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REDUCING CONFLICTS BETWEEN NAMIBIAN FARMERS AND CHEETAHS

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Abstract: Namibia has the world's largest remaining population of free-ranging cheetahs (*Acinonyx jubatus*), of which 90% are found on commercial livestock and game farms. During the 1980s, farmers killed large numbers of cheetahs and the cheetah population declined from 6,000 to less than 3,000 animals. We surveyed farmers to understand specific reasons for the population decline. We found that the primary problem was a perceived conflict with livestock farming. Game farmers reported more cheetah problems and removed higher numbers than livestock farmers. Our results suggest that new methods of livestock and wildlife management urgently need to be integrated with land management.

Key words: cheetah, conflict, livestock and game farmers, management, Namibia

Protected areas do not ensure the survival of the cheetah (*Acinonyx jubatus*). Most cheetah populations are found outside of protected areas and come into conflict with livestock farmers due to agricultural development and a reduced wild prey base (Caro 1994, Marker 1998). Developing strategies for maintaining cheetah populations and habitats outside of protected areas is critical for the long-term survival of the species.

The largest remaining free-ranging cheetah population is in Namibia (Morsbach 1987, Marker-Kraus and Kraus 1997). Most (90%) of the approximately 2,500 cheetahs (20% of the world's population) are found in a contiguous 275,000-km² parcel of commercial farmland (Marker 1998). Nearly 6,000 commercial livestock farms utilize 44% of Namibia's available agricultural land (Schneider 1994) and produce cattle, smallstock (goats and sheep), and wild game species. Most Namibians (70%) are directly or indirectly dependent on agriculture as a livelihood (Schneider 1994). Beef products contribute 87% of the country's gross agricultural income (van Salkwyk 1995), and an estimated 70% of Namibia's huntable game species are on privately held commercial cattle farms (Joubert and Mostert 1975). In the 1980s and early 1990s, fenced game farms replaced many cattle farms and surrounded both native and exotic game species with

game-proof fencing. Game farms are managed primarily for trophy hunting, an economically lucrative activity that contributes large amounts of foreign currency to the Namibian economy.

Internationally, the cheetah is listed as threatened or endangered on Appendix I of the Convention on International Trade in Endangered Species (CITES), which restricts international trade (CITES 1992). In Namibia, the cheetah is classified as a protected animal, but a cheetah can be shot to protect one's life or property. Many farmers practice preventive management (i.e., eliminating the cheetah indiscriminately, independent of livestock loss, by shooting it either on sight or after trapping; Marker-Kraus and Kraus 1997). Between 1978 and 1994, the Ministry of Environment and Tourism (MET) documented over 9,588 cheetah removals from the Namibian farmlands, with average removals between 1978 and 1985 at 827/year and from 1986 to 1995 at 297/year (Nowell 1996). From 1980 to 1991, CITES (1992) reported 6,782 cheetahs removed by Namibian farmers, thereby reducing the population by more than half from 6,000 animals to less than 3,000 (Morsbach 1987). According to the Ministry of Agriculture's Department of Veterinary Services (DVS), 100,066 predators were killed between 1986 and 1994, of which 1.1% (1,094) were cheetahs (Marker-Kraus et al. 1996).

Actual livestock loss results from a variety of factors, including predation, drought conditions, diseases, reproductive failure, birth defects, injury, poisonous plants, natural causes, and stock theft. According to DVS, between 1986 and 1994, predation was responsible for an average of 13% of cattle losses (reported on 2% of the country's farms) and 35% of smallstock losses (reported on 11% of the country's farms). Losses due to cheetahs represented 29% of all cattle predation and 3% of all smallstock predation.

Efforts have been underway in Namibia by several government departments and nongovernment organizations (NGOs) to encourage the farming community to manage the farmland ecosystem for a healthy cheetah population. To understand the attitudes within the farming community toward cheetahs (i.e., livestock loss and game loss) and to independently assess the removal rate of cheetahs by farmers, we conducted a personal interview survey. Here, we identify components of farmland management that have contributed to the cheetah's decline. Moreover, our data suggest that changes in farm management practices could potentially reduce conflicts between farmers and cheetahs.

METHODS

A personal interview survey was conducted between 1991 and 1993 (Marker-Kraus et al. 1996). Information collected included (1) physical features of the farmland, (2) livestock and wildlife densities, (3) current livestock and wildlife management practices, (4) livestock losses due to predators, (5) interactions

between cheetahs and other wildlife, (6) cheetah sightings and removals in the survey area, (7) observations about cheetah behavior, and (8) farmers' attitudes and suggested solutions to reducing conflict with the cheetah. Historical data on livestock/predator conflicts in Namibia were obtained from DVS and CITES (Marker-Kraus et al. 1996). Game farmers having any game-proof fencing on their farms were identified. Not all farmers responded to all questions; therefore, the results are based only on the responses.

RESULTS

We surveyed a cross-section of farmers representing 15% of the commercial cattle farmland (N = 241 farmers owning 385 farms) covering 2,671,908 ha in the north-central commercial cattle farmland (7% of Namibian farms). Although many of these farmers had smallstock primarily for personal use, the commercial livestock in this area was cattle. Over 90% of the farmers surveyed had limited knowledge about problems facing the cheetah and the farmer's role in its long-term survival. Most survey participants (75%) proposed solutions to the actual or perceived cheetah conflict, and 40% said that wildlife and/or livestock management would reduce conflicts, including maintaining higher concentrations of free-ranging game for cheetah prey and better livestock management.

The physical features of these farmlands varied widely and have been altered extensively over the last century by the farmers. Most farmers (87%) surveyed owned farms that were less than 15,000 ha (average 8,000 ha). Most (75%) of the farmlands were fenced for cattle, and 25% were mixed cattle and game-fenced, of which 9% were only game-fenced. Cattle fencing is made up of 5 strands of nonbarbed galvanized wire to restrict cattle movements, creating livestock "camps" that enable rotation of stock through the farm. Livestock fencing does not stop the migration of wildlife. Game fencing is constructed for nonjumping game (1.4 m with 11 wires) or high-jumping game (2.6 m, usually with 21 wires) that restricts wildlife movement both in and around fenced areas. Farmers reported that most of the game (88%) was free-ranging, native species and was found outside game-fenced areas. The estimated average ratio of game to livestock was 1:2. Exotic game was found only in game-fenced farms and represented 15% of the species on game farms.

Perceived Cheetah Problems and Stock Loss

It is difficult to define a "cheetah problem" because livestock loss specifically due to cheetahs is often unknown and farmers' perceptions of predation differ. Many farmers accept losing 1 or 2 calves a year, while others find any loss an economic hardship, and attitudes toward the cheetah do not necessarily reflect actual loss of livestock. Farmers in the survey were asked whether they had a problem with cheetahs. Of those responding, 75% did not consider the cheetah a

problem (Fig. 1a). Problems reported by farmers were greater for black-backed jackal (*Canis mesomelas*), leopard (*Panthera pardus*), and caracal (*Caracal caracal*) than cheetah (Fig. 1a). Problems reported by game farmers versus livestock farmers were higher for all 4 species of predators and nearly double for the cheetah (Fig. 1a).

Although most farmers did not report having a cheetah problem, most (85% overall) reported some predation of cattle and predation of smallstock (64% overall; Fig. 1b). Of the farmers reporting a cheetah problem, only 32% indicated how many cattle or smallstock they lost to cheetahs, suggesting that perception may not be directly linked to livestock losses.

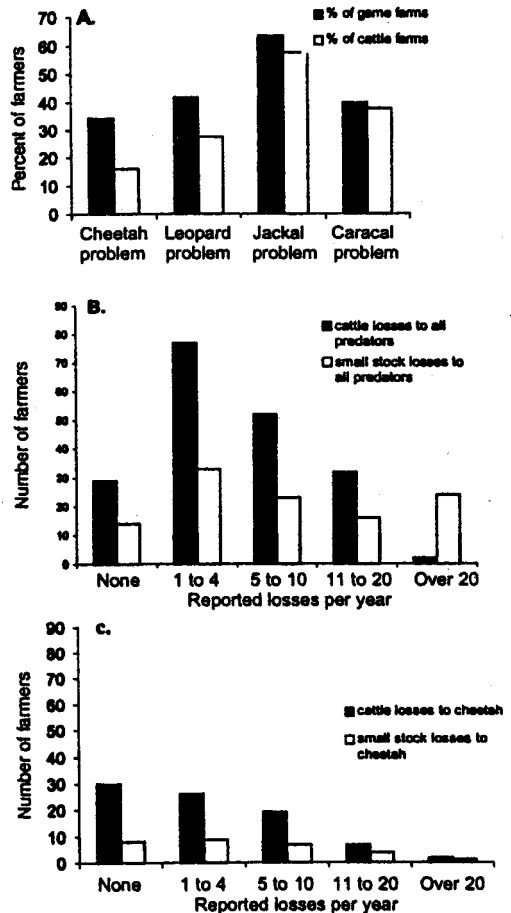


Fig. 1. Farmers' assessments of predator problems and distribution of predator related livestock loss: A. Reported predator problems by species and farm management type. B. Distribution of reported loss estimates due to predators. C. Distribution of reported loss estimates due to cheetahs.

Fig. 1c shows that 64% of the farmers reported cattle losses specifically attributed to cheetahs. Only 11% claimed that losses due to cheetahs were greater than 10 animals per year. Most (51%) of all cattle killed by cheetahs were <3 months of age, and 29% were <8 weeks old. Some (26%) of the farmers attributed smallstock losses specifically to cheetahs, and 14% claimed that losses due to cheetahs were greater than 10 animals (Fig. 1c).

Game farmers reported more problems with cheetahs and other predators (Fig. 1a). However, the extensive size of these fenced farms makes game monitoring difficult. For this reason, game farmers could not quantify game loss to predators or game losses specifically to cheetahs. However, game farmers reported that most predation by cheetahs in game farms was to nonindigenous species, primarily blesbok (*Damaliscus dorcas phillipsi*).

Cheetah Removals

The farmers interviewed reported removing a total of 2,646 cheetahs (1980–1993) from the survey area (Table 1). Game farms (25% of the farmers) removed 48% of the cheetahs, with an average of 23.28 cheetahs removed per farm, compared to only 8.18 cheetahs removed per livestock farm. Game farmers reporting problems removed an average of 43.5 animals versus an average of 11.8 animals removed by livestock farmers. This removal by livestock farmers reporting a problem (11.8) was about the same average number of removals as game farmers not reporting a problem (11.88; Table 1). Livestock farmers not reporting a problem removed an average of 7.4 cheetahs. When asked why so many cheetahs were removed, farmers reported that because of their diurnal hunting behavior cheetahs are spotted more frequently than other predators such as leopards and thus are perceived as being more abundant.

The number of cheetahs removed (Table 1) suggests that removals reported to CITES (1992) are underestimated. Removals reported by farmers in this survey are 36% of those reported to CITES for the same period while covering only 7% of the country. Our results suggest that removal of cheetahs was not in response to specific loss of livestock, but that a few farmers, particularly game farmers, removed large numbers of cheetahs.

DISCUSSION

A variety of factors influence the public's perception of cheetahs as problem animals, including the animals' diurnal hunting behavior (which increases their visibility, thus increasing the perception that cheetahs are plentiful). The principal problem, however, is that traditional farming practices consider that all predators are vermin whether there is actual livestock loss or not. At the time of the survey, most livestock farmers indicated that they could live with cheetahs on their farms

Table 1. Cheetah removals by type of farm management. Game farms tend to remove a disproportionately high number of cheetahs.

	Farm type	
	Game	Livestock
Total cheetahs removed	1,280	1,366
Mean number of cheetahs removed per farmer	23.28	8.18
Mean number of cheetah removals per farmer reporting cheetah problems	43.52	11.81
Mean number of cheetahs removed per farmer not reporting cheetah problems	11.88	7.44
Number of farmers responding	49	108
Percentage of farmers	31.10	68.90

without killing them, and many farmers identified livestock management techniques that could reduce livestock loss. For example, farms that are managed more intensively have a lower risk or perceived risk of livestock losses due to predators (i.e., farms with more camps). More camps involve a more intensive farming system and more rapid rotation of livestock, thus reducing predator conflict.

Most of the cattle lost to cheetahs were calves. To reduce calf loss, the use of calving camps was recommended by farmers. Proper location of the calving camps was also identified as an important factor, as they should not be placed in areas of known or regular cheetah activity or in areas with high numbers of aardvark (*Orycteropus afer*) holes (calves regularly fall into these holes, and the cheetah is often blamed).

Predation on calves declines if farmers synchronize calving (calving seasons) within their herd, with other farms in the area, and with wildlife calving times. High concentrations of cattle during calving season combined with a fast rotation schedule through smaller camps (thus not allowing local predators to become familiar with the management pattern) assists in reducing livestock loss. The highest percent of calf loss was in heifers (cows giving birth for the first time). Putting heifers together with older cows or in closely observed calving camps, as well as in camps where there are more cows and calves for protection, also can reduce loss.

Using donkeys as guarding animals to accompany calving herds is a tactic employed successfully in Namibia, and keeping horns on a few members of the herd assisted in aggression toward predators, thus reducing loss from predators.

Identification of smallstock management practices to reduce livestock loss to predators included the use of lambing camps, corralling herds, and employing herders or guarding dogs. The use of both a herder and a dog together is recommended, since

smallstock, if not sufficiently protected, panics at the sight of a predator.

Contrary to views expressed by livestock farmers, most game farmers indicated that they could not live with cheetahs on their farms. Common sense or logic suggests that if a healthy prey base of wild game is maintained, the chance of having cheetah problems will be minimal. However, our results suggest that game farmers view the cheetahs as a greater problem and remove them in higher numbers. Game farmers view the cheetah as a direct economic threat because it preys on valuable game that is kept primarily for trophy hunting. The introduction into heavily bushed areas of exotic game species like blesbok and common impala (*Aepyceros melampus*), as well as native springbok (*Antidorcas marsupialis*), can attract cheetahs; loss among these species is often greatest. These animals require additional protection from predators, and electric fencing may be an effective solution. However, electric fencing is expensive and requires ongoing maintenance. Most game farmers are not willing to invest the necessary time and money. Most game farmers' attitudes and management practices are in direct conflict with continued cheetah survival on their land.

Approximately 1,000 farmers control the cheetah's fate in Namibia. Namibian farmlands are a dynamic, constantly changing system, and for cheetahs to persist, farmers must be flexible in their management approaches. Farmers using integrated management techniques and strategies for predator control can coexist with cheetahs. The farmer holds the key to the cheetah's survival; therefore, conservation measures must take into account farmers' needs, resources, and attitudes. With proper management of farmlands, the cheetah will continue to exist in Namibia. With proper planning and increased education, the cheetah can become a natural resource and a national treasure for all Namibians.

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