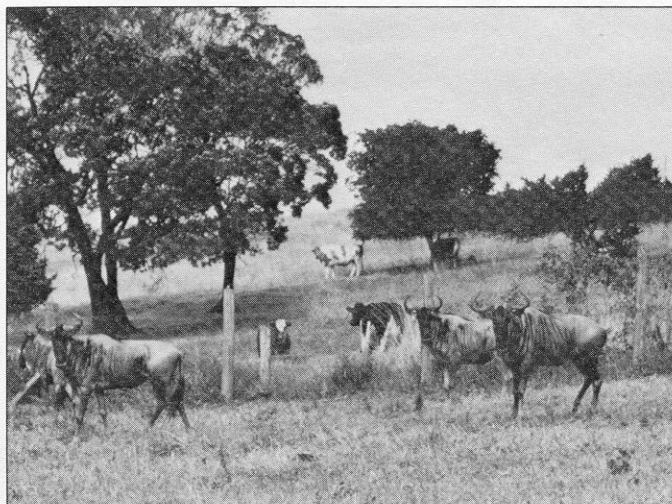


TAMING WILDLIFE DISEASES

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Can livestock and wildlife coexist on Africa's grazing lands?

A range war has been waged over Kenya's plains for decades. On one side are cattle ranchers and their herds; on the other, conservationists and wild animals. At stake is the future productivity of grazing lands.

The competition is due not only to lack of space, but to the widespread belief that wild animals harbour a number of serious diseases. These diseases are transmitted to the domestic herds with which wildlife comes into contact, causing severe economic losses.

Even back in 1857, David Livingston advocated the destruction of game in East Africa as a means of eliminating the tsetse fly, carrier of trypanosomiasis and bane of animal and human. The ineffectiveness of this solution was amply demonstrated as the tenacious tsetse found new hosts, but not until thousands of wild animals had been needlessly slaughtered. Attempts to control rinderpest—a highly infectious viral disease that causes inflammation of mucous membranes—followed the same technique: Between 1941 and 1951, some 10 000 animals were killed along the Tanzania-Zimbabwe border.

Since then the balance of power has shifted as ecologists worldwide protested this wanton destruction. Wildlife has become recognized at least as a major tourist attraction and the source of a larger part of East Africa's foreign exchange earnings. In 1977, the Kenyan government imposed a ban on hunting, thereby protecting the wildlife, but alienating farmers. And so the battle continues.

Much of the problem has been due

to a lack of understanding of the role of wild animals as reservoirs and transmitters of diseases of importance to livestock production and human health. Not until the early 1960s was the need for research in this field recognized. In 1967, a project to develop a sound understanding of wildlife disease and its importance to the economic development of the region was launched at the Veterinary Research Laboratories of the Kenyan Ministry of Livestock Production. Initially supported by the Food and Agriculture Organization of the United Nations (FAO), the project is now funded by the Canadian International Development Agency (CIDA); IDRC manages the CIDA funds.

The project has helped dispel some myths about disease transmission and may lead to a more peaceful coexistence between wildlife and domestic animals. In fact, it has been shown that disease transmission between wild and domestic animals is less significant than was once thought. Three major risks are reported: Theileriosis or East Coast Fever (ECF), a parasitic disease carried by the brown ear tick harboured by buffalo; Malignant Catarrhal Fever (MCF), a viral disease transmitted by the wildebeest; and trypanosomiasis, of which buffalo and giraffe are the main reservoirs.

Theileriosis is a major constraint to livestock production in Africa. In East Africa alone, some 500 000 cattle die each year as a result of infection, and records show that animals that recover are infertile. Although 30 wild ruminants were found to harbour theileriosis parasites, only the buffalo carried the *T.*

lawrencei species that is suspected of playing a key role in causing ECF.

Although scientists hope that effective drugs for the treatment of ECF can be found, research on the control of the disease has been complicated by the discovery that buffalo may harbour more than one strain of *T. lawrencei*. The role of different theilerial parasites will now be studied in an attempt to find a cure for the disease.

Because of the serious losses caused by Malignant Catarrhal Fever, cattle ranchers and Maasai pastoralists whose properties border Kenya's game parks have demanded the elimination of wildebeest from their fields. Although the exact mode of transmission of MCF is not known, cattle appear to contract the disease when grazing with wildebeest during the latter's calving season. Researchers have isolated the virus from the nasal and eye secretions of calves less than three months old, suggesting that wildebeest calves are the most important source of the disease. And while almost all the infected cattle die, the wildebeest calves recover.

Attempts to control MCF have so far failed, and the only effective method of protecting livestock is to isolate them from the wildebeest for at least three months following wildebeest calving.

Of all the diseases, trypanosomiasis presents the most complex interactions between wildlife, humans, and domesticated animals. Wild animals are known to act as reservoir hosts for human and livestock pathogens. In livestock, at least three major species of trypanosomes are involved, each causing dif-

ferent diseases. An estimated 60 million cattle are infected in Africa, and mortality can reach 70 percent.

However, some animals seem to have a better immunological defense against trypanosomes than others. Imported cattle breeds have little or no tolerance, whereas indigenous breeds such as Zebu and Ndama fare better in tolerating the disease. Most wildlife appears to be highly susceptible to infection, but some resist the onslaught of disease very well (thus becoming living reservoirs).

As population pressures force livestock production onto areas where trypanosomiasis is endemic, research into the mechanism of host resistance — and the potential of strengthening or transferring it to domestic livestock — appears to offer the only practical solution. Wildlife, cattle, and trypanosomes must coexist, for the time being at least.

Other diseases were found to pose little risk to domestic cattle. The buffalo was the only wild ruminant commonly infected with foot-and-mouth disease, but the virus was not readily transmitted to cattle. Rinderpest, imported into Africa with domestic livestock, did not seem to have become established in wildlife, contrary to expectations. A pan-African vaccination campaign of domestic animals carried out in the 1960s has almost eradicated the disease.

A study of intestinal parasites of sheep showed that although Thomson's gazelle could carry species transmissible to sheep, the gazelle was not an important source of infection, although the two animals often graze together.

The findings suggest that domestic cattle and wild stock can safely coexist and may open the door for improved land use patterns in Kenya.

Domestic livestock have always had a greater economic importance to people than has wildlife. The rationale of controlling wildlife disease has been to protect investment by protecting the health of domestic stock. In recent years, however, the potential economic value of wildlife has increased. As the need to intensify production on limited land area and to conserve productive resources have become important concerns in agriculture, wildlife species have become feasible alternatives.

Areas that are of marginal value for agriculture and cattle ranching, particularly in dry areas, could be well-suited to wildlife utilization through game ranching. Unlike domestic livestock, wild animals do not require constant protection against tsetse flies and ticks, and some animals — like the oryx and the elan — do not require as much water as cattle.

According to Dr David Hopcraft, a wildlife rancher in Kenya's Athi River area, game ranching as an alternative to cattle could also have environmental benefits. Cattle can destroy pasturelands through overgrazing and through tracking, which causes soil compaction and erosion. No such problems were found with gazelle grazing on

similar pastures. Moreover, he says, gazelles produce 50-100 percent more meat per hectare.

But despite the advantage of wildlife ranching, the integration of wild and domestic animals has not been considered in most African countries. Dr Hopcraft attributes this to sentimental attitudes. "Because of the history of catastrophic destruction of wild animals," he says, "wildlife utilization has become an emotional issue." In Kenya, for example, it is illegal to harvest meat from indigenous African species raised on African lands.

"From the reasonable or logical point of view", he says, "if we are to look at conservation of our natural resources, particularly in dry lands, then we must find ways of keeping the true African animals."

There are obstacles to be overcome, however, before game ranching becomes widespread — the definition of ownership and costs of preventing poaching, for example. Research will also be needed to define the most

appropriate economic balance between the different systems of wildlife utilization.

According to the researchers participating in the project, policy and legislative changes are required if the findings of wildlife disease research are to be of greater benefit to domestic cattle production and rational wildlife management in East Africa. Education is also required to convince conservationists that land conservation and wildlife conservation go hand in hand.

The researchers consider nevertheless that the stage is now set for farmers and ranchers to be given financial incentives to allow game animals to share their land with livestock, thereby ensuring the continued existence of large numbers of plains game animals despite intensified livestock and crop production. □

For more information, consult Wildlife disease research and economic development: proceedings of a workshop held in Kabete, Kenya, 8 and 9 September 1980, Lars Karstad, Barry Nestel, and Michael Graham, editors, IDRC-179e.



(Facing page) Wildebeest, Kenya: Wildlife harbours disease, but may also hold the key to immunity against it. (Above) Ticks on the ears of cattle transmit parasitic East Coast Fever in livestock.