

Botswana's fences Kalahari

Over the past 20 years or more fences have been erected around the part of the Kalahari that lies in Botswana without thought about the impact on the wildlife. Over the years the fences have taken a massive toll of animals whose traditional migration routes to water have been sealed off. The authors, who have been working in the Kalahari since 1981, examine the current situation and suggest some of the possible remedies that are so urgently needed.

We have been studying antelope movements in the northern part of Botswana's Central Kalahari Game Reserve since April 1981. In the course of our work we have reached the conclusion that a massive decline of Kalahari wildlife populations has occurred. One reason for this decline is obvious. Fences now enclose much of that part of the Kalahari that lies within Botswana, blocking or severely disrupting wildlife movements both out of and into the region. In times of drought species that are unable to cope with the abnormally arid conditions need to move out of the Kalahari to perennial water sources such as the Okavango system and the Limpopo and Orange rivers. Heavy mortality must result if their movement to water is blocked. In the periods of above average rainfall, which regularly occur in southern Africa, improved conditions allow the movement of animals into the Kalahari from the better watered areas to the north and east. The ending of such movements must also reduce the overall abundance of animals in the Kalahari. At least one species has now completely disappeared from the



A doomed wildebeest calf, left behind on the trek to Lake Xau
(Douglas Williamson).

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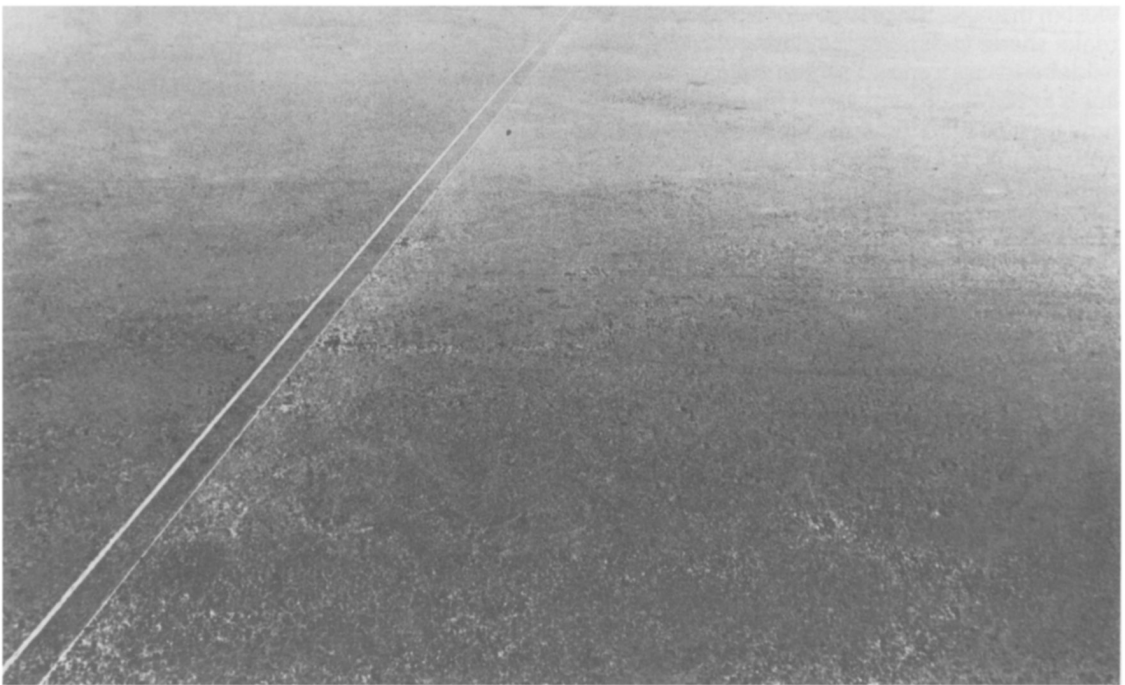
and the depletion of wildlife

Douglas Williamson and Jane Williamson

area. Zebra, which were reported by Silberbauer (1965) as resident in the northern Kalahari, have not been seen there since the severe droughts of the 1960s. These were the first serious droughts to occur after the erection of the veterinary cordon fences that blocked the migration of zebra to perennial surface water.

Another species, wildebeest, still regularly migrates out of the Kalahari during periods of drought, but now has only very restricted access

to surface water in the Lake Xau area. Their access to the Limpopo and Orange rivers in the south-east and south is now completely cut off. The heavy mortality resulting from their disrupted migration has been documented several times since the erection of the veterinary cordon fences during the 1950s. Silberbauer (1965) reported heavy mortality on the fences during the droughts of the 1960s. Child (1972) described wildebeest die-offs at Lake Xau in 1964 and 1970. Owens and Owens (1980, 1983a,b) have given detailed



A veterinary cordon fence from the air. Like colonial boundaries, these fences are arbitrary lines drawn on a map (Douglas Williamson).

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accounts of the migration of wildebeest and their concentration at Lake Xau.

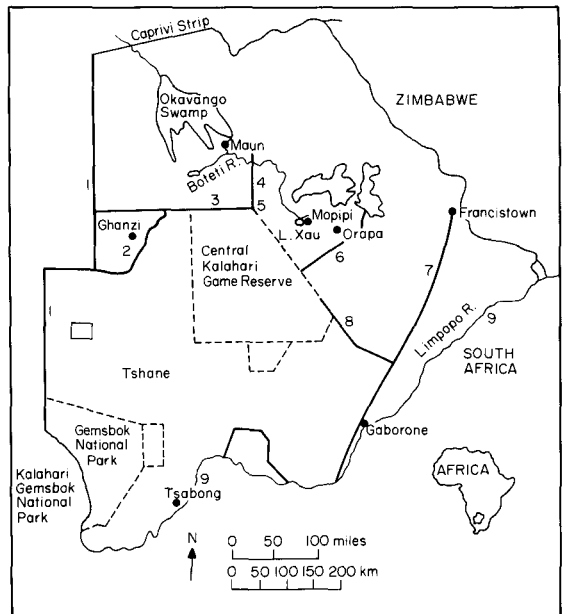
A plausible explanation for the regular wildebeest concentrations at Lake Xau was suggested to us by Dirk Kreulen, a Dutch scientist who worked in the Kalahari as a member of a team employed to carry out a range and animal inventory of the region (DHV, 1980). He pointed out that the continuous barrier of fences from the northern tip of South Africa's Kalahari Gemsbok National Park to the end of the tail-end fence near Lake Xau probably has the effect of funnelling all the migrating animals into the Lake Xau area.

The wildebeest always suffer heavy mortality when they concentrate at Lake Xau but the situation was especially grim in 1983. The area had had five years of below average rainfall and Lake Xau itself was dry. Apart from a few pools, the Boteti River was also dry. The only substantial body of water in the region was the Mopipi Reservoir, which serves the Orapa diamond mine. Mopipi is east of Lake Xau, while the only shade in the area was to be found in the woodlands well west of the lake. Since high ambient temperatures make shade indispensable during the time of the wildebeest concentration the animals were obliged to make a round trip of up to 100 km each time they needed to drink. Moreover, the drought and chronic overstocking of cattle had severely depleted the grazing in the vicinity of Lake Xau and Mopipi. Large tracts of land had been completely denuded of grass and there were regular dust storms. These extremely stressful conditions were aggravated by the people living near Mopipi Reservoir, who, as well as killing a substantial number of animals, subjected them to various forms of harassment, which almost certainly caused heavy additional mortality.

The scene below the wall of the Mopipi Reservoir was reminiscent of a First World War battlefield. In places the density of wildebeest carcasses exceeded 50 per hectare. The nature of the interactions between people and animals at Mopipi would make it difficult for even the most avid romantic to sustain the argument that aesthetics are a plausible motivation for conservation in the developing world. Having witnessed these interactions at first hand, one is sorely tempted to

agree with the collector in J. G. Farrell's novel, *The Siege of Krishnapur*, that aesthetics are 'a sham . . . a cosmetic painted on life by rich people to conceal its ugliness'.

In addition to contributing to the disappearance of zebra and to the plight of migrating wildebeest, there can be little doubt that the fences, in conjunction with expanding human settlement, also prevent animals normally resident in the better watered areas to the north and east from moving into the Kalahari during periods of above average



Fences around the Kalahari.

- Fence.
 - - - - - National Park/Game Reserve Boundary.
- Fences
- vcf—veterinary cordon fence.
 - 1. Namibia/Botswana boundary.
 - 2. Ghanzi ranches.
 - 3. Kuke vcf.
 - 4. Makalamabedi vcf.
 - 5. Tail-end vcf.
 - 6. Central Ngwato vcf.
 - 7. Main road/railway line.
 - 8. Dibete vcf.
 - 9. South Africa/Botswana boundary.



Some wildebeest reach the water, many die around it (Douglas Williamson).



One of the many carcasses in the area west of Lake Zau. Drifting sands are beginning to cover it (Douglas Williamson).

rainfall. We have evidence both from the literature (Silberbauer, 1965; Campbell and Child, 1971) and from interviews with Bushmen long resident in the area that species such as elephant, rhino, buffalo, roan, sable and tsessebe regularly moved into the northern Kalahari during periods of above average rainfall. All these species are now absent from the Kalahari.

In addition to the fences we are aware of no fewer than eight factors that must also be contributing to the decline of Kalahari wildlife. One of these, the spread of pastoralism, has been operating for a very long time but its rate of spread has accelerated drastically since the 1950s, when the sinking of boreholes in otherwise waterless areas began on a large scale.

The other factors are:
 the prevailing drought;
 expanding human settlement;
 the erection of yet more fences;
 the proliferation in hitherto inaccessible areas of new roads and tracks made by mineral prospecting companies;
 the diversion of the Boteti River to supply water for the Orapa diamond mine;
 the settlement of large numbers of people in the vicinity of mines in previously remote areas;
 illegal hunting on a very large scale.

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Our contention that Kalahari wildlife populations have been drastically reduced is not based only on the disappearance of a number of species and the identification of various factors which must be adversely affecting wildlife. The results of an aerial survey programme that we have been conducting provide a modicum of quantitative evidence in support of this contention.

In each of the first two years of our study we completed six extensive aerial surveys and pooled the results of these to make an estimate of mean large herbivore biomass through the year. We have compared these estimates with expected biomass, which we calculated using a technique developed by Coe *et al.* (1976) and based on the dependence of large herbivore biomass on rainfall.

In the first year of our study the observed large herbivore biomass was only 24 per cent of the expected value. In the second year this declined to about 11 per cent of the expected value. This drop was almost entirely due to a steep decline in the number of wildebeest entering our study area. Other populations remained remarkably constant. Because our aerial survey work is unavoidably fraught with inaccuracies arising from our limited manpower and equipment, it would be disingenuous to imply that our esti-

mates of large herbivore biomass should be accepted uncritically. The overwhelming probability is that we have underestimated present biomass, but the discrepancy between the observed and expected values is so enormous that we nevertheless have no doubt that there has been a massive reduction of large herbivore biomass in the Kalahari. Our confidence in this conclusion is considerably strengthened by the fact that the biomass estimate for the first year of our study is virtually identical with a biomass estimate for the whole Kalahari made in 1979 (DHV, 1980).

On the basis of the evidence that we have collected, we infer that wildlife faces a bleak future in the Kalahari and in view of this inference we have felt obliged both to try to understand how the existing situation has arisen and to consider whether or not anything can be done to ameliorate it. As we understand it, the existing situation is partly the unintentional result of a number of uncoordinated fencing schemes and partly a reflection of a widespread indifference or even hostility to wildlife conservation.

The fences around the Kalahari include the international boundary fences between Botswana and Namibia and Botswana and South Africa, fences along main roads, ranch fences and veterinary cordon fences. They have been erected over a period of more than two decades and there is no evidence of any consideration having been given to their impact on wildlife populations.

Indifference to wildlife conservation has a certain logic when one views the world through the eyes of rural people living at a meagre subsistence level. To such people wildlife is seldom more than a source of free meat and hides and, perhaps, of additional income and it is often a nuisance or a threat. It is also logical for people who see economic development as an overriding concern to accord a low priority to wildlife conservation. Present economic benefits from wildlife are very small compared to those derived, for example, from the cattle and mining industries in Botswana.

Although we can think of no programme that could be guaranteed to reverse present trends in the Kalahari, we believe that there are steps that could be taken that might result in an improve-

ment in the situation. These include: a detailed assessment of the ecological status of the Kalahari ecosystem; formulation of an integrated land-use plan for the Kalahari in terms of which orderly development of the region could occur; formulation of a management plan for the Central Kalahari Game Reserve; a pilot project for the provision of artificial water supplies for wildlife in the Central Kalahari Game Reserve; a radical upgrading of the law enforcement capability of the conservation authorities; vigorous promotion of the development of wildlife-based industries, with the object of convincing local people that the wildlife resource is a valuable asset with the potential of contributing significantly to economic development.

We make no claim that these suggestions are either comprehensive or definitive. We simply wish to illustrate that remedial action is possible. Clearly, it is also increasingly urgent.

Acknowledgment

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References

- Campbell, A.C. and Child, G. 1971. The impact of man on his environment in Botswana. *Botswana Notes and Records*, **3**, 91–110.
- Child, G. 1972. A wildebeest die-off at Lake Xau. *Arnoldia*, **5**(31), 1–13.
- Coe, M.J., Cumming, D.H. and Phillipson, J. 1976. Biomass and production of large African herbivores in relation to rainfall and primary production. *Oecologia*, **22**, 341–354.
- DHV Engineering 1980. *Countryside Range and Animal Assessment*. Report to Government of Botswana, 5 vols.
- Owens, M. and Owens, D. 1980. The fences of death. *Afr. wild Life*, **34**(6), 25–27.
- Owens, M. and Owens, D. 1983a. Fences of death. *Wildlife*, June, 214–217.
- Owens, M. and Owens, D. 1983b. Kalahari migration. *Int. Wildlife*, September–October, 32–35.
- Silberbauer, G.B. 1965. *Bushmen Survey Report*. Botswana Government Publication, Gaborone. 138 pp.

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