

Humpty Dumpty and The Rhinos

There are some 13,000 black rhinos left in the wild. That is our best guess and it could be a few thousand out either way. Too many populations are remote and too many under impenetrable cover to give us a better fix. 13,000 doesn't sound beyond hope; many safe species number far fewer. But of course, the criteria of endangerment do not rest on numbers alone, but on trends and threats, actual or perceived. In other words, on vulnerability. By this reasoning, the black rhino is endangered, far more than the figures show. Most survive in small isolated populations of fewer than 50 individuals spread over most of Sub-Saharan Africa, and even the few populations exceeding 1,000 are dwindling and fragmenting fast.

Geneticists claim that populations fewer than 50 in number will suffer inbreeding depression—a loss of genetic heterogeneity and, consequently, lower natality and higher mortality. Whether inbreeding becomes acute depends on several factors, among them: sex ratio, male breeding differential, and the frequency and randomness of rhino contacts. Eventually, small isolated populations will lose genetic adaptability and become vulnerable to extinction by competition, disease, or other agencies. So what is the geneticist's solution?

Conserve big populations. That is biological logic.

Here reality objects: big populations are most vulnerable to poaching. It is the Tsavo story. Tsavo once had the most rhinos in Africa, more than 8,500 in the late 1960s. Ten years later, fewer than 150 remained, most of them widely scattered and seldom in contact. The same has happened to all other big populations save Luangwa Valley which, though protected by the most expensive black rhino conservation programme, has still lost ground dangerously, and Selous, which is mercifully remote but may not long remain so. Remoteness and cost penalize big-population conservation.

The conservation record is best on specific small populations, such as Aberdares, Nairobi National Park and Addo, areas easily and intensely patrolled. Manpower coverage tips the balance. Only small populations are affordable.

We confront a dilemma then: big is best, but small is feasible. How can it be resolved?

Here the black rhino predicament affords a conservation challenge, for it foreshadows numerous species destined to fragment into island populations. Such species will be half-way safe, half-way managed, not quite secure or big enough to survive unaided, nor so endangered or so few that captive propagation is the only solution. The black rhino affords us a valuable chance to pose questions and solve issues confronting future fragmentary species.

We can approach the size-feasibility dilemma in two ways, by reducing the need for management intervention where possible, and when it is necessary, by improving propagation techniques and reducing their costs.

Intervention can be minimized in several ways. First, by national censuses to identify all populations, both on public and private lands. Few countries have more than a hazy notion of rhino numbers. Each population should be classified by size, demographic status, and vulnerability. Second, criteria for selecting populations most likely to survive without intervention should be drawn up. Priority should be given to animals within existing sanctuaries, to the biggest and demographically most viable populations, and to those least vul-

nerable and most protectable. Third, special attention should be given to rhino populations on private lands, where they are important, as in Kenya. Policies inducing landowners to conserve are essential. No landowner will make a special effort if, as a result of his conservation success, the Government unilaterally hauls away rhinos and dumps them in unsafe areas. On the other hand, the Government must protect rhinos on private lands against changes in attitude, land ownership, and safety.

Lastly, merging populations prior to localized extinctions can also prevent loss of valuable genetic heterogeneity and circumvent the need for later and continued intervention in small populations. Ones and twos scattered everywhere add up to nothing that can survive. Consolidated, such remnants can be better protected, will need little or no further intervention, and will produce viable progeny for rehabilitation, when feasible.

There are three main repositories for remnant populations—public lands (usually national parks or reserves), private lands, and zoos. One can imagine a situation where, like the northern white rhino, a marginal population survives in zoos and national parks. In this case it would be expedient to consider both part of an international herd and to manage them accordingly. A three-way interchange of wild, private-property and zoo animals may be necessary, expedient, or simply cheaper. By widening the scope to all categories, we may be able to minimize later management, and greatly reduce the public conservation costs.

If management is necessary, we need to be sure it is precise and cheap. Many rhinos have been moved from vulnerable to safe areas, and from excess herds both to marginal populations and to establish new ones. Most recently five excess South African rhinos were shipped to Texas ranches to begin a breeding herd where, under the supervision of the American Association for Zoological Parks and Aquariums, they will be bred. Obviously, capture and translocation techniques must be continuously perfected, as must rehabilitation to the wild, or into new areas. We still have a long way to go in improving these methods. An operation may soon be underway to transport a few remnant Sumatran rhinos from the dense jungles of Sabah to North American zoos. The feasibility and cost, estimated at more than a million dollars, may yet prevent the project. It would be a disaster to see a species go extinct for lack of know-how or affordable capture costs.

In theory, at least, inbreeding can be avoided by techniques other than risky and costly translocation. Artificial insemination is routine for domestic stock. It is cheap and risk-free. Why not with rhinos? Zoos should be technological testing grounds for endangered species management, and increasingly are so. With all those rhinos now being tranquillized and moved, it would be easy enough to electroejaculate males and retain a sperm bank. But then we need to know when the female is in estrus. Are there behavioural cues, or must we develop and rely on hormonal assays from urine samples? Again, zoos are ideal laboratories in which to develop improved and cheaper technology. It requires the conservationist to pose the problems, and the zoo researcher to study solutions.

After Humpty Dumpty fell off the wall, no one knew how to put him back together again. Species fragmentation could

end like Humpty Dumpty. It need not. Given the spectre of ever more fragmentation, we need plenty of practice to make sure we can do so routinely and cheaply. In putting the smaller

rhino pieces together again, we can learn lessons for patching up other Humpty Dumpties.

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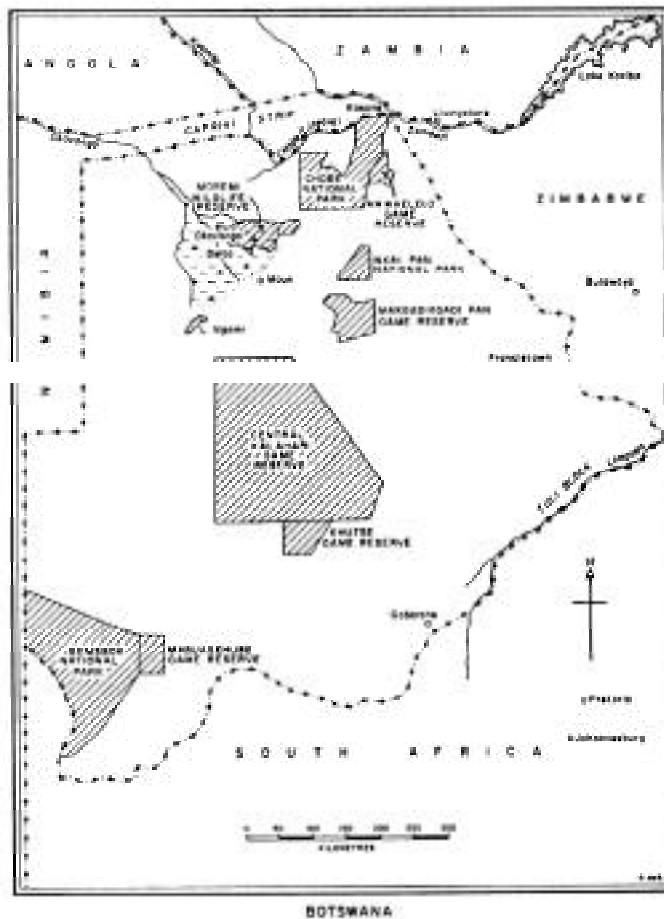
The Ivory Industry in Botswana

For a long time, most countries in southern Africa have exported considerable quantities of raw ivory to Europe and Asia, where various commodities are manufactured from it, and many items have been sent back to the source countries for sale. When international tourism to Africa became a major industry in the 1960s, beads, bangles and other ivory jewellery from India and Hong Kong could generally be found in African curio shops. More recently, the slowing of economic growth, scarce foreign exchange and vast unemployment have encouraged entrepreneurs in some of these African countries to start their own businesses to earn money from producing the types of ivory items mainly in demand by tourists.

African production of ivory commodities has met with varying success. Even in South Africa, which attracts hundreds of thousands of foreign visitors every year and where ivory pieces are among the major products sold in curio shops, locally manufactured ivory jewellery could not compete with that from Hong Kong were it not for the transport costs and 25% duty imposed on the latter. On the other hand, some of the locally carved statues of wildlife in South Africa are masterpieces and recognized as such by ivory collectors all around the world. In Zimbabwe, where the annual retail value of locally made ivory commodities is approximately \$8 million, it is the residents and citizens of the country who buy most of the ivory items made there, to take with them to sell for hard currency when they go abroad.

While Botswana has not been a major source for raw ivory on international markets, it has attracted European sport hunters since the nineteenth century, and trophy ivory continued to be exported from the country until very recently. Botswana's ivory manufacturing industry started in 1975, one year before South Africa's and two years after Zimbabwe's. The company which began commercial ivory manufacturing, Botswana Game Industries (B G I), hired an English jeweller to teach some local Africans how to make ivory beads, bangles and lighters at its headquarters in Francistown, northern Botswana close to the major elephant populations. The company expanded its workforce to 20 ivory craftsmen and in 1976 began producing carved tusks and small sculptures of elephants and buffaloes. However, the carvers had no previous experience their workmanship was inferior and it did not look as if the enterprise would be profitable. In 1977 B G I stopped producing carvings, and in 1979 closed down the part of the factory that manufactured ivory beads, bangles and lighters.

There were relatively few foreign tourists visiting Botswana, and B G I was not competitive on international markets with the production from Hong Kong, which was considerably cheaper because the Chinese are better skilled, waste less ivory and work longer hours. Despite being exempt from the 20% to 25% import duty in South Africa (because Botswana is a member of the Customs Union), B G I's worked ivory could not make significant inroads even there.



B G I had consumed between two and three tonnes of ivory a year from 1975 to 1979, which it had bought from local licensed hunters, licensed traders and from the Botswana government. One of the directors used some of the ivory waste to fertilize the roses in his garden; he could find no other use for it.

A second ivory carving factory started up in Francistown in 1975, but was put up for sale in 1977. Josef Generalis, a Greek, bought it. Called Ivory Products, this company now has 25 ivory craftsmen, although only eight are carvers. Some are former B G I employees, and the others are labourers from the area around Francistown, mostly Kalanga men. Using electric drills, lathes and other tools, they make jewellery (mainly bangles), candlesticks, lamps, lighters, salt and pepper shakers, napkin rings and smoking pipes. The carvers produce designs on whole tusks and sculpt African tribal head statues and small elephants. They work a 45-hour week and are paid for each piece they make, averaging \$138 a week. One highly skilled Zimbabwean carver working for Ivory Products earned on average \$300 a week in 1983. Approximately 40% of the finished ivory pieces are exported to South Africa; most of the rest go to Germany and the United States;