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Who Rules The Park?

AFRICAN LIONS have a problem. Of all the big cats, lions are the easiest to find. They inhabit open country, they live in groups, they are relatively active during the day, and they like to roar. Add these habits to their appetite for domestic stock and the threat they pose to humans, and it is not surprising that lions have been virtually eliminated outside Africa's parks and reserves. Leopards routinely take domestic dogs from the suburbs of Nairobi, yet these secretive cats still comprise a significant component of the city's remaining wildlife. But whenever lions from Nairobi National Park pick off a thoroughbred or a prized cow, they are tracked down and destroyed.

Africa contains a large number of reserves, and at first glance the lion's future may seem secure. The Serengeti, for example, covers 5,600 square miles and has as many as 3,000 lions. Sizable populations may also exist

Africa's lions fight disease and displacement

BY CRAIG PACKER



EGYPTIAN EXPEDITION OF THE METROPOLITAN MUSEUM OF ART, ROBERTS FUND, 1898.

in Kruger Park in South Africa, the Selous and a few other sites scattered across Africa. These parks have become ecological islands, however, surrounded

by a hostile sea of agriculture and human development. Once isolated, each small population must survive in whatever circumstances its habitat may provide, whether drought or fire or flood.

Many of the most famous lion populations (the tree-climbing lions of Lake Manyara, the dark-maned lions of Ngorongoro Crater, the much-photographed lions of Amboseli and Nairobi national parks) number no more than 50 individuals each,

and only a fraction of these actively breed. With such small population sizes, the deleterious effects of inbreeding may seriously hamper reproduction. My colleagues and I have collaborated with geneticists and reproductive physiologists from the National Cancer Institute and the

The second largest feline predator, the lion once ranged from Greece to India and in much of Africa (an Egyptian tomb painting depicts a lion as an underworld being).



National Zoological Park, in Washington, D.C., to measure the extent of this problem in the Ngorongoro Crater. Our detailed studies have revealed that the Ngorongoro lions suffer a significant loss of genetic diversity compared with those in the Serengeti. Associated with this loss is a higher degree of reproductive problems, including sperm abnormalities and impaired testicular function. While Ngorongoro's lions still reproduce well enough to perpetuate themselves for the immediate future, the genetic effects of close in breeding are cumulative, and their long-term chances of survival are poor unless new blood can somehow be introduced to each population.

Perhaps the most immediate threat to the future of the African lion is the fact that each park *directly* abuts an area of human activity. Step outside a park and you stand in someone's field. Lions are fiercely territorial, land is more scarce than food, and lions often rear more offspring than can successfully settle within the reserve. Thus young lions often seek unoccupied areas outside the park, relying on a diet of livestock. Pastoralists rarely welcome hungry subadults and respond by baiting the young animals with carcasses laced with insecticide or other poison. Faced with enough lions, people will also try to cut off the supply at the source, setting out poisoned carcasses inside the park itself. This tactic wiped out the entire lion population of Amboseli in the early 1990s.

More recently, we have discovered that the sheer numbers of people can pose serious threats to lions inside an otherwise well-protected national park. In early 1994, my field assistants, numerous tourists, and the chief veterinary officer of Tanzania National Parks saw several of the Serengeti lions suffering from severe neurological disorders, including persistent twitching and *grand mal* seizures. Within four months, over 35 percent of the Serengeti population had died. The cause was ultimately determined to be canine distemper. This was the first reported incidence of a fatal canine distemper outbreak in a wild population of big cats, and through the good fortune of a coincident study of the domestic dogs around the Serengeti, we can now confirm that the virus originated in villages surrounding the Serengeti. Canine distemper belongs to a class of viruses that includes measles and can persist only in a large population of susceptible hosts. We estimate that over 30,000 domestic dogs live within a six-mile radius of the Serengeti.



Male lions must constantly struggle to maintain access to the pride's breeding females, who produce young every two years. Male cubs are often ousted from the pride when intruding males vanquish their fathers. These young males then try to take over another pride. If successful, they often kill the cubs, bringing the females into estrus and ensuring the new males' genetic legacy.





Ultimately, canine distemper is a threat resulting from the enormous increase in the human population of the region—exceeding 4 percent per *year* to the west of the park. Thus the problem will only intensify in the future. We have initiated a large-scale vaccination program called Project Life Lion to bring decent veterinary services to these rural areas. However, distemper is likely to become a worldwide problem, and dog vaccinations should be encouraged anywhere that people live in close proximity to wild carnivores.

Finally, of course, the African lion has economic importance in the trophy hunting industry. Many of the hunting reserves provide essential buffer areas around the national parks (lion numbers should be kept low in areas immediately adjacent to villages), but trophy hunting is essentially unregulated in many parts of Africa. Unlike most trophy species, lions have a complex social system wherein a group of males takes over a pride of females. Incoming males face intense competition for continued breeding rights to a pride, and males seldom waste time on being stepfathers. When they first take over a pride, they usually kill any small cubs they encounter. The resident females then return to breeding status within a few days, accelerating the reproduction rate of the infanticidal males. The ability of males to maintain continued access to a pride depends on the size of their coalition, and any additional mortality to adult males (including trophy hunting) will greatly increase their offspring's risk of being killed. Several studies are under way to measure the impact of trophy hunting, and it is too early to say whether infanticide has seriously increased. But it is clear that trophy hunting should be closely monitored.

Despite all of these dangers, lions should survive for some time yet, at least those living in the larger reserves. Lions breed rapidly, and these threats are incidental compared to the systematic slaughter of tigers. Still, I wish lions would learn a few tricks from their more secretive cousins!

Craig Packer, a behavioral ecologist and professor at the University of Minnesota, is the author of Into Africa (University of Chicago Press), winner of the 1995 John Burroughs medal.