

Marker-Kraus L, Kraus D. 1997. Conservation strategies for the long-time survival of the Cheetah by the Cheetah Conservation Fund. *International Zoo Yearbook* 35:59-66.

Keywords: 1NA/Acinonyx jubatus/CCF/cheetah/conservation/conservation strategy/ecosystem/education/endangered species/farmland/human-predator conflict/livestock/livestock-guarding dog/management/strategy/survival

Abstract: The cheetah's attraction to livestock farmland poses a direct threat to the species' survival. The Cheetah Conservation Fund's primary focus is in areas outside of the protected reserves, working with the local livestock farming communities to develop ways to reduce conflict between humans and cheetahs and devise a cheetah conservation management plan which secures habitat for the species and considers land use needs. This document reports over a survey's period going from 16 November 1993 to 31 May 1994, during that the CCF made progress in many different areas. Particularly, it noticed improvements in the media attention from newspapers, radio and television, in its biological data-base on wild-caught cheetahs, in the much interest from the farming community in continuing the Livestock Guardian Dog Program, and in educational involvement.

Conservation strategies for the long-term survival of the Cheetah

Acinonyx jubatus

by the Cheetah Conservation Fund, Windhoek

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The Cheetah *Acinonyx jubatus* is declining throughout its range because of loss of habitat, a declining prey base and competition with livestock interests. Throughout Africa there are less than 15 000 animals remaining. The largest wild population of Cheetahs is in Namibia, although in the last 12 years numbers have been reduced by half to c. 2500 animals. Significant declines have continued as farmers capture and remove Cheetahs as 'pests'. Established in 1990, the Cheetah Conservation Fund aims to secure habitats for the long-term survival of the species and its ecosystems. The primary focus of the Fund is working outside of the protected reserves with the local livestock farming communities to develop ways to reduce conflict between humans and Cheetahs. The Fund also conducts independent and collaborative research, disseminates information and recommends management techniques to farmers.

Key-words: cheetah, conservation, ecosystems, endangered species, farming, Namibia

Loss of habitat, a declining prey base and competition with large predators and livestock interests are having a serious affect on wild Cheetah *Acinonyx jubatus* populations. At time of writing there are fewer than 15 000 Cheetahs remaining in Africa and c. 200 in Asia (Marker-Kraus *et al.*, 1996). Most live outside protected game reserves in small, isolated groups, where they are often in conflict with human interests and livestock and most populations continue to decline (Marker-Kraus *et al.*, 1996).

Namibia is home to the largest population of Cheetahs in the world (Fig. 1). However, in the last 12 years their numbers have been reduced by half to c. 2500. In Namibia, between 1980 and 1991, 6829 Cheetahs were legally removed from the

wild, mainly through indiscriminate catching in live traps and shooting (CITES, 1992). Significant declines in the population have continued as farmers capture and remove Cheetahs because they are regarded as 'pests' which have a severe negative economic impact on livestock and the wild game industry. If this threatened species is to be saved this perception must be reversed. The survival of the Namibian Cheetah is in the hands of approximately 1000 commercial farmers and their willingness to integrate Cheetah conservation efforts into farm management.

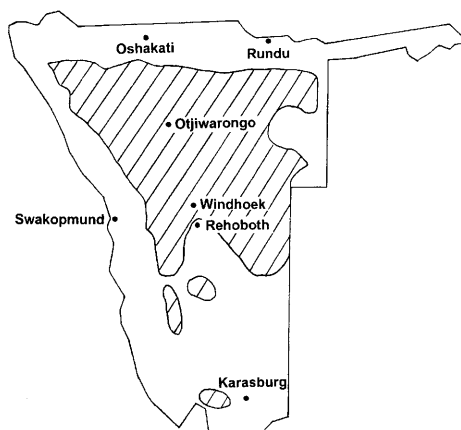


Fig. 1. Distribution of Cheetahs *Acinonyx jubatus* in Namibia in 1995.

BACKGROUND

In the early 1980s extensive research was conducted on wild and captive Cheetahs which identified genetic impoverishment and health problems in the captive population (O'Brien *et al.*, 1983, 1985, 1987; Wildt *et al.*, 1983, 1987; Wildt, Chakraborty *et al.*, 1984; Wildt, Meltzer *et al.*, 1984; Evermann *et al.*, 1988; Marker & O'Brien, 1989; Heeney *et al.*, 1990). In 1983 the North American regional studbook was established (Marker, 1983) and in 1994 the North American Species Survival Plan (SSP) was developed. The international studbook, established in 1987 (Marker-Kraus, 1990), is now in its 6th edition (Marker-Kraus, 1995). Several regional captive-management programmes have also been initiated (Marker-Kraus, this volume). In 1988 the SSP developed a research-based Master Plan (Grisham & Lindburg, 1988) and the findings have been published (Brown *et al.*, 1993; Caro, 1993; Dierenfeld, 1993; Evermann *et al.*, 1993; Howard *et al.*, 1993; Laurenson, 1993; Lindburg *et al.*, 1993; Marker-Kraus & Grisham, 1993; Munson, 1993; Wildt & Grisham, 1993; Wildt *et al.*, 1993; Grisham, this volume).

Research on Cheetahs in captivity has yielded extensive information about their biology, physiology and behaviour. The captive population is not self-sustaining but has been maintained through importation of wild-caught animals, 99% of which have come from Namibia (Marker-Kraus & Grisham, 1993; Marker-Kraus, 1995). Over 90% of all captive Cheetahs are descended from animals originally exported from Namibia. Data from research on the captive population can be used to assist the long-term management of free-ranging populations. A recent recommendation is to manage captive and wild Cheetah populations jointly in order to provide an effective population size which would allow the maintenance of a specified amount of genetic diversity and protect against loss resulting from demo-

graphic fluctuations (Marker-Kraus & Grisham, 1993; Marker-Kraus, 1995).

Because of the extensive research that was conducted on Cheetahs in the 1980s and the development of the North American SSP, the South West African Department of Nature Conservation (SWADNC) asked for assistance from the SSP group. In 1989 a Memorandum of Understanding was signed between the SSP and the SWADNC which included a component on the development of a Cheetah conservation and research programme in Namibia. Working in cooperation with the SSP and the Namibian Ministry of Environment and Tourism (MET), the Cheetah Conservation Fund was developed in 1990.

GOALS AND OBJECTIVES

The goal of the Cheetah Conservation Fund is to secure habitats for the long-term survival of Cheetahs and their ecosystems in Namibia and other appropriate African habitats. Because the majority of remaining Cheetahs are found outside protected areas (Marker-Kraus *et al.*, 1996), the maintenance of biological diversity on farmlands and the use of sound farm management practices are integral to efforts to save the species and reduce human-Cheetah conflicts. The Cheetah Conservation Fund is the only international organization created to support *in situ* conservation research programmes for a threatened large felid.

The Cheetah Conservation Fund is developing a management plan aimed at benefiting both Cheetahs and farmers. The multi-faceted approach includes: (1) conducting long-term conservation research and education programmes on Cheetah throughout Namibia; (2) identifying important aspects of farmland ecosystems that are necessary to sustain healthy Cheetah populations; (3) promoting farm management practices that reduce livestock losses from predators; (4) assisting in the management of and recommended health protocols for Chee-

tahs in captivity; (5) expanding various programmes into other countries where Cheetahs are threatened.

ACTIVITIES OF THE CHEETAH CONSERVATION FUND

Although the need for conservation measures had been identified, particularly with respect to the ability of the Cheetah to survive in the changing habitats of the agriculture and livestock lands (Myers, 1975, 1986; Wrogemann, 1975; Joubert, 1984; Hamilton, 1986; Wilson, 1987; Stuart & Wilson, 1988; Laurenson, 1993), minimal conservation action occurred prior to the development of the Cheetah Conservation Fund. In April 1991 a permanent base was established on a farm in north-central Namibia, the main Cheetah area in the country, in order to work directly with the people most affected by the species. Working with farmers, teachers and the public, the Cheetah Conservation Fund promotes conservation of the species, the maintenance of healthy prey populations on livestock farms and livestock management methods which emphasize non-lethal predator control. These conservation and education efforts are supported by on-going research which focuses on: (1) the identification of important aspects of farmland ecosystems necessary to sustain healthy Cheetah populations; (2) the collection of biological samples to aid in the development of an extensive database on wild populations; (3) radio-tracking Cheetahs to learn more about their movements through farms and to monitor them in areas where new livestock and wildlife management practices are being tested.

RESEARCH AND CONSERVATION EDUCATION

In Namibia over 90% of Cheetahs live in a contiguous area of over 275 000 km² of commercial farmland that supports cattle, sheep, goats and wildlife. Farmers have successfully removed most of the large predators to reduce livestock losses. Chee-

tahs are known to kill small stock and calves up to 6 months of age but are blamed for far more losses than they actually cause (Marker-Kraus *et al.*, 1996). Although classified as protected, a Cheetah can be shot to protect life or property and most farmers practice 'preventative management' by shooting the animals whenever they are seen or after live-catching them in traps.

The first stage of the long-term conservation programme was an in-depth survey in districts where Cheetahs still exist. Statistics were obtained on Cheetah population density and distribution patterns, vegetation and overall condition of the land, availability of prey, numbers of livestock, livestock and game management practices and the interaction between farmers, Cheetahs and other wildlife. More than 385 farms over 2 600 000 ha (15% of the national cattle farms) were surveyed in the north-central region of the country. Of the 240 farmers interviewed, over 95% stated that they had no knowledge of the risks to the Cheetah and the role Namibia played in the long-term survival of the species (Marker-Kraus *et al.*, 1996).

To understand the circumstances which have led to the success of Cheetahs on Namibian farmlands and the subsequent decline of the species we looked back into recent history. The current situation can be attributed over-utilization of the land and to ecological changes that have occurred as a result. In the early part of the century water holes were developed which resulted in more wildlife being attracted to the farmlands. Many wild animals were then killed because they were competing with livestock for water and food. In the 1960s severe drought, overgrazing and the reduction of large herds of migratory game changed the vegetation in the area. As farmland developed, farmers came into conflict with large predators and because of the extensive size of farms protective management of livestock was seldom employed. After

the 1960s the Cheetah population began to increase probably because there were fewer predators and more water which attracted wildlife.

In the 1970s frequent rainfall produced good grasses and farmers started to stock two to three times the number of cattle that was recommended. By the late 1970s, when the first signs of the worst drought of the century appeared, the degenerative effects of overgrazing became obvious and grasses began to disappear. In many areas 60–90% of the open grassland became heavy bush. To compensate for the loss of grazing land farmers resorted to catching migratory game to protect their pastures for domestic stock and between 1981 and 1983 the game populations in Namibia declined by 50% (Joubert, 1985). During this time a rabies virus reduced the Kudu *Tragelaphus strepsiceros* population by nearly 80% (Hassel, 1984), which further reduced the potential food availability for Cheetahs.

In the 1980s, with limited grass cover because of drought and drastically reduced wildlife populations, farmers began to remove as many as 700–800 Cheetahs per year from the wild (CITES, 1992). Between 1980 and 1991 about 6782 free-ranging Cheetahs were lost (CITES, 1992; Marker-Kraus *et al.*, 1996).

Cheetah are primarily live-caught at 'playtrees' which tend to have sloping trunks, which the animal can run up easily, and large horizontal limbs from which the surroundings can be surveyed. They leave their scat (faeces) on the limbs of the tree and urinate on the trunk as markers. Namibian farmers have named these trees 'newspaper trees' because of their importance to the social interactions of Cheetahs. Although three types of tree have been used as playtrees, Cheetahs usually use large camel-thorn trees *Acacia luederitzii*. Some farms do not have playtrees (pass-through farms), so the Cheetahs move quickly on to the next playtree, while others have several and some have only one. The farmers set 2 m long wire

cage traps, with drop doors at each end and a trigger in the middle, at these trees. A thorn bush boma (enclosure) makes the cage the only passage to the tree and any Cheetah entering the trap triggers the doors. Once caught, the animal's vocalizations attract other Cheetahs which are also caught.

The use of live-traps is largely indiscriminate because the animal which is killing livestock is not singled out. In each region there are farmers who leave traps open all the time. Information from the survey suggests that continuous catching opens territories and creates a vacuum which encourages more Cheetahs into the area and increases the potential problems for the farmer. Research is in progress to identify the significance of playtrees; for example, whether scent marking the tree affects the social stability and proximity of the Cheetah population and how this affects avoidance and/or attraction.

In August 1992 the Cheetah Conservation Fund, in co-operation with local farmers, began a tag and release programme to assess the density, structure, behaviour and movements of the Cheetah population (McVittie, 1979; Morsbach, 1987). To date over 100 Cheetahs have been tagged and released. When Cheetahs are captured, blood samples, skin biopsies and a full set of body measurements are taken. To date, over 200 animals have been examined. Information from the analysis will provide data on the health and level of genetic variation within the Namibian population which can be used to assist in the long-term management of the species in the wild and in captivity. An extensive database is being developed and preliminary data are currently being analysed. This is the first time biological information on free-ranging Cheetahs in Namibia has been collected. The information and the research methods used to obtain it are being shared with farmers, wildlife professionals and students in an effort to involve them in the more technical aspects of Cheetah conservation

(Marker-Kraus *et al.*, 1996). In February 1994 a research team from the North American SSP came to Namibia to collaborate with the Cheetah Conservation Fund on evaluating reproductive and health parameters of Cheetahs in Namibia (Wildt *et al.*, 1996; Grisham, this volume).

In March 1993 the Cheetah Conservation Fund began a full-time radio-telemetry programme in an area of c. 7000 km². Radio-telemetry is being used to investigate home-range requirements and migratory behaviour of Cheetahs. This information will also enable farmers to learn more about the movements of the species through their farmlands. Over 20 Cheetahs have been radio-collared and twice a week they are tracked using a fixed-winged aeroplane; thick bush, criss-crossed farm fences and the long distances that the cats travel do not allow for ground tracking. Some cats have been tracked for over 2 years and home ranges can be up to 1500 km².

Monitoring the movements of the animals will make it possible to assess the effectiveness of new livestock and wildlife management strategies that are being used to reduce Cheetah-human conflicts. In January 1994, the Cheetah Conservation Fund and the Livestock Guarding Dog Program from Hampshire College, Massachusetts, set up a pilot programme on farms in the study area. Anatolian shepherds, a breed of livestock guarding dog from Turkey, were imported and established in flocks of sheep and herds of goats. At present there are over 20 dogs working on farms protecting small stock from predators. All dogs were donated to the farming community and a co-operative dog breeding programme has increased the number of dogs available for placement on farms. The Cheetah Conservation Fund monitors this programme which, although still in its early stages, appears to be successful.

The Cheetah Conservation Fund also assists farmers to develop co-operative management protocols for wildlife on

their land and the use of non-lethal predator management practices. Through direct contact with individuals, meetings of the farmer's association and a newsletter for farmers, the community is kept informed of the progress being made and is encouraged to remain actively involved in all aspects of the Cheetah conservation programme. Over the past 4 years farmers have become more positive about Cheetahs and the Cheetah Conservation Fund is developing a conservation management plan for livestock and wildlife that is beneficial to Cheetahs and farmers.

An extensive public outreach programme, which is being developed to raise awareness about the need to preserve Namibia's rich biodiversity and the role of the Cheetah in healthy ecosystems, includes: (1) conducting interactive assembly programmes which inform students of the role they could play in helping to conserve the Cheetah; (2) distributing subject-specific education packs to schools; (3) distributing activity sheets to students; (4) using non-formal education methods to promote social and cultural activities.

Programmes being developed in Namibia are being adapted for use in other southern African countries. In June 1993 the Cheetah Conservation Fund was asked to present its work on non-lethal predator control to the Botswana Wildlife Department. In 1994 the Botswana government asked the Cheetah Conservation Fund to begin a similar conservation programme in their country. Discussions are also under way with non-governmental organizations in Zimbabwe, South Africa and Zambia regarding the development of similar programmes: at time of writing the Cheetah Conservation Fund is collaborating with a Cheetah reintroduction programme in South Africa and is assisting in Cheetah conservation efforts in Zambia and Zimbabwe. These countries have geographically connected Cheetah populations and a co-operative long-term strategy will be

important to conserve a larger gene pool. Research and outreach programmes provide knowledge and tools necessary to develop management programmes and policies for the sustainable utilization of wildlife and ecosystems in which Cheetahs live.

The World Zoo Organization and the Conservation Breeding Specialist Group describe the role of zoos as follows: 'Zoos are rapidly evolving to serve in multiple ways as conservation centres....As conservation centres, zoos must additionally address sustainable relationships of humankind and nature, explain the values of ecosystems and the necessity of conserving biological diversity, practise the conservation ethic throughout zoo operations, and cooperate within the world zoo network and with other conservation organizations.' (IUDZG/CBSG(IUCN/SSC), 1993).

This stated role implies the necessity of a strong link between *in situ* and *ex situ* conservation, which would allow the channelling of expertise and resources from the zoological community into *in situ* conservation efforts. Information obtained from the wild can be used for the management of captive populations. Conversely, such a link would enable zoos to gain a better insight into the interaction between wild animals, natural habitats and local inhabitants, around which education and conservation efforts can be developed.

The Cheetah Conservation Fund welcomes and facilitates the participation of many international organizations in its programmes. Zoological facilities worldwide have contributed educational material, research expertise and finances to the global effort of Cheetah conservation. A telling statement in the summary report produced by the North American SSP team visit was: 'Our contributions to conservation can be increased exponentially by transforming our skills and talents to managers and explorers of

biodiversity in other countries.' (Wildt *et al.*, 1996).

The Cheetah can only survive if its habitat is preserved and can support healthy prey populations. These elements can only be maintained through a holistic approach on farmlands which incorporates land use, livestock and wildlife management. A balance needs to be maintained between the economic needs of the people and the survival of the species. Conservation of this last large stronghold for Cheetahs in southern Africa will determine if the species will survive for future generations. It is tempting to think that the loss of only one species will not affect us but we must remember that all things are connected.

ACKNOWLEDGEMENTS

The author wishes to thank the WILD Foundation, the Bay Foundation, the Weeden Foundation, NOAHS Center of the National Zoological Park, World Wildlife Fund South Africa and the Namibian Nature Foundation for support of the activities of the Cheetah Conservation Fund.

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Manuscript submitted 22 January 1996
