

Game farming in South Africa as a force in conservation

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There are perhaps 7000–10,000 farmers in South Africa who derive some income from game farming. They sell the meat, sell live animals to other farmers, allow hunters to shoot animals for trophies, or allow tourists onto their land for game viewing. The system has benefits for both wildlife and the farmers, and it is tempting to assume that similar results could be obtained in other African countries. But is it that simple?

The commercial use of wildlife is morally unacceptable to some people, but others appreciate its potential benefits. It can benefit the human population by providing meat or income from otherwise unproductive land, and it can also benefit wildlife. Not only is such sustainable use in accordance with the aims of the World Conservation Strategy, but it can also be a positive force promoting species and habitat conservation. How effective it is remains to be evaluated.

The spectrum of commercial exploitation ranges from uncontrolled hunting of wild populations at one extreme to intensive domestication at the other. Somewhere in the intervening shades lies the expanding industry known as 'game farming' in southern Africa. Projects to domesticate antelope, such as at the Galana Ranch in Kenya, have received much publicity, but it is in South Africa, Namibia and, to a lesser extent, Zimbabwe that the industry has undergone the greatest development.

This account relies heavily on the South African experience, although in many respects the country is atypical of Africa. Most land is privately owned, fenced, and is, or has been, used for

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grazing domestic stock or for arable crops. Game populations were severely depleted early this century by hunting and agricultural pressure. The country's long history of farming also means that there is now little 'unproductive' land. Even the drier regions of the Karoo are used for sheep, albeit with much lower stock densities than in the more favourable areas.

What is game farming?

Game farming, as exemplified by practice in South Africa, is a loose term embracing many different types of exploitation of varying intensities. A few farms in South Africa are given over exclusively to game, but more often game animals coexist with domestic stock. Some farmers tolerate or actively encourage game animals on their properties purely for aesthetic reasons; others have more commercial interests. There are four main ways to generate income from game: cropping and sale of the meat, or venison as it is normally termed; hunting, by paying clients; live animal sales to other game farmers; and game viewing, where facilities are offered to visitors to view or photograph game. Hunting can be further subdivided into safari or trophy hunting, in which the client, usually from overseas, pays for shooting large, mature animals and keeps only the trophy (horns, skull, skin etc.), the meat being a minor consideration; and local, or biltong, hunting in which the client, usually a South African, shoots surplus stock primarily for meat for his own consumption. These different types of exploitation can be found in all possible permutations.

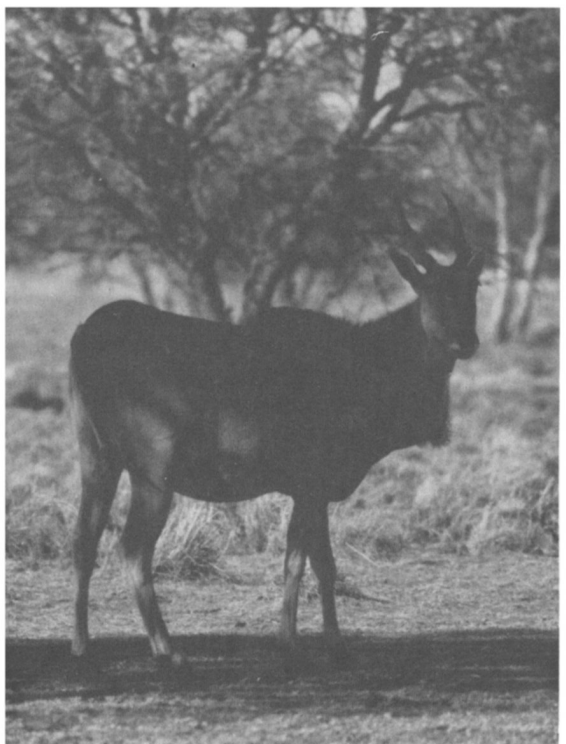
The species used depend on their local abund-

ance and the type of market. The last full census of game in South Africa was undertaken in 1971, and the numbers of the five main commercial species were 269,000 springbok *Antidorcas marsupialis*, 4720 eland *Taurotragus oryx*, 96,700 blesbok *Damaliscus dorcas phillipsi*, 349,300 impala *Aepyceros melampus* and over 17,550 kudu *Tragelaphus strepsiceros* (Skinner, 1973).

In addition, there are appreciable numbers of gemsbok *Oryx gazella*, black wildebeest *Connochaetes gnou* and red hartebeest *Alcelaphus buselaphus*, especially in the drier regions of the Northern Cape, Orange Free State and Western Transvaal. Blue wildebeest *Connochaetes taurinus* are widespread and nyala *Tragelaphus angasi* are locally important in Natal and the Eastern Transvaal. Several other species such as mountain reedbuck *Redunca fulvorufula*, steenbok *Raphiceros campestris*, common duiker *Sylvicapra grimmia*, bushbuk *Tragelaphus scriptus*, zebra *Equus burchelli* and wart hog *Phacochoerus aethiopicus* are widespread, but not extensively used commercially. Rarer species such as white rhino *Ceratotherium simum*, buffalo *Syncerus caffer*, lion *Panthera leo*, giraffe *Giraffa camelopardalis*, bontebok *Damaliscus dorcas dorcas* and sable antelope *Hippotragus niger* are economically very important for trophy hunting. Most privately owned land in South Africa is fenced at least with standard 1.4-m jackal-proof stock fence, which makes non-jumping species, such as springbok, blesbok and red hartebeest effectively captive (Jooste, 1983). Jumping species such as kudu, eland and impala require a fence of 2.3 m, and so, except on game-fenced farms, their populations are more mobile.

How many game farms are there?

It is difficult to estimate the number of 'game farms' in South Africa, not least because of the problems of definition. Conroy and Gaigher (1982) define game farming as 'the economic use of game within the farm confines', and, even if this is accepted, official figures, if available, are hard to interpret as the legislation in the four provinces and the statistics collected differ widely. In Cape Province, 1148 landowners were licensed to make use of game commercially in 1982 (Jooste, 1983). This is approximately 10 226



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Left, top: Nyala (R.A. Luxmoore).
 Left, bottom: Eland (R.A. Luxmoore).
 Above: Impala (R.A. Luxmoore).

per cent of landowners and accounts for 26 per cent of private land (Colvin, *in litt.*). In Transvaal, there were 528 registered game farms in 1983 (P. Millstein, pers. comm.), although Young (1975) estimated that there were over 3000 farms commercially exploiting game in 1975. This disparity probably reflects the fact that many farmers derive some income from game without officially holding game-farm status. It is estimated that 3200 landowners in Orange Free State use game in some way, but mostly on a very limited scale (OFS Department of Nature Conservation, *in litt.*). Natal has 30 registered game ranches; 205 other farmers derive some income from game on mixed stock farms and a further 1028 landowners, grouped into 81 'conservancies', practise co-operative protection and management of wildlife (Rowe-Rowe, 1984).

The number of registered game farms is a poor indicator of the extent of commercial game exploitation. Orange Free State was the largest exporter of venison in 1981/82, but has the smallest number of registered game 'reserves', the only category of game usage that is officially licensed. It is tentatively suggested that there may be between 7000 and 10,000 farmers deriving some income from game in the whole country.

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The products of game farming

The traditional use for game in South Africa, apart from a little home consumption of meat, was to dry it and sell it as biltong. The internal market for fresh venison has never been great, and it was not until 1972 that it was exported to the lucrative and extensive market in West Germany (Conroy and Gaigher, 1982). Since then, the pattern of game use has changed radically and it is now generating large financial returns. During 1980/81, 1446 tonnes of venison were exported from South Africa, earning an estimated R8 million in foreign currency (Jooste, 1983). There has been a similar expansion in interest and investment by the farming community and the game populations have undoubtedly grown (Skinner, 1975; Bigalke, 1984; Fairall, 1984). Large sums have been spent in erecting game fences, and game animals for stocking new farms are regularly bought at auctions at high prices.

Cropping is probably the most widespread form of commercial use: on a small scale, it is usually conducted by shooting at night using spotlights mounted on a vehicle, but where larger numbers of game must be culled, helicopters are used. There were previously three culling contractors using helicopters, but by 1983 two had gone out of business. The surviving firm, Kovisco, operates five helicopters and a fleet of 25-tonne freezer trucks. The technique is particularly suited to the open land of the centre of the country, where there are large herds of blesbok and springbok, and some 50,000–60,000 of these are culled by the company each season (Van Zyl, 1983). The carcasses are processed in a central abattoir in accordance with veterinary health regulations for export. The economics of this enterprise are finely balanced and dependent on the price obtainable for venison; this fell dramatically from around R2.30 per kg in 1982 to R0.80 per kg in 1983 in response to reduced demand in West Germany. This caused a realization of the need to develop a more stable domestic market in South Africa (Visser, 1983). Cropping depends on the more common species: blesbok and springbok in Orange Free State and Northern Cape have already been mentioned, but impala are important in Transvaal and Natal, while kudu are abundant in the Eastern Cape. Less common



Blesbok (*R.A. Luxmoore*).

species may be sold in small numbers, often to the local hotel trade.

Trophy hunting relies on rarer species: the prices that clients are prepared to pay varies inversely with the abundance. The trophy fee for a springbok in 1983 was R90, while for a bontebok it was R700, for sable antelope R2800, and white rhinos attracted an average fee of R7060 (average figures compiled for 1982/83 by the Natal Parks Board). In addition to the trophy fee, the clients also pay a daily rate for accommodation, usually in the region of R400. The average trophy hunt in total costs approximately R9000, but if rarer species, such as elephant or white rhino, are involved this can rise to R20,000 (Kettlitz, 1983). Although trophy hunting uses very few animals, it generates a disproportionately large income and may well be the main source of profit from game on farms that offer it. Trophy hunting accounted for 35 per cent of the R12.5 million generated by game exploitation in Namibia in 1980 (Jooste, 1983).

Live animal sales may also be very lucrative. Farmers wishing to build up their game stocks must buy nucleus herds, either from the Provincial Parks or from other game farmers, the former usually being cheaper, as they try to encourage the introduction of game to suitable habitats. Prices are again related to scarcity, varying from about R50 for an impala to R2400 for an adult white rhino (Natal Parks Board game prices, 1983/84). Large numbers of antelope are usually captured by driving them into temporary funnel-shaped traps constructed of plastic sheeting with a crush at the end, but the rarer and larger animals may be captured by tranquillizer dart.

Game viewing is not widely exploited on private land as a commercial venture, but some proper-

ties do specialize in it. Well known examples are the luxury game lodges in the Eastern Transvaal, such as Mala Mala and Londolozi, where game viewing is used to attract custom to hotel or chalet accommodation. Glamorous species like lion, elephant and rhinos are particularly welcome on these properties.

Why do people farm game?

It is tempting to conclude from the growth in popularity of game farming in South Africa that it might be a highly lucrative activity, preferable to conventional agriculture. In fact, there is little evidence to support this view, and nearly all game farming merely serves as a financial supplement to the total income of the farm. At a meeting of the Game Committee of the South African Agricultural Union in September 1983, the members were asked if any of them derived their entire farm income from game. None did (A.A. Ferrar, pers. comm.). Colvin (1984) conducted a questionnaire survey of game farmers in the Cape Province and found that, out of 363 respondents, only four derived more than half their farm income from game, 24 derived 10–50 per cent, 96 less than 10 per cent, and 239 received only a 'minimal' financial contribution from game. A similar survey of 53 game farmers at the First National Game Congress found that seven derived over 75 per cent, seven between 50 per cent and 74 per cent, four between 24 per cent and 49 per cent, 28 between 1 per cent and 24 per cent, and seven derived none of their farm income from game (Anon., 1982). Certainly the maximum income can only be realized if the farmer exploits several or all of the potential uses of game, and many specialized game farmers also offer advice or contract services, such as culling or capture, to others. The difficulty in returning a

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Bontebok (R.A. Luxmoore).

profit from game alone has led many farmers to attempt to stock the game at excessive densities, which has resulted in veld degradation on 19 of the 30 such properties in Natal (Rowe-Rowe, 1984).

Mixed farming is therefore emerging as being both financially and ecologically more attractive. Collinson (1979) carried out an economic study of a farm that combined beef and impala production in Natal. He found that the beef enterprise produced a net profit of R2.80 per ha but, when combined with impala-cropping, this could be increased to R5.00 per ha. However, he pointed out that the impala production relied heavily on capital assets installed for the beef farm such as fences, watering points, farm buildings and transport. He further cautioned against the establishment of a farm using only impala on ecological grounds, predicting that serious habitat degradation would result. Figures have also been published for a mixed sheep and springbok enterprise in the arid Karoo region (Conroy and Gaigher, 1982). These show that the sheep contributed R8.57 per ha and the springbok R4.48 per ha. The presence of springbok did not seem to reduce significantly the number of sheep that could be kept per unit area.

Although there is economic potential for mixed game farming, the majority of the expansion in game populations took place before the development of the crucial venison export market (1972), and certainly before financial viability was proved. What then is the explanation for the rise in popularity of game farming? Bigalke (1984) has suggested that it has been caused primarily by aesthetic rather than economic motives: the farmers like having game animals on their properties and are proud of being able to boast a healthy game population. Colvin (1984) found

that 57 per cent of the game farmers he surveyed in Cape Province gave aesthetic reasons for keeping game animals. However, 52 per cent of farmers also carried out some commercial cropping at some time. Thus, although the primary reasons for embarking on game farming may be non-commercial, the importance of a potential economic return should not be underestimated in affecting a farmer's decision to introduce or preserve game.

Implications for conservation

As game farming is so widespread and involves so many species, it is clearly a force in conservation, whether beneficial or detrimental, that must be reckoned with. About 69 per cent of all land in South Africa is under private ownership (Conroy and Gaigher, 1982); as Rowe-Rowe (1984) pointed out, any programme to conserve wildlife in the country must include this land. He suggested the term 'farm game' to describe wildlife on private land, to include operations where commercial use does not take place, and which might not be included in 'game farming'. The numbers of farm game and the extent of their distribution have undoubtedly increased, partially as a result of planned introductions and also reduction of persecution. Species diversity has also benefited, especially where trophy hunting or aesthetic motives have been the driving force. Both create a demand for rare species, which are consequently introduced, often at great cost, and spectacular animals, such as gemsbok, sable and rhinos, are much sought-after. There is also a demand for exotic (non-indigenous) species, but the provincial Departments of Nature Conservation restrict such introductions by refusing to grant licences. Similar discouragement is given to the movement of native South African species

to habitats where they do not naturally occur or where they might interbreed with resident species or subspecies. Thus, bontebok may not normally be introduced to farms with blesbok, and *vice versa*. Veterinary health regulations may further restrict wildlife movements.

Predators have not increased to a similar extent, and many people feel that they have no place in the context of game farming, even if only because of complaints from neighbouring stock farmers. Exceptions to this are the game ranches of the Eastern Transvaal bordering on the Kruger National Park, where the presence of lion and leopard significantly enhance the commercial tourist potential of the properties (Varty, 1982). Thresher (1981) estimated the value of an adult male lion in Amboseli Park, Kenya, for attracting tourist income to be \$515,000. This was far in excess of the value of the same animal as a trophy and also easily outweighed its consumption of antelope meat as prey. The aims of game farming and conservation may similarly diverge with respect to smaller, non-economic species such as pangolins, aardwolf and rodents, whose populations may consequently suffer from exclusive encouragement of commercial species.

Natural habitat has also benefited from game farming. An attractive alternative to arable farming reduces the area of land put under the plough, and some game farmers actively encourage the return to natural vegetation for aesthetic reasons. This is particularly true where photographic safaris or trophy hunting are practised. Unfortunately, the often expressed view that game cause less habitat degradation than domestic stock has largely been disproved. The carrying capacity for wildlife is no greater than for cattle (Mentis and Duke, 1976) and, depending on the species mix, a lower density may be needed if severe overgrazing is to be avoided (Mentis, 1977; Rowe-Rowe, 1984). The concept of using unproductive land also needs closer examination. If the low productivity is due to poor vegetation, which will only support a low density of domestic stock, then it will also carry a low (normally lower in terms of biomass) density of wild ungulates. If, on the other hand, it is due to the absence of agricultural improvement—the lack of bush clearance, stock fencing or provision of watering points—then it may be possible to farm game

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there profitably with minimal capital investment and without having to disrupt the natural habitat. Endemic diseases such as trypanosomiasis, to which game animals are resistant, have also restricted agricultural development in the past. However, it is not true to say that game animals are resistant to all natural diseases, and Young (1975) has pointed out that they are continually threatened by epizootics such as anthrax and rinderpest.

Aesthetic appreciation and financial gain are both causes of the expansion of game farming, but they have very different implications for conservation. If game farming is undertaken for aesthetic reasons alone, it usually costs money, either in lost agricultural production or in capital outlay and running costs. It therefore becomes a luxury—and luxuries are not indulged in by poor farmers, and are the first to be dispensed with in times of hardship. Economic motives are harder to justify on moral grounds, but they are easier to 'sell' to farmers. The chief drawback of treating game farming purely as an economic venture is that it is then governed by market forces. If it becomes unprofitable, owing for instance to a fall in the price of venison, then there is a danger that it will be discontinued.

The future for game farming in other countries

In South Africa, the key to the industry is the system of land tenure (Conroy and Gaigher, 1982). Although it is technically impossible to exercise ownership over live game, in practice the landowner has exclusive legal rights over the disposal of game shot on his property (Greyling, 1984). This, coupled with the high degree of private land-ownership, means that many people have a proprietorial interest in game exploitation. Namibia and Zimbabwe are in a similar position, but the majority of land in other African countries is publicly owned. Extensive game exploitation programmes would, therefore, have to be state-run, and indeed there are already such schemes in several countries, including Burkina Faso, Ghana and Mozambique. The practicality of such programmes has yet to be demonstrated. The economics of South African game farming rely on trophy hunting, live sales and venison exports.

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The first of these can be practised almost anywhere, but live sales are dependent on other game farmers, and venison exports to the crucial European market can only take place from areas free from Foot-and-Mouth Disease. Most other countries in Africa have the disease and must, therefore, rely on local sales, which command a lower price, although Zimbabwe game farmers appear to subsist on trophy hunting and local venison sales. One large ranch earned over US\$200,000 from safari operations in 1982 and sold 40 tonnes of venison to local people at Z\$1 per kg (Pitman, 1984).

Earlier proponents of game farming suggested that, as the natural fauna had evolved in the African ecosystem, it could, therefore, be expected to thrive with little or no human intervention. However, experience in South Africa has shown that the management of mixed populations of grazing ungulates to maximize production and avoid habitat damage is complex and requires a high level of administrative management. Fairall (1984) predicts that game farming will never be a way of obtaining food by unsophisticated means.

In many ways, game farming appears to have benefited the conservation of large ungulates in South Africa. There are, however, possible adverse effects from translocation, genetic mixing, loss of local adaptation, and increased exposure to disease of domestic stock. These must be taken into account when facing the temptation to extend game farming to other countries. Even if ways are found to avoid the adverse effects, it is certain that modifications of technique will be needed to meet different social and economic conditions.

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