace did a lot of good for whales and does a good job in many areas, but is quite wrong about kangaroos.

Apart from knowledge about the size of kangaroo populations, the aerial surveys also gave me a close-up view of the extent of habitat degradation in our semi-arid lands. These so-called "sheep rangelands" are chenopod shrublands, which occupy about 20% of the con-

inent. Here are found about 15% of our sheep and *most* of our kangaroos (Fig. 1) — about 20 million sheep and at least 10 million kangaroos. After thousands of hours flying over it at low level on aerial surveys, the strongest impression I am left with is the huge impact of hard-footed, hard-feeding sheep on the landscape. It is difficult to find a scene on which the imprint of hard hooves is not clearly visible. The vegetation has been ground underfoot, exposing the fragile ancient soil to wind and water erosion. Soil has filled in the creeks, which now flow under the sand. Compaction of the soil (the sheep's-foot-roller effect) has changed the drainage properties of the soil, modifying its suitability for plant growth. Where trees remain, the understory has been mostly replaced by bare earth. The ground is crisscrossed by a maze of anastomosing tracks, and hills have become stepped horizontally with winding footpads. Whatever your perspective, habitat degradation is a disaster. We must do something about it.

And now there is a new threat. Sheep grazing in many parts of the rangelands is said to be only marginally profitable and there is increasing interest in intensified farming of goats, which now run feral throughout the area. If intensive goat farming becomes established, we can expect much of the sheep rangeland, already barren and overgrazed, to take the final step into desert.

What can be done? Clearly the salvation for this habitat would be the removal, or at least the significant reduction, of sheep in much of the rangelands. This will not happen unless there is some alternative (or significant supplementary) economic base, and I believe that kangaroos can provide that base.

Kangaroos, unlike sheep and goats, have evolved in the Australian habitat, are soft-footed, and do not take the grass as low down when they feed. Further, most seeds pass undamaged through kangaroos, whereas sheep grind seeds and so destroy the seed "bank."

In my view, all that is needed to bring about a significant reduction in sheep numbers is a solid, well-organized marketing drive for kangaroo products. Agricultural economists have estimated that a three- to fourfold increase in the price of kangaroo meat would make "farming" kangaroos economically attractive. At present, a typical sheep property might have 6000 sheep and 3000 kangaroos. The grazier raises the sheep deliberately and the kangaroos inadvertently. Paradoxically, instead of selling the kangaroos, he gives them away to the local kangaroo shooter and is glad to have them gone. If the price of kangaroo products were to rise, it would not take long for graziers to take an interest. If the price rose enough, such interest could overtake that in sheep. Graziers would soon realize that numbers of kangaroos can best be increased by decreasing numbers of sheep, to the benefit of their own land and the whole ecology of the shrublands.

Two important assumptions behind this proposal are

that the populations of kangaroos are sufficiently resilient to sustain regular harvest and that the meat and leather are good enough products to support a big increase in price. More than 100 years of experience show that kangaroos can sustain a substantial annual harvest. Data collected by John Robertshaw and Robert Harden at the University of New England, from records from all the "kangaroo states," led them to conclude that direct killing by man has had little overall effect on the numbers and distribution of the large kangaroos. As an example, 20 million bounty payments were made on kangaroos in Queensland between 1877 and 1906, when such payments ceased. This was an average of 660,000 bounties per annum. Pest destruction and commercial harvesting continued unabated, yet between 1954 and 1987, in the same state, an annual average of 730,000 kangaroos was harvested. Similar examples could be given for other states. Quite apart from that long experience with "harvesting," for more than a decade now the populations have been the subject of extensive and regular aerial surveys, which provide a good index of changes in abundance. Over that period we have seen good seasons and we have seen droughts, with kangaroo numbers rising and falling in response to the availability of grass. Throughout that decade, more than 2 million kangaroos have been harvested each year (about 10% of the total population), but there has been no indication of any long-term downward trend in numbers.

What about the value of the meat and leather? The leather has always enjoyed spirited demand because of its strength and suppleness. It is in the meat, however, that there is potential for a big increase in price. Perhaps because of the traditional perception of kangaroos as pests and because it has always been a traditional food item among aborigines, white Australians have had a dim view of eating kangaroo. This is, however, changing rapidly. In most states, the sale of kangaroo meat for human consumption is prohibited, even though consignments are regularly inspected, passed fit, and exported overseas. The prohibition on local sale probably exists because beef and lamb producers fear competition. In South Australia, however, the sale is legal, and more than 150 restaurants list kangaroo dishes. What began as a novelty item a few years ago is rapidly becoming established as a routine item on menus. Well-selected steaks, cooked properly, are as tender as the tenderest beef, distinct in flavor, yet not so different as to be off-putting. Kangaroo meat also makes excellent roast, kebabs, and stew, and kangaroo-tail soup is a delicacy. Not only will the flavor and texture support a higher price for kangaroo meat, but it has less than 2% fat and most of that is polyunsaturated. No other red meat comes close, from a nutritional point of view. It really is the red meat you *can* eat.

Other Australian states are now reviewing the regulations. I think a three- to fourfold price increase is a

very conservative goal. When demand rises, so should price when supply is limited. And please note that my proposal does *not* advocate any increase in the proportion of kangaroos presently taken.

But how can a conservationist argue for an industry based on the killing of wildlife? In this case, I believe, very easily, because there are compelling arguments for the proposal, even apart from those related to halting the spread of deserts.

For one thing, to conserve abundant and widespread populations of kangaroos, the maintenance of habitat is mandatory. The highest densities of red, eastern gray, and western gray kangaroos all occur in the sheep rangelands (Fig. 1). If this area continues to be pushed toward desert, it will not be to the long-term benefit of kangaroos.

There are also important animal welfare arguments. Traditional opponents of the kangaroo industry always express concern about cruelty, yet what I am proposing is a harvest of free-range animals, which live as free, wild creatures — unhindered, unhampered, and not owned by any individual. The ones who are shot, at night, in the head, will not even hear the bullet that kills them. To quote Dr. David Butcher of the Royal Society for the Prevention of Cruelty to Animals, "paddock slaughter of animals unaware of danger is an advance over the techniques currently used with domestic animals" (Butcher, in Lunney & Grigg 1988). In the same paper, Butcher listed nine other "positive animal welfare" benefits that would accompany the scenario I have outlined.

Some advantages flow directly from the prediction that, under this proposal, the current pest status of kangaroos will be altered forever. No longer would the rural community tolerate illegal shooting of kangaroos by weekend or casual and inexperienced shooters. No longer would graziers conduct illegal "drives" in which kangaroos are rounded up and shot by inexperienced shooters, often in daylight and often with shotguns. No longer would waterholes be poisoned to reduce kangaroo numbers. Kangaroos would simply be much too valuable. The size of the present annual illegal kill is completely unknown. Some estimates make it as large as the legal kill, which is 3 million or so, but nobody knows.

What *is* known is that, if the illegal killing stops, the killing of kangaroos will become the province of only the skilled professional. The number of animals that die in inexperienced hands would fall dramatically, probably to near zero. In my view, all considerations argue strongly in favor of the proposal.

Valerius Geist recently made a case against giving dead wildlife value (Geist 1988) claiming that it was to the detriment of wildlife. That may be true in many, even most, cases. It is not true for kangaroos. None of Geist's examples even came close to paralleling the situation for kangaroos. Australia allows no legal sport shooting of any of the kangaroo species or any other native mammal, and I am not proposing active husbandry or farming in the conventional sense. Furthermore, there are few other animals for which there is such an extensive base of population data, plus 100 years harvesting experience to draw upon. Generalizations such as Geist's are always useful, but each case must, in the end, be judged on its own merits.

In my opinion, the manifold conservation and animal welfare merits of the case for a careful, controlled harvest of free-ranging kangaroos warrant thoughtful consideration by conservationists, graziers, agricultural economists, land managers, and the community in general.

#### Literature Cited

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