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Abstract: Unlike many other places, Serengeti National Park is an animal paradise where cheetahs survive relatively well. However cheetahs always seemed rare. Throughout most of the rest of Africa, cheetahs seem to disappear rapidly. In our surveys in several West African countries in the years 1991-92, we found that cheetahs are gone from most places. One last stronghold in eastern Burkina Faso, where the complex of protected areas around "W" National Park and the proposed Arli National Park provide an adequate-sized area for the cheetah population to survive. But poaching of cheetahs and their prey remains a serious problem throughout West Africa and everywhere the cheetahs are very shy.

Serengeti Cheetahs

Story and Photos by George and Lory Frame

Unlike many other places, Serengeti National Park is an animal paradise where cheetahs survive relatively well.



Even under the apparently ideal ecological conditions of the Serengeti National Park, cheetahs always seemed rare.

ACROSS THE GLARE AND SHIMMER of mid-morning heat, we saw a herd of Thomson's gazelles grazing calmly in the distance. Suddenly, as though on signal, the gazelles exploded in a widening fan. They fled, their black side-stripes flashing up and down with every bound. After a short distance, the gazelles stopped and looked back. We turned our binoculars to where they were looking and saw the reason for their alarm. A cheetah was walking openly, now that it had failed its short chase.

The cheetah sat awhile, looked all around, then headed toward another promising area. Her new course led close to our truck but she ignored us. She was one of the tourist-wise cheetahs of Tanzania's Serengeti National Park. As she walked past, we scrutinized the pattern of spots on the cheetah's face, chest, and legs. This was an easy one. She was Female No. 22, also known as Malaika, one of the 442 cheetahs in our file of numbered individuals.

She was lactating, which meant she had a new litter of cubs that probably was hidden nearby. If we followed Malaika at a respectful distance after her hunt, perhaps she would lead us to her lair.

Malaika topped a rise and stopped abruptly at the sight of a dozen gazelles grazing in the distance. She began a cautious, tedious approach toward the prey. Every time a gazelle raised its head to look around, she froze motionless. When its head lowered to eat, she crept forward again. After more than half an hour, Malaika was less than 50 metres from the nearest gazelle. She then leapt forward in an incredible burst of speed. She would have only one brief try.

Malaika did not fail. She chased the adolescent female gazelle for more than 200 metres. Malaika's forepaw finally bowled over the prey, and she went for its throat with a suffocating bite. She dragged her limp prey to the concealment of a tall clump of grass and let go. Already the gazelle was dead. Malaika sat a few minutes, panting. Then she crouched and started to eat. In about an hour, all that remained of the gazelle were its entrails, some skin, and most of the skeleton.

Malaika sat up and washed her face with a paw. She apparently was in no hurry to return to the cubs that we wanted so much to see. Soon she began walking, but we eventually discovered that her destination was a waterhole. Malaika drank, then walked to higher ground and groomed again.

If our studies of cheetah behaviour taught us anything, it was to be patient. We waited, watched, recorded and waited some more. We kept detailed notes of the things we saw as we roamed throughout our study area on the Serengeti Plains and surrounding woodlands. We followed the cheetahs in our safari-equipped four-wheel-drive vehicle, and often watched cheetahs continuously day and night for several days at a time. To a large extent this was made possible by a vehicle provided through the East African Wild Life Society.

Finally, Malaika began walking again. Normally, she was so tame that she sometimes climbed on top of our car to examine her reflection in the windshield and fender mirrors, or to look for distant prey. But now that she was a mother with tiny dependent cubs, she demonstrated an uncharacteristic aloofness. Nearly two hours passed before Malaika arrived at the dense vegetation of a drainage line. When she disappeared into a depression under an eroded bank, we approached slowly and quietly in our vehicle until she was once again in sight.

Malaika carefully looked around. Then, apparently satisfied that all was safe, she uttered several throaty staccato purrs. These were answered by barely audible chirps, as three small blackish cubs climbed clumsily through the dense grass. Although their eyes were open the cubs were still unsteady on their feet, which suggested that they were barely three weeks old. The tiny cubs tottered and looked up into their mother's face in a searching way. Malaika lowered her head to lick the cubs, then lay down in the shade. Her cubs snuggled beside her.

For us, finding Malaika with tiny cubs provided the opportunity to observe the development of cheetahs from an early age. We hoped her cubs would survive.

Our records of other litters in the Serengeti

study area suggested that about 70 percent of the cheetah cubs die. Most of the deaths occur during the first three months, when the small cubs are easily preyed upon by spotted hyenas, lions, leopards, and possibly birds of prey. Often entire litters are lost. Even if predators do not kill the unguarded cubs, a sudden rainstorm might flood their hiding place, or a grass fire might burn through. Or, if the grass dries and the gazelles and wildebeest migrate away, the young cheetahs are likely to face starvation when their mother's hunting trips become too long. On the other hand, the cubs that survive their first three months are almost certain to live at least until they become young adults.

Mother cheetahs with newborn cubs are limited in how far they can travel. Malaika moved her cubs to a new lair every few days, but all the hiding places were within an area of about one square kilometre. In the same five weeks, because gazelles were present in moderate density, Malaika hunted in an area of only ten square kilometres. But during the following year, when her cubs were able to travel, Malaika took them throughout her 800-square-kilometre home range.

The primary reason for our study of cheetahs was to evaluate their conservation status in the Serengeti ecosystem. Even under the apparently ideal ecological conditions of the Serengeti National Park, cheetahs always seemed rare. Our goal, therefore, was to find out if cheetahs really were so few, and if so, why. The answer involved, in part, a study of cub production and survival.

We recorded 91 different litters and found that cheetah births in the Serengeti occur throughout the year, although more litters seem to be born in the rainy season. The largest litter that we saw during our five-year field study was six cubs. In captivity, however, cheetahs are known to bear as many as eight cubs in one litter. The average litter size for the Serengeti cheetahs was about four, when the cubs are still in their lair. But at 5 to 12 weeks old, when the small blackish cubs were travelling with their mother, the litters averaged only two or three cubs. The small cubs are vulnerable because, during their first three months, they cannot outrun other predators.

By the end of our study, we had 1,260 recorded sightings of cheetah individuals and groups. Also, we had hundreds of pages of detailed notes on their behaviour and ecology, from which we learned about cheetah society. Forty percent of the sightings were of adult females with cubs. Thirty-five percent were lone adults of either sex. And most of the remaining sightings either were littermates separated from their mother, or were groups of adult males. Thus, cheetah social organization was neither like lions or leopards.

Adult female cheetahs lived alone, except during courtship or when they have cubs. The largest group in our records was nine cheetahs, which consisted of two adult females each with a litter

of cubs. We believe that these two females had to be closely related (probably sisters) to be so tolerant of each other.

Adult male cheetahs, in contrast to the solitary females, often lived in all-male groups of two, three, or even four. Nearly half our sightings of male cheetahs were of groups.

We monitored many litters from shortly after birth until adulthood, and found that cubs stayed with their mother until they were about 13 to 20 months old. Then gradually over several days, the litter separated from their mother. The brothers and sisters stayed together for several months more.

Sexual maturity occurs when the cheetahs are 17 to 23 months old, judged from their behaviour. At that age, the adult females left their littermates, one by one, apparently when they came into oestrus. Sometimes it probably was the littermates who left their oestrus sister, to avoid aggression from the local territorial males.

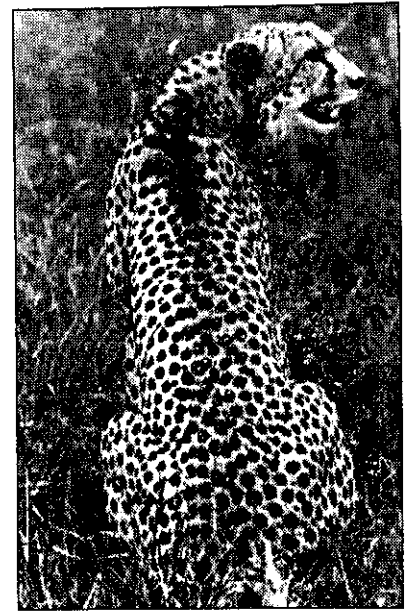
Young adult female cheetahs continued living in their mother's home range. Adult female cheetahs did not defend a territory. Instead they simply avoided each other.

In our study, young adult male cheetahs emigrated from their mother's home range. We resighted emigrating males in entirely new areas, about 20 kilometres from their mother's range, and they never returned. Probably the local territorial males chased these young adult males away. We know that adult male littermates often remained together for years, probably for life. Non-littermates sometimes joined together in all-male groups of two, three, or four.

Territorial male cheetahs patrol and defend a well-defined area. They regularly mark trees, bushes and rocks with urine, feces and scratches. Their territories are in places with moderate vegetative cover, such as kopjes, drainages and woodlands. Not all male cheetahs are territorial. Those without a territory wander as nomads, searching for a suitable place that isn't already claimed by another male.

The territorial males that we studied in the Serengeti maintained territories of about 12 to 36 square kilometres. Unlike the female cheetahs who migrated 50 to 80 kilometres to follow prey, the territorial males did not migrate. When there was no food or water within their territory, the males temporarily left to feed and drink nearby, but they promptly returned. We know of lone males and groups of males who held their territory at least four years, but eventually they were killed or chased away by stronger males.

We observed a fight between a group of three territorial males and three intruding males at Naabi Hill in the middle of the Serengeti Plains. The encounter began when the three territorial males



Since we finished our research some years ago, other researchers have come to the Serengeti and continue the long term studies.

chased and caught one of the intruders. All three territorial males fought with the intruder, biting him repeatedly all over his body and pulling out mouthfuls of fur. The territorial fight resulted in one intruder dead, one chased away, and one injured. The defenders appeared unharmed, except that one had a bloody lip.

Male territoriality limits the potential density of cheetahs. When the cheetah population increases, more of the available habitat is claimed by territorial males, leading to more conflict and more deaths. We believe that many male cheetahs are forced into ecologically marginal areas, where they face increased hazards. Females, too, are affected through increased harassment from the sexually motivated males. Sometimes, territorial males intent on mating hold a mother cheetah captive for a day or two. The harassment prevents the mother from tending her cubs, and we think may sometimes result in cub deaths.

The higher mortality of males during their wandering and in fights with other male cheetahs accounts for the observed sex ratio: equal numbers of females and males are born, but by adulthood there are twice as many females as there are males.

We studied cheetah hunting to evaluate their success rate in various ecological conditions. Cheetahs are primarily daytime hunters, with decreased hunting activity during the heat of mid afternoon. We recorded 493 hunts in which 203 kills were made. Nearly 60 percent of the kills were Thomson's gazelles.

Stalking was seen in about two-thirds of all hunts. The stalks lasted from a few minutes to an hour or more. Cheetahs selected prey that were alone or else in just small groups, to minimize the likelihood of being seen. It seemed to us that the prey seldom were selected with regard to physical condition, but rather for unalertness and vulnerability. Stalking enabled the cheetahs to approach within 10 to 50 metres of the prey, which greatly increased the chance that the chase would be suc-

cessful. Only 40 percent of the Thomson's gazelles that were stalked were then chased, because more often than not the cheetah was discovered. For tiny prey such as hares, stalking rarely was used, because cheetahs inadvertently flushed hares while walking and immediately gave chase.

There was no evidence that cheetahs grouped together to hunt larger prey. However, when adult male cheetahs were already grouped for territorial reasons, or when a mother cheetah was with her nearly full-grown cubs, they then sometimes hunted larger prey.

In our study we were surprised to learn how unsuited cheetahs are for living and hunting in short grasslands. Cheetahs are very much dependent on cover for stalking their prey, for hiding from other predators (such as spotted hyenas and lions), and for shade during the heat of the afternoon. Most of the Serengeti Plains is suitable, however, because of the cover of grasses and herbs which provide concealment for a crouched cheetah.

Since we finished our research some years ago, other researchers have come to the Serengeti and continued the long-term studies of cheetahs.

Our greatest satisfaction from these years of research is in knowing that the Serengeti National Park is one place where cheetahs are doing relatively well. Throughout much of Africa, cheetahs are rapidly disappearing. In our surveys in several West African countries in the years 1991-92, we found that cheetahs are gone from most places. One last stronghold is in eastern Burkina Faso, where the complex of protected areas around the 'W' National Park and the proposed Arli National Park provide an adequate-sized area for a cheetah population to survive. But poaching of cheetahs and their prey remains a serious problem throughout West Africa, and everywhere the cheetahs are very shy.

The time is approaching when viable populations of cheetahs will exist in and around only several of the continent's larger national parks, and one of these places will be the Serengeti.

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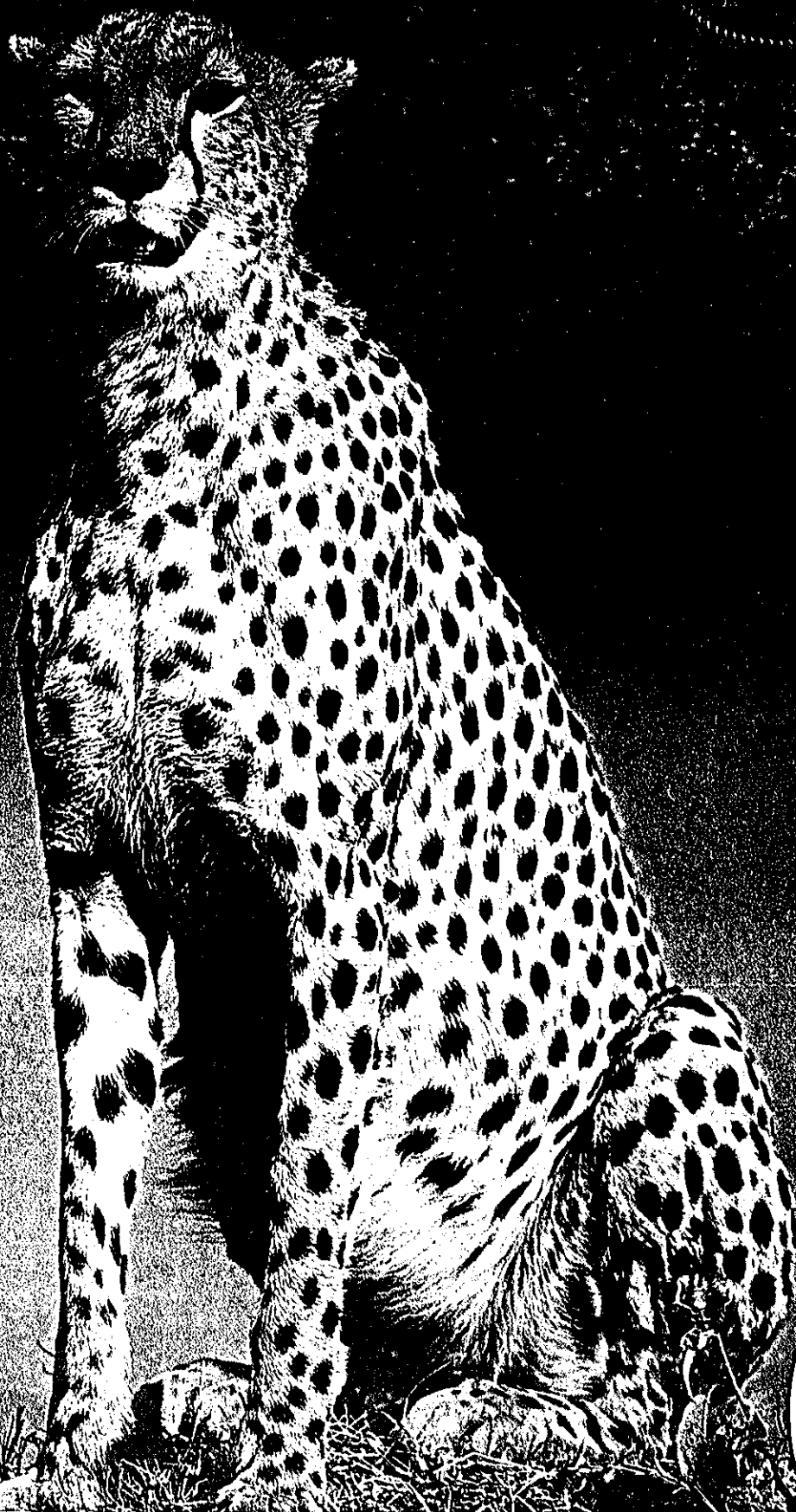
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