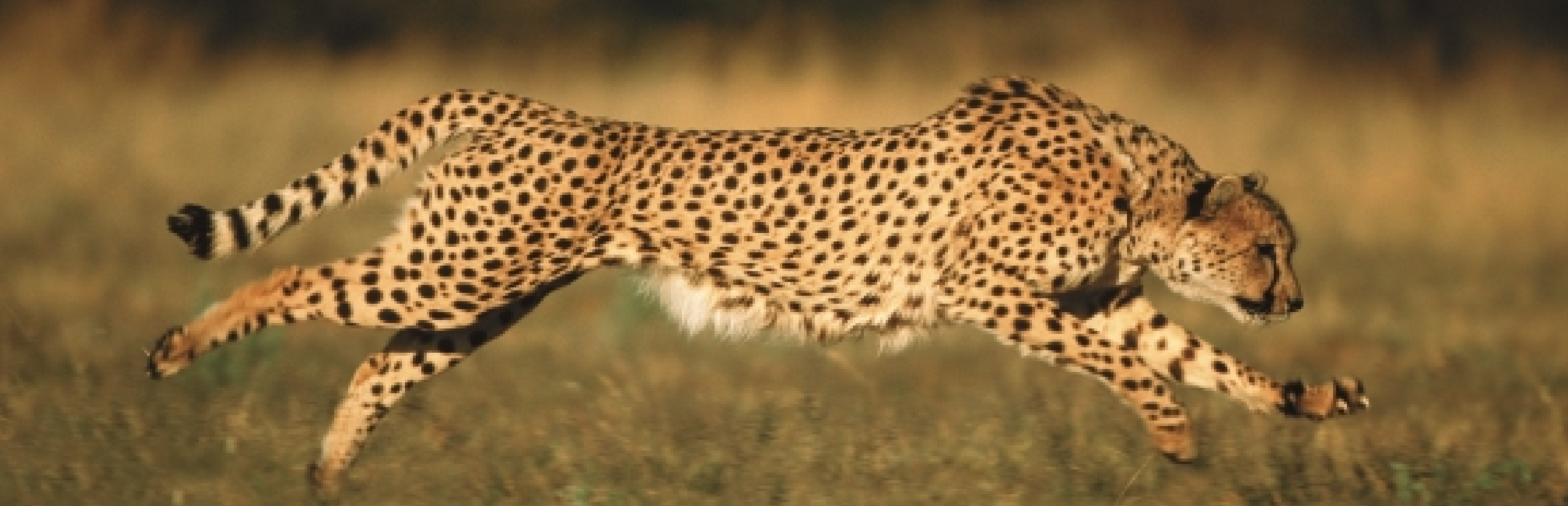
Durant S. 2004. Survival of the Fastest - The Cheetahs of Serengeti. Africa Geographic:30-33.

Keywords: 1Afr/1TZ/Acinonyx jubatus/cheetah/endangered species/genetic diversity/habitat fragmentation/habitat loss/inbreeding/livestock/measures/population density/predator/protected area/Serengeti

Abstract: The cheetah is the most endangered large cat in Africa. The key to conserving it rests largely outside protected areas where most of Africa's cheetahs remain. In Tanzania the long-running Serengeti Cheetah Project is active in cheetah research and protection measures. The low population density of cheetahs, both inside and outside protected areas, makes them particularly vulnerable to the impact of habitat loss and fragmentation. Increasingly fragmented, cheetah populations become vulnerable to inbreeding and the loss of genetic diversity. The human/carnivore conflict is a growing issue in Tanzania, as it is elsewhere in Africa. Where the traditional pastoral lifestyle is disappearing and modern livestock practices pertain, the emphasis is placed on the eradication of the predators.

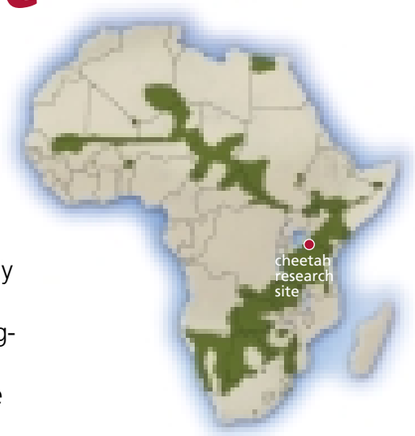


MARTIN HARVEY

Survival of the fastest

THE CHEETAHS OF SERENGETI

The difficulty about cheetahs is firstly that they are shy, and secondly that they occur in very low densities. Research on them is thus a challenge, particularly outside protected areas. In Tanzania, the long-running Serengeti Cheetah Project has told us a lot of what we know about these cats but, as their numbers drop alarmingly, there is still much for Sarah Durant and her colleagues to discover.



Out-running extinction? The cheetah is the most endangered large cat in Africa. The key to conserving it rests largely outside protected areas where most of Africa's cheetahs remain.

Only a century ago, cheetahs were widespread across virtually the entire African continent and through Asia to India. They ranged across wooded savanna, open plains and desert, avoiding only forest and swamps. Their prowess in the chase has been admired since the time of the pharaohs, and, being easy to domesticate, they were caught and trained for hunting. These sleek cats became very popular among the wealthy across North Africa and Asia – the Mughal Emperor, Akbar the Great, was reported to have a stable of a thousand. All were wild caught (they never bred in captivity) and, inevitably, this had a drastic impact on the wild populations.

By 1968 cheetahs had been eradicated from India and, apart from a population of 60 in Iran, soon afterwards from the rest of Asia too. The picture across North Africa is similar, although a few small populations persist in Niger, Algeria and perhaps Libya. Today most of the world's surviving cheetahs occur in eastern and southern Africa. There are no reliable estimates of the total population, but educated guesses suggest it is in the region of 10 000 – and declining. No longer is the capture for hunting to blame; rather, the more modern ills of persecution and habitat loss.

Of all the large carnivores, the cheetah is one of the most vulnerable to environmental degradation. Its ecology, while perfectly suited for ranging freely across extensive savannas and surviving in hostile and arid environments, is sadly inadequate for coping with the pressures inflicted by humans. And, unusually for a large carnivore, about two-thirds of the entire population lives outside the protected area system.

Cheetahs always occur at low densities. In some areas, particularly arid lands, they can be the only large carnivore and here the population size is probably limited by the availability of prey. Where prey is plentiful, as it is in many protected areas, other factors come into play. Areas with abundant prey tend to attract high numbers of larger and aggressive predators such as lion and spotted hyaena, which often take hard-won prey from cheetahs and may kill their cubs. At less than a quarter of the weight of a full-grown lioness, a female cheetah can do ▶

little to defend her offspring against attack. The mortality inflicted by the larger predators is so intense that it limits cheetah numbers, even where prey is abundant such as on the Serengeti Plains in Tanzania.

Large protected areas such as the Kruger and Serengeti national parks, which cover 20 000 and 14 000 square kilometres respectively, each hold no more than 250 and 275 adult cheetahs. Most other protected areas are much smaller and cannot hope to support viable cheetah populations.

Outside protected areas, the densities of other large carnivores tend to be lower, but then so too are the densities of prey, with the result that there are seldom more than five cheetahs per 100 square kilometres. Its low population density, both inside and outside protected areas, makes the cheetah particularly vulnerable to the impact of habitat loss and fragmentation. Clearly, if cheetahs are to survive in the long term, steps will have to be taken to conserve them outside as well as inside the protected area system.

Historically, cheetahs were unlikely to have come into much direct conflict with man. Pastoralism used to be the dominant form of land use across arid and semi-arid lands in much of Africa and Asia, and livestock management practices developed over thousands of years minimised the loss of stock to predators. During the day, grazing livestock was seldom left unattended and at night was corralled into enclosures. Where these practices endure, mainly in Africa's less developed countries, the cheetah's future is linked to the survival of the traditional pastoral lifestyle – and, inevitably, to the empowerment of traditional societies.

In the relatively developed countries of southern Africa, however, more modern practices pertain; the stock is allowed to graze without the protection of a herdsman and the emphasis is placed instead on the eradication of predators. Outside the conservation areas of these countries, persecution poses the dominant threat to large carnivores, including the cheetah.

The Tanzania Cheetah Conservation Program (TCCP) of the WCS and the Zoological Society of London (with additional support from Frankfurt Zoological Society and the St Louis Zoo) aims to ensure the long-term survival of cheetahs in Tanzania. A core part of the programme's activities is the Serengeti Cheetah Project, the longest-running study of free-ranging cheetahs in the world. It has provided much of what we know about cheetahs in the wild, including their ecology, ranging patterns, social behaviour and hunting strategies. Because it has run for 30 years, this project can link changes in birth and survival rates to environmental circumstances, which enables us to make predictions about cheetah numbers under varying ecological conditions.

Visitors to Tanzania may well come across the TCCP's 'Cheetah Watch' leaflets, which ask them to send in photographs of any cheetahs they see. The photographs are entered into the programme's database and matched against a growing catalogue that monitors cheetahs across Tanzania. In return, the TCCP posts names of contributors on its website, *www.wcs.org/cheetahs*. The leaflets also provide a guide to 'cheetah friendly' viewing practices. Being diurnal hunters and naturally wary, cheetahs are very vulnerable to the impact of tourism. In a recent incident in the Serengeti, a cub died because it was scared by visitors and ran away from its mother, never finding her again.

Another key focus of the Serengeti study is identifying the paternity of cheetah cubs. Cheetahs meet briefly for mating, which is seldom observed, and separate soon afterwards. The mother (and often grandmothers and great-grandmothers) of most of the cheetahs in a population is easily identified, but nothing is known about its paternal line. As cheetah populations become increasingly fragmented they become vulnerable to inbreeding and the loss of genetic diversity. By working out the paternal as well as the maternal line of a population, we will be able to predict how much diversity is lost from one generation to the next. This, in turn, will allow us to plan the genetic management of small cheetah populations.

The TCCP is also working closely with the Global Cheetah Forum to initiate a comprehensive cheetah survey. Reliable estimates of the size of the Serengeti's cheetah population are unique, and there is an urgent need for comparable data on other populations. Such data are vital not only to identify and address threats to cheetah survival, but also for persuading governments and other key stakeholders to adopt appropriate measures to conserve populations in the wild. The programme is well placed to test a variety of census techniques and aims to develop a reliable and cost-effective methodology that can be used across a broad range of habitats.

Finally, human/carnivore conflict is a growing issue in Tanzania, as it is elsewhere in Africa. If cheetahs are to survive, the means to ensure peaceful coexistence between them and people must be found. The TCCP will be expanding previous investigations into conflict issues in Maasai communities adjacent to the Serengeti into a nationwide survey. As land is lost to cultivation, areas outside the protected area system are increasingly crucial for the survival of these beautiful and vulnerable cats.

Breaking boundaries

Well known for its exceptional beauty, grace and speed, the cheetah is also fascinating in that it is semi-social and has unusual ranging patterns that are found in no other feline. In most cat species, the females hold small territories which they defend fiercely against other females; the males maintain territories that enclose one or several female territories and they, like the females, defend them against same-sex intruders. In the cheetah, by contrast, the females have large home ranges that overlap those of other females, enabling them to track migratory or low-density prey. The males hold small territories (often less than one-tenth the size of those held by females) within these ranges.

Unlike all other cats except lions, cheetahs tend to be social. Males form permanent coalitions of two or three individuals which are usually, but not exclusively, made up of brothers – a system unique in the mammal kingdom. It is relatively unusual for a male mammal to defend only a portion of a female's home range – and only cheetahs do this in groups.

Its low population density makes the cheetah particularly vulnerable to the impact of habitat loss and fragmentation

LORNE SULCAS

All cheetahs have a unique pattern of spots, a useful tool for identifying individuals.