

# Cheetah Status Report

## Botswana 2007

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# Status Report for the Cheetah in Botswana

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## Abstract

Historically, cheetahs (*Acinonyx jubatus*) have been distributed throughout Botswana. With once pristine habitat, very low human populations and one of the largest concentrations of ungulates on the continent, space and prey was plentiful. However, the last 40 years have seen great changes in the natural habitat, with overstocking of livestock, range partitioning, the arrival of deep borehole technology and the erection of cordon fences causing dramatic reductions in wildlife populations and the overall integrity of the Kalahari ecosystems. This report assesses current national cheetah status and distribution, detailing the factors presently affecting these populations.

## History

Little historical data is available on cheetahs' status nationally. In 1975, Myers, estimated Botswana's cheetah population at 1000-2000. The cheetah was considered to be sparsely distributed. Two-thirds of the country was considered to be suitable habitat, the semi arid Kalahari ecosystem in the South and West (700 cheetah), and the well-watered savannah of the Okavango Delta in the North West, which supports higher prey populations (800 cheetah). The remaining third of the country in the East, being semi arid and over utilised was assumed to have very low cheetah densities (500 cheetah). There was great concern over the extensive veldt deterioration due to a lack of management of the national herd of 1.5million cattle. Habitat degradation was resulting in declines in perennial grassland, an increase in scrub savannah, lowered water tables and disappearance of wildlife (Myers 1975). These concerns remain today and the need for habitat conservation in Botswana has never been greater.

## Distribution and Population Estimation

### Background of current estimates

Very little focused research has been carried out on cheetah in Botswana. However, the Department of Wildlife and National Parks (DWNP) carried out spoor surveys of predators in the Central Kalahari Game Reserve (CKGR) as part of a ground monitoring program of wildlife in the Kalahari ecosystem, between 1996-1999. The methods developed by Dr. Stander in Namibia (Stander 1998) were utilised. Data collected along defined road transects of known length was used to provide an index of abundance. Later, this data was analysed using the spoor frequency/predator density calibration factors determined by Dr. Funston's study in the Kgalagadi Gemsbok Trans Frontier Park (KGTP) which provided estimates for dune and tree savannah habitats in the region. The analysis yielded the result of 112 cheetahs in the CKGR at a density of 0.25-0.26 cheetah/100 km<sup>2</sup> (DWNP 2000). Dr Paul Funston carried out the Kgalagadi Trans Frontier Lion Project from 1998-2001. Although the focus was on lions, all predator spoor were recorded and analysed to provide density estimates for use in the region. 204 cheetahs were estimated to inhabit the KTP at a density of 0.57 cheetah/100 km<sup>2</sup> (Funston 2001). This data was then utilised for Botswana's draft predator management strategy. This was compiled in 2001 and provides the accepted estimates for cheetahs based on the current knowledge.

The national density estimates were derived from these calibration factors found in the CKGR and KGTP. The following assumptions were made to estimate the cheetah population size:

- Density in the Kgalagadi Wildlife Management Area is intermediate between the CKGR and KGTP estimates, i.e. between 0.26-0.56 cheetah/100 km<sup>2</sup>.
- Density in other areas varies between 0.15-0.56 cheetah/100 km<sup>2</sup>.
- Cheetahs only occur in 25% of the Central Agricultural Unit (Winterbach 2003).

This study provides a total national population estimate of **1768 cheetahs**.

Management units	Estimate	Density/100 km <sup>2</sup>
Okavango	52	0.35
Dry North	164	0.36
Kwando/Chobe	19	0.35
Pandamatenga	11	0.37
Pans	43	0.35
Central Agricultural	119	0.09
Northern Tuli GR	2	0.29
Ngamiland Agricultural	246	0.35
Ghanzi Farms	136	0.35
Kgalagadi WMAs	302	0.41
CKGR	113	0.21
KTP	204	0.57
Kgalagadi Agricultural 1	55	0.35
Kgalagadi Agricultural 2	302	0.35

It is noted by Winterbach that the assumption of 0.15-0.56 cheetah/100 km<sup>2</sup> in the agricultural zones is likely to be very conservative, as cheetah distribution in Botswana includes large areas outside conservation zones where effective management of these agricultural zones is essential.

**Table 1.** Cheetah estimates from Botswana's draft predator policy (Winterbach 2003).

## Survey methods

The information used to represent the status of Botswana's cheetah has been derived from:

- **Draft National Predator Management Strategy (Winterbach 2003).** Includes data from spoor surveys in the Central Kalahari Game Reserve and Kgalagadi Gemsbok Trans frontier Park.
- **Problem Animal Control (PAC) records.** Botswana's Department of Wildlife and National Parks (DWNP) includes a PAC section which responds to complaints concerning problem animals and administers a nationwide compensation system. These reports reflect the level of wildlife/conflict occurring in various regions and can be useful to assist in understanding distribution of various species. Reports were collected from between 1998-2006.
- **Status report questionnaires.** A questionnaire was sent out in 2006, to individuals throughout Botswana considered to be knowledgeable about wildlife and the status of predators. This included researchers, conservation workers, safari operators, lodge operators, guides, game and livestock farmers, landowners and the DWNP. Individuals were asked to report on the status of cheetahs, prey and habitats in their area of operations, as well as on current trends, threats and concerns. 18 questionnaires were returned.
- **Sighting reports.** As far as possible sighting reports have been compiled throughout Botswana, from individuals, safari operators, guides, lodges, land owners, and other members of the public.
- **Interviews.** From 2003-2006, Cheetah Conservation Botswana (CCB) has been carrying out interviews in farming communities experiencing predator conflict, to assess cheetah distribution, levels of farm management and current attitudes of landowners. 170 farms and cattle posts have been interviewed.
- **Literature review**  
Relevant publications relating to Botswana were utilised for background information.

## Current distribution

In 1992 it was considered that cheetahs were widespread throughout Botswana, being most common in the South West and North West (Vandepitte 1992). Today, although widespread, cheetah distribution will likely be concentrated in the southern part of the country where densities of competitors will be lower (ODMP 2006). It is considered that a large part of the cheetahs' distribution occurs outside protected areas and there may be higher densities in agricultural zones (where wild prey is available) than in conservation zones (Winterbach 2003).

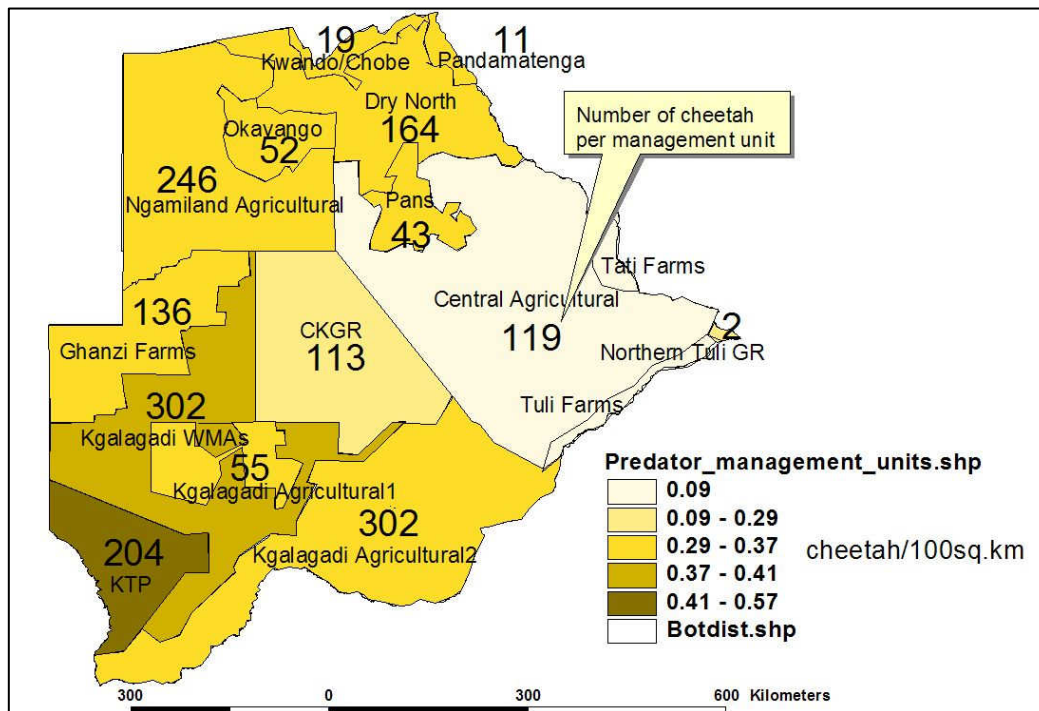
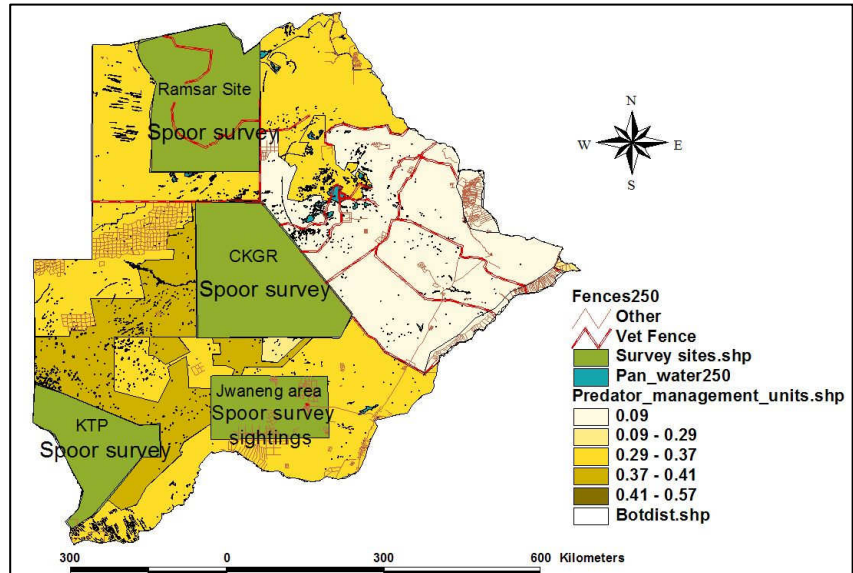


Fig 1. Current National Cheetah Estimates related to predator management zones.

According to estimates (Table 1, Fig.1) the **Kgalagadi Trans Frontier Park (KTP)** and **Kgalagadi Wildlife Management Area (WMA)** have the highest densities of cheetah. The **Central Kalahari Game Reserve (CKGR)** has lower estimates than might be expected, although prey has decreased considerably in the last 40 years and lions may be a limiting factor in this area. **The agricultural zones** throughout Botswana are important areas for cheetah, in these areas competitors such as lions and spotted hyenas have been removed, although livestock conflict now limits these populations. The **Central Agricultural Zone** has the lowest densities. This region is the most populated and utilised region in the country and has the highest cattle biomass. The protected areas in the North, **Okavango, Chobe and the Pans** have the highest prey densities, but also the highest lion and spotted hyena populations. Therefore, cheetah numbers are limited in these areas. From the current cheetah distribution estimates the importance of conservation management for the cheetah in agricultural zones is very clear.

From PAC reports, interviews and sightings it can also be seen that cheetahs are present throughout Botswana, with the exception of some areas of the Central Agricultural Unit, such as the **Tati Farms** in the North West of the area, where no reports for cheetahs have been made in last 10 years (PAC records; interviews). Conversely, within the Central Agricultural Unit, the **Tuli Block Farms** in the South West have higher numbers of reports than the rest of the area. (PAC records, G. Marnewick, 2006 status questionnaire). The Tuli region is an area of mixed land use, with a gradual increase in sustainable wildlife utilisation and ecotourism in the region. This may have led to a local recovery if cheetah numbers in the region.

**Fig 2.** Location of areas which have had more focused studies



Since the spoor surveys in CKGR and KTP, further studies have been carried out to assess cheetah numbers. The Okavango Delta Management Plan carried out a baseline survey of cheetah and leopard numbers in the Ramsar Site (Fig 2). The cheetah population was estimated through spoor surveys at 243. Cheetah density was estimated at 0.7 cheetah/100 km<sup>2</sup>. The core area for cheetahs within the site is the Kwando area with an estimated density of 1.4 cheetah/100 km<sup>2</sup>. These estimates are considerably higher than originally estimated in the National Predator Strategy (0.35 cheetah/100 km<sup>2</sup>). This suggests that this area holds a more significant population than previously considered (ODMP 2006).

Cheetah Conservation Botswana has been conducting a spoor survey in Jwana Game Park in the Kgalagadi Agricultural 2 zone. Although the studies are not yet complete from data collected to date, it is estimated that a population of approximately 150 exists within the study area which spans approximately a quarter of the zone (*A.Houser, unpublished data*). This is higher than the estimated 302 for the whole region. Although this supports the assumption that cheetah numbers are likely to be higher in the agricultural zones than the national estimates (Winterbach 2003).

### ***Trends over the past five years***

The first predator monitoring programs were completed in 1999 in the CKGR and in 2001 in KTP. It was the aim of the DWNP to carry out follow up spoor surveys every 5 years. However, this has not yet been completed and there are not updated figures with which to determine trends. The follow up spoor surveys are planned to take place over the next two years in the CKGR (*Moses Selebatso, research officer, Ghanzi DWNP, pers comm*).

A general view is that cheetah numbers may be increasing in the agricultural zones. High predator populations in protected areas; removal of lion (*Panthera leo*) and spotted hyena (*Crocuta crocuta*) from farmlands and the effect on natural prey movements due to the expansion of artificial water points, may encourage cheetahs to utilise these areas. Of people (n=78) interviewed on trends over the last 5 years in the agricultural zones, 68% felt cheetah populations were increasing. 20% felt they had remained constant. While only 12% reported them to be decreasing. (*R.Klein, unpublished data*) However, high stocking rates and boreholes have made farmlands potential sinks for national predator populations, particularly cheetahs. Claims that cheetah numbers are increasing are just as likely to be attributed to an increase in livestock encounter rates due to expansion into areas previously inaccessible to farming. This requires urgent further study.

Certain areas such as the Molopo Farm block in Southern Botswana (Fig 1 Kgalagadi Agricultural Unit2) have seen clearly decreasing cheetah populations (Dr. M. Bing, 2006 status questionnaire). Sightings of cheetahs were once a regular occurrence in this savannah habitat. However, this region is heavily affected by illegal trade in cheetah due to the proximity of the South African border, as well as livestock conflict. Reports of decreasing cheetah populations have also come from the Central Agricultural Unit. Orapa Game Park and Khama Rhino Sanctuary have experienced decreasing populations over the last 5 years (K. Soopu, 2006 status questionnaire).

In protected areas there are concerns that cheetah populations are decreasing due to increasing densities of lion and spotted hyena (Dr. K. Alexander, D. Mills, H. Winterbach, 2006 status questionnaires).

### Situation in protected areas

Fully protected areas are National Parks and Game Reserves and occupy 17% of Botswana. An additional 21% is designated as Wildlife Management Areas (WMA's), where it is intended that the main form of land use will be sustainable wildlife utilization (Herremans 1998).

#### Central Kalahari Game Reserve - (52,800 km<sup>2</sup>)

The largest protected area in the country. It is made up of sandveld, acacia woodland and scrub. The CKGR changes dramatically through the seasons. During the rainy season seasonal game is found in large numbers, particularly springbok, gemsbok and wildebeest. Cheetahs are resident within the Reserve. (B.Badenhorst, 2006 status questionnaire; DWNP, 2000)

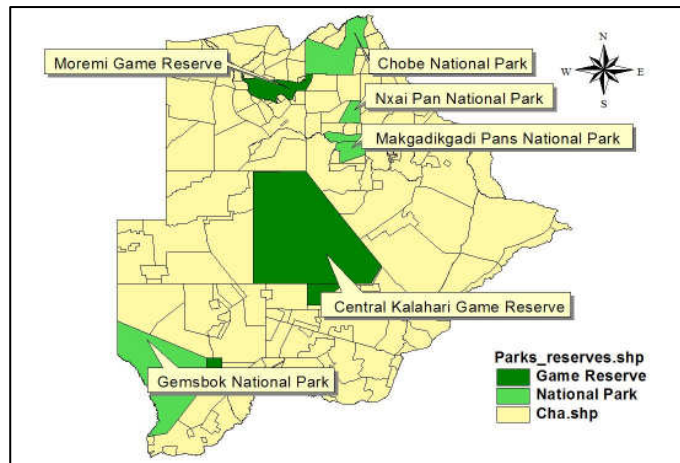


Fig 3. National Parks and Reserves in Botswana

Table 2. Density estimates for cheetah in Central Kalahari Game Reserve (DWNP 2000)

Species	Total Estimate	Lower limit	Upper limit
Cheetah	112	84	141

Sightings are recorded by tourists and collected by DWNP, but these are not yet compiled and made available. The CKGR is an important refuge for Botswana's cheetahs and further studies are required to understand the population dynamics within the area.

#### Kalahari Gemsbok Trans Frontier Park - (28,400 km<sup>2</sup>)

Situated in the South West of Botswana, the KTP is made up of sand veldt, acacia woodland and scrub, frequently interspersed with pans. The pans support nutritious grasses and with the provision of artificial water points there are good populations of springbok, gemsbok and hartebeest. Cheetahs may exist at the highest densities in Botswana within this reserve (Funston 2001, Winterbach 2003). Spoor surveys must be repeated to determine trends.

Habitat	No individual spoor	Spoor frequency	Spoor density	Density estimate (/100 km <sup>2</sup> )	Population Estimate
Dune savannah	60	75.7	1.7	0.57	89
Tree savannah	100	85.1	1.7	0.57	115
Total	160	80.1	1.7	0.57	204

Table 3. Density estimates for cheetah in major habitats of Kgalagadi Trans frontier Park (Funston 2001)

#### Chobe - (10,698 km<sup>2</sup>)

Habitats range from riverine, grassland, mopane woodland to acacia scrub. Cheetahs are rarely seen in this region, although they are occasionally seen in Savute and Nogatshaa. Cheetahs used to be found in the Northern part of the park but appear to have decreased in the region. This may be related to an increase in lion populations in the area (Dr. Alexander, 2006 status questionnaire).

#### Makgadikgadi and Nxai Pan National Park – (7478 km<sup>2</sup>)

The pans make up an area of approx 12,000 km<sup>2</sup>, although only 7478 km<sup>2</sup>s is protected. This area is predominantly characterised by numerous large pans and grassland. Large herds of springbok and zebra congregate during the rainy season as the clay soils yield rich grazing. For the remainder of the year the game is highly dispersed. Cheetahs are present in the Pan areas but not in high numbers and have a seasonal rather than constant presence (Dr. G. Maude; D. Dugmore, 2006 status questionnaires).

#### Moremi Game Reserve– (4871 km<sup>2</sup>)

The reserve incorporates a large part of the Okavango delta. Moremi is a key wildlife area with high populations of elephant, buffalo, lion, spotted hyena and large game. However, cheetahs are present but not common (OWS, 2006). This is possibly due to inter-predator conflict with lion and hyena which limits the cheetah population in the area. (Dr. Alexander, H. Winterbach, 2006 status questionnaires).

#### Northern Tuli Game Reserve – (1,350 km<sup>2</sup>)

This area is a combination of mopane forest, acacia bush veldt, grassland and riverine habitats. Cheetahs are present but tend to be nomadic and not permanent, appearing to be more common during impala calving season. Since 2004, 19 cheetahs have been utilising the reserve (V. Stein, 2006 status questionnaire). This implies the cheetah densities may be higher than earlier suggested (Winterbach 2003).

## Present knowledge

**Table 4.** Summary of current knowledge base on cheetahs in Botswana.

Spoor surveys are due to be carried out by Cheetah Conservation Botswana in Ghanzi and Tuli farmlands in 2007. This will give a calibration factor for the farming regions of these areas and allow trends to be monitored.

## Gaps in knowledge

**Population size:** Spoor surveys need to be carried out in different habitats and land uses throughout the country to fine tune current estimates of cheetah populations.

**Trends:** Repeat spoor surveys need to be scheduled every 5 years in order to establish trends.

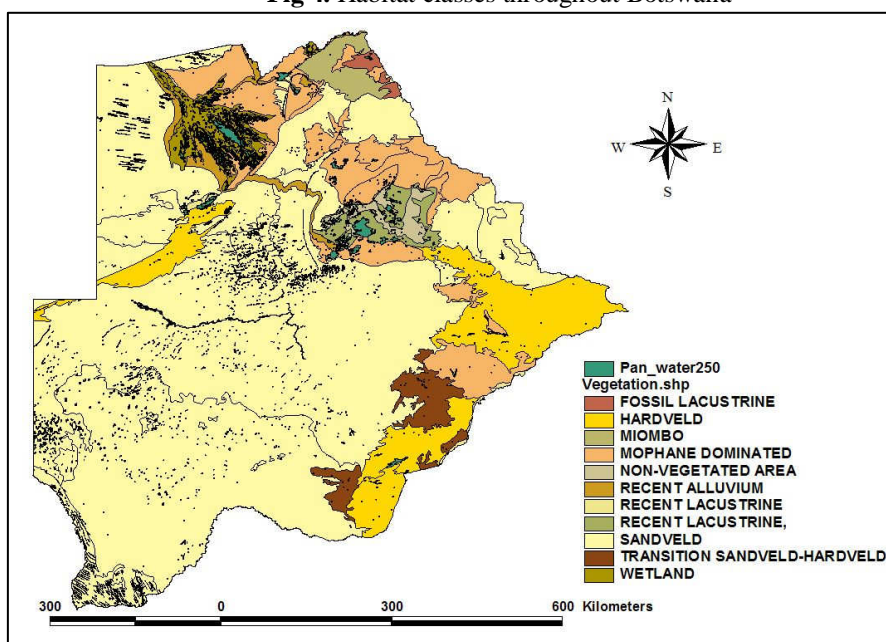
**Conflict:** It is known that the cheetah is considered a significant problem animal in many communities. The impact of such conflict on cheetah populations needs to be urgently assessed.

Zone	Population size	Trends	Conflict levels
Northern Conservation	Dr K Alexander (2006) Spoor surveys	No studies	PAC reports
Northern Agricultural	No studies	No studies	PAC reports
Southern Conservation	Senior wildlife biologist DWNP (2000) Dr P Funston (2001) Spoor surveys	No studies	PAC reports
Southern Agricultural	Studies by CCB to be completed end of 2007. Spoor surveys	No studies	PAC reports, studies by CCB to be completed end of 2007

## Habitat

Most of Botswana is semi-arid. Mean annual rainfall ranges from 650 mm in the extreme northeast to less than 250 mm in the extreme southwest. Almost all rainfall occurs during the summer months, from October to April, and rainfall is highly variable temporally and spatially. The North-West, is dominated by the large inland delta and permanent wetland of the Okavango Delta, while the Central-North East consists of a large area of calcrete plains and salt pans. The East and South-East is hard veldt and with around 450mm annual rainfall. Most of the remaining areas of the country, about two-thirds, are covered by deep Kalahari sands and is sparsely populated (Jones 1999).

**Fig 4.** Habitat classes throughout Botswana



## Regional differences

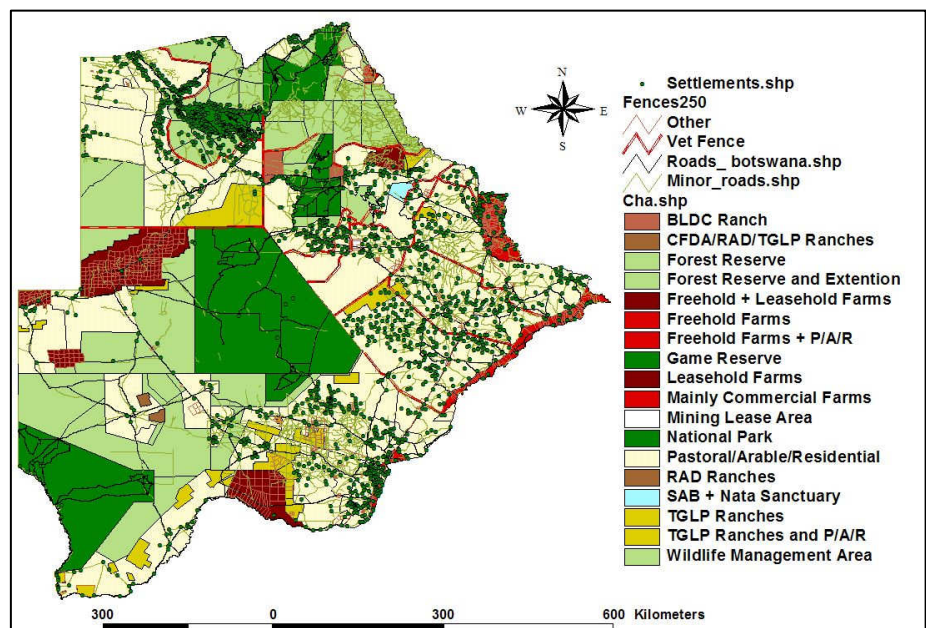
Cheetahs have been reported as present in each major habitat type in Botswana (2006 status report questionnaires; interviews 2003-06; PAC records). The cheetah density estimates are highest in the Kalahari sand veldt and it is generally assumed that cheetah numbers are greater in the South West and North West, as well as in the agricultural zones where wild prey is available, due to an absence of large predators.

## Land Use Change

Since the 1970's cattle farmers in Botswana have benefited economically under the European Union Beef Protocol Agreement, which paid above world prices for Botswana's beef. Along with the development of deep borehole drilling technology and good rainfall years in the 1970s, this provided a strong incentive for the expansion of permanent livestock keeping into Kalahari pastures (Cooke 1985) and a move from low density usage by hunter-gatherer populations to borehole-centred livestock keeping (Perkins 1996). It is a change that has resulted in the substitution of domestic stock for formerly large herds of wild ungulates over large areas (Perkins and Ringrose 1996). The 1975 Tribal Grazing Land Policy (TGLP) (BGG 1975), promoted the expansion of commercial cattle ranches, contrasting with the previously followed informal cattle-post system, in response to concerns of overgrazing and degradation due to the communal land system (Abel & Blaikie 1989). Later, the 1991 National Policy on Agricultural Development (NPAD) reinforced TGLP and called for an acceleration in the fencing of communal areas (Cullis & Watson 2005). Hunter-gatherers and other non-cattle owners found their lands reclassified under the TGLP, for use as cattle ranches (Hitchcock 1996).

In response to this imbalance, Wildlife Management Areas (WMA's) were established through the Fauna Conservation Act, in 1986 (Republic of Botswana, 1986). These areas now make up 20% of land in Botswana, although many are still to be officially gazetted (Spinage 1991).

**Fig 5.** Land use, roads and settlements in Botswana.



This has resulted in significant loss of wild lands to livestock. Much of the land occupied by wildlife in the 1970's is now given over to livestock production, with very small populations of wildlife remaining (Adams *et al* 2002). This is largely due to the 'expansion of the cattle industry via boreholes in vast areas otherwise inhospitable to livestock and therefore reserved for wildlife' (Boggs 2000). In 1936, permanent access to rangelands was around 20% of Botswana's land area, by 1986 this figure had risen to over 45% (Arntzen *et al* 1996).

The expansion of farming into the Kalahari, with considerable areas of new land for grazing, has continued for many decades and resulted in a significant increase in the national cattle herd, from 1.2 million in 1934 to about 3 million in 1998 (White 1998a). The maximum sustainable herd is about 3.3 million cattle (World Bank 1983). Livestock numbers keep growing, despite reports of overgrazing and many warnings that long term rangeland degradation will continue under the current land use. (Cooke 1985).

High rates of stocking and borehole densities eventually result in widespread thorn bush encroachment (Verlinden 1997), sometimes generating woodland in as little as two decades (Abel *et al* 1987). In view of the current livestock distribution and densities, thorn bush encroachment probably affects most of the unprotected land. (Bonica 1992). Studies on grazing in the Kalahari show that as more boreholes are established more bush encroached zones appear, at the expense of grass covered grazing areas (Perkins 1999). A reduction in surface water and increased manifestation of drought during the last century, have also been attributed to large-scale land abuse rather than to changes in rainfall (Herremans 1998).

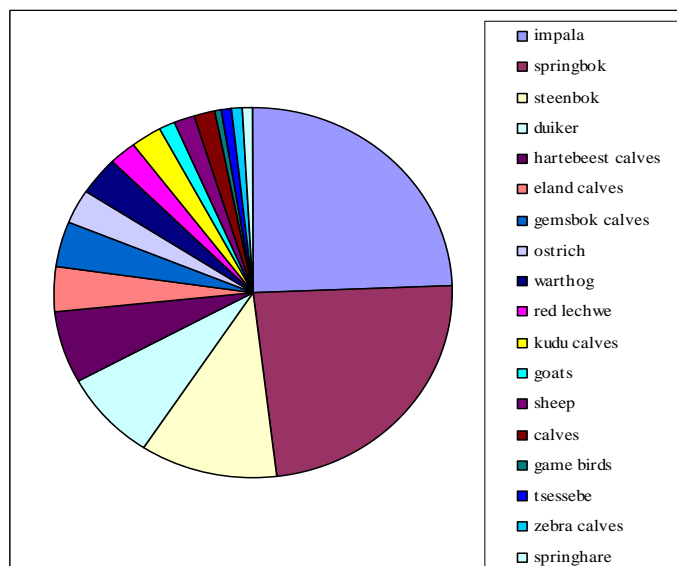
Another important land development in Botswana was the creation of veterinary fences, erected in order to control the spread of livestock disease. They also effectively blocked migration routes of vast numbers of migratory ungulates. It has been strongly suggested that mass die-offs in dry season refuges in drought years are related to these being fenced off (Boggs 2000). The same restrictions arise from the increasing installation of ranch fences. Drought therefore will have a more severe impact on wildlife populations, due to the limitations on movement of migratory species to areas of surface water (Jones 1999).

## Prey

Impala and springbok are among the most common prey items for Botswana cheetahs, followed by small game such as steenbok and duiker. Calves of larger ungulates are also key prey items, such as eland, gemsbok, hartebeest and kudu calves (2006 status questionnaires, 2003-06 interviews).

Alternative prey species do include small stock and calves. However, the perception in livestock farming communities, that cheetahs are a particular pest is possibly the reason that livestock is well represented in list of prey items.

**Graph 1.** Responses from nationwide reports - main cheetah prey



### Proportion of livestock in diet of cheetahs

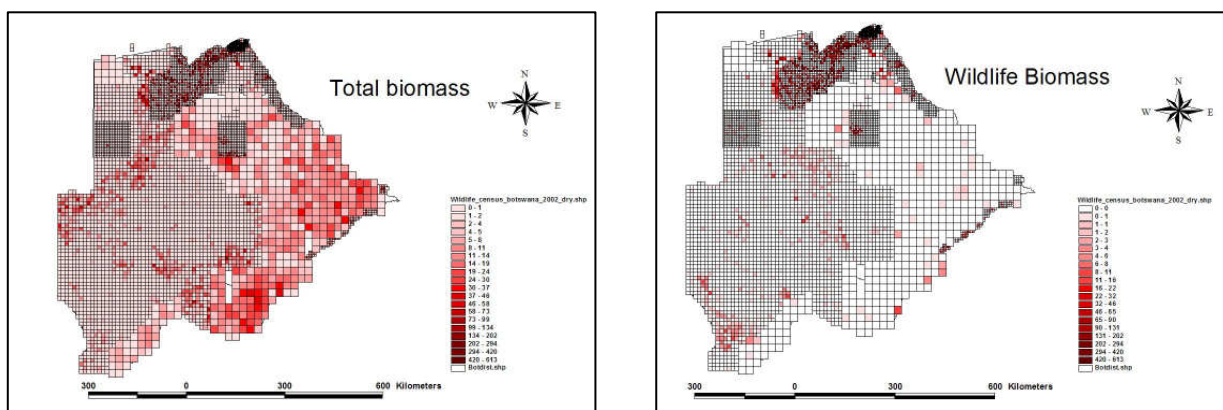
There have not been any studies to assess this in Botswana. Cheetahs are considered to be a regular problem animal, particularly in southern and western Botswana.

### Evolution of prey species populations over the past 10 years

Before the land use changes of the 1970's, Botswana had one of the largest surviving reservoirs of African plains game left on the continent' (White 1998a). It is now generally accepted that there have been drastic reductions in the wildlife population over the last 40 years (Adams *et al* 2002; Boggs 2000). The decline is due to several reasons, including loss of habitat to growing human and livestock populations, installation of veterinary fences, drought, poaching and over hunting. As a result of these factors, wildlife is increasingly restricted to protected areas, which are insufficient in size and wealth of resources to support the current numbers of wildlife without seasonal movement. (Verlinden 1997; Crowe 1995)

Mass die offs occurred in the severe drought between 1982 and 1986, resulting in an 80% reduction in Kalahari ungulates (Verlinden 1997). This occurred as a result of dry season refuges being fenced off and increasingly encroached by humans and livestock, with less available surface water for wildlife. Subsequent game counts in 1992 showed no significant recovery (Bonifica 1992).

Competition for grazing and water between wildlife and livestock may also be a factor, with studies showing 'strong inverse relationship between cattle and wildlife densities', demonstrating that wildlife disappears from livestock invaded areas' (Arntzen 1998; Bonica 1992). Despite the low human population and land devoted to conservation and wildlife utilization, the conservation status of most mammals deteriorates (Herremans 1998). It is also likely that wildlife numbers will decrease further in the future (Jones 1999).



**Fig 6 and 7.** The total biomass and wildlife biomass estimated from aerial surveys in 2002 dry season. The majority of the total biomass is made up of livestock (DWNP 2000).

However, it is a consideration that among cheetahs preferred main prey, steenbok, duiker and springbok are less influenced by human settlements than other wildlife species. Springbok prefer short grass and dwarf shrubs which occur around pans and ancient river beds, but also occur around boreholes grazed by cattle. Also, browse is generally still abundant or even locally increased in highly grazed areas (Verlinden 1997), so there could be potential for cheetahs to persist in farming areas. However, along with this will be an increase in livestock encounter rates and conflict with communities, which are significant threats to the cheetah population.

### Health and Genetics

Cheetah Conservation Botswana has collected blood samples from 50 free ranging cheetahs in both the Southern and Ghanzi Districts in Botswana during the years 2004 through 2007. Forty seven (47) of these samples were sent to the Faculty of Veterinary Science, Onderstepoort in South Africa for diagnostic serology. These cheetahs were tested for IgG antibodies to feline herpesvirus (FHV), feline calicivirus (FCV), feline coronavirus (FEC), feline panleukopaenia (FPV), canine distemper virus (CDV) and for toxoplasmosis by immunoflorescence testing. They were also tested for puma lentivirus (PLV) using an ELISA test. Twenty two (22) were tested for feline leukemia virus (FLV) antigen using an ELISA test produced for domestic cats.

Disease	No. sampled	Positive	Negative	% positive
Feline Herpesvirus (FHV)	47	3	44	6%
Feline Calicivirus (FCV)	47	7	40	15%
Toxoplasma gondii	47	26	21	55%
Feline Corona Virus	47	7	40	15%
Puma Lentivirus (PLV)	47	0	47	0%
Canine Distemper Virus	23	1	22	4%
Feline Leukemia Virus (FLV)	22	0	22	0%

**Table 5.** Infectious Disease Surveillance in Botswana's Cheetah Population (Dr K.Good, unpublished data)



### Relevant conclusions

The results obtained can only indicate that these cats have been exposed to and developed a titer to these viruses. Viral testing, of both domestic and non-domestic felids throughout the country, will give a better understanding of the prevalence of diseases throughout the country. As communities grow, domestic and non-domestic animals will come into contact with each other more often, increasing the chance of spreading disease. Also, translocation is a tool utilised for predator management by the DWNP. It is vital to understand the risks of spreading disease when translocating problem animal.

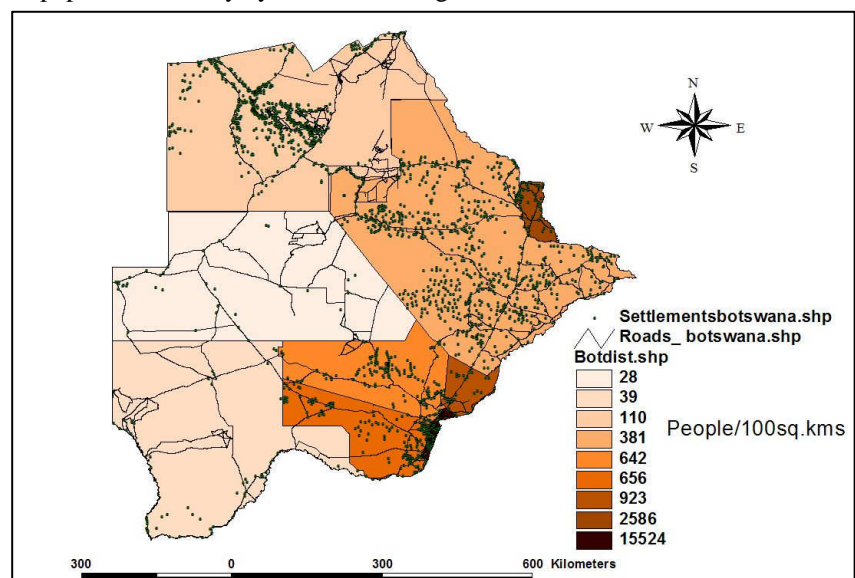
## Human Population

The human population is approaching 1.6 million, and is growing at ca. 2.3% per year. The average population density is only 3 inhabitants per km<sup>2</sup>, but more than 80% of the population is concentrated in the east on more fertile soils in the hardveld (covering ca. 20% of the country). More than 75% of the population lives in rural areas, (Botswana Central Statistics Office CSO 2001) but population density is low suggesting there is potential for larger species of wildlife to coexist with people (Newmark *et al* 1994). Small-scale farming is the primary economic activity for the majority of rural communities. Livestock have a strong cultural and economic value to most rural citizens of Botswana (Twyman 2001) and are widespread throughout the country. Unusually, with a national livestock herd of over 3 million, livestock outnumber people, with two tropical livestock units for every person in the country (CSO, 2001).

Fig 8. Human population density by district showing settlement distribution and roads.

### Changes in distribution of population

Since the 1970's the human populations have expanded along with the expansion of the livestock industry into vast areas of the Kalahari previously inhospitable. This has been accompanied by the move away from low density usage by hunter-gatherer populations to borehole-centred livestock keeping (Perkins 1998). Recently, there have been migrations away from cattleposts to villages and then larger urban centres, in search of employment (Scott Wilson; Ecosurve 2002). Although on the whole the human impact on the landscape increases.



### Other aspects that might affect cheetahs

The increase in utilisation of the Kalahari ecosystem has resulted in associated bush encroachment, increases in the utilisation of game and poaching (Verlinden 1997), as well as an increase in predator /livestock conflict as these species come increasingly into contact.

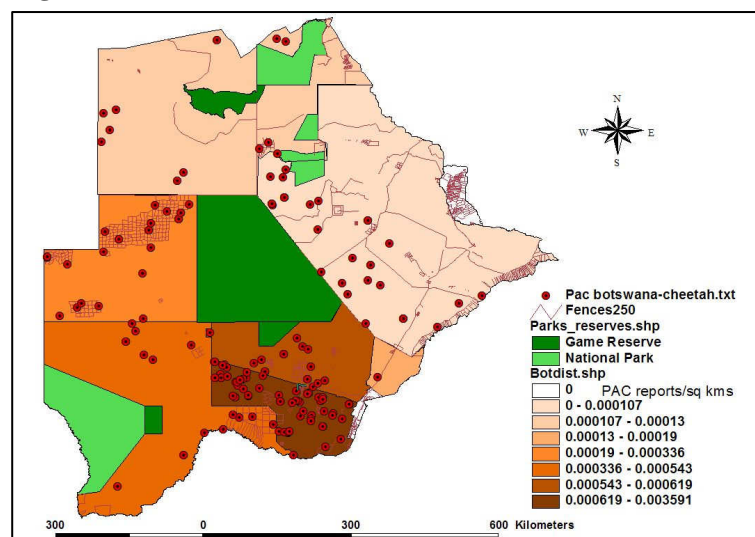
## Threats and Problems

The primary threats to Botswana's cheetah populations are reductions in available habitat and prey; conflict with livestock farming communities and poaching for the illegal wildlife trade.

### Livestock conflict

As in much of Southern Africa, one of the biggest threats to cheetah populations in Botswana is the conflict with livestock farming communities. Figures are not available but it is assumed that significant numbers of cheetah are killed as perceived problem animals. PAC reports are a useful indicator of cheetah distribution. As well as helping to identify conflict hotspots where focused awareness raising and community support can take place. Cheetah problems are highest in the Southern district of Botswana.

Fig 9. Distribution of PAC records for cheetah 1998-2006



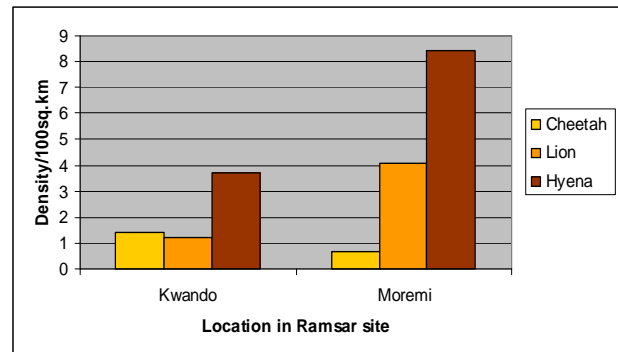
Interview surveys (n=78) were carried out in Southern Botswana, assessing farm management and community perceptions. 60% of interviewees perceived they had a cheetah problem. 75% had a negative perception of cheetahs. 13% were indifferent and only 12% had a positive perception of cheetahs. Perceived problems were greater in commercial farms and villages though reduced in the cattle posts. Cattle posts are often small, subsistence operations and greater care is taken over livestock. Commercial farms generally utilise an open system and little predator or livestock management takes place (Rebecca Klein, unpublished data 2005). Similar interview surveys (n = 123) were conducted at almost the same times in Ghanzi District. The survey showed that 32% of farmers experience livestock losses. 76% of the farmers supported cheetah conservation, though the support reduced to 47% for cheetah conservation beyond protected areas boundaries. Like in the Southern District, most livestock losses were reported in commercial farms, especially in farms with game farming (Selebatso 2006). Rural communities in Botswana tend to view the cheetah as a threat to livestock and of no value. Retaliatory killings are widespread but unreported and recorded. While it is illegal to kill cheetah for any reason, the reality of enforcing this is immensely challenging.

### **Illegal trade**

There is a regular illegal trade operating between Botswana and South Africa. Live animals and skins are smuggled across the long porous borders between the two countries (see policy and legislation).

### **Conflict with larger predators in protected areas**

Inter-specific competition with lion and spotted hyena appears to influence cheetah distribution such that cheetahs will avoid these species in both space and time (Durant 1998). Analysis of spoor surveys in the Okavango/Linyanti Ramsar site show that areas with higher cheetah densities, such as Kwando (1.4 cheetah/ km<sup>2</sup>), had lower densities of lion (1.2 lion/ km<sup>2</sup>). Conversely, in Moremi, cheetah density was halved and lion and hyena densities increased substantially (ODMP 2006).



**Graph 2.** Predator Densities in Moremi and Kwando.

## **Solutions**

Botswana has shown much interest in conserving its large predator species and has started a strategic management plan for large carnivore populations, aiming to improve its current approach to problem animal species.

### **DWNP Managed Compensation Scheme**

In Botswana, the Department of Wildlife National Parks (DWNP) is responsible for the state funded compensation scheme for livestock depredation or crop destruction by wild animals. A claim must be filed at the DWNP then validated, by investigating the evidence and ensuring that the damage was caused by one compensated species. In practice, it is very difficult to verify all claims (Hemsom 2003). In 1997, the DWNP compensation scheme excluded livestock losses by cheetahs and other species that were not listed as dangerous in the Botswana Wildlife Conservation and National Parks Act no. 28 of 1992 (BGG 1996). The exclusion of cheetah depredation from compensation and the ban on killing of problem cheetahs may also have contributed to low tolerance by farmers (Selebatso 2006). In response to this cheetah and wild dog were added to the list of compensated animals in April 2004. It is hoped that this will increase tolerance towards these predators. In practice communities are not satisfied with the current compensation system. It is felt the reimbursements are insufficient and untimely. DWNP officers may have difficulties getting to claims in time and this can cause friction with local farmers (DWNP officers, per comms).

### **DWNP Managed Problem Animal Control (PAC)**

In Botswana, PAC is the responsibility of DWNP PAC officers. After an initial complaint, PAC officers advise the complainants of methods that can reduce the problem. Livestock owners are advised to herd stock during the day and kraal animals at night. PAC officers also address communities through traditional council meetings. The second stage in PAC is non-lethal control. PAC teams may chase the predator, shoot over the animal's head and use non lethal explosives to move the animal away, normally towards a protected area. Translocations may also occur if predator returns, which must be done in the presence of a licensed veterinarian. Occasionally, with persistent problem animals or when there is threat to human life, lethal control may be considered. This rarely happens in the case of cheetahs. There is no clear evidence that these methods are effective in decreasing conflict, although it is the hope that these measures will reduce the number of cheetahs killed by farmers (Moses Selebatso, pers comm).

## **Policy and Legislation**

### **Botswana law**

The cheetah has always been classified as Royal game or conserved animals under the different game laws in Botswana and as such was protected from hunting since 1968. (Spinage 1991). The hunting of cheetahs was again prohibited in 1992 with the Wildlife Conservation and National Parks Act (BGG 1992) which states that the cheetah is a protected predator species in Botswana that may be hunted or captured only under and in accordance with the terms and conditions

of a Director's permit. At this time cheetahs could be killed in defense of stock. In 2000 a moratorium was passed banning the killing of cheetah and lion for any reason, including due to predator conflict, after an alarming rate of killing of the species by farmers in protection of their livestock (BGG 2000). This law was reinforced in 2005 (BGG 2005) with the passing of a statutory instrument banning the killing of cheetah as problem animals and issuing offenders with P1000 (US\$200) fine or 1 year imprisonment.

### **Red Data Book listing**

IUCN lists the cheetah as Vulnerable (VU), therefore it is considered to be facing a high risk of extinction in the wild. (IUCN 2006).

CITES lists the cheetah as Appendix 1 (CITES). No international trade in cheetahs is allowed.

### **Implementation of laws**

Where possible the laws are implemented by the DWNP. However, due to large distances and limited manpower, laws are very difficult to enforce.

### **Extent of translocation of cheetahs**

Translocation is a technique utilised by the PAC department in situations where a predator is considered to be a persistent problem. It is carried out as a last resort as an alternative to killing the individual. However, there is no proper monitoring of the consequences of translocation. There are no mechanisms for guiding and monitoring of translocation exercises. However, the DWNP is currently developing a translocation policy for carnivores (*Moses Selebatso, pers comm*).

### **Consequences of trans located cats**

There are no compiled records of trans-located cheetahs due to PAC activities. No post release monitoring has been done. In certain regions, such as the Ghanzi farmlands, where farmers trap cheetahs considered to be problematic, translocation is occurring regularly. In the last part of 2006 the following translocations took place. These were carried out by Cheetah Conservation Botswana, with DWNP support.

<b>Description</b>	<b>Capture site</b>	<b>Release site</b>
1 female, 2 sub adults	Ghanzi farm	Predator friendly farm near Kang
2 single males	Ghanzi farm	Predator friendly farm in Ghanzi
1 female, 4 single males, 1 male coalition of 2 males	Ghanzi farm	CKGR

**Table 6.** Translocations carried out June-Dec 2006 in Ghanzi region.

There is an acknowledgement from the DWNP that translocation is not an ideal solution. However, it is seen as an option preferable to lethal control. A better option could be enforcing the use of responsible farm management.

### **Relevant international treaties**

Botswana follows the CITES restriction on the hunting and trade of cheetahs.

### **Sustainable use**

There has been a ban on hunting cheetahs since 1968. Prior to this, in 1967, records for game trophies were compiled: 1964=54; 1965=55; 1966=37; 1967=54 (UNDP 1969). Since this time legal hunting has not occurred. However, Botswana may consider hunting cheetahs in the future. Currently, cheetahs are seen as having no value to communities and are considered a primary conflict species. Sustainable utilisation could serve to give the species a value and assist with its conservation. The Namibian cheetah conservation strategy states that increasing the economic value of cheetahs is the best incentive to encourage farmers to tolerate them. A population model suggests that an annual removal of up to 20% of the male population and 5% of the female population is sustainable (Winterbach 2003). However, the need for more focused density estimates are required before determining the appropriate offtake from the population.

### **Legal trade**

Botswana has a CITES quota of 5 cheetahs. However, this is not utilised as Botswana also has laws stating that the species can not be hunted or killed for any reason.

### **What can be legally traded**

There is no trade, whether trophies or live animals.

### **Illegal trade**

This occurs regularly and is one of the primary threats to Botswana's cheetah population. It is not possible at this stage to accurately assess how many cheetahs are leaving the country. However, it has been estimated to be approximately 50-60 individuals annually, mostly sub-adults and cubs (*D. Cilliers, NCMP; A. Houser, CCB, pers comm*). This is based on conversations and information picked up from farmers in the Bray area of South Africa, which is situated on the Botswana border. Reports were received in early December 2006 of 4 cubs offered to a farmer in the Bray area. The

mother of the cubs had been killed. Later, 7 cheetahs were smuggled across the border during the second half of December 2006. (*D. Cilliers, pers comm*).

## **Cheetahs in Captivity**

### ***Captive facilities***

5 cheetahs are currently being kept in 2 temporary holding facilities in the Ghanzi farmlands. The cheetahs were captured as problem animals in the district, and are now utilised to attract tourists. 2 cheetahs are kept at Mokolodi Nature Reserve, in South East Botswana, they were orphaned due to livestock conflict. Hand raised, they now act as ambassadors of the species. There are no other records of cheetahs in captivity in Botswana.

### ***Privately kept or in zoos***

There are no zoos in Botswana.

### ***Breeding centres***

Breeding of cheetah is not encouraged in Botswana and there are no breeding centres.

### ***Captive cheetah regulations***

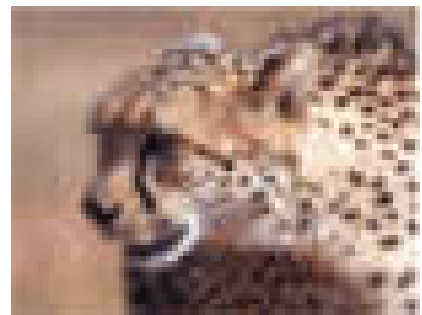
Currently, there are no regulations. DWNP is still working on predator policies for keeping animals in captivity but acknowledges they are urgently required.

### ***Important next steps for conserving cheetahs***

- More in-depth information is required on the population size, distribution and trends. Baseline data for key habitats needs to be collected. Follow up spoor surveys need to take place in CKGR and KTP. Spoor surveys need to be done in WMA's and farming areas. Studies need to assess the impact of predator/livestock conflict on cheetah populations.
- There is a strong need to raise awareness amongst communities about the status of cheetahs, the importance of predators and use of effective livestock management techniques to reduce losses.
- Enforce the use of livestock management techniques in order to qualify for compensation.
- Investigate alternative livelihoods to enable communities to benefit from coexistence with cheetahs. i.e. ecotourism, veldt products, predator friendly beef, honey production.
- The maintenance of corridors between protected areas (Wildlife Management Areas) in order to maintain healthy prey populations.
- Investigate the option of sustainable utilisation of Botswana's cheetah population.
- Investigations into illegal trade and strong penalties for offenders.
- A captive predator policy is urgently required, with guidelines on holding large predators in captivity.

## **Conclusions**

For viable cheetah populations to be maintained in Botswana, there needs to be major policy changes away from actions which promote and favour the livestock industry, to those which support wildlife. Wildlife needs to be seen as a productive land use and there needs to be a constituency of rural people who believe that wildlife makes an essential contribution to their livelihoods (Crowe 2005). The need for Botswana to seriously question its focus on cattle farming, the benefits of the European Union Beef subsidy and the sustainability of cattle keeping in the Kalahari has never been greater (Perkins 1999). At this time, Botswana supports a significant number of the Southern African cheetah population. It is vital that national wildlife policies incorporate the need for cheetah conservation nationally, particularly in agricultural zones. Such management is essential to enable Botswana to conserve this threatened national resource and Africa's most endangered large cat.



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Thank you.

## **Appendices**

### ***I. List of projects***

Cheetah Conservation Botswana (CCB) is a long term conservation project incorporating research, community outreach and public education. CCB has research camps in Jwaneng and Ghanzi farmlands, along with a national community and education program to raise awareness and promote alternative predator management.

### ***II. List of organizations involved***

Cheetah Conservation Botswana, Mokolodi Nature Reserve, Private Bag 0457, Gaborone, Botswana.

Email: [info@cheetahbotswana.com](mailto:info@cheetahbotswana.com). Website: [www.cheetahbotswana.com](http://www.cheetahbotswana.com)

Botswana Predator Conservation Program, Private Bag 13, Maun, Botswana. Email: [lycaon@info.bw](mailto:lycaon@info.bw)

Centre for Conservation of African Resources: Animals, Communities and Land Use (CARACAL) Private Bag K60, Kasane, Botswana, Email: [caracal@botsnet.bw](mailto:caracal@botsnet.bw) Website: [www.caracal.com](http://www.caracal.com)

### ***III. Responsible authorities***

Ministry of Environment, Wildlife and Tourism. Private Bag BO199, Gaborone. Tel: +267 3914955

Department of Wildlife & National Parks. Box 131, Gaborone. Tel: 3971405

## **References**

- Abel N. *et al*, 1997. Mis-measurement of the productivity and sustainability of African communal rangelands: a case study and some principles from Botswana. *Ecological Economics* 23:113-133.
- Abel, N. O. J, & Blaikie, P. M. 1989. Land degradation, stocking rates and conservation practices in the communal rangelands of Botswana and Zimbabwe. *Land Degradation and Rehabilitation*, 1, 101–123.
- Adams, M.*et al*, 2002. National Land Policy: Issues Report. Natural Resource Services (Pty) Ltd, Gaborone report for Republic of Botswana Ministry of Lands, Housing and Environment, Department of Lands.
- Arntzen, J. 1998. Economic Value of Communal Rangelands in Botswana: a case study CREED Working Paper Series No.17, International Institute for Environment and Development, London.
- Botswana Government Gazette (BGG) 2005.** Statutory Instrument No 27 of 2005 killing of cheetahs suspension order. Ministry of Wildlife , Environment and Tourism, Government of Botswana. Government Printer.
- BGG,2000.** Statutory Instrument No. 69 of 2000 restricting the killing of lions and Cheetahs by both public and wildlife staff. Ministry of Commerce and Industry, Government of Botswana. Government Printer, Gaborone.
- BGG, 1996.** Cab Directive 17/96: amendment of section 46 of the WCNPA 28 of 1992..Government of Botswana.
- BGG, 1992.** Wildlife Conservation and National Parks Act no. 28 of 1992. Government Printer, Gaborone.
- BGG, 1975.** National Policy on Tribal Grazing Land Government Paper No. 2 of 1975. Government Printer.
- Boggs, L. 2000.** Community power, participation, conflict and development choice: Community wildlife conservation in the Okavango region of northern Botswana. Evaluating Eden Series Discussion Paper No.17. IIED. International Institute for Environment and Development, London.
- Bonifica 1992,** Aerial Surveys of Botswana 1989-1991. Final Report. Technical Assistance to the Department of Wildlife and National Parks. Gaborone 145 pp.
- Cooke, H.J. 1985.** The Kalahari today: a case of conflict over resource use. *Geographical Journal*, **151**: 75–85.
- Crowe D. 1995.** Present Status of Wildlife. In The present status of wildlife and its future in Botswana. Proc. of A Symposium /Workshop. Kalahari Conservation Society/Chobe Wildlife Trust. 11-28.
- CSO Central Statistics Office 2001.** [www.cso.gov.bw](http://www.cso.gov.bw).
- Cullis, A & Watson, C. 2005.** Winners and losers:privatising the commons in Botswana. No.9 in Securing the commons series. IIED. International Institute for Environment and Development, London
- Jones, B. 1999.** Community-based natural resource management in Botswana and Namibia. Evaluating Eden Series Discussion Paper No.6. IIED. International Institute for Environment and Development, London.
- Funston, Paul, et al 2001.** Spoor frequency estimates as a method of determining lion and other large mammal densities in the Kalahari Transfrontier Park. *Endangered Wildlife Trust*: 36-52.
- Hemson, G. 2001.** The Ecology and Conservation of Lions: Human-Wildlife Conflict in semi-arid Botswana. PhD thesis. Lady Margaret Hall, University of Oxford.

- Herremans, M. 1998.** Conservation status of birds in Botswana in relation to land use. *Biological Conservation* 86 (1998) 139-160.
- Hitchcock, R. K. 1996.** Kalahari communities: Bushmen and the politics of the environment in southern Africa. Copenhagen: IEGIA (Document No. 79).
- IUCN, 2006.** IUCN Red List Categories. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland.
- Myers, N. 1975.** The cheetah in Africa. International Union Conservation status report.
- Newmark *et al*, 1994.** The conflict between wildlife and local people living adjacent to protected areas in Tanzania: Human density as a predictor. *Conservation Biology*, 8: 249-255.
- ODMP 2006.** Wildlife Management Component. Leopard and cheetah baseline inventory in the Okavango Delta. Final Report. Dr K. Alexander, CARACAL, PBK60, Kasane, Botswana.
- Perkins, J.S. 1996.** Botswana: fencing out the equity issue. *Cattleposts and cattle ranching in the Journal of Arid Environments* 33: 503-517.
- Perkins J. S. and Ringrose SM. 1996.** Development Cooperation Objectives and the Beef Protocol: The Case of Botswana: A study of Livestock/ Wildlife/ Tourism/Degradation Linkages. For Metroeconomica Ltd. Contract B-7-504094. University of Botswana, Gaborone.
- Selebatso, M. 2006.** Livestock losses and farmers' perceptions towards cheetah (*Acinonyx jubatus*) conservation in Ghanzi District, Botswana. MSc Thesis, Norwegian University of Life Sciences.
- Senior Wildlife Biologist, 2000. DWNP records. DWNP, Gaborone, Botswana.
- Scott Wilson and Ecosurve, 2002.** Environmental Appraisal for the Construction of a Game Fence around Makgadikgadi Pans National Park. Scott Wilson and Ecosurve. Box 201306. Gaborone.
- Spinage, C. 1991.** History and Evolution of the Fauna Conservation Laws of Botswana; Botswana Society.
- Stander, P.E. 1998.** Spoor counts as indices of large carnivore populations: the relationship between spoor frequency, sampling effort and true density. *Journal of Applied Ecology* 35: 378-385.
- Twyman, 2001.** Natural resource use and livelihoods in Botswana's Wildlife Management Areas. *Applied Geography* 21 (2001) 45-68
- UNDP 1969.** Survey of the wild animal hide and skin industry. Report to the Government of Botswana. United National Development Program. FAO No. TA 2637.
- Vandepitte 1992.** Report on cheetah conflict in Botswana. DWNP Records, Gaborone.
- Verlinden, A. 1997.** Human settlements and wildlife distribution in the southern Kalahari of Botswana. *Biological Conservation*, 82: 120-136.
- Winterbach, C. 2003.** Predator Management Strategy. Department of Wildlife and National Parks, Gaborone.
- White, R. 1998a.** Livestock and Land Tenure in Botswana. Land Reforms in Southern Africa: Review of land reform strategies and community-based natural resource management ZERO-Regional Environment Organisation, Harare.
- World Bank, 1983.** Livestock Subsector Memorandum Eastern Africa. Projects Department. Southern Agriculture Division, Botswana.





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