Acknowledgements

For steering the process of formulating this conservation and managemnet strategy for Cheetahs and Wild dogs, we salute the the Kenya National large carnivore task force.

We would like to extend our gratitude to the stakeholders who participated in the workshop that formulated the strategy among whom include:

- Wildlife biologists & Wildlife Managers (government and private)
- Conservation NGO's
- Mr. Patrick Omondi, Dr. Charles Musyoki and Ms Monicah Chege for the final editing and proof reading of the strategy.

Special thanks also go to the Howard G. Buffett Foundation and the Wildlife Conservation Society for funding the national workshop that made the formulation of this strategy possible.

The photographs used in this strategy have been provided by Drs. Rosie Woodroffe, Laurence Frank, Stephanie Dloniak and Mordecai Ogada.

Table of Contents

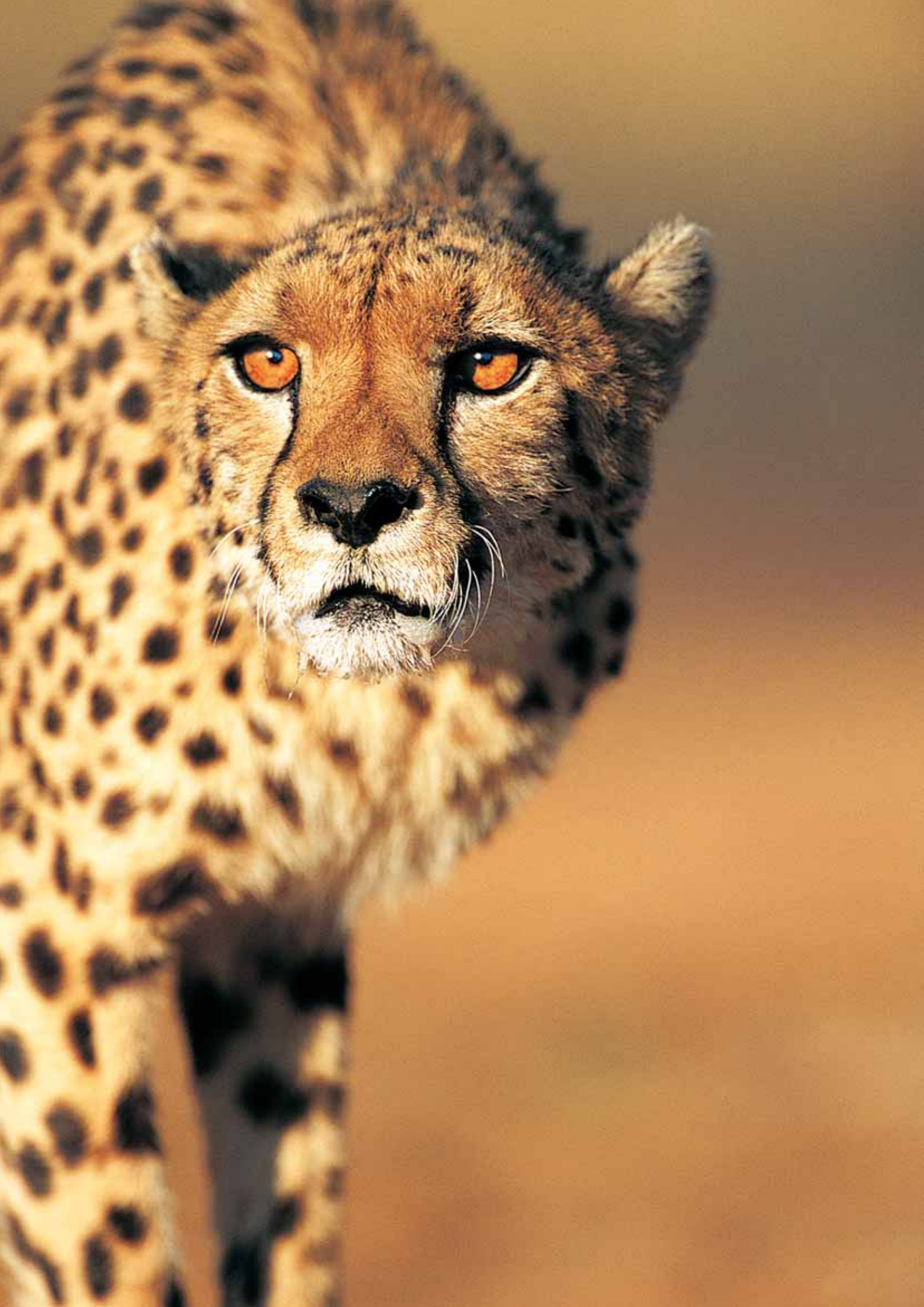
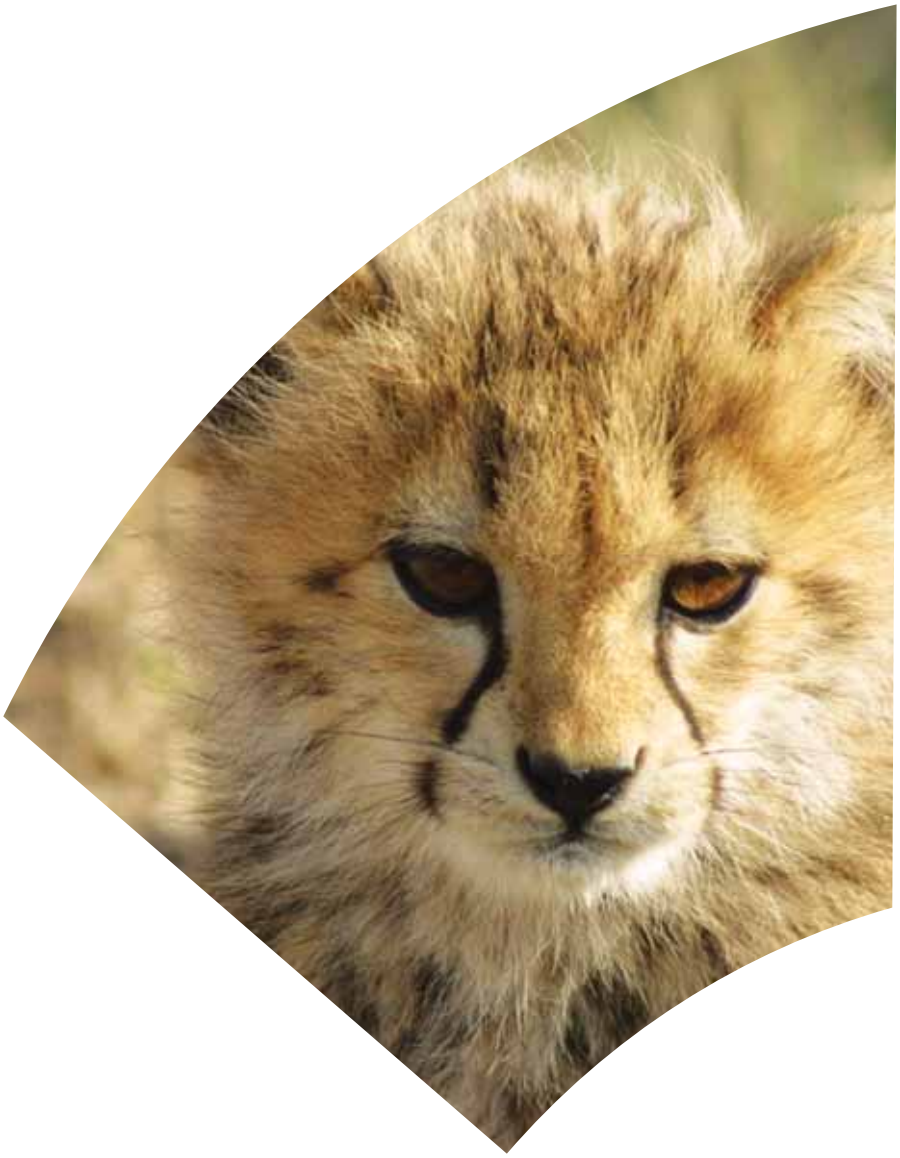


Table of Contents (Continued)

List of Figures

List of Tables



Abbreviations

The following abbreviations and acronyms are used in this document:

AWF	African Wildlife Foundation
CBO	Community Benefit Organisation
CCF	Cheetah Conservation Fund
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CSG	Canid Specialist Group (part of SSC)
DDC	Drylands Development Centre
EAWLS	East African Wildlife Society
ESOK	Ecotourism Society of Kenya
ILRI	International Livestock Research Institute
IUCN	International Union for the Conservation of Nature and Natural Resources
KARI	Kenya Agricultural Research Institute
KATO	Kenya Association of Tour Operators
KPSGA	Kenya Professional Safari Guides Association
KTB	Kenya Tourism Board
KTF	Kenya Tourism Federation
KWS	Kenya Wildlife Service
MOU	Memorandum of Understanding
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
SLWDP	Samburu-Laikipia Wild Dog Project
SSC	Species Survival Commission (part of IUCN)
TAWIRI	Tanzania Wildlife Research Institute
UNEP	United Nations Environment Programme
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London

Foreword

Kenya Wildlife Service (KWS) is a state corporation established by an act of Parliament, CAP 376, with a mandate for wildlife conservation and management in Kenya. Since its inception in 1990, KWS has achieved much in curbing poaching, enlisting support in conservation, and establishing infrastructure and human capacity development. The success has been made possible through support from the Government of Kenya, international and local donors, and development partners.

In the past both cheetahs and wild dogs were widely distributed across Kenya. However, over the years, due to human population increase that has led to loss of habitat, reduction in prey base, conflicts with people, diseases and poorly managed tourism, African wild dog and cheetah numbers have greatly reduced. Cheetahs and wild dogs are now resident in about 23% and 13% of their historical range in Kenya respectively.

African wild dogs and cheetahs form a vital component of Kenya's natural ecosystems and play a critical role in Kenya's tourism industry. In a bid to conserve the remaining population of the two species KWS and the national large carnivore task force spearheaded the process of formulating this national strategy in a workshop that was attended by the species specialists and conservation managers from governmental and non-governmental conservation organizations. Inclusion of all stakeholders was important in ensuring that the strategy is owned and accepted by all.

The strategy has five key components that guide its implementation; the vision, goal, objectives, targets and activities.

KWS recognizes and appreciates the input and efforts of all stakeholders in the conservation and management of carnivores in Kenya. Successful implementation of the strategy is imperative as this will ensure that the species former stable populations and habitat is restored. This will require the participation and collaboration of all stakeholders: the Kenya government donors, the private sector and the community.

The Board of Trustees calls upon the Government of Kenya, donors, conservation partners and all stakeholders to support the implementation of the activities in this document.

Hon. David Mwiraria
Chairman Board of Trustees
KWS

Preface

The national strategy for the conservation of cheetahs and wild dogs was developed as part of a range wide conservation planning process. It is the first of a suite of strategic plans for the conservation and management of the country's large carnivore species. Kenya Wildlife Service intends to develop six national strategies for all six of the country's large carnivore species within a common framework.

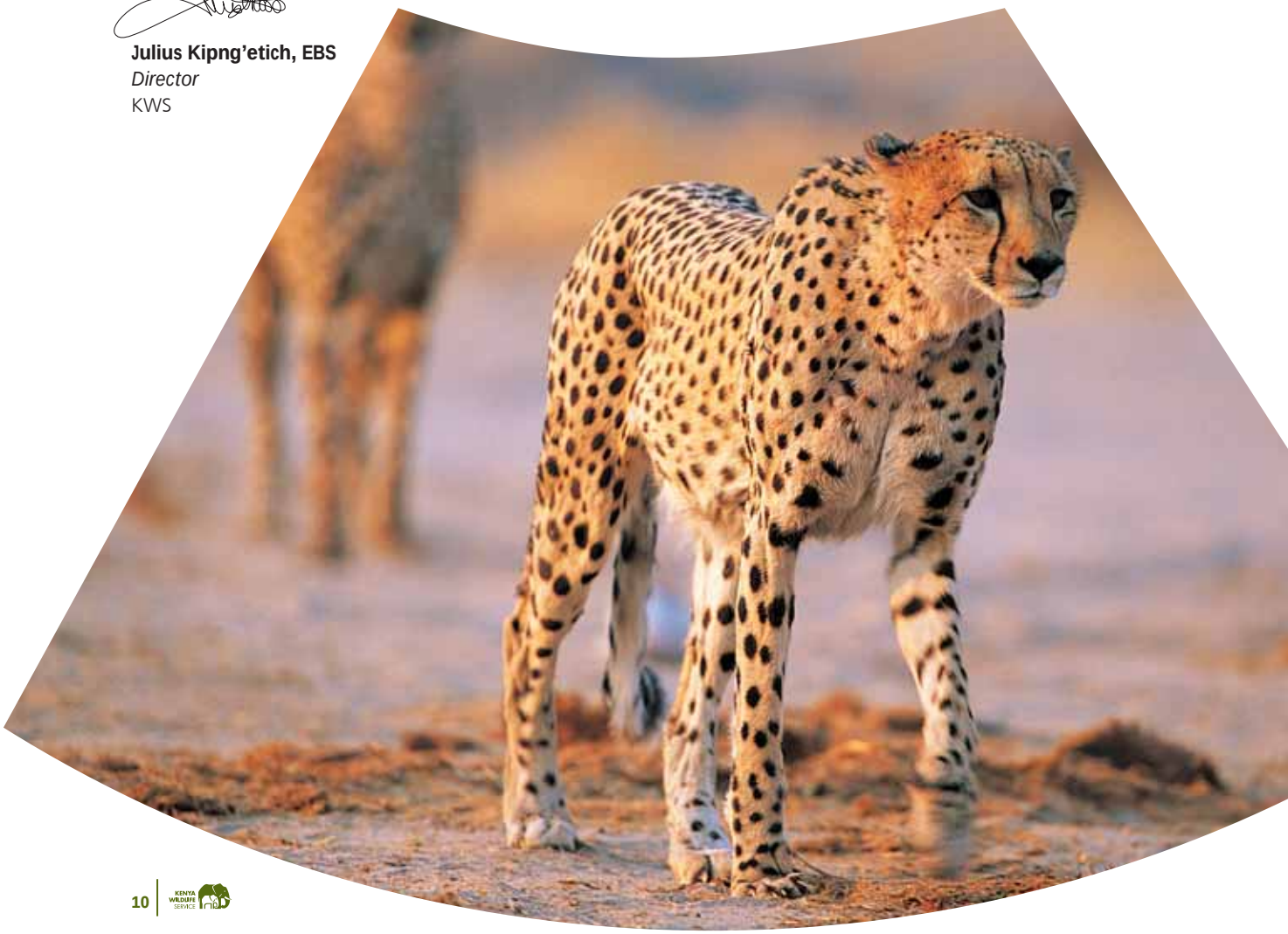
This strategy recognizes the need to establish carnivore conservation zones outside protected areas. Over 80% of the cheetah population in Kenya lives outside protected areas on private and community land. Two-thirds of the African wild dogs in Kenya range outside protected areas. This means that conservation activities outside protected areas are absolutely critical to ensure that these populations are conserved both inside and outside protected areas in the long term.

Stakeholders in the strategy formulation workshop realized the need to designate carnivore conservation zones on private and community land in order to make a substantial contribution to the conservation of these species. The challenge that KWS has is that of identifying and documenting areas across Kenya where ecotourism can effectively assist large carnivore conservation through providing economic benefits to local communities and hence increase their tolerance to these species. Cheetahs and wild dogs have large area requirements; the strategy therefore recommends for creation of more space outside protected areas for large carnivore conservation.

The urgency to put the measures for the conservation of these species in place cannot be overemphasised due to the accelerated decline in the distribution of cheetahs and wild dogs.

I call upon the Government of Kenya, donors, conservation partners and all stakeholders to support the implementation of this document.

Julius Kipng'etich, EBS
Director
KWS



Executive Summary

The African wild dog (*Lycaon pictus*) and the cheetah (*Acinonyx jubatus)* present major challenges for conservationists in the 21st Century. All large carnivores need large areas to survive; yet wild dogs and cheetahs range more widely, and hence need larger areas, than almost any other terrestrial carnivore species anywhere in the world. As human populations encroach on Africa's last wild areas, these two threatened species are often the first species to disappear.

Kenya supports globally important populations of both cheetahs and wild dogs. This strategic plan for their conservation is the first step in a programme to manage and conserve all of Kenya's large carnivore species. Given wild dogs' and cheetahs' similar ecological needs, it makes sense to plan their conservation together. Moreover, management enacted for these two species will also benefit lions, leopards, and hyaenas, though the converse is not necessarily the case given wild dogs' and cheetahs' requirement for far greater areas of wildlife-friendly habitat. This strategy is also the first to be developed as part of a rangewide conservation planning process for cheetahs and wild dogs, conducted in collaboration with the Cat and Canid Specialist Groups of IUCN/SSC.

Important populations of cheetahs and wild dogs are recognised in the Tsavo, Mara-Serengeti and Laikipia-Samburu ecosystems. Encouragingly, wild dog populations appear to have increased in size and extent over the past decade. Areas of northern and eastern Kenya could potentially support cheetahs and wild dogs in ecological settings quite distinct from those further south and west; however the species' status in these areas is poorly known and surveys are badly needed.

Although both cheetahs and wild dogs are economically important to Kenya's tourism industry, the majority of these animals reside outside the protected areas which are the focus of most tourism. Over 80% of cheetah geographic range, and two-thirds of wild dog geographic range, falls on community and private lands. As a result, the populations inside protected areas would not be viable if isolated from unprotected lands. For this reason, conservation activity outside protected areas is absolutely critical for the long-term survival of these two species both inside and outside reserves.

Several important wild dog and cheetah populations straddle international boundaries. Transboundary management is therefore likely to be needed for conserving both species in Kenya in the long term.

As little or no unoccupied habitat was identified where wild dog or cheetah populations could be restored, the strategic plan focuses on securing the remaining populations rather than restoring those that have been lost.

The strategic plan for the species' conservation in Kenya recognises the need to:
(i) promote coexistence of cheetahs and wild dogs with people and domestic animals;
(ii) provide relevant stakeholders and managers with scientific and timely information on the status of and threats to cheetah and wild dog populations;
(iii) strengthen human, financial and information resources for conserving cheetahs and wild dogs;
(iv) ensure that appropriate legislation is in place to allow wild dog and cheetah conservation at the national and international level; and
(v) mainstream cheetah and wild dog conservation in land use planning and its implementation.

Kenya Wildlife Service is the appropriate authority to oversee implementation of this strategic plan, in partnership with a number of NGOs and other institutions.

Chapter 1

1.0 Introduction

1.1 Background

The African wild dog (*Lycaon pictus*) and the cheetah (*Acinonyx jubatus*) present major challenges for conservationists in the 21st Century. Both species were formerly widely distributed in Africa, but both have experienced drastic reductions in numbers and geographic range in recent decades (Ray, Hunter & Zigouris, 2005). All large carnivores need large areas to survive; yet wild dogs and cheetahs range more widely, and hence need larger areas, than almost any other terrestrial carnivore species anywhere in the world. As human populations encroach on Africa's last wild areas, wild dogs and cheetahs – particularly susceptible to the destruction and fragmentation of habitat – are often the first species to disappear.

Despite their globally threatened status (wild dogs are listed as endangered and cheetahs as vulnerable (IUCN, 2006a)), their ecological importance as top carnivores (Woodroffe & Ginsberg, 2005b), and their value to Africa's tourism industry (Lindsey et al., 2007), remarkably little conservation action has been implemented for these two species to date. The majority of Africa's protected areas are too small to conserve viable populations, and active conservation efforts on unprotected lands have hitherto been restricted to a handful of projects.

Three factors have hindered conservation activity for cheetahs and wild dogs:

(1) The species' massive area requirements mean that conservation planning is needed on a daunting spatial scale, rarely seen before in terrestrial conservation.
(2) Lack of information on the species' distribution and status, and on the tools most likely to achieve effective conservation.
(3) Capacity to conserve these species is lacking in most African countries; expertise in managing more high-profile species such as elephants and rhinos may not be transferable to wild dogs or cheetahs because the threats and conservation challenges are likely to be different. Against this background, conservation issues associated with wild dogs and cheetahs are being addressed together because, despite being taxonomically quite different, the two species are ecologically very similar and hence face very similar threats.

1.2 Planning large carnivore conservation in Kenya

The national strategy for cheetah and wild dog conservation in Kenya is the first of a suite of strategies planned for the country's large carnivore species. These strategies are being developed within a common framework (Woodroffe et al., 2007b) and, together, are intended to achieve:

(i) Numerically viable and ecologically functional populations of all large carnivore species native to Kenya;
(ii) Numerically viable and ecologically functional populations of key wild prey species within Kenya; and
(iii) A declining proportion of livestock killed by predators within Kenya.

Kenya Wildlife Service (KWS) intends to develop national strategies for all six of the country's native large carnivore species: cheetahs, lions, leopards, striped and spotted hyaenas, and African wild dogs. Five main themes are expected to be common to these strategies (Woodroffe et al., 2007b):

(1) Ensuring that ecologically functional predator and prey populations are preserved inside reserves, through minimal management intervention
(2) Establishment of carnivore conservation zones outside government protected areas, to boost reserves' ability to conserve numerically viable carnivore populations
(3) Instituting targeted lethal control of problem animals as a replacement for indiscriminate poisoning
(4) Encouraging new mechanisms for local people to receive financial benefits from hosting large carnivores and their prey, especially in carnivore conservation zones
(5) Continually evaluating the policy's performance based upon a system of adaptive management, by monitoring carnivore and prey numbers and distribution, and conflicts with local people.

These broad approaches were kept in mind in the course of developing the national strategy for cheetah and wild dog conservation.

1.3 National planning within a rangewide context

This strategy for the conservation of cheetahs and wild dogs in Kenya was developed as part of a Rangewide Conservation Planning Process for the two species. Recognising the serious conservation issues facing cheetahs and wild

dogs, in 2006 the Cat and Canid Specialist Groups of the IUCN/SSC, in partnership with the Wildlife Conservation Society (WCS) and the Zoological Society of London (ZSL) initiated a process to plan for the species' conservation across their combined geographic range. This process, conducted in close partnership with government conservation authorities, aimed to develop a coordinated array of national conservation strategies for all range states, nested within broader regional strategies. The Kenya national strategy is the first such strategy developed within this rangewide process.

The Rangewide Conservation Planning Process has six stated objectives:

(1) To foster appreciation for the need to conserve wild dogs and cheetahs, particularly among conservation practitioners in range states.
(2) To collate information on wild dog and cheetah distribution and abundance on an ongoing basis, in order to direct conservation efforts and to evaluate the success or failure of these efforts in future years.
(3) To identify key sites for the conservation of wild dogs and cheetahs, including corridors connecting important conservation areas.
(4) To prepare specific global, regional and national conservation action plans for both cheetahs and wild dogs.
(5) To encourage policymakers to incorporate wild dogs' and cheetahs' conservation requirements into land use planning at both national and regional scales.
(6) To develop local capacity to conserve cheetahs and wild dogs by sharing knowledge on effective tools for planning and implementing conservation action.

A key component of this process is a series of workshops, bringing together specialists on the species' biology with conservation managers from governmental and non-governmental conservation organisations. Close involvement of government representatives was considered absolutely critical since these are the organisations with the authority to implement any recommendations at the management and policy levels. While the process will eventually cover the entire geographic range of both species, the large number of range states involved means that productive discussion and interchange would be very difficult to achieve at a single workshop covering all regions. Workshops are therefore being conducted at the regional level, covering eastern, southern, and west-central Africa for cheetahs and wild dogs together, and North Africa and Asia for cheetahs only (wild dogs being absent from this last region).

Although the species' extensive area requirements demand conservation planning on a very large spatial scale, wildlife conservation policy is formulated, authorised and enforced at the national level. It is critical, therefore, that conservation planning be enacted at this level, and national workshops were considered a vital component of the rangewide process. Each regional workshop is therefore being followed immediately by a national workshop in the host country. Hence, the eastern Africa regional workshop was followed by a Kenya national workshop. As well as providing an opportunity to develop a national conservation strategy for the two species, this workshop allowed delegates from other countries in the region (attending as observers) to acquire the experience needed to prepare national workshops in their own range states. This process will eventually lead to the development of national action plans for all range states.

1.4 Biology and conservation needs of African wild dogs

African wild dogs are highly social members of the canid family. Packs cooperate to hunt their prey (Creel & Creel, 1995), which consists mainly of medium-sized ungulates (particularly impala, Aepyceros melampus) but may range in size from hares (*Lepus spp*) and dik diks (*Madoqua spp*, Woodroffe et al., 2007c) to kudu (*Tragelaphus strepsiceros*) and even, occasionally, eland (*Taurotragus oryx*, Van Dyk & Slotow, 2003). Packs also cooperate to breed, with usually only one female and one male being parents of the pups (Girman et al., 1997a), but all pack members contributing to pup care (Malcolm & Marten, 1982). As females have never been observed to raise pups to adulthood without assistance from other pack members, packs, rather than individuals, are often used as the units of measuring wild dog population size.

Unlike most carnivore species (other than cheetahs), wild dogs tend to avoid areas of high prey density (Mills & Gorman, 1997), apparently because larger carnivores prefer such areas (Creel & Creel, 1996). Lions (*Panthera leo*) and hyaenas (*Crocuta crocuta*) both represent important causes of death for adult and juvenile wild dogs (Woodroffe et al., 2007a).

Probably because of this tendency to avoid larger predators, wild dogs live at low population densities and range widely. Population densities average around 2.0 adults and yearlings per 100km^2 (Fuller et al., 1992a) and home ranges average 600-800km^2 per pack in eastern Africa (Woodroffe & Ginsberg, 1998), with some packs ranging over areas in excess of 2,000km^2 (Fuller et al., 1992a). Both wild dogs and cheetahs occupy home ranges larger than would be predicted on the basis of their energy needs (Figure 1.1).

Chapter 1

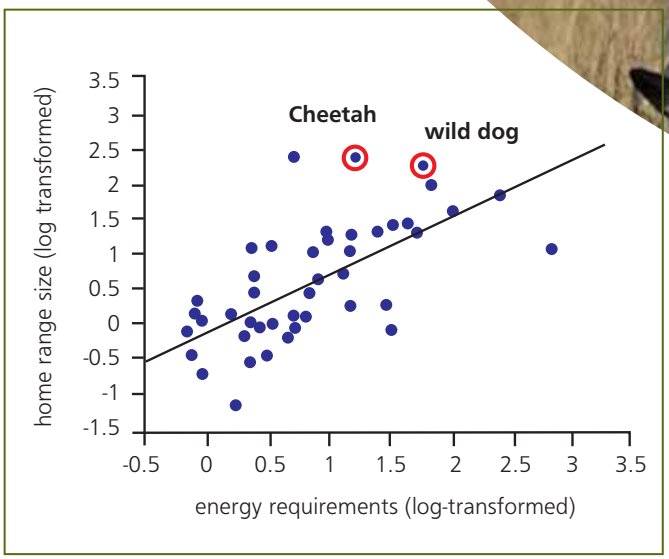


Figure 1.1 *The relationship between energy requirements and home range size in multiple carnivore species, showing the large home ranges occupied by cheetahs and wild dogs in comparison with their energy needs. Wild dogs are recorded as having greater needs than cheetahs because the social unit is a pack rather than an individual. Data are from Gittleman & Harvey (1982).*

Most new wild dog packs form when young animals (often but not always in their second year (McNutt, 1996)) leave their natal packs in same-sex dispersal groups, and seek new territories and members of the opposite sex. Such dispersal groups may travel hundreds of kilometres (Fuller et al., 1992b), and have been recorded in areas very remote from resident populations (Fanshawe et al., 1997). This dispersal behaviour can complicate the interpretation of distribution data, as sightings of small groups of wild dogs do not necessarily indicate the presence of a resident population. However, the behaviour does allow wild dogs to recolonise remote areas when opportunities arise.

Wild dog populations in different regions of Africa are morphologically and genetically different, but no subspecies are recognised (Girman & Wayne, 1997b; Girman et al., 1993). Wild dogs are habitat generalists, and have been recorded in habitats as diverse as wooded savannah (Creel & Creel, 2002), short grasslands (Kuhme, 1965), montane forest (Dutson & Sillero-Zubiri, 2005), montane moorland (Thesiger, 1970) and mangroves (see Figure 3.1).

The first Africa-wide status survey for wild dogs was conducted in 1985-8 (Frame & Fanshawe, 1990), and this was updated in 1997 (Woodroffe, Ginsberg & Macdonald, 1997b) and 2004 (Woodroffe, McNutt & Mills, 2004). These surveys revealed substantial loss and fragmentation of wild dog populations, with the species extirpated across most of western and central Africa, and greatly depleted in eastern and southern Africa. However, the distribution data which were collated mainly by exhaustive postal correspondence, were somewhat biased towards protected areas with little information available from unprotected lands. By 1997, wild dogs had disappeared from most of Africa's protected areas, persisting only in the largest reserves (Woodroffe et al., 1998). In 2004 the species was estimated to number fewer than 6,000 adults and yearlings (Woodroffe et al., 2004). The species is listed as 'endangered' by the IUCN (IUCN, 2006a).

Wild dogs' decline has been related to their limited ability to inhabit human-dominated landscapes. Where human densities are high and habitat consequently fragmented, wild dogs encounter hostile farmers and ranchers, snares set to catch wild ungulates, high speed traffic, and domestic dogs harbouring potentially fatal diseases (Woodroffe & Ginsberg, 1997a). While these threats are common among large carnivores, wild dogs' low population densities and wide ranging behaviour mean that they are both more exposed to, and more susceptible to, these human impacts in comparison with most other species (cheetahs being a possible exception).

Despite these human impacts on their populations, wild dogs can coexist successfully with people under the right circumstances (Woodroffe et al., 2007c). Wild dogs seldom kill livestock where wild prey remain at even comparatively low densities (Rasmussen, 1999; Woodroffe et al., 2005c), and traditional livestock husbandry is a highly effective deterrent (Woodroffe et al., 2006). Tools have been developed to reduce the impacts of conflicts

with game and livestock ranchers, accidental snaring, and road accidents, although safe and effective tools to manage disease risks are still under development (Woodroffe et al., 2005a).

1.5 Biology and conservation needs of cheetahs

The cheetah is one of the most unique and specialised members of the cat family. It can reach speeds of 103km/hour (Sharp, 1997), making it the fastest creature on land. However, despite their specialised hunting strategy, cheetahs are habitat generalists, ranging across a wide variety of habitats, from desert through grassland savannahs to thick bush (Myers, 1975).

Cheetahs have a social system unlike that of any other cat species. Cheetah females are tolerant of other females, and do not maintain territories, having large overlapping home ranges instead (Caro, 1994). Females are highly promiscuous, with high levels of multiple paternity within litters and no evidence of mate fidelity (Gottelli et al., 2007). Cheetah males are often social, forming permanent coalitions of two or three animals, usually brothers, which stay together for life (Caro & Durant, 1991). Males in groups are more likely than single males to take and retain territories, which they then defend against male intruders (Caro & Collins, 1987a). In the Serengeti ecosystem in northern Tanzania and southwestern Kenya, male territories average 50km^2, while females and males without territories cover arounnd 800km^2 every year (Caro, 1994). This system, where males are social and hold small territories, and females are solitary moving across several male territories annually is known in no other mammal species (Gottelli et al., 2007).

Cheetah females are able to give birth to their first litter at two years, after a three month gestation (Caro, 1994). The cubs are kept in a lair for the first two months of their life, while their mother leaves them to hunt every morning and returns at dusk (Laurenson, 1993). Cheetah cub mortality can be high. In the Serengeti, mortality of cubs from birth to independence was 95% (Laurenson, 1994). There, cubs died mostly because they were killed by lions or hyaenas: mothers cannot defend cubs against these much larger predators (Laurenson, 1994). Cubs may also die from exposure or fire, or from abandonment if their mother is unable to find food. If they survive, the cubs will stay with their mother until they are 18 months old, after which they will roam with their littermates for another six months (Caro, 1994). The greatest recorded longevity in the wild is 14 years for females and 11 years for males, however females have never been recorded as reproducing beyond 12 years (Durant unpublished data). Demographic parameters are available for only a small number of populations: mean and variance of birth and survival have only been published from the long term study in the Serengeti National Park, Tanzania (Durant, Kelly & Caro, 2004), whilst mean birth and survival rates are available from ranch lands in Namibia (Marker et al., 2003a).

Cheetahs are predominantly diurnal, although hunting at night is not uncommon (Caro, 1994). Cheetahs hunt by a stealthy stalk followed by a fast chase. Because of their unrivalled speed and acceleration, cheetahs can hunt successfully even if they start a chase at a much greater distance than bulkier and heavier large cats, such as lions and leopards (*Panthera pardus*). They take a wide variety of prey, depending on habitat and geographic location, but they prefer prey of 15-30kg: the size of a Thomson's gazelle (*Gazella thomsonii*) or impala.

Like wild dogs, and unlike most other large carnivore species, cheetahs tend to avoid areas of high prey density, probably because other large carnivore species are found in these areas (Durant, 1998, 2000). Lions have been documented to be largely responsible for the high mortality of cheetah cubs observed in the Serengeti (Laurenson, 1994), and will also kill adults, whilst hyaenas can also kill cubs and will steal kills from cheetahs.

"Like wild dogs, and unlike most other large carnivore species, cheetahs tend to avoid areas of high prey density, probably because other large carnivore species are found in these areas."

Chapter 1

Cheetahs used to be widespread across Africa, and across Asia as far east as India. However today, there are no cheetahs left in Asia except for a small population in Iran, and only a few populations remain in north and west Africa. Most of the remaining cheetah populations are concentrated in sub-Saharan Africa. The first status survey for cheetahs was conducted in the early 1970s (Myers, 1975). Later surveys of selected countries were conducted in the 1980s (Gros, 1996, 1998, 2002; Gros & Rejmanek, 1999), and a summary of current knowledge of global status was collated in 1998 (Marker, 1998). However accurate information on status and densities is extremely difficult to collect for this species, which is shy and rarely seen across most of its range. Furthermore, the ranging patterns of the species incline it to cluster at small "hotspot" localities, making estimating numbers additionally problematic at the broader scale (Durant et al., 2007).

Like wild dogs, and probably because of similar tendencies to avoid larger predators, cheetahs live at low densities with recorded levels ranging between 0.3-3 adult cheetahs/100km^2 (Burney, 1980; Gros, 1996; Marker, 2002; Mills & Biggs, 1993; Morsbach, 1986; Purchase, 1998). Although markedly higher estimates have been documented in some areas, it is likely that these estimates do not reflect the true density, as individuals counted may roam outside the survey area (highlighting a general problem with surveying cheetah populations *see Bashir et al., 2004).*

Home range size has been recorded as ranging from 50km^2 for territorial males in the Serengeti (Caro, 1994) to over 1,000km^2 in Namibia (Marker et al., in press). Like those of wild dogs, cheetah home ranges are much larger than would be predicted from their energy needs (Figure 1.1). Because they can range across such large areas, cheetahs can also disperse widely, and have been recorded as moving hundreds of kilometres (Durant unpublished data). This makes it difficult to determine whether occasional cheetah sightings in an area represent transient individuals or a resident population. However, this ability to disperse enables cheetahs to recolonise new areas fairly easily should they become available.

Global population size has been 'guesstimated' at 14,000 (Myers, 1975) and 'less than 15,000' (Marker, 2002). The species is listed as vulnerable according to IUCN red list criteria (IUCN, 2006a). Although the published population size estimates do not suggest a decline, there is a consensus among the world's cheetah experts that such a decline has occurred, either because the 1970's figure was an underestimate, or because the later figure was an overestimate. Certainly the distribution of the species has contracted markedly from its historical range. Declines have been largely attributed to habitat loss and fragmentation (Marker et al., 2003b; Myers, 1975). The disappearance of the species from across nearly its entire Asian range was in part also due to the habit of the Asian aristocracy to capture and use cheetahs for hunting (Divyabhanusinh, 1995). Today, in sub-Saharan Africa, lethal control, due to perceived or actual conflict with livestock or game ranching, also plays an important role in the decline of the species (Marker et al., 2003b; Myers, 1975).

1.6 The eastern Africa regional workshop

The eastern Africa regional workshop on conservation planning for cheetahs and wild dogs was held on 1st-6th February, 2007, at Mpala Research Centre in Kenya. It was attended by 28 delegates including government and NGO representatives from southern Sudan, Ethiopia, Uganda, Kenya and Tanzania, and species specialists from Botswana, Namibia, Kenya, Tanzania, USA and UK (Figure 1.2). Data were also contributed by a participant from northern Sudan, who was prevented from attending the workshop by a US trade embargo against the Government of Sudan.

Figure 1.2 *Delegates to the conservation planning workshop for African wild dogs and cheetahs in eastern Africa, held at Mpala Research Centre, Kenya in February 2007.*

The eastern Africa workshop had two principle objectives:

- To collate information on wild dog and cheetah status and distribution within the region, in a format that could be used to inform conservation planning, and
- To prepare a regional strategic plan for the species' conservation.

The strategic plan was designed to be a template which could be used, with fairly minor modifications, to develop national strategies for the species' conservation. Details of the workshop agenda, methodology, and outcomes are published separately (IUCN/SSC, in prep).

1.7 The Kenya national workshop

The Kenya national workshop on conservation planning for cheetahs and wild dogs was held on 7-8th February, 2007, at KWS Headquarter in Nairobi. It was attended by 38 participants including KWS and NGO representatives, as well as 16 observers from southern Sudan, Ethiopia, Uganda, Tanzania, Botswana and Namibia (Figure 1.3). Names and contact details of participants are presented in Appendix 1.

1.8 Structure of this report

Chapters 2 and 3 of this report present details of the status and distribution of cheetahs and wild dogs, respectively, in Kenya and neighbouring areas of eastern Africa.

Chapter 4 describes the threats to both species. The data presented in these chapters was collated in the course of the regional workshop and presented to participants in the national workshop for discussion and updating.

Chapter 5 describes the development of the national conservation strategy at the national workshop. This national strategy was developed by presenting the regional strategy to participants in the national workshop, and seeking their approval to use the regional strategy as a template for the national strategy. When this approach was agreed upon, national participants modified and expanded the regional strategy, adding details to produce a Kenya-specific national strategy. The agenda for the workshop is presented in Appendix 2, and a logical framework table of the national strategic plan is provided in Appendix 3.

Figure 1.3 *Delegates to the conservation planning workshop for African wild dogs and cheetahs in Kenya, held at KWS Headquarters in February 2007.*

Chapter 2

2.0 The Distribution and status of cheetahs in Kenya

2.1 Historical distribution

In the past, cheetahs were broadly distributed within Kenya. Cheetahs are habitat generalists, able to persist in a wide array of environmental conditions as long as there is availability of pey, ranging from desert to reasonably thick bush. Hence, cheetahs are thought to have occurred across most of Kenya before human activity modified substantial proportions of natural habitats (Myers, 1975). The species' historical distribution is shown in Figure 2.1.

The highest cheetah densities have been recorded in wooded savannah (Caro, 1994; Marker et al., in press). However, the species lives at low density wherever it occurs, partly because of its competition with other large carnivores, such as lions and spotted hyaenas (Durant, 1998). Because of this, cheetah densities in pristine wilderness that harbour large numbers of other large carnivores are similar to densities in relatively degraded habitat where prey densities are low and larger carnivores have been excluded. This is because the best habitats attract the highest densities of competing carnivores. It unlikely, therefore, that cheetahs were ever abundant, despite their widespread distribution.

2.2 Current distribution

2.2.1 Sighting information

Mapping of cheetahs' current distribution was informed by maps of recent and historical sighting data (Figure 2.2). The presence of sighting observations signify that cheetahs have definitely occurred in that area, but does not signify whether there is a resident, breeding population or whether the sightings

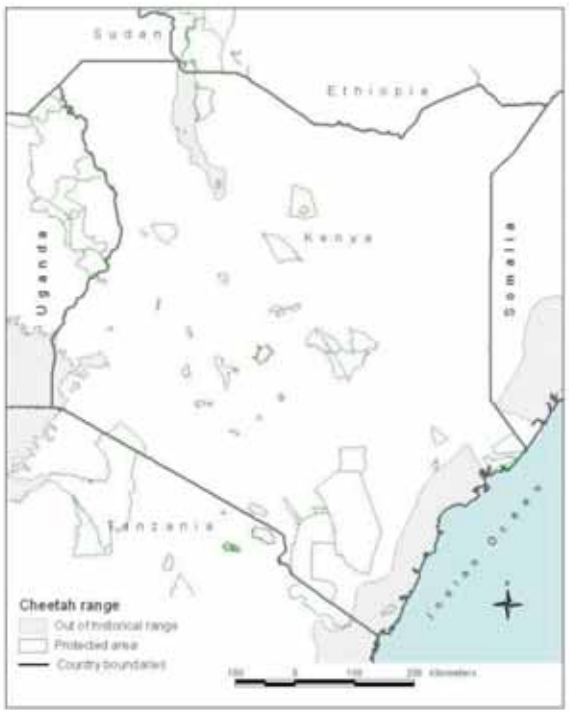


Figure 2.1 *Cheetahs' approximate historical range in Kenya. Given their ability to use a broad array of habitats, cheetahs probably ranged across much of Kenya prior to the impact of human activity.*

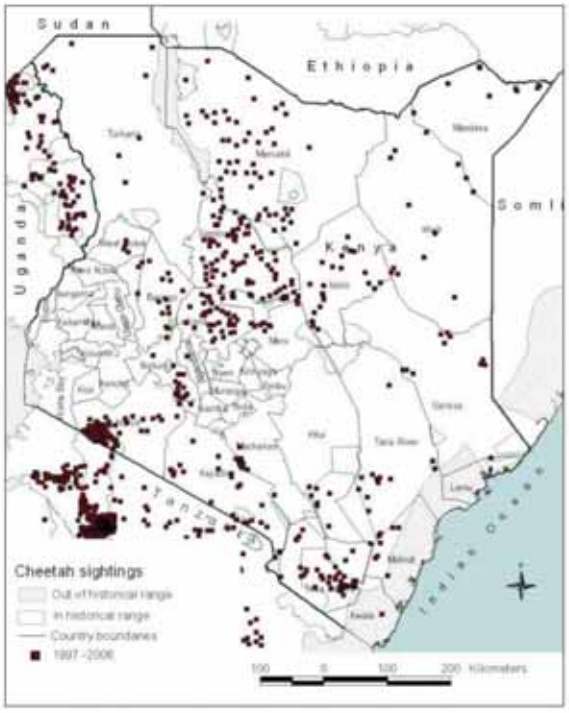


Figure 2.2 *Confirmed locations of cheetahs in and around Kenya in the period 1997-2006. Note that sighting frequency is greatly influenced by survey effort.*

are of transient individuals. The presence of a cluster of sightings in one area, which are widely distributed across time, is more likely to indicate a resident population. The absence of sighting information in an area can mean one of two things: either there are no cheetahs in the area, or there are cheetahs in the area but they have not been recorded. The latter explanation is likely to be the case in areas where there are few observers.

2.2.2 Categories of current geographical range

Since cheetah distribution within Kenya is imperfectly known, the mapping process recognised six categories of current geographical range (Figure 2.3). These categories are more or less identical to those used for wild dogs (see chapter 3).

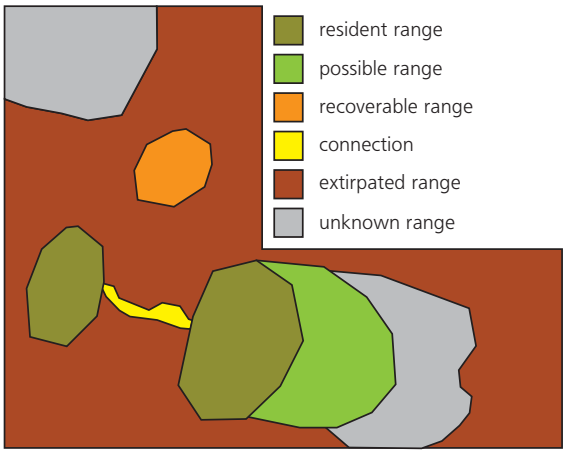


Figure 2.3 *Possible disposition of different types of geographic range on an imaginary map*

(1) Resident range: land where cheetahs are known to be still resident
(2) Possible range: land where cheetahs may still be resident, but where residency has not been confirmed in the last 10 years.
(3) Connecting range: land where cheetahs may not be resident, but which dispersing animals may use to move between occupied areas, or to recolonise extirpated range. Such connections might take the form of 'corridors' of continuous habitat or 'stepping stones' of habitat fragments.
(4) Unknown range: land where the species' status is currently unknown and cannot be inferred using knowledge of the local status of habitat and prey.

Extirpated range: land where the species has been extirpated. This can be further divided into:
(5) Unrecoverable range: land where habitat has been so heavily modified (e.g. by cultivation or urbanisation) or fragmented as to be uninhabitable by resident cheetahs for the forseeable future.
(6) Recoverable range: land where habitat and prey remain over sufficiently large areas that either natural or assisted recovery of cheetahs might be possible within the next 10 years if reasonable conservation action were to be taken.

2.2.3 Current distribution across different range categories

Figure 2.4 shows the areas of cheetahs' historical geographic range judged, in 2007, to fall into these six categories; Table 2.1 presents the same data in a quantitative format. Two resident populations are recognised in Kenya; these are listed in Table 2.2 and shown in Figure 2.5. However, as these populations are separated by areas of 'possible' range, it is conceivable that they might be connected to one another.

The population estimates provided in Table 2.2 must be interpreted with great caution as they were derived using a variety of formal and informal approaches, often on the basis of extremely sparse data. However, there is no more accurate data available. Only one of the two known resident populations (Laikipia/Samburu) falls entirely in Kenya; the other spans the Kenya-Tanzania border. Kenyan sub-populations in the Masai Mara, Masailand and Tsavo are connected to one another through contiguous areas of Tanzania. Both of Kenya's cheetah populations are globally important, being two of just four populations in eastern Africa estimated to number ≥200 adults and adolescents (IUCN/SSC, in prep).

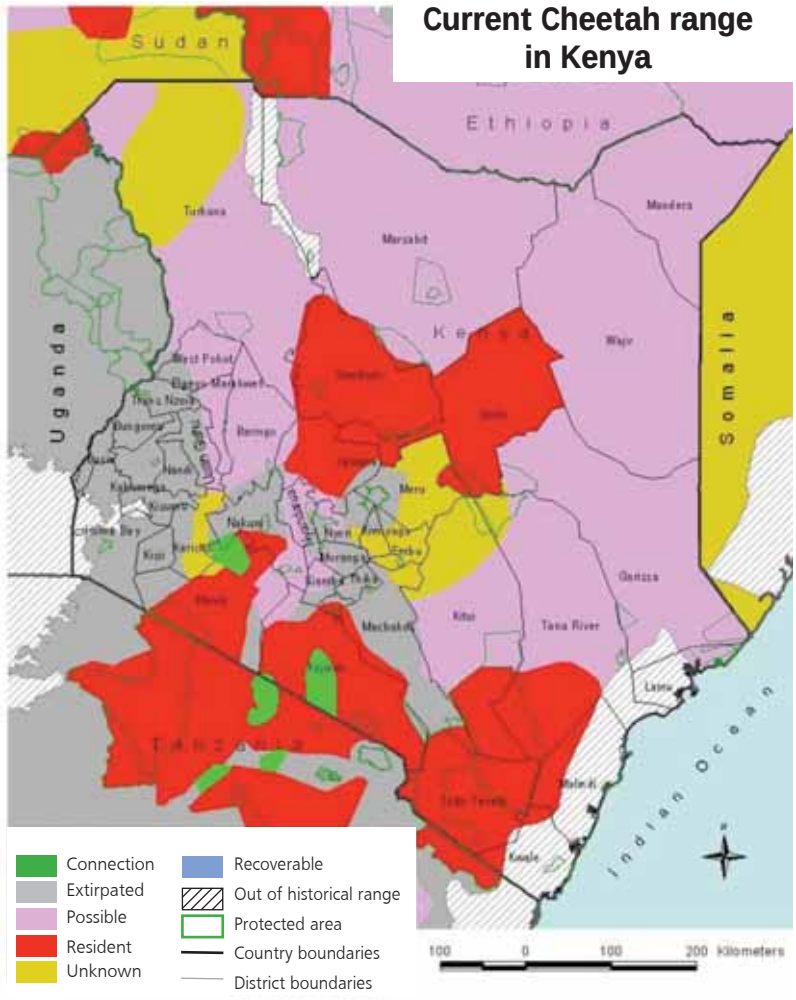


Figure 2.4 Map of cheetah distribution and status in Kenya in 2007

Table 2.1 Status of cheetahs in Kenya

Category of geographic range	Total km²	% of historical range
Historical range	475,133	–
Resident range	107,412	22.6%
Possible range	266,827	56.2%
Unrecoverable range	57,025	12.0%
Recoverable range	0	0%
Connecting range	3,677	0.8%
Unknown range	40,192	8.5%

The current geographic distribution of cheetahs in Kenya is reduced in comparison with their historical distribution. Cheetahs are known to be resident in about 23% of their historical range in Kenya. However, it is considered possible that another 56% of their former range might still support resident populations (Table 2.1). This large area of 'possible range' covers most of northern and eastern Kenya, highlighting the need for surveys in these areas.

Overall, cheetahs were considered definitely extirpated across a minimum of 12% of their historical range in Kenya. This is almost certainly an under-estimate; it is likely that no populations reside in much of the 'unknown' and 'possible' range. Importantly, none of this extirpated range was considered recoverable: that is, it was thought to be unable to support cheetah populations in future. This suggests that, once habitat is lost to cheetahs, it may be gone forever.

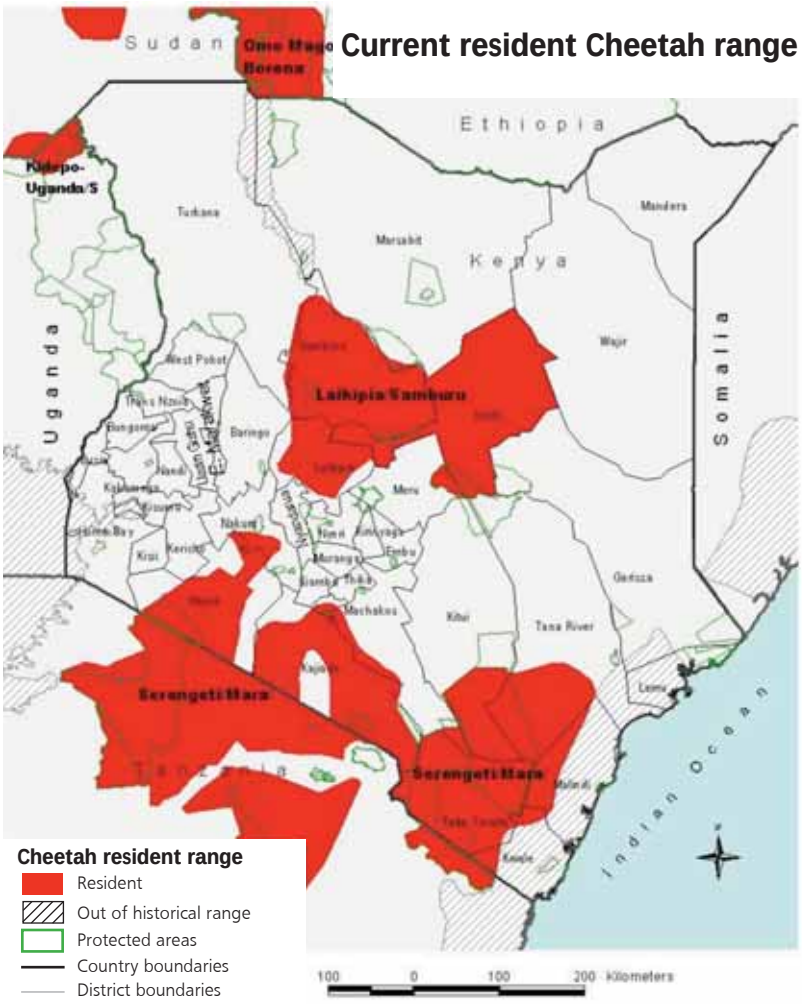


Figure 2.5 Distribution of resident cheetah populations in and around Kenya, based on data collated in 2007

Table 2.2 Areas in Kenya considered by participants to support resident cheetah populations. Population estimates are calculated using a number of different methodologies and have a very wide margin of error. Locations are in Figure 2.5. Note that the total population size estimate includes some animals in Tanzania and should not be used as an estimate of Kenya's cheetah population.

Name	Area (km²)		Transboundary?	Population estimate
	total	*protected*		
Laikipia/Samburu	47,390	2,074	no	450*
Serengeti/Mara/Tsavo	98,616¶	36,177¶	yes (with Tanzania)	710†¶
Grand total:	**146,006¶**	**38,251¶**		**1,160¶**

*Population sizes estimated from the size of the polygon using a conservative density of 1 adult per 100km2 and 12 adults (including yearlings) per pack; †Population sizes estimated by participants using a variety of methodologies. ¶Estimate includes some land outside Kenya, and some animals resident on that land, in transboundary populations.

A small, but important 0.8% (3,677km^2) of cheetahs' historical range is considered potentially significant for conservation because it connects areas of resident or possible range. This connecting habitat falls to the east of Lake Magadi, and also to the south and west of the Mau escarpment, and is believed to allow dispersing animals to move within the large Serengeti/Mara/Tsavo population. Whilst the connecting range is small in size, its importance outweighs its area, as without maintaining such areas the regional cheetah population will become even more fragmented and genetically isolated. A connecting range, by definition, contains no resident populations and hence is likely to be highly threatened.

2.2.4 Distribution across protected areas

As is apparent from Figure 2.4, a comparatively small proportion of cheetahs' current geographical range falls inside Kenya's national parks and reserves (Table 2.3). Over 80% of resident range, and over 95% of possible range, falls outside government-designated protected areas. These figures highlight the overwhelming importance of conservation activities outside protected areas to safeguard Kenya's cheetah population. Measures such as the proposed designation of 'carnivore conservation zones' on private and community lands (Woodroffe et al., 2007b) will be vital for the long-term survival of this species in Kenya. To illustrate this point, if the unprotected lands within the largest range polygon (Serengeti/Mara/Tsavo) were to become uninhabitable for cheetahs, this population would fall from over 700 adult and adolescent animals to around 260 animals in a number of smaller fragmented populations. Several of these smaller population would be too small to remain viable and would ultimately become extinct.

All connecting areas fall outside protected areas. As there is no recoverable range for cheetahs, ensuring the maintenance of range outside protected areas in a systematic way is likely to be critical for preservation of this species.

Table 2.3 Occurrence of areas known or suspected to be important for cheetah conservation in IUCN Category I-IV protected areas within Kenya.

Category of geographic range	Area (km^2) and % falling inside protected areas	
	km^2	*%*
resident range	21,199	19.7%
possible range	10,860	4.1%
recoverable range	0	0%
connecting range	0	0%

2.2.5 Distribution across international boundaries

As shown in Figure 2.4, the larger of Kenya's two known resident cheetah populations traverses the Tanzania border. If possible range is included, the number of transboundary populations is increased, with populations possibly straddling Kenya's borders with Ethiopia and Uganda. The importance of these transboundary populations, both for cheetah conservation and for tourism, highlights the need to consider transboundary management of cheetah conservation in some areas.

2.2.6 Distribution across ecoregions

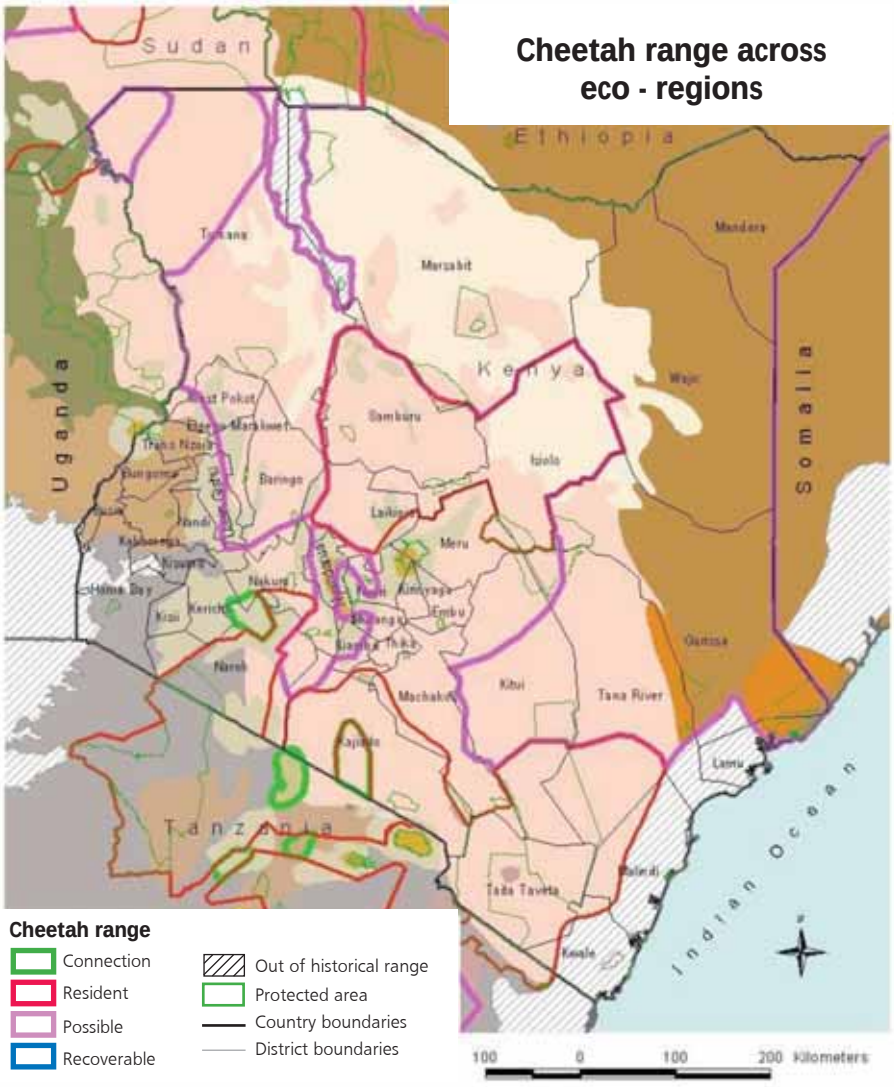
If ecologically representative populations of cheetahs are to be conserved, then efforts should be made to ensure that populations are spread across a wide range of habitats. Cheetah range (resident, possible and connecting) was therefore mapped with regard to the ecoregions identified by the World Wide Fund for Nature (WWF, Olson et al., 2001). The results are shown in Figure 2.6.

The majority of Kenya's resident cheetahs occupy the 'Northern Acacia-Commiphora bushlands & thickets' ecoregion, extending in the North into 'Masai xeric grasslands and shrublands'.

The large area of 'possible' cheetah range in northern and eastern Kenya is ecologically quite different from the areas of known resident cheetah range. This extensive area, which spans Kenya's border with Ethiopia, was identified as a high priority for cheetah surveys within the eastern Africa region, not only because of its size, but also because it covers several ecoregions which are poorly

represented among eastern Africa's resident cheetah populations (IUCN/SSC, in prep). In particular, the 'Northern Zanzibar-Inhambane coastal forest mosaic', located in the area of the Kenya-Somalia border, contains no known resident cheetah populations.

Figure 2.6 Distribution of cheetah geographic range across WWF Ecoregions

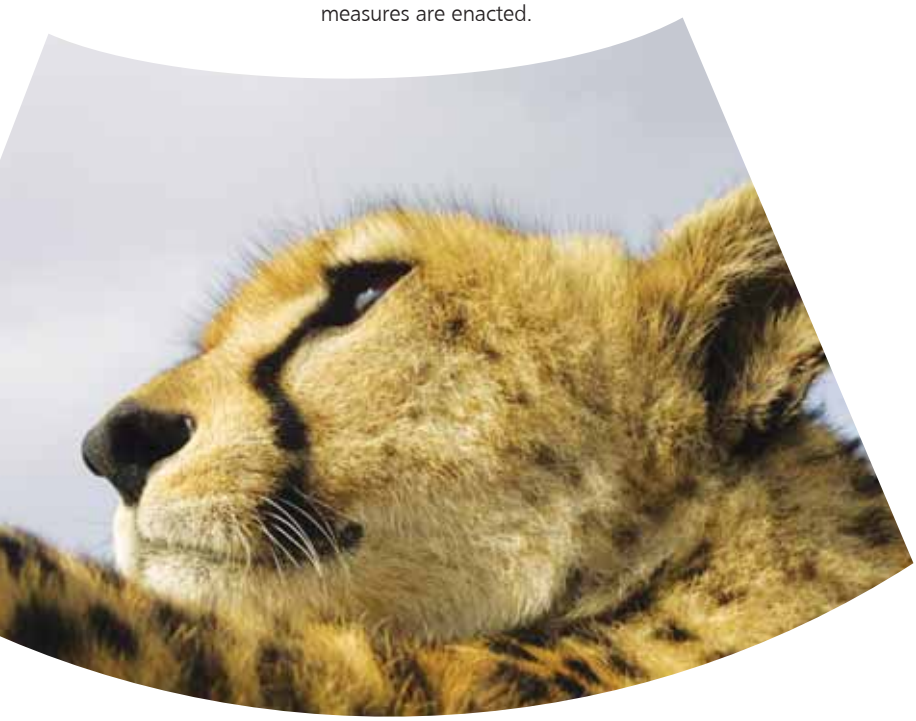


- Albertine Rift montane forests
- Central Zambezian Miombo woodlands
- East African halophytics
- East African mangroves
- East African montane forests
- East Saharan montans xeric woodlands
- East Sudanian savanna
- Eastern Arc forests
- Eastern Miombo woodlands
- Entrean coastal desert
- Ethiopian montane forests
- Ethiopian montane grasslands and woodlands
- Ethiopian montane moorlands
- Ethiopian xeric grasslands and shrublands
- Hobyo grassland and shrublands
- Itigi-Sumbu thicket
- Masai xeric grasslands and shrublands
- Nothern Acacia-Commiphora bushland and thickets
- Nothern Congolian forest-savanna mosaic
- Nothern Zanzibar-Inhambabe coastal forest mosaic
- Red Sea coastal desert
- Ruwenzon-Virunga montane moonlands
- Sahara desert
- Saharan flooded grasslands
- SaheliaN Acasia savanna
- Serengeti volcanic grasslands
- Somali volcanic grasslands
- Somali Acacia-Commiphora bushlands and thickets
- Somali montane xeric woodlands
- South Saharan steppe and woodlands
- Southern Acacia-Commiphora bushland and thicktes
- Southern Rift montane forest-grassland mosaic
- Southern Zanzibar-Inhambane coastal forest mosaic
- Tibesti-Jebel Uweinat montane xeric woodland
- Victoria Basin forest-savanna mosaic
- Zambezian flooded grasslands

Hence, if such populations were found to remain, they would have a high conservation value. It is worth noting that the wild dog population resident in this same area has also been highlighted as a conservation priority due to its ecological uniqueness (see section 3.2.5).

2.3 Conclusions

As in other parts of Africa, cheetahs in Kenya appear to have experienced a marked contraction of their geographic range over the past one or two hundred years. Despite this, two extensive cheetah populations are known to remain, which should be viable in the long term if appropriate conservation measures are enacted.



Although cheetahs are economically and ecologically important inside protected areas such as the Masai Mara and Samburu National Reserves, the overwhelming majority of Kenya's cheetahs live outside protected areas – over 80% of occupied habitat falls on community and private lands. Given cheetahs' low population density, the populations inside protected areas are almost certainly dependent on adjoining unprotected lands for their long-term viability. Hence, conservation activities outside reserves in absolutely critical if populations are to be conserved, both inside and outside protected areas, in the long term. Measures such as the designation of carnivore conservation zones on private and community lands (Woodroffe et al., 2007b) are therefore likely to make a substantial contribution to cheetah conservation.

Over half of Kenya's known resident cheetahs live in a population which spans the Kenya-Tanzania border. Other possible populations straddle the borders with Ethiopia and Uganda. In the long term, conserving such populations is likely to require transboundary cooperation.

Cheetahs' status is uncertain across much of northern and eastern Kenya: this entire area is considered 'possible range'. This area is important not only because of the large number of cheetahs that it could potentially contain, but also because it is ecologically distinct (in terms of ecoregions) from areas currently known to be occupied by resident cheetah populations. Surveys of this area are therefore needed. Note that wild dog surveys of northern Kenya are also considered a high priority, for similar reasons (see Chapter 3).

No areas were identified where recovery of extirpated cheetah populations might be considered. Reintroduction is not, therefore, appropriate to conserve cheetahs in Kenya in the medium term. This indicates the irreversible nature of the decline in the distribution of cheetahs. Once the habitat is lost, it is very difficult to recover it, demonstrating the importance of ensuring that planning for cheetah conservation is put in place as soon as possible, before habitat is irretrievably fragmented and lost.

"As in other parts of Africa, cheetahs in Kenya appear to have experienced a marked contraction of their geographic range over the past one or two hundred years."

Chapter 3

3.0 The Distribution and status of African wild dogs in Kenya

3.1 Historical distribution

In the past, wild dogs were broadly distributed across Kenya. Wild dogs are habitat generalists, able to persist in a wide array of environmental conditions as long as there is availability of prey. Although the highest wild dog densities have been recorded in wooded savannah (Creel et al., 2002), populations have been recorded in habitats as diverse as short grasslands (Kuhme, 1965), montane forest (Dutson et al., 2005), and mangroves (Figure 3.1). Hence, it is likely that wild dogs were distributed throughout Kenya before human activity modified substantial proportions of natural habitats. The species' historical distribution is shown in Figure 3.2.

Today, wild dogs remain uncommon even in essentially pristine wilderness, apparently due to negative interactions with larger carnivores (Creel et al., 1996; Mills et al., 1997). Hence, despite their formerly broad geographical distribution, wild dogs were probably never abundant.

3.2 Current distribution

3.2.1 Point locations

The first step in mapping wild dogs' current distribution was to collate data on the locations of recent (i.e. the past 10 years) confirmed records of wild dogs' presence, primarily (though not exclusively) sightings of live animals. The locations of these records are shown in Figure 3.3. This data is highly biased by observation effort: for example the large numbers of records from central Kenya reflects the presence of an active wild dog research project in this area.

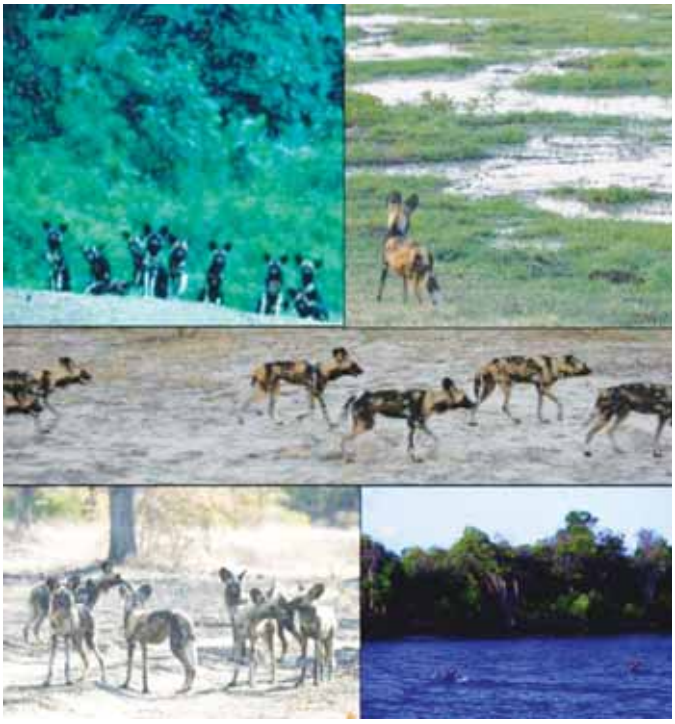


Figure 3.1 – *Wild dogs live in a wide array of habitats from montane forest (upper left, showing wild dogs in the Harenna forest in Ethiopia) and swamp margins (upper right) to desert (centre), semi-arid areas (lower left) and even, occasionally, mangrove forest (lower right, showing wild dogs swimming off the coast of Lamu District in northern Kenya).*

Chapter 3

Figure 3.2 *Wild dogs' approximate historical range in Kenya. Given their ability to use a broad array of habitats, wild dogs probably ranged across the whole of Kenya prior to the impact of human activity.*

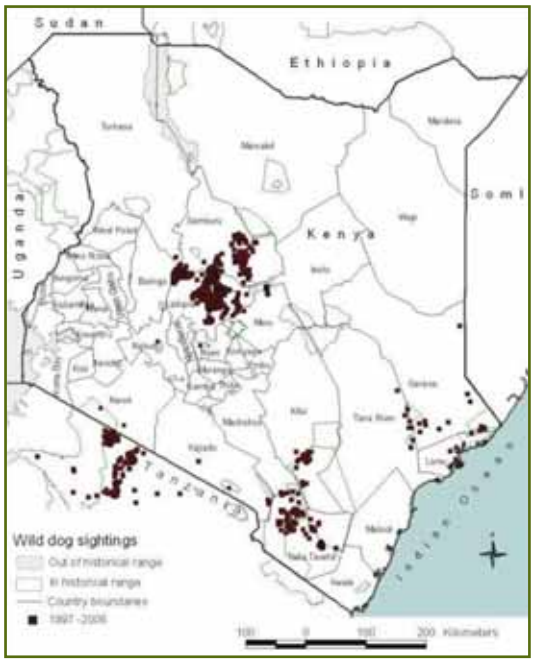


Figure 3.3 *Confirmed locations of wild dogs in and around Kenya in the period 1997-2006. Note that sighting frequency is greatly influenced by survey effort.*

3.2.2 Categories of current geographical range

Since wild dogs' distribution is imperfectly known across the region, the mapping process recognised six categories of current geographical range (Figure 3.4). The same categories were used to classify cheetah geographical range.

(1) ***Resident range:*** land where wild dogs are known to be still resident

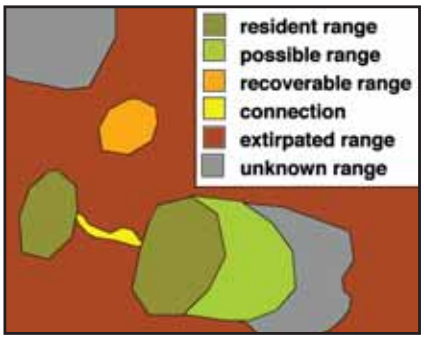
(2) ***Possible range:*** land where wild dogs may still be resident, but where residency has not been confirmed in the last 10 years.

Extirpated range: land where the species has been extirpated. This can be further divided into:

(3) ***Unrecoverable range:*** land where habitat has been so heavily modified (e.g. by cultivation or urbanisation) or fragmented as to be uninhabitable by resident wild dogs for the forseeable future.

(4) ***Recoverable range:*** land where habitat and prey remain over sufficiently large areas that either natural or assisted recovery of wild dogs might be possible within the next 10 years if reasonable conservation action were to be taken.

Figure 3.4 Possible dispositions of different types of geographic range on an imaginary map



(5) connecting range: land where wild dogs may not be resident, but which dispersing animals may use to move between occupied areas, or to recolonise extirpated range. Such connections might take the form of 'corridors' of continuous habitat or 'stepping stones' of habitat fragments.

(6) unknown range: land where the species' status is currently unknown and cannot be inferred using knowledge of the local status of habitat and prey.

3.2.3 Current distribution across different range categories

Figure 3.5 shows the areas of wild dogs' historical geographic range judged, in 2007, to fall into these six categories; Table 3.1 presents the same data in a quantitative format. Seven resident populations are recognised in Kenya; these are listed in Table 3.2 and shown in Figure 3.6. However, as these populations are separated by areas of 'unknown' range, it is conceivable that some of them might be connected to one another.

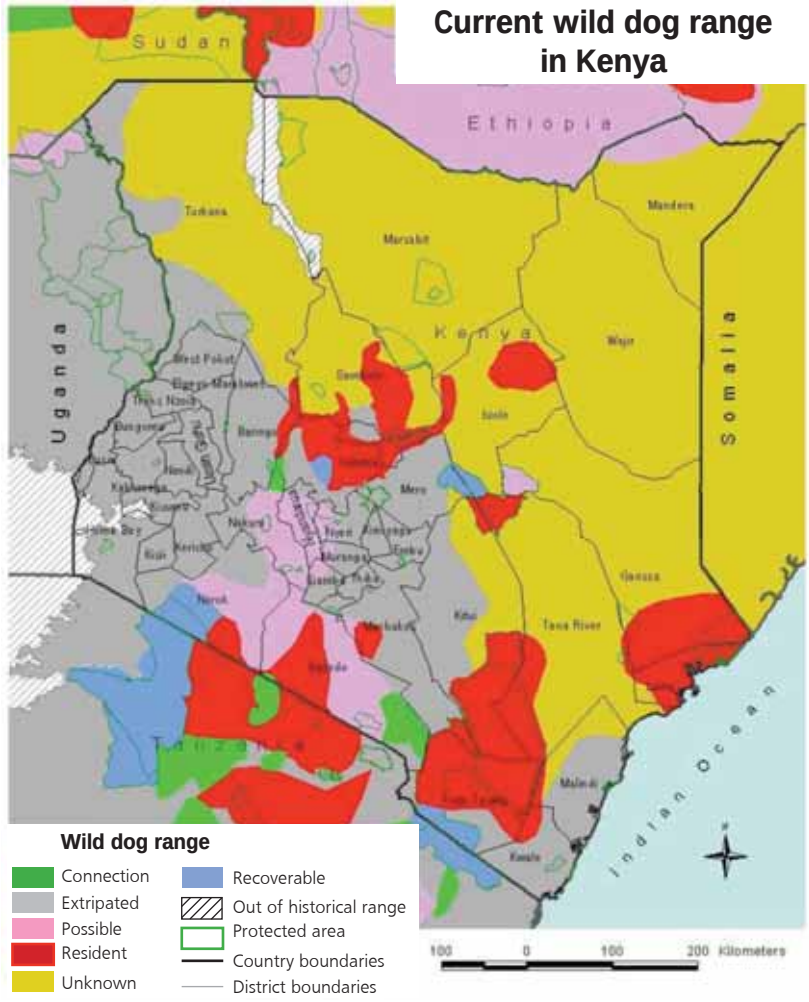


Figure 3.5 Map of wild dog distribution and status in Kenya in 2007

Table 3.1 Status of African wild dogs in Kenya

Category of geographic range	Total km²	% of historical range
historical range	495,906	–
Resident range	64,261	13.0%
Possible range	29,513	6.0%
Unrecoverable range	126,610	25.5%
Recoverable range	6,739	1.4%
Connecting range	3,001	0.6%
Unknown range	265,782	53.6%

Chapter 3

Wild dogs are considered to be still resident in approximately 13% of their historical range. Although this figure represents a 'worst case scenario', it does highlight the substantial contraction in geographic range that appears to have occurred in this species.

Despite this past decline, wild dog numbers have increased in Kenya in recent years. The largest population, occupying parts of Samburu, Laikipia and Isiolo Districts (Figure 3.3), recolonised this area naturally in the late 1990's (Frank, Woodroffe & Ogada, 2005) – for the preceding 15 years wild dogs had been absent from this area (Fanshawe et al., 1997). Likewise, sighting frequencies from the Tsavo ecosystem have increased relative to those in the early 1990's (Jennings, 1992). Wild dogs are also gradually increasing in number and recolonising the Mara-Serengeti ecosystem following a die-off in 1990-1 (Burrows, 1995).

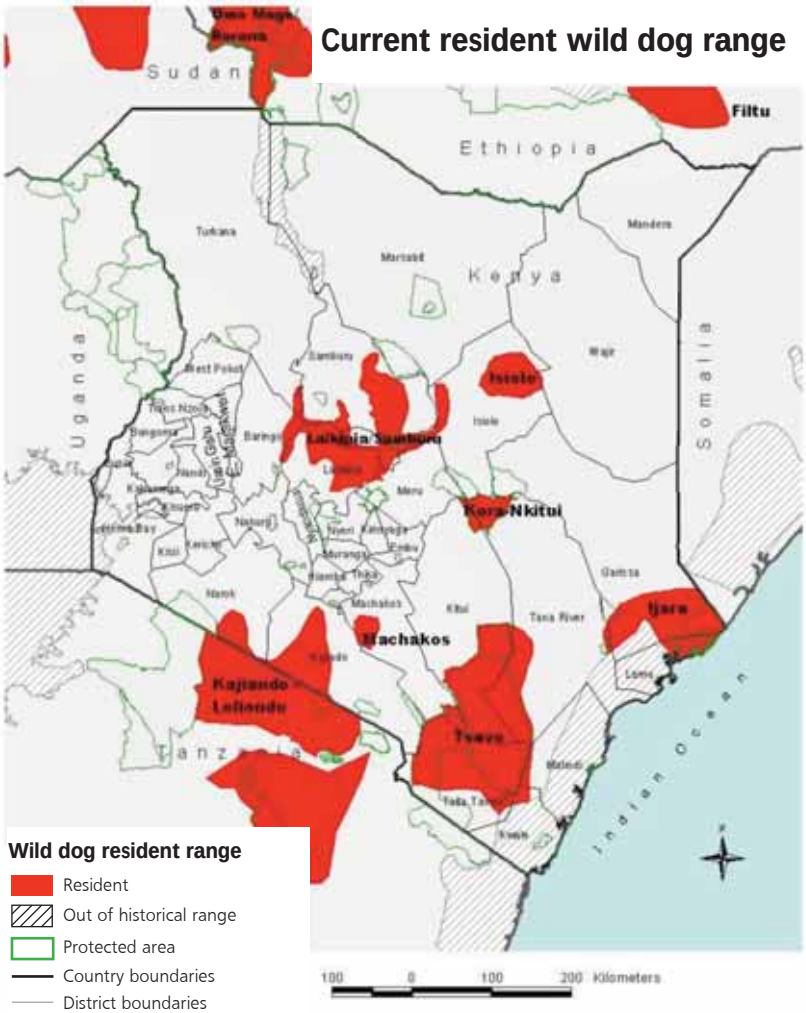


Figure 3.6 *Distribution of resident wild dog populations in Kenya, based on data collated in 2007*

Table 3.2 below shows the areas in Kenya considered by participants to support resident wild dog populations. Population estimates are calculated using a number of different methodologies and have a very wide margin of error. Locations are in Figure 3.7. Note that the total population estimate includes some animals resident in Tanzania and should not be used as a national estimate for Kenya. The national population is estimated at approximately 800 adult and yearling wild dogs (Table 3.2); however this estimate has a large (but unknown) margin of error. This estimate is higher than previous estimates (of about 350 animals, Ginsberg & Woodroffe, 1997; Woodroffe et al., 2004); the difference reflects better data but also substantial growth in the national population.

Name	Area (km²)		Transboundary?	Population estimate	
	total	*protected*		*adults*	*packs*
Ijara-Lamu	13,031	1,974	probably (with Somalia)	130*	11*
Isiolo	3,552	0	no	30†	2†
Kajiado-Loliondo	29,089¶	18¶	yes (with Tanzania)	100†¶	8†¶
Kora-Nkitui	2,008	2,008	no	20†	2†
Machakos	1,062	0	no	25†	2†
Samburu-Laikipia	13,885	368	no	220†	20†
Tsavo	24,431	17,355	no‡	100†	12†
Grand total:	**87,058¶**	**21,723¶**		**845¶**	**57¶**

*Population sizes estimated from the size of the polygon using a conservative density of 1 adult per 100km² and 12 adults (including yearlings) per pack; †Population sizes estimated by participants using a variety of methodologies; ‡Pecoverable range across border in Tanzania. ¶Estimate includes some land outside Kenya, and some animals resident on that land, in transboundary populations.

In addition to these known, resident populations, it is considered possible that approximately 6% of wild dogs' historical range in Kenya might still support resident populations. Furthermore, no information on status was available for a massive 54% of the species' historical range within Kenya. If even a small proportion of this 'possible' and 'unknown' range still supports wild dogs, the species' status could be more encouraging than the data on resident range would imply. This large area of 'unknown' range falls in northeastern Kenya, highlighting the need for surveys in this area.

The data indicate that wild dogs are extirpated across approximately 26% of their historical range. This is almost certainly a substantial under-estimate; it is likely that a high proportion of the 'unknown' range no longer supports wild dogs. Of this extirpated range, only 1.4% (6,739km²) was considered likely to be able to support wild dog populations in future. Patches of such 'recoverable' range occur in and around the Masai Mara National Reserve, in the southern part of the Tsavo ecosystem, in Meru National Park, and in south-western Laikipia. All of these areas adjoin resident populations and are likely to be recolonised naturally if conditions allow.

Despite supporting no known resident populations, a further 0.6% (3,001km²) of extirpated range was considered potentially important for wild dog conservation because it connected areas of resident or possible range. The largest patch of such connecting range falls in eastern Kajiado District, between Tsavo and Amboseli.

3.2.4 Distribution across protected areas

Much of wild dogs' current geographical range falls outside Kenya's protected areas. This is quantified in Table 3.3. This data indicates that conservation activities outside protected areas are likely to be critical for the preservation of this species.

"it is considered possible that approximately 6% of wild dogs' historical range in Kenya might still support resident populations"

Table 3.3 Occurrence of areas known or suspected to be important for wild dog conservation in IUCN Category I-IV protected areas within Kenya.

Category of geographic range	Area (km^2) and % falling inside protected areas	
	km^2	*%*
Resident range	21,705	33.8%
Possible range	2,346	7.9%
Recoverable range	4,554	67.6%
Connecting range	313	10.4%

3.2.5 Distribution across international boundaries

As shown in Figure 3.6, several important areas for wild dog conservation traverse international boundaries. Of the seven resident populations listed in Table 3.2, two (29%) are known or strongly suspected to be transboundary. These populations represent an estimated 230 adult and yearling wild dogs, almost a third of the national total. If possible and recoverable range are included, the number of transboundary populations is increased, with a population possibly spanning Kenya's border with Ethiopia, and recoverable range in Mkomazi Game Reserve in northern Tanzania adjacent to the population resident in Tsavo.

The size and number of these transboundary populations highlights the need to consider transboundary management of several of Kenya's wild dog populations.

3.2.6 Distribution across ecoregions

Figure 3.7 shows the locations of range polygons important for wild dog conservation (resident, possible, recoverable and connecting) across WWF's ecoregions (Olson et al., 2001). The majority of Kenya's resident wild dog populations occupy the 'Northern Acacia-Commiphora bushlands & thickets' ecoregion. However, the Ijara-Lamu population appears ecologically distinctive, mainly inhabiting the 'Northern Zanzibar-Inhambane coastal forest mosaic' and 'Somali Acacia-Commiphora bushlands & thickets' ecoregions. While populations resident in other countries are known also to inhabit these two ecoregions, the Ijara-Lamu population is the only one in the world resident in the 'East African mangrove' ecoregion. Figure 3.1 shows a photograph of wild dogs using mangrove habitat, highlighting the ecological and behavioural uniqueness – and hence high conservation value – of this wild dog population. Given the small area of mangrove falling within the Ijara-Lamu range polygon (558km^2), it could be useful to conduct surveys in the adjoining area of Somalia, which shares the same ecoregion and may well support more wild dogs.

The areas identified as recoverable range within Kenya all fall within ecoregions which are already reasonably well represented in number and geographical extent by polygons of resident range. Hence, while wild dog recovery in areas such as the Serengeti-Mara ecosystem should be encouraged, to restore ecological functionality, to increase wild dog numbers, and to enhance tourism opportunities, such recovery is unlikely to greatly influence representation across ecoregions.

3.3 Conclusions

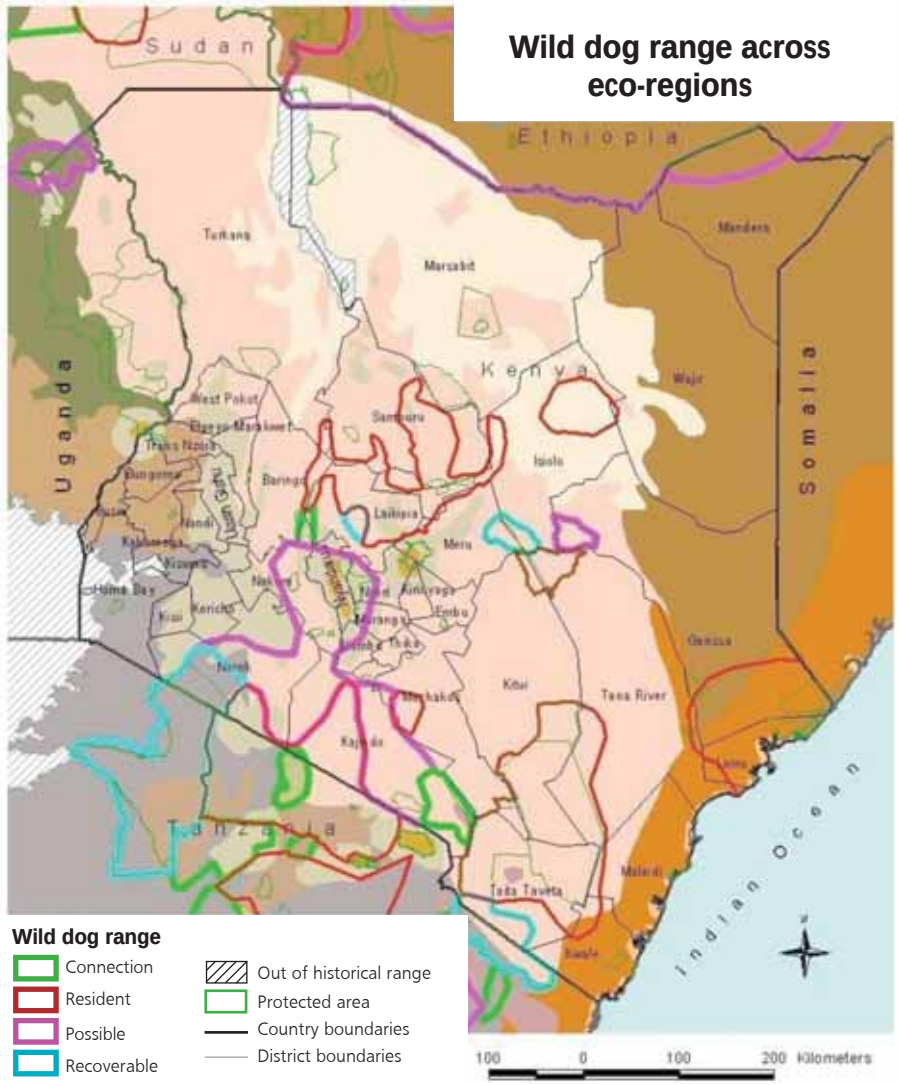
As in other parts of Africa, wild dogs in Kenya have experienced a substantial contraction of their geographic range over the past one or two hundred years. However, several populations have begun to recover naturally in recent years, highlighting the possibilities for future wild dog conservation in Kenya.

Most remaining resident populations rely on unprotected, as well as protected, lands for their survival: two-thirds of resident range falls outside protected areas. This highlights the need for conservation efforts outside parks and reserves. Given wild dogs' vulnerability to extinction inside reserves (Woodroffe et al., 1998), measures such as the designation of carnivore conservation zones on private and community lands (Woodroffe et al., 2007b) are likely to make a substantial contribution to wild dog conservation.

Nearly a third of Kenya's wild dogs live in populations which span international boundaries, particularly the Kenya-Tanzania border. Conserving such populations is likely to require transboundary cooperation.
Although the number and geographical extent of known populations is fairly small, no data is available from large tracts of north-eastern Kenya: surveys of this area are urgently needed.

Only a comparatively small number of locations were identified where recovery of extirpated wild dog populations might be considered. All of these adjoin areas that are currently occupied and natural recovery is therefore likely. Reintroduction is therefore not necessary to conserve wild dogs in Kenya in the medium term.

Figure 3.7 Distribution of wild dog geographic range across WWF Ecoregions



- Albertine Rift montane forests
- Central Zambezian Miombo woodlands
- East African halophytics
- East African mangroves
- East African montane forests
- East Saharan montans xeric woodlands
- East Sudanian savanna
- Eastern Arc forests
- Eastern Miombo woodlands
- Entrean coastal desert
- Ethiopian montane forests
- Ethiopian montane grasslands and woodlands
- Ethiopian montane moorlands
- Ethiopian xeric grasslands and shrublands
- Hobyo grassland and shrublands
- Itigi-Sumbu thicket
- Masai xeric grasslands and shrublands
- Nothern Acacia-Commiphora bushland and thickets
- Nothern Congolian forest-savanna mosaic
- Nothern Zanzibar-Inhambabe coastal forest mosaic
- Red Sea coastal desert
- Ruwenzon-Virunga montane moonlands
- Sahara desert
- Saharan flooded grasslands
- SaheliaN Acasia savanna
- Serengeti volcanic grasslands
- Somali volcanic grasslands
- Somali Acacia-Commiphora bushlands and thickets
- Somali montane xeric woodlands
- South Saharan steppe and woodlands
- Southern Acacia-Commiphora bushland and thicktes
- Southern Rift montane forest-grassland mosaic
- Southern Zanzibar-Inhambane coastal forest mosaic
- Tibesti-Jebel Uweinat montane xeric woodland
- Victoria Basin forest-savanna mosaic
- Zambezian flooded grasslands

Chapter 4

4.0 Threats to wild dog and cheetah populations in Kenya

4.1 Introduction

An evaluation of threats to wild dog and cheetah populations is a crucial component of strategic planning for the species' conservation. Understanding the nature of these threats is critical to identifying measures likely to mitigate the threats and hence achieve conservation objectives.

Global threats to wild dog and cheetah populations have been assessed previously (Bartels et al., 2001, 2002; Marker, 1998; Woodroffe et al., 2007a; Woodroffe et al., 1997a; Woodroffe et al., 2004). However, one conclusion of these assements is that threats vary between regions. For the purposes of conservation planning within Kenya, we therefore used data on threats to Kenyan wild dog and cheetah populations, contributed by participants in the regional workshop, and reviewed by participants in the national workshop. Participants in the regional workshop were asked to list the factors most likely to threaten each population, and to provide evidence that each factor represented a threat. Participants then identified the constraints acting to prevent alleviation of these proximate threats: for example, if accidental snaring was identified as a proximate threat to a particular population, lack of capacity to control illegal snaring might constrain alleviation of the threat.

This information was reviewed and collated separately for wild dogs and cheetahs. However, as the threats identified were almost identical for the two species, they are discussed together.

4.2 Proximate threats

4.2.1 Habitat loss and fragmentation (both species)

Loss and fragmentation of habitat together represent the over-arching threat to both cheetah and wild dog populations, which contributes to several of the other proximate threats listed below. This was identified as a threat to all the wild dog and cheetah populations resident in Kenya. Because both species live at such low population densities and range so widely, they require much larger areas of land than do other carnivore species, and are correspondingly more sensitive to habitat loss. Conserving each viable population is likely to require land areas far in excess of 10,000km^2. Fortunately, both species have the ability to survive and breed in human-dominated landscapes under the right circumstances; hence such large areas may be protected, unprotected, or a combination of the two. Both species also have excellent dispersal abilities, making it comparatively easy to maintain gene flow between populations, and to encourage recolonisation of suitable unoccupied habitat by conserving connecting habitat.

4.2.2 Conflict with livestock farmers (both species)

Both cheetahs and wild dogs are threatened by conflict with livestock farmers in parts of their geographic range. Within Kenya, such conflict was identified as a threat to all resident populations of wild dogs and cheetahs. While both species tend to prefer wild prey over livestock, both may kill livestock under some circumstances and are therefore killed by farmers. Such conflict may involve both subsistence pastoralists and commercial ranchers. As neither species regularly scavenges, they are less susceptible to poisoning than are other carnivores such as hyenas and leopards, but may be shot or speared.

4.2.3 Prey loss (both species)

Both cheetahs and wild dogs are highly efficient hunters, able to survive in areas of comparatively low prey density. Nevertheless, loss of prey from some areas, due to hunting, high livestock densities, or habitat conversion, may directly impact cheetah and wild dog populations, essentially as a component of habitat loss. Prey loss can also have serious indirect effects, since predation on livestock may become more frequent where wild prey is depleted (Woodroffe et al., 2005c), intensifying conflict with livestock farmers. Prey loss was identified as a potential threat to all of the wild dog and cheetah populations resident in Kenya.

4.2.4 Accidental snaring (principally wild dogs)

Although neither species is regularly targeted by snaring, both species may become captured accidentally in snares set for other species. Such accidental snaring is a major source of wild dog mortality in some areas (Woodroffe et al., 2007a). Within Kenya, accidental snaring

was identified as a likely threat to the Ijara-Lamu wild dog population. While effects on cheetah populations are less well quantified, snared cheetahs are reported occasionally and snaring may threaten some populations.

4.2.5 Road accidents (both species)

High speed roads represent a threat to both cheetah and wild dog populations. Wild dogs in particular use roads to travel and rest, and are therefore especially vulnerable to road accidents. This is of particular concern where paved roads cross or adjoin major wildlife areas, such as the Nairobi-Mombasa road which traverses Tsavo National Park. Road accidents were identified as a threat to several wild dog and cheetah populations in Kenya.

4.2.6 Poorly managed tourism (both species)

Unregulated tourism has the capacity to threaten both cheetahs and wild dogs. In cheetahs, negative effects of tourism mainly involve interference with hunting, scaring cheetahs away from kills to which they are unlikely to return, and separation of mothers from cubs, due to the presence of large numbers of tourist vehicles. This is considered a particular problem in the Masai Mara. In wild dogs, most impacts arise from tourists visiting active dens on foot, causing packs to move dens or even abandon their pups. This has been an occasional problem in the Samburu-Laikipia wild dog population. In contrast, well-regulated tourism can make substantial contributions to wild dog and cheetah conservation, both through the revenue it generates for conservation, and by raising awareness.

4.2.7 Infectious disease (mainly wild dogs)

Infectious disease can have major impacts on wild dog populations. Rabies contributed to the extinction of the wild dog population in the Serengeti-Mara ecosystem in 1991 (Gascoyne et al., 1993; Kat et al., 1995), and canine distemper decimated a captive population held in Mkomazi National Reserve (van de Bildt et al., 2002), illustrating the capacity of both viruses to provoke major population crashes. Both viruses are maintained within populations of domestic dogs; hence disease risks are likely to be particularly high for wild dogs living outside protected areas. Infectious disease appears to be the principal threat to wild dogs in the Samburu-Laikipia population, where several packs have been lost to rabies. Although cheetahs are occasionally affected by infectious disease (notably mange within the Serengeti-Mara ecosystem (Caro et al., 1987b)), disease is not known to threaten free-ranging cheetah populations.

4.2.8 Hunting and live trade (mainly cheetahs)

Cheetahs are occasionally hunted for their fur and for cultural uses. Additionally, illegal trade in cheetah cubs to the Middle East has been reported in Ethiopia and is suspected in some other areas. Such trade has not been confirmed within Kenya, however.

4.3 Constraints on alleviating threats

Conserving cheetah and wild dog populations requires mitigating the threats listed above, on a very large spatial scale. Participants in the regional workshop therefore identified the barriers to achieving this outcome. These constraints were classified into four categories: political, economic, social and biological. Once again, results for cheetahs and wild dogs were extremely similar. Political constraints included lack of land use planning, insecurity in some ecologically important areas, and lack of political will to foster cheetah and wild dog conservation. Economic constraints included lack of financial resources to support conservation, and lack of incentives for local people to conserve wildlife. Social constraints included negative perceptions of wild dogs and cheetahs, lack of capacity to achieve conservation, lack of environmental awareness, rising human populations, and social changes leading to subdivision of land and consequent habitat fragmentation.

These potentially mutable human constraints contrast with several biological constraints which are characteristic of wild dogs and cheetahs and cannot be changed: these included the species' wide ranging behaviour, their negative interactions with other large carnivores, and their susceptibility to infectious disease.

4.4 The "problem tree"

Threats to wild dog and cheetah populations, and constraints on alleviating those threats, were combined at the regional workshop to formulate a "problem tree" (*this is shown in Figures 4.1 and 4.2*). The tree highlighted the importance, for conservation of the two species, of engaging with those responsible for land use planning, and also of securing appropriate funding and developing the necessary capacity within the range states.

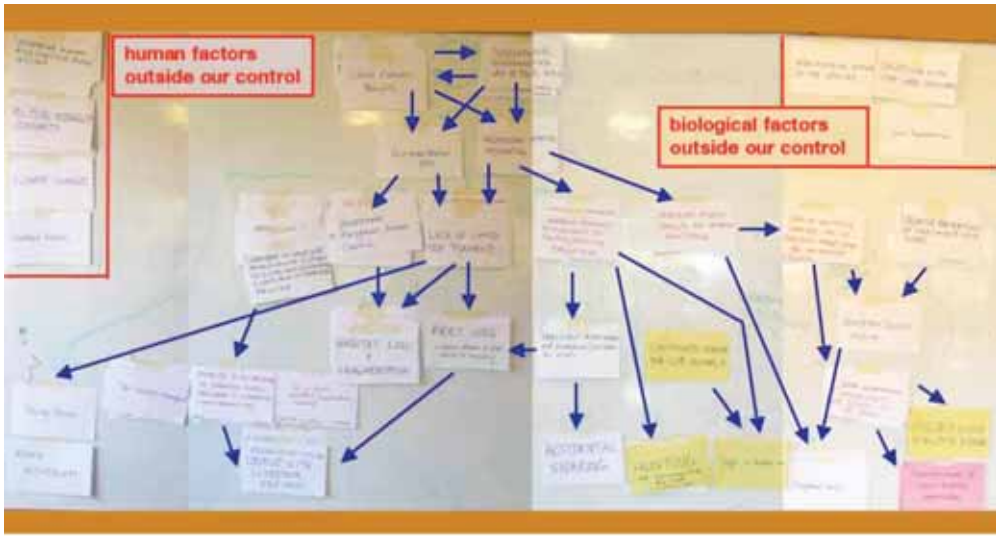


Figure 4.1 – The original "problem tree" developed by participants in the eastern Africa regional workshop. Ultimate causes are at the top; arrows indicate how these causes generate the proximate threats to wild dog and cheetah populations shown at the bottom. Figure 4.2 shows the same information in a more readable form.

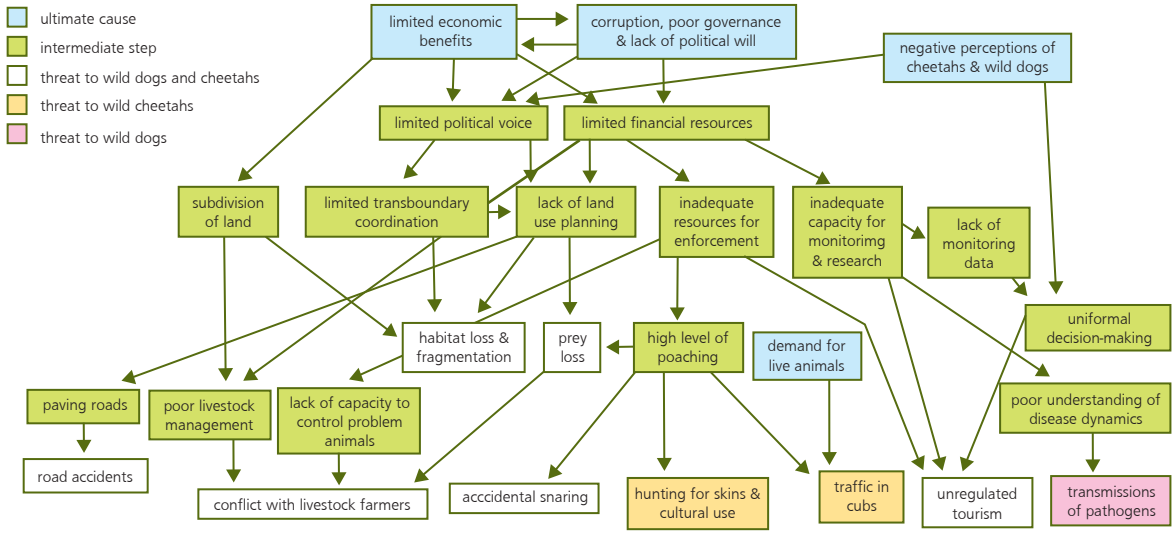


Figure 4.2 – The "problem tree" developed by participants in the eastern Africa regional workshop. This is summarised from the original tree shown in Figure 4.1, for greater readability.

This summary of the problems facing wild dog and cheetah conservation was used to inform a problem analysis which was critical for the development of the strategic plan; this is detailed in Chapter 5. In recent years, tools have been developed to address many of the proximate threats to wild dogs and cheetahs (e.g. Woodroffe et al., 2005a), but the ultimate causes of these threats include problems such as human encroachment on wildlife areas, and lack of conservation capacity, which are common to many species in the region.

4.5 Conclusions

Data indicate that both the proximate and ultimate threats faced by cheetahs and wild dogs are very similar. Indeed, these threats are similar to those faced by all large carnivores in Africa; however wild dogs' and cheetahs' extremely wide-ranging behaviour makes them acutely sensitive to these threats and mean that the threats need to be addressed over extremely large areas.

The similarity in threats faced by the two species also means that, with very few exceptions, conservation activities implemented for either species are likely to benefit both. For this reason, participants in the process decided to formulate a single conservation strategy for the two species, rather than one for each species.

Chapter 5

5.0 Strategic plan for cheetah and wild dog conservation in Kenya

5.1 Background

The strategic plan for wild dog and cheetah conservation in Kenya was developed using a process which was deliberately participatory and consensus driven, involving as many stakeholders as was practicable. This approach was taken both to ensure that the expertise and knowledge of all participants informed the plan, and also to ensure that the plan would be jointly owned by relevant institutions and individuals, facilitating its implementation.

As described in Chapter 1, the national strategy for wild dog and cheetah conservation in Kenya was developed within a broader regional context. A strategic plan for the species' conservation in eastern Africa was developed first, by a team of participants from across the region, including representatives of governmental authorities, relevant NGOs, and species specialists. From within Kenya, this regional workshop involved several high-level participants from KWS, as well as the African Wildlife Foundation, African Wild Dog Conservancy, Cheetah Conservation Fund Kenya, Mara Carnivore Conservation Project, and the Samburu-Laikipia Wild Dog Project.

Figure 5.1 Delegates from KWS and CCF Kenya, participating in the eastern Africa regional conservation planning workshop which preceded the Kenya national workshop

The eastern Africa regional strategy was then presented to a larger group of stakeholders, along with the background data used to construct it, at a Kenya national workshop held at KWS Headquarters in Nairobi immediately after the regional meeting. Delegates to this national meeting are listed in Appendix 1, and the agenda for the meeting is provided in Appendix 2. Participants in the national meeting were asked to consider whether the regional strategy could be used as a template for developing the national strategy and, after some discussion, this approach was adopted.

5.2 Structure of the strategic plan

Following strategic plans established for other species in Africa (IUCN, 2005, 2006b), the Kenya national plan had five key components:

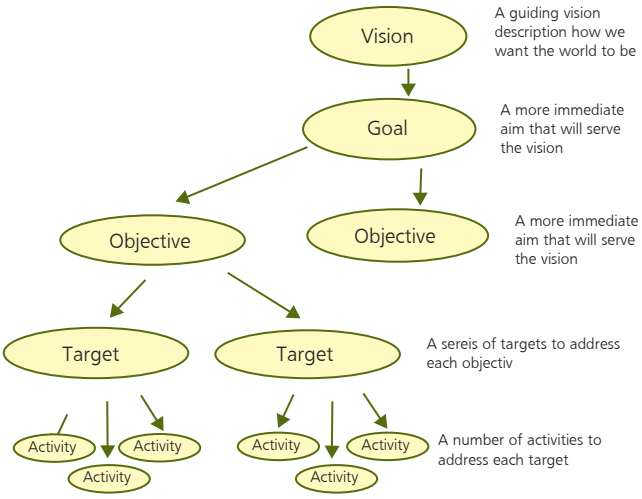
(1) A long-term vision for the species' conservation
(2) A medium-term goal for the strategic plan
(3) A number of objectives which together address the proximate and ultimate threats to the species' conservation
(4) Several targets to address each objective
(5) A list of of activities to address each target

The relationships of these components to one another is illustrated in Figure 5.2.

5.2.1 The Vision

A long term vision was developed to form the guiding purpose for the strategic plan over the next 25-50 years. It was intended reflect an optimistic, but realistic, view of the future of cheetah and wild dog conservation and should provide a source of inspiration.

Figure 5.2 Structure of the strategic plan



The vision developed for the regional strategy was *"To secure viable and ecologically functional cheetah and wild dog populations as valued components of development in eastern Africa"*. This vision was carefully worded to reflect:

(i) The need to conserve viable populations, that is, relatively large populations which are able to persist in the long term;

(ii) The need to conserve ecologically functional populations, that is, populations exposed to as full a range as possible of ecological challenges to which they would have been subjected in their evolutionary history, including their natural predators, parasites and prey, across a range of natural ecosystems;

(iii) The need to conserve the species as valued components of development, that is, within a context of human development which acknowledges the economic, cultural and ecological value provided by cheetahs and wild dogs.

This vision was broadly accepted by participants in the Kenya national workshop. In particular, it was noted that, within Kenya, this view of wild dogs and cheetahs as 'valued components of development' incorporates reduction in conflict between people and wildlife, and promotion of economic benefits from wildlife, in a sustainable manner. Tourism is a key component of such development.

The vision of the national strategy is therefore:

Vision:
To secure viable and ecologically functional cheetah and wild dog populations as valued components of development in Kenya

5.2.2 The Goal

The goal was intended to reflect what the strategic plan should accomplish in a shorter time period than that identified for the vision – around 10-20 years. The goal should thus be realistic and achievable. It should also be broadly measurable, in that it should be possible to know when it has been achieved. The goal therefore needs to be more clearly defined than the vision, although it should support the vision statement.

The goal agreed for the eastern Africa regional strategy was *"To reverse declines and improve the status of cheetah and wild dog populations and their habitats across eastern Africa"*.

Participants in the Kenya national workshop broadly agreed with this goal. They noted that, within Kenya, improving the "status" of these two species refers not only to their biological status (e.g. numbers, distribution) but also to their perception by people within Kenya, which is critical to their conservation. Participants also noted a clear need for better information on the two species' distribution, abundance and population trends to determine where declines have occurred and to monitor future recovery.

The goal of the national strategy is therefore:

Goal:
To reverse declines and improve the status of cheetah and wild dog populations and their habitats across Kenya

5.2.3 Objectives

The problem analysis described in section 4.4 was used to develop objectives for the eastern Africa strategic plan. The proximate and ultimate threats to the species' persistence, and constraints on the species' conservation, were grouped into six themes:

(1) Coexistence: This theme covers problems relating to coexistence of people and domestic animals with cheetahs, wild dogs and their prey

(2) Surveys and information: This theme concerns problems arising from a lack of information about cheetahs and wild dogs including information on range, population status, habitat and management.

(3) Capacity development: This theme includes problems arising from insufficient capacity such as manpower, resources, training and equipment.

(4) Policy and legislation: This theme covers problems arising from a lack of or inappropriate policies and legal frameworks within the wildlife sector.

(5) Advocacy: This theme comprises problems arising from a low public importance attached to cheetah and wild dog conservation. This category largely addresses policy and legislation issues outside the remit of the group, i.e. outside the remit of the government wildlife sectors, and hence falling under other ministries. This includes critically important issues such as land use policy and development.

(6) National planning: This theme addresses problems arising from a lack of national strategies for cheetah and wild dog conservation. This was a relatively small, but nonetheless important, category which covered the translation of the regional strategic plan into national action plans and subsequent implementation at the national level.

These themes were used to develop objectives for the regional strategy, ensuring that all issues identified in the problem analysis were addressed by the objectives, and that no objective addressed issues not identified by the problem analysis.

All of the objectives developed for the regional strategy were adopted for Kenya's national strategy, with the exception of the last, which deals with national planning; this was fulfilled by development of the Kenya national plan.

Hence, the objectives of the Kenya national strategy were:

Objective 1:
Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals

Objective 2:
Provide relevant stakeholders and managers with scientific and timely information on the status of and threats to cheetah and wild dog populations

Objective 3:
Strengthen human, financial and information resources for conserving cheetahs and wild dogs in collaboration with stakeholders

Objective 4:
Review and harmonise existing legislation, and, where necessary, develop new legislation, for conservation across cheetah and wild dog range at national and international levels

Objective 5:
Mainstream cheetah and wild dog conservation in land use planning and its implementation

Under Objective 1, participants noted that within Kenya, the "people" with whom cheetahs and wild dogs must coexist are not only local communities but also private landowners, tourists, tour operators, and other users of lands which support wildlife.

Under Objective 2, participants noted the direct translation of this regional issue to the Kenya situation, where there is a widely-recognised need for better information on cheetah and wild dog distribution and status.

Under Objective 4, participants noted that, within Kenya, local as well as national legislation would be important in implementing cheetah and wild dog conservation. Several aspects of the regional strategy referred to the indirect effects of sport hunting on wild dog and cheetah conservation; this is not relevant to Kenya since the newly-developed draft Wildlife Policy excludes sport hunting. Since transboundary management is likely to be very important to conserve these two species in Kenya, it is important that legislation be reviewed in the context of new and existing international treaties.

Under Objective 5, participants noted the need to make cheetah and wild dog conservation central to any land use plans developed in relevant areas of Kenya.

5.2.4 Targets, activities, timelines, actors and indicators

Once the objectives were agreed, targets were developed to meet the objectives. Each objective was associated with a number of targets, each of which specified a way in which progress would be made towards achieving the objective, and on what timescale. Targets were devised to ensure that if all targets under an objective were met, then that objective would be met. The targets set for the Kenya national strategy were slightly modified from those identified for the eastern Africa regional strategy.

Each target was, in turn, associated with a number of activities. Activities are highly specific and describe exactly what projects need to be completed to achieve the targets and thus, in turn, the objectives. Once again, activities for the Kenya national strategy were modified from those devised for the regional strategy. Additionally, for each activity within the national strategy, a timeline was set, and the institutions best placed to perform the activity (actors) were specified. Finally, measures were identified that could be used as indicators of successful completion of each activity.

Chapter 5

5.3 National strategy for the conservation of cheetahs and African wild dogs in Kenya

The agreed national strategy is presented here as text, and in tabular form in Appendix 3.

Vision

To secure viable and ecologically functional cheetah and wild dog populations as valued components of development in Kenya.

Goal

To reverse declines and improve the status of cheetah and wild dog populations and their habitats across Kenya.

Objective 1
Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals

Target 1.1 *Sustainable tools to reduce wild dog and cheetah impacts on livestock developed and disseminated across the country within three years*

Activity 1.1.1 Identify areas where cheetah and wild dog populations are significantly threatened by conflict with livestock farmers
Timeline: 6 months
Actors: KWS and other participants in the national workshop
Indicators: Distribution map of areas where cheetah and wild dog populations are significantly threatened by conflict with livestock farmers

Activity 1.1.2 Identify the circumstances that contribute to livestock depredation by cheetahs and wild dogs in the identified areas
Timeline: 3 years
Actors: KWS, Cheetah Conservation Fund, Samburu-Laikipia Wild Dog Project, Ijara-Lamu Wild Dog Project, EAWLS, AWF, local communities
Indicators: Report on the circumstances that contribute to livestock depredation by cheetahs and wild dogs

Activity 1.1.3 Develop effective strategies for documenting and disseminating existing information on reducing cheetah and wild dog impacts on livestock to relevant parties across Kenya
Timeline: 1 year
Actors: KWS and its Predator Group, conservation partners and related NGOs, local communities
Indicators: Strategy document produced

Activity 1.1.4 Work with communities in affected areas to develop and implement the most effective livestock husbandry strategies to reduce depredation by cheetahs and wild dogs
Timeline: 2 years
Actors: KWS and its Predator Group, conservation partners and related NGOs, local communities
Indicators: Measureable reduction in depredation rates by cheetahs and wild dogs

Activity 1.1.5 Work with communities in affected areas to develop and implement the most effective land use and wildlife management strategies to reduce depredation by cheetahs and wild dogs
Timeline: 2 years
Actors: KWS and its Predator Group, conservation partners and related NGOs, local communities, local authorities, Ministry of Lands
Indicators: Measureable reduction in depredation rates by cheetahs and wild dogs

Target 1.2 *Initiate and maintain programmes for local people to derive sustainable economic benefits from the presence of cheetahs, wild dogs, and their prey, in selected areas within three years*

Activity 1.2.1 Identify and document areas across Kenya where ecotourism could effectively assist cheetah and wild dog conservation through sustainable economic benefits for local communities, and hence improving tolerance of both species
Timeline: 1 year
Actors: KWS, tourism sector, local communities, local authorities, local and international development partners
Indicators: Document areas across Kenya where ecotourism could effectively assist cheetah and wild dog conservation

Activity 1.2.2 Encourage sustainable ecotourism programmes and the distribution of their revenue to appropriate parties in cheetah and wild dog range
Timeline: 3 years
Actors: KWS, tourism sector, local communities, local authorities, provincial administration, local and international development

partners, NEMA, ESOK

Indicators: Increased number of certified ecotourism programmes. Certified, externally audited, financial statements of accounts where applicable.

Activity 1.2.3 In areas of Kenya where ecotourism is unlikely to provide sufficient benefits, investigate alternative options for economic benefits, direct or indirect which encourage cheetah and wild dog conservation

Timeline: 3 years

Actors: KWS, development partners, local communities

Indicators: List of alternative options developed for further consideration

Activity 1.2.4 Develop and disseminate guidelines for responsible tourist viewing of cheetahs and wild dogs

Timeline: 1 year

Actors: KWS, IUCN/ SSC Canid Specialist Group, Tanzania Carnivore Programme, tourism sector (Kenya Professional Safari Guides Association, KTB, KATO, ESOK), conservation groups and NGOs.

Indicators: Guideline document prepared and disseminated; measurable reduction in reports of harassment (e.g. in Masai Mara)

Target 1.3 *Awareness creation programmes relevant to cheetah and wild dog conservation developed in key areas within three years*

Activity 1.3.1 Identify target areas and audiences best placed to influence cheetah and wild dog conservation

Timeline: 6 months

Actors: KWS, Cheetah Conservation Fund, conservation groups and NGOs.

Indicators: Document target areas and audiences best placed to influence cheetah and wild dog conservation

Activity 1.3.2 Investigate local traditions, knowledge and cultural values relevant to cheetahs and wild dogs, incorporate into existing outreach materials and strategies, and disseminate.

Timeline: 2 years

Actors: KWS, CCF,conservation groups and NGOs.

Indicators: Outreach materials developed and disseminated

Target 1.4 *Programmes to reduce indiscriminate hunting and illegal offtake of wild ungulates implemented in affected areas within three years.*

Activity 1.4.1 Identify areas where wild dog and/ or cheetah populations are significantly threatened by accidental snaring

Timeline: 1 year

Actors: KWS, local communities, private conservancies, local authorities, carnivore and wildlife monitoring projects

Indicators: Report documenting areas where wild dog and/or cheetah populations are significantly threatened by accidental snaring

Activity 1.4.2 Identify areas where prey loss contributes to conflict between livestock farmers and cheetahs or wild dogs, or directly undermines the viability of wild dog or cheetah populations

Timeline: 3 years

Actors: KWS, local communities, private conservancies, local authorities, carnivore and wildlife monitoring projects

Indicators: Report documenting areas where prey loss contributes to conflict between livestock farmers and cheetahs or wild dogs, or directly undermines the viability of wild dog or cheetah populations

Activity 1.4.3 Support the implementation of measures to reduce indiscriminate hunting and/or illegal offtake in identified areas

Timeline: Immediate and continuous process

Actors: KWS, private conservancies, local authorities, local communities, conservation organisations and NGOs

Indicators: Reduced incidences of hunting/poaching/ illegal offtake, lower incidences of accidental snaring of carnivores, lower incidences of conflict and reduced evidence of prey loss affecting cheetahs and wild dogs

Target 1.5 *Holistic carnivore disease management strategies developed in key areas within three years*

Activity 1.5.1 Identify areas where wild dog populations are significantly threatened by carnivore diseases

Timeline: 1 year

Actors: KWS and other stakeholders

Indicators: Distribution map of areas where wild dog populations are significantly threatened by carnivore diseases

Activity 1.5.2 Work with veterinary departments of the Government of Kenya to encourage domestic dog vaccination and husbandry within identified areas

Timeline: Immediate and continuous process
Actors: KWS and Department of Veterinary Services; tourism sector is a potential source of funding
Indicators: Minimum 70% of domestic dogs vaccinated against rabies in identified areas

Activity 1.5.3 Evaluate existing disease management strategies for wild dogs and related species to assess their likely relevance to Kenya

Timeline: 6 months
Actors: KWS and other stakeholders
Indicators: A report on the evaluation

Activity 1.5.4 Identify circumstances where intervention may or may not be appropriate through continued research on the dynamics of carnivore disease in areas where domestic dogs coexist with wildlife

Timeline: 3 years
Actors: KWS, Samburu-Laikipia Wild Dog Project, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI ,KARI
Indicators: Scientific reports determining circumstances where intervention may or may not be appropriate to manage carnivore disease

Activity 1.5.5 Evaluate the conservation potential of vaccinating free ranging wild dogs against carnivore diseases

Timeline: 3 years
Actors: KWS, Samburu-Laikipia Wild Dog Project, Wildlife Conservation Society, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI, KARI
Indicators: Scientific reports evaluating the conservation potential of vaccinating free ranging wild dogs against carnivore diseases

Activity 1.5.6 Conduct research into epidemiology of mange in cheetah and wild dog populations

Timeline: 3 years
Actors: KWS, Samburu-Laikipia Wild Dog Project, Wildlife Conservation Society, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI, KARI
Indicators: Scientific reports providing insights into the source and dynamics of the disease

Activity 1.5.7 Develop a holistic carnivore disease management strategy for each key area

Timeline: 5 years
Actors: KWS and other stakeholders
Indicators: Strategy documents prepared and implemented

Objective 2
Provide relevant stakeholders and managers with scientific and timely information on the status of and threats to cheetah and wild dog populations

Target 2.1 Surveys and monitoring to evaluate presence, trends and threats in key cheetah and wild dog ranges initiated and maintained.

Activity 2.1.1 Prioritise and conduct surveys to determine presence in areas identified as unknown, possible and connecting range within Kenya

Timeline: 2 years
Actors: KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group
Indicators: Database on wild dog and cheetah distribution and status established and resident range map updated. Also, subgroup of cheetah and wild dog researchers to oversee this monitoring, under auspecies of KWS Large Carnivore Working Group.

Activity 2.1.2 Within known areas of resident range, initiate and maintain monitoring activities to determine population trends and threats

Timeline: Two years, with annual review
Actors: KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group
Indicators: Database on wild dog and cheetah distribution and status established and information on threats and trends incorporated

Activity 2.1.3 Within currently known resident ranges, conduct research, establish demographic and threat status

Timeline: 2 years
Actors: KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group
Indicators: Established database contains repeatable data on status and threats to produce trend information

Target 2.2 *Strategies for disseminating information relevant to cheetah and wild dog conservation to all key stakeholders across Kenya developed and implemented within one to three years*

Activity 2.2.1 Use Kenya national workshop materials, publications, meetings and/or other media to disseminate information relevant to cheetah and wild dog conservation

Timeline: 1 year and with continual addition of new information
Actors: KWS carnivore office, relevant research projects and NGOs
Indicators: Annual reports made available; research permits tied to commitment to make findings widely available; all participating local institutions publish in newsletters and web sites about participation in this process; policy briefs produced; heightened awareness measured by decreased conflict, increased tolerance and increased value/ perception reflected in conflict evaluations and surveys.

Activity 2.2.2 Establish a standardised database format to facilitate the collection and sharing of data

Timeline: 1 year
Actors: KWS carnivore office
Indicators: Useful, comprehensive and accessible data base established

Activity 2.2.3 Establish a Kenya national database linked to the eastern Africa regional database allowing dissemination of resulting information

Timeline: 2 years and continuous thereafter
Actors: KWS carnivore office, Tanzania Carnivore Programme (Tanzania Wildlife Research Institute)
Indicators: Database established, data entered and updated

Objective 3
Strengthen human, financial and information resources for conserving cheetahs and wild dogs in collaboration with stakeholders

Target 3.1 *A cheetah and wild dog financial, implementation, and operational plan for Kenya developed within two years*

Activity 3.1.1 Identify individuals and institutions to undertake these activities in Kenya

Timeline: By the end of the national workshop
Actors: KWS to identify financial needs and identify internal and supporting partners; suggestions include WCS, EAWLS, UNEP, Pact, CCF, KTF, tourism partners, business specialists, Ministry of Finance, Ministry of Planning, Ministry of Tourism, Office of the President
Indicators: Appropriate individuals and institutions identified

Activity 3.1.2 Review existing and possible financial resource needs for the conservation of cheetahs and wild dogs

Timeline: 1 year
Actors: KWS and partners
Indicators: Donor presentation to encourage input. Commitment to funding and interest by at least 3 major participants

Activity 3.1.3 Develop, produce and disseminate a cheetah and wild dog financial, implementation, and operational plan for Kenya

Timeline: 2 years
Actors: KWS and partners
Indicators: Plan produced and disseminated

Activity 3.1.4 Monitor, evaluate and revise the implementation of the financial, implementation, and operational plan

Timeline: Every 3 years
Actors: Funding strategy leader will hopefully come forward from the process
Indicators: Plan evaluated and revised as appropriate

Target 3.2 *Have effective extension, enforcement, and monitoring personnel trained and equipped to operate within 50% of the cheetah and wild dog population ranges in Kenya within three to five years*

Activity 3.2.1 Establish Carnivore Office within Kenya Wildlife Service

Timeline: 1 year
Actors: KWS and its Large Carnivore Working Group
Indicators: Carnivore Office established and operational

Activity 3.2.2 Strengthen activities to address urgent issues affecting cheetah and wild dog conservation (e.g. trafficking in cheetah cubs) wherever they are known to occur

Timeline: I year
Actors: KWS strengthened and supported by NGOs
Indicators: Point person identified in KWS. Action taken to investigate and reduce activities threatening wild dogs and cheetahs

Activity 3.2.3 Complete a Training and Resource Needs Assessment in "a national workshop" with relevant stakeholders

Timeline: 1 year
Actors: KWS (lead) aided by NGOs (e.g. Cheetah Conservation Fund). Tourism industry is a potential source of funding
Indicators: Workshop planned within 6 months and held within 1 year

Activity 3.2.4 Strengthen collaboration in monitoring of resident and connecting range for cheetahs and wild dogs
Timeline: 1 year
Actors: KWS and its Large Carnivore Working Group, NGOs, conservancy monitoring organisations including community scouts, parabiologists, community liaison officers
Indicators: Monitoring in place and information compiled in all areas of resident and connecting range

Activity 3.2.5 Integrate Training Needs Assessment with financial, implementation, and operational plan, and national action plan
Timeline: 2 years
Actors: KWS and key leaders from the planning process
Indicators: Fully integrated plan prepared

Activity 3.2.6 Implement the recommendations from the training and needs assessment, including placing a cheetah and wild dog specialist or advocate (whether biologist, parabiologist, or community liaison officer) in each target population
Timeline: 3 years
Actors: KWS and leading NGOs from the planning process
Indicators: Recommendations of training and resource need assessment implemented

Activity 3.2.7 Evaluate and revise strategic plan
Timeline: Every 3 years
Actors: KWS and other key leaders from the planning process
Indicators: New and focused plan prepared

Objective 4
Review and harmonise existing legislation, and, where necessary, develop new legislation, for conservation across cheetah and wild dog range at national and international levels

Target 4.1 *Identify the gaps in information on cheetah and wild dog conservation which can assist in policy development*

Activity 4.1.1 Produce a review document on national protected species legislation and its implications for cheetah and wild dog conservation
Timeline: 1 year
Actor: KWS
Indicators: Review document produced

Target 4.2 *Information on the extent of illegal wildlife related activities within cheetah and wild dog ranges for relevant authorities to strengthen policy/law enforcement and quality tourism provided within one to three years*

Activity 4.2.1 Develop standardised methodologies to collect information on illegal activities relevant to cheetah and wild dog conservation within resident range
Timeline: 1 year
Actor: KWS
Indicators: Standardised survey methods developed

Activity 4.2.2 Collect spatially explicit information on the magnitude of illegal activities relevant to cheetah and wild dog conservation within resident range and include within national and regional databases
Timeline: 2 years
Actors: KWS and other relevant stakeholders
Indicators: Information on illegal activities collected and entered into the national database

Activity 4.2.3 Quantify the impacts of insensitive tourism on cheetahs and wild dogs inside and outside of protected areas and use to develop outreach materials to raise awareness about cheetah and wild dog friendly observation practices
Timeline: 3 years
Actors: KWS, local authorities and other stakeholders
Indicators: Report on impacts produced, outreach materials produced and disseminated

Target 4.3 *Explicit information provided to relevant authorities to support identification and prioritisation of corridor and dispersal areas for improved connectivity of cheetah and wild dog geographic ranges within three years*

Activity 4.3.1 Establish the spatial extent of corridor and dispersal areas between areas of resident and possible range
Timeline: 3 years
Actors: KWS, existing and identified cheetah and wild dog researchers coordinated by the carnivore liaison office
Indicators: Corridors and dispersal areas mapped

Activity 4.3.2 Establish threats, habitat quality, and the extent of suitable habitat in and surrounding corridors and dispersal areas
Timeline: 3 years
Actors: KWS, existing and identified cheetah and wild dog researchers, local authorities and other stakeholders
Indicators: Threats and habitat quality in and around corridors identified and mapped

Target 4.4 *Develop a framework to co-ordinate management and conservation*

of transboundary cheetah and wild dog populations within one to three years

Activity 4.4.1 Develop and support proposals for cheetahs and wild dogs to be listed within the Convention on Migratory Species

Timeline: 2 years
Actors: KWS, Tanzania Wildlife Division (as potential co-sponsor of CMS proposal)
Indicators: Cheetahs and wild dogs listed on Convention on Migratory Species and first transboundary Memoranda of Understanding signed.

Objective 5
Mainstream cheetah and wild dog conservation in land use planning & its implementation

Target 5.1 *Relevant local government authorities and other appropriate stakeholders are made aware of cheetah and wild dog conservation within one year*

Activity 5.1.1 Initiate and implement visiting programme to regional and local government offices, and other relevant individuals and institutions to present and distribute information on cheetah and wild dog conservation issues, posters etc

Timeline: 1 year
Actors: KWS, local authorities, wildlife fora, cheetah and wild dog projects, and other stakeholders.
Indicators: Information presented at Dryland Development Centre and county council meetings within all known and connecting wild dog and cheetah range

Activity 5.1.2 Convene a parliamentary conservation caucus

Timeline: During 2008
Actors: KWS and its Carnivore Working Group
Indicators: Caucus established, and includes MPs from areas of known cheetah and wild dog range

Target 5.2 *Land use plans compatible with wild dog and cheetah conservation established for areas of resident and connecting range, within five years*

Activity 5.2.1 Identify priority areas to be incorporated into land use plans

Timeline: 6 months
Actors: KWS, East African Wildlife Society
Indicators: Priority areas identified and documented

Activity 5.2.2 Encourage land use planning in community conservancies and private land holdings

Timeline: 2 years
Actors: KWS, local community benefit organisations, Local NGOs, and provincial administration
Indicators: Number of community conservancies developed in known cheetah and wild dog range areas, and number of Natural Resource Management plans developed in those conservancies

Activity 5.2.3 Integrate village and community plans into cross-sectoral (and species) plans such as conservancies

Timeline: 2 years
Actors: KWS, local community benefit organisations, local NGO's and Provincial Administration
Indicators: Number of Natural Resource Management plans integrated into the management of conservancies in range area

Target 5.3 *Awareness is raised among relevant donors and civil society about cheetah and wild dog populations, the effects of land use on them, and the economic and conservation consequences within two to three years*

Activity 5.3.1 Initiate poster campaigns to raise awareness of cheetah and wild dog conservation within their range, including possible and connecting areas

Timeline: 1 year
Actors: KWS Conservation Education Department, Wildlife Clubs of Kenya.
Indicators: Educational materials produced and distributed in the range areas

Activity 5.3.2 Promote representation of cheetah and wild dog conservation issues in mass media (including movies and documentary films) within Kenya

Timeline: 1 year
Actors: KWS, East African Wildlife Society, Wildlife Clubs of Kenya, Educational Institutions, Cheetah Conservation Fund
Indicators: Programs with the cheetah and wild dog conservation message aired in the media

Activity 5.3.3 Develop, disseminate and maintain cheetah and wild dog literature and information repositories, online and within Kenya

Timeline: 1 year
Actors: KWS, East African Wildlife Society, Wildlife Clubs of Kenya, educational institutions
Indicators: Website developed for cheetah and wild dog conservation, and information materials on cheetah and wild dogs obtained, catalogued and made available

Chapter 6

6.0 Implementation of the National Strategy

As described in Chapter 1, this national strategy was developed within the context of a programme to develop conservation plans for all of Kenya's large carnivores. While cheetahs and wild dogs are unique among African carnivores in their requirement for extremely large areas of continguous wildlife-friendly habitat, it is clear that many of the activities recommended in this strategy will also benefit other species which face similar direct and indirect threats: this includes lions, leopards and hyaenas. These other species can be conserved in areas somewhat smaller than those needed by cheetahs and wild dogs (Woodroffe et al., 1998), but otherwise face similar threats. Hence, cheetahs and wild dogs are likely to act as good 'umbrella species' for planning the conservation of all the large carnivores, determining the spatial scale across which conservation activities must be implemented.

Implementing this strategy will require a focus on lands outside protected areas, since the majority of wild dog and cheetah range falls on such community or privately owned land. It would not be possible to conserve viable populations of either species solely within Kenya's protected area system: the parks are simply too small to support these wide-ranging species. The designation of 'carnivore conservation zones' on unprotected lands – a prior recommendation of the KWS Working Group on the Conservation and management of Large Carnivores (Woodroffe et al., 2007b) – would be of great benefit in protecting cheetahs and wild dogs.

Several of Kenya's important wild dog and cheetah populations occupy transboundary areas, and long term conservation will depend upon conservation activities occurring not only within Kenya, but also in neighbouring countries. The Convention on the Conservation of Migratory Species of Wild Animals (CMS) provides one means for coordinating transboundary management, and Kenya indicated its interest in using this approach to the CMS Council immediately after the national workshop (http://www.cms.int/news/PRESS/nwPR2007/04_Apr/sc14.htm).

Since KWS is the only wildlife authority in Kenya, this is the appropriate body to oversee implementation of the national strategy. Indeed, many of the actions proposed in this strategy involve KWS in various different roles. KWS has expressed its intention to establish a Large Carnivore Office within its species programme, and this is a vital step in ensuring implementation of this plan, and those to be developed in future for other carnivore species.

"Implementing this strategy will require a focus on lands outside protected areas, since the majority of wild dog and cheetah range falls on such community or privately owned land."

References

Bartels, P., Bouwer, V., Crosier, A., Celliers, D., Durant, S.M., Grisham, J., Marker, L., Mulama, M., Venter, L., Wildt, D., & Friedmann, Y. (2001) *Global cheetah action plan - final workshop report* IUCN/SSC Conservation Breeding Specialist Group, Pretoria.

Bartels, P., Bouwer, V., Crosier, A., Celliers, D., Durant, S.M., Grisham, J., Marker, L., Mulama, M., Venter, L., Wildt, D., & Friedmann, Y. (2002) *Global cheetah action plan review - final workshop report* IUCN/SSC Conservation Breeding Specialist Group, Pretoria.

Bashir, S., Daly, B., Durant, S.M., Forster, H., Grisham, J., Marker, L., Wilson, K., & Friedmann, Y. (2004) *Global cheetah* (Acinonyx jubatus) *monitoring workshop report* Tanzania Carnivore Programme, Arusha.

Burney, D.A. (1980) *The effects of human activities on cheetah* (Acinonyx jubatus) *in the Mara region of Kenya*, University of Nairobi, Nairobi.

Burrows, R. (1995). Demographic changes and social consequences in wild dogs 1964-1992. I*n Serengeti II: research, management, and conservation of an ecosystem* (eds A.R.E. Sinclair & P. Arcese), pp. 400-420. Chicago University Press, Chicago.

Caro, T.M. (1994) *Cheetahs of the Serengeti plains* University of Chicago Press, Chicago.

Caro, T.M. & Collins, D.A. (1987a) Male cheetah social organisation and territoriality. *Ethology*, **74**, 52-64.

Caro, T.M. & Durant, S.M. (1991) Use of quantitative analyses of pelage characteristics to reveal family resemblances in genetically monomorphic cheetahs. *Journal of Heredity*, **82**, 8-14.

Caro, T.M., Holt, M.E., FitzGibbon, C.D., Bush, M., Hawkey, C.M., & Kock, R.A. (1987b) Health of adult free-living cheetahs. *Journal of Zoology*, **212**, 573-584.

Creel, S. & Creel, N.M. (1995) Communal hunting and pack size in African wild dogs, *Lycaon pictus. Animal Behaviour*, **50**, 1325-1339.

Creel, S. & Creel, N.M. (2002) *The African wild dog: behavior, ecology and conservation* Princeton University Press, Princeton.

Creel, S.R. & Creel, N.M. (1996) Limitation of African wild dogs by competition with larger carnivores. *Conservation Biology*, **10**, 1-15.

Divyabhanusinh (1995) *The end of a trail – The cheetah in India* Banyan Books, New Delhi.

Durant, S.M. (1998) Competition refuges and coexistence: an example from Serengeti carnivores. *Journal of Animal Ecology*, 67, 370-386.

Durant, S.M. (2000) Living with the enemy: avoidance of hyenas and lions by cheetahs in the Serengeti. Behavioral Ecology, **11**, 624-632.

Durant, S.M., Bashir, S., Maddox, T., & Laurenson, M.K. (2007) Relating long-term studies to conservation practice: the case of the Serengeti cheetah project. *Conservation Biology*, **21**, 602-611.

Durant, S.M., Kelly, M., & Caro, T.M. (2004) Factors affecting life and death in Serengeti cheetahs: environment, age and sociality. *Behavioral Ecology*, **15**, 11-22.

Dutson, G. & Sillero-Zubiri, C. (2005) Forest-dwelling African wild dogs in the Bale Mountains, Ethiopia. *Canid News*, **8**, 1-6.

Fanshawe, J.H., Ginsberg, J.R., Sillero-Zubiri, C., & Woodroffe, R. (1997). The status and distribution of remaining wild dog populations. In The *African wild dog: Status survey and conservation action plan* (eds R. Woodroffe, J.R. Ginsberg & D.W. Macdonald), pp. 11-57. IUCN, Gland.

Frame, L.H. & Fanshawe, J.H. (1990). African wild dog *Lycaon pictus*: A survey of Status and Distribution 1985-88.

Frank, L.G., Woodroffe, R., & Ogada, M.O. (2005). People and predators in Laikipia District, Kenya. In *People and wildlife - Conflict or coexistence?* (eds R. Woodroffe, S. Thirgood & A.R. Rabinowitz), pp. 286-304. Cambridge University Press, Cambridge.

Fuller, T.K., Kat, P.W., Bulger, J.B., Maddock, A.H., Ginsberg, J.R., Burrows, R., McNutt, J.W., & Mills, M.G.L. (1992a). Population dynamics of African wild dogs. In *Wildlife 2001: Populations* (eds D.R. McCullough & H. Barrett). Elsevier Science Publishers, London.

Fuller, T.K., Mills, M.G.L., Borner, M., Laurenson, M.K., & Kat, P.W. (1992b) Long distance dispersal by African wild dogs in East and South Africa. *Journal of African Zoology*, **106**, 535-537.

Gascoyne, S.C., King, A.A., Laurenson, M.K., Borner, M., Schildger, B., & Barrat, J. (1993) Aspects of rabies infection and control in the conservation of the African wild dog *(Lycaon pictus)* in the Serengeti region, Tanzania. *Onderstepoort Journal of Veterinary Research*, **60**, 415-420.

Ginsberg, J.R. & Woodroffe, R. (1997). Extinction risks faced by remaining wild dog populations. In T*he African wild dog: Status survey and conservation action plan* (eds R. Woodroffe, J.R. Ginsberg & D.W. Macdonald), pp. 75-87. IUCN, Gland.

Girman, D., Mills, M.G.L., Geffen, E., & Wayne, R.K. (1997a) A molecular genetic analysis of social structure, dispersal, and interpack relations of the African wild dog *(Lycaon pictus). Behavioural Ecology and Sociobiology*, **40**, 187-198.

Girman, D.J. & Wayne, R.K. (1997b). Genetic perspectives on wild dog conservation. In *The African wild dog: Status survey and conservation action plan* (eds R. Woodroffe, J.R. Ginsberg & D.W. Macdonald), pp. 7-10. IUCN, Gland.

Girman, D.J., Wayne, R.K., Kat, P.W., Mills, M.G.L., Ginsberg, J.R., Borner, M., Wilson, V., Fanshawe, J.H., FitzGibbon, C.D., & Lau, L.M. (1993) Molecular-genetic and morphological analyses of the African wild dog *(Lycaon pictus). Journal of Heredity*, **84**, 450-459.

Gittleman, J.L. & Harvey, P.H. (1982) Carnivore home range size, metabolic needs and ecology. *Behavioural Ecology and Sociobiology*, **10**, 57-63.

Gottelli, D., Wang, J., Bashir, S., & Durant, S.M. (2007) Genetic analysis reveals promiscuity among female cheetahs. *Proceedings of the Royal Society of London Series B-Biological Sciences*.

Gros, P.M. (1996) Status of the cheetah in Malawi. *Nyala*, **19**, 33-36.

Gros, P.M. (1998) Status of the cheetah *Acinonyx jubatus* in Kenya: a field-interview assessment. *Biological Conservation*, **85**, 137-149.

Gros, P.M. (2002) The status and conservation of the cheetah *Acinonyx jubatus* in Tanzania. *Biological Conservation*, **106**, 177-185.

Gros, P.M. & Rejmanek, M. (1999) Status and habitat preferences of Uganda cheetahs: an attempt to predict carnivore occurrence based on vegetation structure. *Biodiversity and Conservation*, **8**, 1561-1583.

IUCN (2005) *Strategy for the conservation of West African elephants* IUCN, Gland.

IUCN (2006a) *2006 IUCN Red list of threatened species* IUCN, Gland.

IUCN (2006b) *Regional conservation strategy for the lion Panthera leo in Eastern and Southern Africa* IUCN, Gland.

IUCN/SSC (in prep) *Regional conservation strategy for the cheetah and wild dog in eastern Africa* IUCN, Gland.

Jennings, S. (1992). Wild dog research programme. National Museums of Kenya, Nairobi.

Kat, P.W., Alexander, K.A., Smith, J.S., & Munson, L. (1995) Rabies and African wild dogs in Kenya. *Proceedings of the Royal Society of London B*, **262**, 229-233.

Kuhme, W.D. (1965) Communal food distribution and division of labour in African hunting dogs. *Nature*, **205**, 442-444.

Laurenson, M.K. (1993) Early maternal behaviour of wild cheetahs: implications for captive husbandry. *Zoo Biology*, **12**, 31-43.

Laurenson, M.K. (1994) High juvenile mortality in cheetahs *(Acinonyx jubatus)* and its consequences for maternal care. *Journal of Zoology*, **234**, 387-408.

Lindsey, P.A., Alexander, R., Mills, M.G.L., Romañach, S.S., & Woodroffe, R. (2007) Wildlife viewing preferences of visitors to protected areas in South Africa: implications for the role of ecotourism in conservation. *Journal of Ecotourism*, **6**, 19-33.

Malcolm, J.R. & Marten, K. (1982) Natural selection and the communal rearing of pups in African wild dogs *(Lycaon pictus)*. *Behavioural Ecology and Sociobiology*, **10**, 1-13.

Marker, L. (1998). Current status of the cheetah *(Acinonyx jubatus)*. In *A symposium on cheetahs as game ranch animals* (ed B.L. Penzhorn), pp. 1-17, Onderstepoort, South Africa.

Marker, L.L. (2002) *Aspects of cheetah* (Acinonyx jubatus) *biology, ecology and conservation strategies on Namibian farmlands*. D.Phil. thesis, University of Oxford, Oxford.

Marker, L.L., Dickman, A.J., Jeo, R.M., Mills, M.G.L., & Macdonald, D.W. (2003a) Demography of the Namibian cheetah, *Acinonyx jubatus*. *Biological Conservation*, **114**, 413-425.

Marker, L.L., Dickman, A.J., Mills, M.G.L., Jeo, R.M., & Macdonald, D.W. (in press) Spatial ecology of cheetahs *(Acinonyx jubatus)* on north-central Namibian farmlands. *Journal of Zoology*.

Marker, L.L., Muntifering, J.R., Dickman, A.J., Mills, M.G.L., & Macdonald, D.W. (2003b) Quantifying prey preferences of free-ranging Namibian cheetahs. *South African Journal of Wildlife Research*, **33**, 43-53.

McNutt, J.W. (1996) Sex-biased dispersal in African wild dogs, *Lycaon pictus*. *Animal Behaviour*, **52**, 1067-1077.

Mills, M.G.L. & Biggs, H.C. (1993) Prey apportionment and related ecological relationships between large carnivores in Kruger National Park. *Symposia of the Zoological Society of London*, **65**, 253-268.

Mills, M.G.L. & Gorman, M.L. (1997) Factors affecting the density and distribution of wild dogs in the Kruger National Park. *Conservation Biology*, **11**, 1397-1406.

Morsbach, D. (1986) *The behaviour, ecology and movements of cheetah on the farm areas of SWA/Namibia* Directorate of Nature Conservation and Recreation Resorts, Windhoek.

Myers, N. (1975) *The cheetah* Acinonyx jubatus *in Africa*. *IUCN Monograph No*. 4 IUCN, Morges, Switzerland.

Olson, D.M., Dinerstein, E., Wikramanayake, E.D., Burgess, N.D., Powell, G.V.N., Underwood, E.C., D'Amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts, T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P., & Kassem, K.R. (2001) Terrestrial ecoregions of the world: a new map of life on Earth. *BioScience*, **51**, 933-938.

Purchase, G.K. (1998) *An assessment of the success of a cheetah reintroduction project in Matusadona National Park*, University of Zimbabwe, Harare.

Rasmussen, G.S.A. (1999) Livestock predation by the painted hunting dog *Lycaon pictus* in a cattle ranching region of Zimbabwe: a case study. *Biological Conservation*, **88**, 133-139.

Ray, J., Hunter, L., & Zigouris, J. (2005) *Setting conservation and research priorities for larger African carnivores* Wildlife Conservation Society, New York.

Sharp, N.C.C. (1997) Timed running speed of a cheetah *(Acinonyx jubatus)*. *Journal of Zoology*, **241**, 493-494.

Thesiger, W. (1970) Wild dog at 5894 m (19,340 ft). *East African Wildlife Journal*, **8**, 202.

Van de Bildt, M.W.G., Kuiken, T., Visee, A.M., Lema, S., Fitzjohn, T.R., & Osterhaus, A.D.M.E. (2002) Distemper outbreak and its effect on African wild dog conservation. *Emerging Infectious Diseases*, **8**, 211-213.

Van Dyk, G. & Slotow, R. (2003) The effect of fences and lions on the ecology of African wild dogs reintroduced into Pilansberg National Park, South Africa. *African Zoology*, **38**, 79-94.

Woodroffe, R., André, J.-M., Andulege, B., Bercovitch, F., Carlson, A., Coppolillo, P.B., Davies-Mostert, H., Dickman, A.J., Fletcher, P., Ginsberg, J.R., Hofmeyr, M., Laurenson, M.K., Leigh, K., Lindsey, P.A., Lines, R., Mazet, J.K., McCreery, K., McNutt, J.W., Mills, M.G.L., Msuha, M., Munson, L., Parker, M.N., Pole, A., Rasmussen, G.S.A., Robbins, R., Sillero-Zubiri, C., Swarner, M.J., & Szykman, M. (2005a) *Tools for conservation of the African wild dog: Do we know enough? What more do we need to know?* Wildlife Conservation Society/IUCN Canid Specialist Group, New York/Oxford.

Woodroffe, R., Davies-Mostert, H., Ginsberg, J.R., Graf, J.A., Leigh, K., McCreery, E.K., Mills, M.G.L., Pole, A., Rasmussen, G.S.A., Robbins, R., Somers, M., & Szykman, M. (2007a) Rates and causes of mortality in endangered African wild dogs (Lycaon pictus): lessons for management and monitoring. *Oryx*, **41**, 1-9.

Woodroffe, R., Dloniak, S., Frank, L.G., Gakuya, F., Muruthi, P., O., M., Ogada, M.O., & Omondi, P. (2007b). The conservation and management of large carnivores – towards a national strategy for Kenya. Kenya Wildlife Service, Nairobi.

Woodroffe, R., Frank, L.G., Lindsey, P.A., ole Ranah, S.M.K., & Romañach, S.S. (2006) Livestock husbandry as a tool for carnivore conservation in Africa's community rangelands: a case-control study. *Biodiversity and Conservation*, **16**, 1245-1260.

Woodroffe, R. & Ginsberg, J.R. (1997a). Past and future causes of wild dogs' population decline. In *The African wild dog: Status survey and conservation action plan* (eds R. Woodroffe, J.R. Ginsberg & D.W. Macdonald), pp. 58-74. IUCN, Gland.

Woodroffe, R. & Ginsberg, J.R. (1998) Edge effects and the extinction of populations inside protected areas. *Science*, **280**, 2126-2128.

Woodroffe, R. & Ginsberg, J.R. (2005b). King of the beasts? Evidence for guild redundancy among large mammalian carnivores. In *Large carnivores and the conservation of biodiversity* (eds J.C. Ray, K.H. Redford, R.S. Steneck & J. Berger), pp. 154-175. Island Press, Washington, D.C.

Woodroffe, R., Ginsberg, J.R., & Macdonald, D.W. (1997b) *The African wild dog*: *Status survey and conservation action plan* IUCN, Gland.

Woodroffe, R., Lindsey, P.A., Romañach, S.S., & ole Ranah, S.M.K. (2007c) African wild dogs *(Lycaon pictus)* can subsist on small prey: implications for conservation. *Journal of Mammalogy*, **88**, 181-193.

Woodroffe, R., Lindsey, P.A., Romañach, S.S., Stein, A., & ole Ranah, S.M.K. (2005c) Livestock predation by endangered African wild dogs *(Lycaon pictus)* in northern Kenya. *Biological Conservation*, **124**, 225-234.

Woodroffe, R., McNutt, J.W., & Mills, M.G.L. (2004). African wild dog. In *Foxes, wolves, jackals and dogs: status survey and conservation action plan. 2nd edition* (eds C. Sillero-Zubiri & D.W. Macdonald), pp. 174-183. IUCN, Gland, Switzerland.

Appendix I: Workshop Delegates

Kenya-based participants

Name	Affiliation	Email
Dorothy Amwata	KWS Nawil	damwata@yahoo.com
Richard Bagine	KWS Biodiversity Research	rkbagine@kws.org
Hadley Becha	East African Wildlife Society	becha@eawildlife.org
Alice Bett	KWS Ecological Monitoring	bettc@kws.org
Inge Burchard	Friends of Nairobi National Park	ingebu@swiftkenya.com
Julilus K Chepte	KWS Tsavo East National Park Park	terp@swiftmombasa.com
Joseph Edebe	KWS Central Rift	edebej@gmail.com
Stephanie Dloniak	Mara Carnivore Conservation	dloniak@kenyaweb.com
Frances Gakuya	KWS Veterinary Services	gakuya@kws.org
Brian Heath	Mara Conservancy	bheath@triad.co.ke
Riz Jiwa	Basecamp Explorer Kenya	riz@basecampexplorer.com
Erustus Kanga	KWS Ecological Monitoring	ekanga@kws.org
B.W. Kavu	KWS	benkavu@kws.org
Cedric A. Khayale	KWS Research	ceddy6@yahoo.co.uk
Anthony King	Laikipia Wildlife Forum	director@laikipia.org
Juliet King	Northern Rangelands Trust	julietking@africaonline.co.ke
Dickson Korir	KWS	info@kws.org
Florence Kulecho	KWS	nnp@kws.org
Bernard Kuloba	KWS Masai Mara	mararesearch@kenyaweb.com
Moses Liforoh	KWS	mliforoh@kws.org
Jared Lumbasi	KWS	hirola@kws.org
Thomas Manyibe	KWS Veterinary Services	tommanyibe@yahoo.com
James Mattengeje	KWS	mattengeje@yahoo.com
Aggrey S. Maumo	KWS	KWS-IKP@wananchi.com
Benson ole Mutunker	The Wildlife Foundation (Kenya)	benmuke@yahoo.com
Jacob Mwamburi Mwanjala	KWS	jkizelem2004@yahoo.com
Ken Mwathe	African Conservation Centre	ken.mwathe@acc.or.ke
Shadrack Ngene	KWS-NCA	ngene@itc.org
Bernard Ngoru	KWS Southern Conservation Area	bngoru@kws.org
Godfreyole Ntapayic	Kajiado Human-Wildlife Conflict Management Network	ntapaturere@yahoo.com
Mordecai Ogada	National Museums of Kenya	mordyogada@yahoo.com
Nick Oguge	Earthwatch Institute	noguge@earthwatch.org
Patrick Omondi	KWS Species Programme	pomondi@kws.org
Ouna W.O.	KWS Western Conservation Area	romukoba@yahoo.co.uk
Mary Wykstra Ross	Cheetah Conservation Fund	cheetah@africaonline.co.ke
Dickson Too	KWS Laikipia	KWS-LKP@wanachi.com
Michael Wanjau	KWS Nairobi National Park	micwanjau@yahoo.com
Joseph K. Warutere	KWS Mountain Conservation Area	aberdare@wananchi.com
Margaret Nyokabi Waweru	Tanzania Wildlife Research Institute	mwaweru@gmail.com
Rosie Woodroffe	Samburu-Laikipia Wild Dog Project	rwoodroffe@ucdavis.edu

International observers

Name	Affiliation	E-mail
Paul Peter Awol	Boma Wildlife Training Centre, Sudan	paulpeterawol@yahoo.com
Lakew Berhanu	Ethiopia Wildlife Conservation Division	lakew.berhanu@gmail.com
Amy Dickman	Tanzania Carnivore Programme	amydickman@gmail.com
Sarah Durant	Tanzania Carnivore Programme	sdurant@wcs.org
Inyasi A. Lejora	Tanzania National Parks	ilejora@hotmail.com
Martin R. Malek	Wildlife Service South Sudan	ringmalek@yahoo.com
Laurie Marker	Cheetah Conservation Fund, Namibia	cheetah@iway.na
Emmanuel Masenga	Tanzania Wildlife Research Institute	emasenga76@yahoo.com
J. Weldon McNutt	Botswana Predator Conservation Program	lycaon@info.bw
Nebbo J. Mwina	Wildlife Division, Tanzania	neborita@hotmail.com
Megan Parker	Botswana Wild Dog Project	mnparker@igc.org
Claudio Sillero-Zubiri	IUCN/SSC Canid Specialist Group	claudio.sillero@zoo.ox.ac.uk
Zainab Suleimani	Ngrongoro Conservation Area Authority	znb_slmn@yahoo.com
Zelealem Tefera	Frankfurt Zoological Society, Ethiopia	kykebero@ethio.net
Frederick Wanyama	Uganda Wildlife Authority	fred.wanyam@uwa.or.ug

Appendix 2: Agenda for the National Workshop

Wednesday, 7th February

Chair: Dr Richard Bagine, Kenya Wildlife Service

9:30 **Official welcome**
Julius Kipn'getich, Director, Kenya Wildlife Service

9:40 **Introductions**
All participants - include introductions of observers and explanation of their role

9:55 **Background, goals, agenda and outputs from this meeting, in the context of the developing national strategy for the conservation and management of large carnivores**
Rosie Woodroffe, Samburu-Laikipia Wild Dog Project

10:10 **Biology and conservation of cheetahs – an overview**
Sarah Durant, Tanzania Carnivore Centre

10:30 **Biology and conservation of African wild dogs – an overview**
Rosie Woodroffe, Samburu-Laikipia Wild Dog Project

10:50 **COFFEE**

Chair: Erustus Kanga, Kenya Wildlife Service

11:20 **Present and discuss national and regional distribution map for cheetahs**
Participants from the preceding regional workshop

11:35 **Present and discuss national and regional distribution map for wild dogs**
Participants from the preceding regional workshop

11:50 **Present and discuss national and regional threats to cheetahs and wild dogs**
Participants from the preceding regional workshop

12:30 **LUNCH**

Chair: Benjamin Kavu, Kenya Wildlife Service

13:30 **Present and discuss regional logframe - review all aspects including vision, goal, and objectives and set in national context**
Discussion by all participants, facilitated by Dr Nick Oguge, Earthwatch

14:30 **Mandate to use this regional strategy at the national level**

14:45 **Brief presentations on tools for cheetah and wild dog conservation**

Chair: Patrick Omondi, Kenya Wildlife Service

14:45 **Tools for surveying at the national level – experience from Tanzania**
Sarah Durant, Tanzania Carnivore Centre

15:00 **Tools for surveying at the national level – experience from Kenya**
Mary Wykstra Ross, Kenya Cheetah Conservation

15:15 **Tools for monitoring inside protected areas**
Stephanie Dloniak, Mara Carnivore Conservation Project

15:30 **Tools for monitoring on community lands**
Juliet King, Northern Rangelands Trust

15:45 **Tools to mitigate conflict between cheetahs and livestock farmers**
Laurie Marker, Cheetah Conservation Fund

16:00 **TEA**

Chair: Ann Kahihia, Kenya Wildlife Service

16:30 **Tools to mitigate conflict between wild dogs and livestock farmers**
Rosie Woodroffe, Samburu-Laikipia Wild Dog Project

16:45 **Tools to reduce disease threats to wild dogs**
Rosie Woodroffe, Samburu-Laikipia Wild Dog Project

17:00 **Reducing tourism impacts**
Brian Heath, Mara Conservancy

17:15 **Maintaining and restoring landscape connectivity**
Ken Mwathe, African Conservation Centre

17:30 **END OF FIRST DAY**

****

Thursday, 8th February

9:00 **Review vision, goal and goal targets for regional strategy and select those relevant to national strategy**
Discussion by all participants, facilitated by Dr Nick Oguge, EarthWatch

9:30 **Review objectives and objective targets for regional strategy and select those relevant to national strategy**
Discussion by all participants, facilitated by Dr Nick Oguge, EarthWatch

10:00 **Briefly review activities for regional strategy and determine working groups to flesh these out, develop indicators, and identify responsible parties and timeframes**
Discussion by all participants, facilitated by Dr Nick Oguge, EarthWatch

10:30 **COFFEE**

11:00 **Working groups develop specific (site-specific where appropriate) activities and indicators**
Working groups

12:30 **Working groups report briefly on progress**
Working groups

13:00 **LUNCH**

14:00 **Continue in working groups; finalise activities and indicators**
Working groups

15:00 **TEA**

15:30 **Present, review, discuss, and finalise logframe for national strategy**
Discussion by all participants, facilitated by Dr Nick Oguge, EarthWatch

16:30 **Discussion of way forward and assignment of tasks (including preparation of report)**
Discussion by all participants, facilitated by Dr Nick Oguge, EarthWatch

17:00 **Closing statement**
Julius Kipn'getich, Director, Kenya Wildlife Service, or appointee

MEETING ENDS

****

Appendix 3: Strategic Plan Logical Framework

Vision
To secure viable and ecologically functioning cheetah and wild dog populations as valued components of development in Kenya
Goal
To reverse declines and improve the status of cheetah and wild dog populations and their habitats across Kenya

Objective	Target	Activity
1 Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals	**1.1** Sustainable tools to reduce wild dog and cheetah impacts on livestock developed and disseminated across the country within three years	**1.1.1** Identify areas where cheetah and wild dog populations are significantly threatened by conflict with livestock farmers *Timeline:* 6 months *Actors:* KWS and other workshop participants *Indicators:* Distribution map of areas where cheetah and wild dog populations are significantly threatened by conflict with livestock farmers
		1.1.2 Identify the circumstances that contribute to livestock depredation by cheetahs and wild dogs in the identified areas *Timeline:* 3 years *Actors:* KWS, CCF, SLWDP, Ijara-Lamu Wild Dog Project, EAWLS, AWF, local communities *Indicators:* Report on circumstances that contribute to livestock depredation by cheetahs and wild dogs
		1.1.3 Develop effective strategies for documenting and disseminating existing information on reducing cheetah and wild dog impacts on livestock to relevant parties across Kenya *Timeline:* 1 year *Actors:* KWS and its Predator Group, conservation partners and related NGOs, local communities *Indicators:* Strategy document produced
		1.1.4 Work with communities in affected areas to develop and implement the most effective livestock husbandry strategies to reduce depredation by cheetahs and wild dogs *Timeline:* 2 years *Actors:* KWS and its Predator Group, conservation partners and related NGOs, local communities *Indicators:* Measureable reduction in depredation rates by cheetahs and wild dogs

Objective	Target	Activity
1 Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals	**1.1** Sustainable tools to reduce wild dog and cheetah impacts on livestock developed and disseminated across the country within three years	**1.1.5** Work with communities in affected areas to develop and implement the most effective land use and wildlife management strategies to reduce depredation by cheetahs and wild dogs *Timeline:* 2 years *Actors:* KWS and its Predator Group, conservation partners and related NGOs, local communities, local authorities, Ministry of Lands *Indicators:* Measureable reduction in depredation rates by cheetahs and wild dogs
	1.2 Initiate and maintain programmes for local people to derive sustainable economic benefits from the presence of cheetahs, wild dogs, and their prey, in selected areas within three years	**1.2.1** Identify and document areas across Kenya where ecotourism could effectively assist cheetah and wild dog conservation through sustainable economic benefits for local communities, and hence improving tolerance of both species *Timeline:* 1 year *Actors:* KWS, tourism sector, local communities, local authorities, local and international development partners *Indicators:* Document areas across Kenya where ecotourism could effectively assist cheetah and wild dog conservation
		1.2.2 Encourage sustainable ecotourism programmes and the distribution of their revenue to appropriate parties in cheetah and wild dog range *Timeline:* 3 years *Actors:* KWS, tourism sector, local communities, local authorities, provincial administration, local and international development partners, NEMA, ESOK *Indicators:* Increased number of certified ecotourism programmes. Certified, externally audited, financial statements of accounts where applicable
		1.2.3 In areas of Kenya where ecotourism is unlikely to provide sufficient benefits, investigate alternative options for economic benefits, direct or indirect which encourage cheetah and wild dog conservation *Timeline:* 3 years *Actors:* KWS, development partners, local communities *Indicators:* List of alternative options developed for further consideration

Objective	Target	Activity
1 Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals	**1.2** Initiate and maintain programmes for local people to derive sustainable economic benefits from the presence of cheetahs, wild dogs, and their prey, in selected areas within three years	**1.2.4** Develop and disseminate guidelines for responsible tourist viewing of cheetahs and wild dogs *Timeline:* 1 year *Actors:* KWS, IUCN/SSC CSG, Tanzania Carnivore Programme, tourism sector (KPSGA, KTB, KATO), conservation groups and NGOs. *Indicators:* Guideline document prepared and disseminated; measurable reduction in reports of harassment (e.g. in Masai Mara)
	1.3 Awareness creation programmes relevant to cheetah and wild dog conservation developed in key areas within three years	**1.3.1** Identify target areas and audiences best placed to influence cheetah and wild dog conservation *Timeline:* 6 months *Actors:* KWS, CCF, conservation groups and NGOs. *Indicators:* Document target areas and audiences best placed to influence cheetah and wild dog conservation
		1.3.2 Investigate local traditions, knowledge and cultural values relevant to cheetahs and wild dogs, incorporate into existing outreach materials and strategies, and disseminate. Timeline: 2 years Actors: KWS, CCF, conservation groups and NGOs. Indicators: Outreach materials developed and disseminated
	1.4 Programmes to reduce indiscriminate hunting and illegal off-take of wild ungulates implemented in affected areas within three years	**1.4.1** Identify areas where wild dog and/or cheetah populations are significantly threatened by accidental snaring *Timeline:* 1 year *Actors:* KWS, local communities, private conservancies, local authorities, carnivore and wildlife monitoring projects *Indicators:* Report documenting areas where wild dog and/or cheetah populations are significantly threatened by accidental snaring

Objective	Target	Activity
1 Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals	**1.4** Programmes to reduce indiscriminate hunting and illegal off-take of wild ungulates implemented in affected areas within three years	**1.4.2** Identify areas where prey loss contributes to conflict between livestock farmers and cheetahs or wild dogs, or directly undermines the viability of wild dog or cheetah populations *Timeline:* 3 years *Actors:* KWS, local communities, private conservancies, local authorities, carnivore and wildlife monitoring projects *Indicators:* Report documenting areas where prey loss contributes to conflict between livestock farmers and cheetahs or wild dogs, or directly undermines the viability of wild dog or cheetah populations
		1.4.3 Support the implementation of measures to reduce indiscriminate hunting and/or illegal offtake in identified areas *Timeline:* immediate and continuous process *Actors:* KWS, private conservancies, local authorities, local communities and NGOs *Indicators:* Reduced incidences of hunting/poaching/illegal offtake, lower incidences of accidental snaring of carnivores, lower incidences of conflict and reduced evidence of prey loss affecting cheetahs and wild dogs
	1.5 Holistic carnivore disease management strategies developed in key areas within three years	**1.5.1** Identify areas where wild dog populations are significantly threatened by carnivore diseases *Timeline:* 1 year *Actors:* KWS and other stakeholders *Indicators:* Distribution map of areas where wild dog populations are significantly threatened by carnivore diseases
		1.5.2 Work with veterinary departments of the Government of Kenya to encourage domestic dog vaccination and husbandry within identified areas *Timeline:* immediate and continuous process *Actors:* KWS and Department of Veterinary Services; tourism sector is a potential source of funding *Indicators:* minimum 70% of domestic dogs vaccinated against rabies in identified areas

Objective	Target	Activity
1 Develop and implement strategies to promote coexistence of cheetahs and wild dogs with people and domestic animals	**1.5** Holistic carnivore disease management strategies developed in key areas within three years	**1.5.3** Evaluate existing disease management strategies for wild dogs and related species to assess their likely relevance to Kenya *Timeline:* 6 months *Actors:* KWS and other stakeholders *Indicators:* A report on the evaluation
		1.5.4 Identify circumstances where intervention may or may not be appropriate through continued research on the dynamics of carnivore disease in areas where domestic dogs coexist with wildlife *Timeline:* 3 years *Actors:* KWS, SLWDP, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI, KARI *Indicators:* Scientific reports determining circumstances where intervention may or may not be appropriate to manage carnivore disease
		1.5.5 Evaluate the conservation potential of vaccinating free ranging wild dogs against carnivore diseases *Timeline:* 3 years *Actors:* KWS, SLWDP, WCS, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI, KARI *Indicators:* Scientific reports evaluating the conservation potential of vaccinating free ranging wild dogs against carnivore diseases
		1.5.6 Conduct research into epidemiology of mange in cheetah and wild dog populations *Timeline:* 3 years *Actors:* KWS, SLWDP, WCS, University of Nairobi, IUCN/SSC Canid Specialist Group, ILRI, KARI *Indicators:* Scientific reports providing insights into the source and dynamics of the disease
		1.5.7 Develop a holistic carnivore disease management strategy for each key area *Timeline:* 5 years *Actors:* KWS and other stakeholders *Indicators:* Strategy documents prepared and implemented

Objective	Target	Activity
2 Provide relevant stakeholders and managers with scientific and timely information on the status of and threats to cheetah and wild dog populations	**2.1** Surveys and monitoring to evaluate presence, trends and threats in key cheetah and wild dog ranges initiated and maintained	**2.1.1** Prioritise and conduct surveys to determine presence in areas identified as unknown, possible and connecting range within Kenya *Timeline:* 2 years *Actors:* KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group *Indicators:* Database on wild dog and cheetah distribution and status established and resident range map updated. Also, subgroup of cheetah and wild dog researchers to oversee this monitoring, under auspecies of KWS Large Carnivore Working Group
		2.1.2 Within known areas of resident range, initiate and maintain monitoring activities to determine population trends and threats *Timeline:* Two years, with annual review *Actors:* KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group *Indicators:* Database on wild dog and cheetah distribution and status established and information on threats and trends incorporated
		2.1.3 Within currently known resident ranges, conduct research, establish demographic and threat status *Timeline:* 2 years *Actors:* KWS, existing and identified cheetah and wild dog researchers, coordinated by the KWS Large Carnivore Working Group *Indicators:* Established database contains repeatable data on status and threats to produce trend information
	2.2 Strategies for disseminating information relevant to cheetah and wild dog conservation to all key stakeholders across Kenya developed and implemented within one to three years	**2.2.1** Use Kenya national workshop materials, publications, meetings and/or other media to disseminate information relevant to cheetah and wild dog conservation *Timeline:* 1 year and with continual addition of new information *Actors:* KWS carnivore office, relevant research projects and NGOs *Indicators:* Annual reports made

Objective	Target	Activity
2 Provide relevant stakeholders and managers with scientific and timely information on the status of and threats to cheetah and wild dog populations		available; research permits tied to commitment to make findings widely available; all participating local institutions publish in newsletters and web sites about participation in this process; policy briefs produced; heightened awareness measured by decreased conflict, increased tolerance and increased value/perception reflected in conflict evaluations and surveys.
		2.2.2 Establish a standardised database format to facilitate the collection and sharing of data *Timeline:* 1 year *Actors:* KWS carnivore office *Indicators:* Useful, comprehensive and accessible data base established
		2.2.3 Establish a Kenya national database linked to the eastern Africa regional database allowing dissemination of resulting information *Timeline:* 2 years and continuous thereafter *Actors:* KWS carnivore office, Tanzania Carnivore Programme (TAWIRI) *Indicators:* Database established, data entered and updated
3 Strengthen human, financial and information resources for conserving cheetahs and wild dogs in collaboration with stakeholders	**3.1** A cheetah and wild dog financial, implementation, and operational plan for Kenya developed within two years	**3.1.1** Identify individuals and institutions to undertake these activities in Kenya *Timeline:* by the end of the national workshop *Actors:* KWS to identify financial needs and identify internal and supporting partners; suggestions include WCS, EAWLS, UNEP, PACT, CCF, KTF, tourism partners, business specialists, Ministry of Finance, Ministry of Planning, Ministry of Tourism, Office of the President *Indicators:* Appropriate individuals and institutions identified
		3.1.2 Review existing and possible financial resource needs for the conservation of cheetahs and wild dogs *Timeline:* 1 year *Actors:* KWS and partners *Indicators:* Donor presentation to encourage input. Commitment to funding and interest by at least 3 major participants

Objective	Target	Activity
3 Strengthen human, financial and information resources for conserving cheetahs and wild dogs in collaboration with stakeholders	**3.1** A cheetah and wild dog financial, implementation, and operational plan for Kenya developed within two years	**3.1.3** Develop, produce and disseminate a cheetah and wild dog financial, implementation, and operational plan for Kenya *Timeline:* 2 years *Actors:* KWS and partners *Indicators:* Plan produced and disseminated
		3.1.4 Monitor, evaluate and revise the implementation of the financial, implementation, and operational plan *Timeline:* every 3 years *Actors:* Funding strategy leader will hopefully come forward from the process *Indicators:* Plan evaluated and revised as appropriate
	3.2 Have effective extension, enforcement, and monitoring personnel trained and equipped to operate within 50% of the cheetah and wild dog population ranges in Kenya within three to five years	**3.2.1** Establish Carnivore Office within Kenya Wildlife Service *Timeline:* 1 year *Actors:* KWS and its Large Carnivore Working Group *Indicators:* Carnivore Office established and operational
		3.2.2 Strengthen activities to address urgent issues affecting cheetah and wild dog conservation (e.g. trafficking in cheetah cubs) wherever they are known to occur *Timeline:* 2 years *Actors:* KWS, strengthened and supported by NGOs *Indicators:* Point person identified in KWS. Action taken to investigate and reduce activities threatening wild dogs and cheetahs.
		3.2.3 Complete a Training and Resource Needs Assessment in "a national workshop" with relevant stakeholders *Timeline:* 1 year *Actors:* KWS (lead) aided by NGOs (e.g. CCF). Tourism industry is a potential source of funding *Indicators:* Workshop planned within 6 months and held within 1 year

Objective		Target		Activity	
3	Strengthen human, financial and information resources for conserving cheetahs and wild dogs in collaboration with stakeholders	**3.2**	Have effective extension, enforcement, and monitoring personnel trained and equipped to operate within 50% of the cheetah and wild dog population ranges in Kenya within three to five years	**3.2.4**	Strengthen collaboration in monitoring of resident and connecting range for cheetahs and wild dogs *Timeline:* 1 year *Actors:* KWS and its Large Carnivore Working Group, NGOs, conservancy monitoring organisations including community scouts, parabiologists, community liaison officers *Indicators:* Monitoring in place and information compiled in all areas of resident and connecting range
				3.2.5	Integrate Training Needs Assessment with financial, implementation, and operational plan, and national action plan *Timeline:* 2 years *Actors:* KWS and key leaders from the planning process *Indicators:* Fully integrated plan prepared
				3.2.6	Implement the recommendations from the training and needs assessment, including placing a cheetah and wild dog specialist or advocate (whether biologist, parabiologist, or community liaison officer) in each target population *Timeline:* 3 years *Actors:* KWS and leading NGOs from the planning process *Indicators:* Reccommendations of training and resource needs assessment implimented.
				3.2.7	Evaluate and revise strategic plan *Timeline:* Every 3 years *Actors:* Kenya Wildlife Service and other key leaders from the planning process *Indicators:* New and focused plan prepared
4	Review and harmonise existing legislation, and, where necessary, develop new legislation, for conservation across cheetah and wild dog range at national and international levels	**4.1**	Identify the gaps in information on cheetah and wild dog conservation which can assist in policy development	**4.1.1**	Produce a review document on national protected species legislation and its implications for cheetah and wild dog conservation *Timeline:* 1 year *Actor:* KWS *Indicators:* Review document produced

Objective	Target	Activity
4 Review and harmonise existing legislation, and, where necessary, develop new legislation, for conservation across cheetah and wild dog	**4.2** Information on the extent of illegal wildlife related activities within cheetah and wild dog ranges for relevant authorities to strengthen policy/law enforcement and quality tourism provided within one to three years	**4.2.1** Develop standardised methodologies to collect information on illegal activities relevant to cheetah and wild dog conservation within resident range *Timeline:* 1 year *Actor:* KWS *Indicators:* Standardised survey methods developed
		4.2.2 Collect spatially explicit information on the magnitude of illegal activities relevant to cheetah and wild dog conservation within resident range and include within national and regional databases *Timeline:* 2 years *Actors:* KWS and other relevant stakeholders *Indicators:* Information on illegal activities collected and entered into the national database
		4.2.3 Quantify the impacts of insensitive tourism on cheetahs and wild dogs inside and outside of protected areas and use to develop outreach materials to raise awareness about cheetah and wild dog friendly observation practices *Timeline:* 3 years *Actors:* KWS, local authorities and other stakeholders *Indicators:* Report on impacts produced, outreach materials produced and disseminated
	4.3 Explicit information provided to relevant authorities to support identification & prioritisation of corridor and dispersal areas for improved connectivity of cheetah and wild dog geographic ranges within three years	**4.3.1** Establish the spatial extent of corridor and dispersal areas between areas of resident and possible range *Timeline:* 3 years *Actors:* KWS, existing and identified cheetah and wild dog researchers cordinated by the KWS large carnivore management committee. *Indicators:* Corridors and dispersal areas mapped
		4.3.2 Establish threats, habitat quality, and the extent of suitable habitat in and surrounding corridors and dispersal areas *Timeline:* 3 years *Actors:* KWS, existing and identified cheetah and wild dog researchers, local authorities and other stakeholders cordinated by the KWS large carnivore management committee. *Indicators:* Threats and habitat quality in and around corridors identified and mapped

Objective	Target	Activity
4 Review and harmonise existing legislation, and, where necessary, develop new legislation, for conservation across cheetah and wild dog range at national and international levels	**4.4** Develop a framework to co-ordinate management and conservation of transboundary cheetah and wild dog populations within one to three years	**4.4.1** Develop and support proposals for cheetahs and wild dogs to be listed within the Convention on Migratory Species *Timeline:* 2 years *Actors:* KWS, Tanzania Wildlife Division (as potential co-sponsor of CMS proposal) *Indicators:* Cheetahs and wild dogs listed on CMS and first transboundary MOU signed
5 Mainstream cheetah and wild dog conservation in land use planning & its implement-ation	**5.1** Relevant local government authorities and other appropriate stakeholders are made aware of cheetah and wild dog conservation within one year	**5.1.1** Initiate and implement visiting programme to regional and local government offices, and other relevant individuals and institutions to present and distribute information on cheetah and wild dog conservation issues, posters etc *Timeline:* 1 year *Actors:* KWS, local authorities, wildlife fora, cheetah and wild dog projects, and other stakeholders. *Indicators:* Information presented at DDC and county council meetings within all known and connecting wild dog and cheetah range
		5.1.2 Convene a parliamentary conservation caucus *Timeline:* During 2008 *Actors:* KWS and its Carnivore Working Group *Indicators:* Caucus established, and includes MPs from areas of known cheetah and wild dog range
	5.2 Land use plans compatible with wild dog and cheetah conservation established for areas of resident and connecting range, within five years	**5.2.1** Identify priority areas to be incorporated into land use plans *Timeline:* 6 months Actors: KWS, EAWLS Indicators: Priority areas identified and documented
		5.2.2 Encourage land use planning in community conservancies and private land holdings *Timeline:* 2 years *Actors:* KWS, local CBOs, Local NGOs, and provincial administration *Indicators:* Number of community conservancies developed in known cheetah and wild dog range areas, and number of Natural Resource Management plans developed in those conservancies

Objective		Target		Activity	
5	Mainstream cheetah and wild dog conservation in land use planning & its implement-ation	**5.2**	Land use plans compatible with wild dog and cheetah conservation established for areas of resident and connecting range, within five years	**5.2.3**	Integrate village and community plans into cross-sectoral (and species) plans such as conservancies *Timeline:* 2 years *Actors:* KWS, local CBO's, local NGO's and provincial administration. *Indicators:* Number of Natural Resource Management plans integrated into the management of conservancies in range area
		5.3	Awareness is raised among relevant donors and civil society about cheetah and wild dog populations, the effects of land use on them, and the economic and conservation consequences within two to three years	**5.3.1**	Initiate poster campaigns to raise awareness of cheetah and wild dog conservation within their range, including possible and connecting areas *Timeline:* 1 year *Actors: KWS, EAWLS, WCK, CCF, Educational Institutions* *Indicators:* Educational materials produced and distributed in the range areas
				5.3.2	Promote representation of cheetah and wild dog conservation issues in mass media (including movies and documentary films) within Kenya *Timeline:* 1 year *Actors: KWS, EAWLS, WCK, CCF* *Indicators:* Programs with the cheetah and wild dog conservation message aired in the media
				5.3.3	Develop, disseminate and maintain cheetah and wild dog literature and information repositories, online and within Kenya *Timeline:* 1 year *Actors:* KWS, EAWLS, Wildlife Clubs of Kenya, educational institutions *Indicators:* Website developed for cheetah and wild dog conservation, and information materials on cheetah and wild dogs obtained, catalogued and made available

Appendix 4: Large carnivore task force members

Patrick Omondi	KWS
Dr. Charles Musyoki	KWS
Dr. Mordecai Ogada	Kenya Wildlife Trust
Ogeto Mwebi	National Museums of Kenya
Dr. Stephanie Dloniak	Maasai Mara Predator Project
Dr.Lawrence Frank	Living with Lions
Dr. Rosie Woodroffe	Laikipia/Samburu Wild dog Project
Dr. Philip Muruthi	African Wildlife Foundation
Dr. Francis Gakuya	KWS