

Acknowledgements

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- Those with professional interest in lion and hyaena management
- Local People

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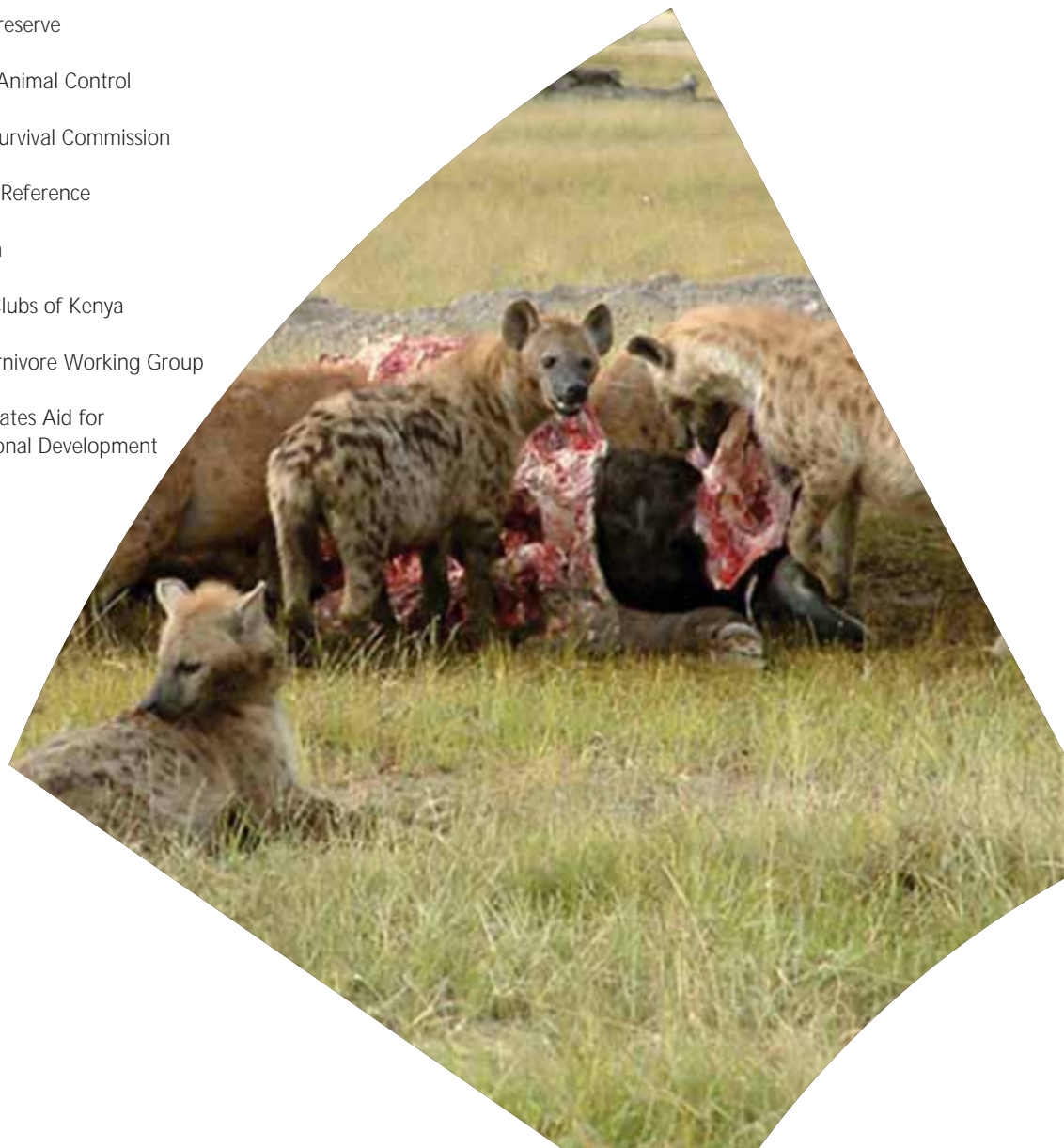
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Abbreviations

CBO	Community Based Organisations
CITES	Convention on International Trade in Endangered Species
EAC	East African Community
GoK	Government of Kenya
HCDA	Horticultural Crops Development Authority
IUCN	International Union for the Conservation of Nature
KARI	Kenya Agriculture Research Institute
KIE	Kenya Institute of Education
KWS	Kenya Wildlife Service
NGO	Non Governmental Organisation
NP	National Park
NR	National reserve
PAC	Problem Animal Control
SSC	Species Survival Commission
TORs	Terms of Reference
TV	Television
WCK	Wildlife Clubs of Kenya
WG	Large Carnivore Working Group
USAID	United States Aid for International Development



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 lions and spotted hyaenas were widely distributed across Kenya. However, over the years, human population increase that has led to loss of habitat, reduction in prey base and conflicts with people has resulted in significant reduction of lion and spotted hyaena numbers.

Lions and spotted hyaenas form a vital component of Kenya's natural ecosystem and play a critical role in Kenya's tourism industry. In a bid to conserve the remaining populations of lions and spotted hyaenas 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. 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 population of large carnivores is on the decline all over the world and Kenya's carnivores are no exception. Despite their reduced populations, large carnivores still cause problems for pastoralists, farmers and conservation managers. Predation on livestock by large carnivores is a serious problem – first, because it can have a major impact on the livelihoods of pastoralists and farmers, and, second, because it leads to the killing of large carnivores, many of which are species of local or international conservation concern.

Lions play a critical role in Kenya's tourism industry. Lion presence in an area is considered an indicator of its wild and natural integrity. The lion is thus one of the flagship species of Kenya for research and tourism and indeed one of the big five.

Due to the globally declining lion populations, the species has been extirpated from at least 30% of their historical range in Eastern and Southern Africa. As often is the case in conservation, there is limited time series data on population status and trend. However, Kenya's national population of lions was estimated at 2,749 in 2002 and 2,280 in 2004. The current estimate is just about 2000 individuals.


Spotted hyaenas occur in most of Kenya's protected areas. Their population was estimated to be between 2000 to 4000 individuals in 1998. Spotted Hyaenas are disliked in community areas where they are often the most serious predators of livestock and are very susceptible to poisoning and slow to recover in areas from which they have been extirpated. Their numbers are severely depleted outside protected areas. This, coupled with their limited ability to recover in areas where they have been extirpated, makes spotted hyaenas particularly reliant on deliberate conservation efforts.

The importance of the conservation challenges facing lions and spotted hyaenas is increasingly recognized in conservation circles. However, few solutions have been developed, and management policies are lacking in the vast majority of the affected regions, Kenya included.

Kenya Wildlife Service recognizes an urgent need to resolve these problems. In response, KWS established a large carnivore task force to advise, among other issues, on the development and implementation of a suite of national conservation and management strategies for large carnivore conservation. The lion and spotted hyaena conservation strategy will guide efforts to conserve these species in the short and long term.

In the long term we hope to have in place articulate national conservation strategies for all critically endangered, endangered and threatened species to provide frameworks within which such species can be conserved for posterity. This is an ambitious undertaking and KWS will continuously consult with stakeholders to ensure that these targets are achieved.

The implementation of this strategy will require resources and I would like to call upon donor organizations and stakeholders to support us so that we can actualize it and conserve lions and spotted hyaenas for prosperity.



Julius Kipnge'tich, EBS
Director
KWS



Executive Summary

Lions (*Panthera leo*) and spotted hyaenas (*Crocuta crocuta*) form a vital component of Kenya's natural ecosystems. By affecting not only prey numbers, but also prey behavior, both species have an important function in structuring ecological communities. In addition to this key ecological function, lions and hyaenas also play a critical role in Kenya's tourism industry. Their presence in an area is considered an indicator of its wild and natural integrity.

Kenya supports important populations of both lions and spotted hyaenas; important populations are in the Tsavo, Laikipia, and Maasai Mara ecosystems thus the need to conserve these species ecosystems natural range. This strategic plan for their conservation is part of a range-wide conservation planning process. Lions and spotted hyaenas have similar ecological needs that qualify the need for a single strategy covering both species encompassing their conservation needs.

The existing protected area network must lie at the core of conservation efforts, with Tsavo and the Mara-Serengeti particularly important for the conservation of ecologically functional populations. However, existing protected areas are not sufficient to protect numerically viable populations of all species. At least some conservation activities must occur outside protected areas – both in their immediate surroundings and, in some cases, in areas of conservation importance quite distant from protected areas. This is likely to require that local communities perceive tangible incentives for carnivore conservation

KWS organized a workshop that brought together wildlife biologists and wildlife managers (government and private), local people, conservation NGO's, lion and hyaena experts, and others with a professional interest in lion and hyaena management issues to formulate this conservation strategy. The strategy recognizes the need for conservation of both species and integrates legislative provisions, with a system of incentives for local people to enable lions and hyaenas to successfully coexist with human activities outside protected areas.

The main objectives of the strategy are:

- (i) To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyaenas in Kenya,
- (ii) To change the negative perception of these carnivores, especially hyaenas,
- (iii) To enhance conservation education in learning institutions,
- (iv) To create awareness of ways to ensure coexistence of man with lions and hyaenas,
- (v) To advocate and lobby for a national land use policy that integrates socio-economic development and conservation of habitat for lions, hyaenas and their prey,
- (vi) To limit or eliminate human-lion/hyaena conflict and related issues,
- (vii) To develop and implement conservation and management policies on lions and hyaenas in both protected areas and non-protected areas,
- (viii) To develop a policy framework on incentives to local communities and landowners to actively participate in the conservation and management of lions and hyaenas,
- (ix) To implement and enforce laws on illegal killing of lions and hyaena and
- (x) To establish an institutional framework to coordinate research, information collection, data storage and dissemination on lions, spotted hyaenas and other large carnivores

This strategy recognises the current and potential geographical range for both lions and hyaenas, the threats facing both species and provides guidance to efforts aimed at their conservation and management.



Chapter 1

1.0 Introduction

1.1 Background

Africa is home to most of the world's lions and spotted hyaenas, with majority of the populations being found in East Africa. However, both species are faced with similar threats to their survival. Competing with an ever-increasing human population for space, persecution by farmers and pastoral communities living close to them, reduction in wild prey base and land use changes constitute the threats facing lions and hyaenas in Kenya. This has led to huge declines in lion and spotted hyaena numbers; on a regional scale lions have been extirpated from at least 83% of their historical range in Africa.

The African lion has been classified by IUCN as vulnerable whereas the spotted hyaena is lower risk (conservation dependent). The ecological importance of these animals as top predators and their role in the tourism industry requires that they receive active protection from wildlife bodies.

1.2 Planning large carnivore conservation in Kenya

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

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., 2007):

- (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 conservation strategy for lions and spotted hyaenas.

1.3 National planning within a range wide context

Recent surveys of lions in Africa indicated a suspected decline of 30-50%, with current population estimates ranging from 23,000 to 39,000. A proposal during the 13th Conference of Parties to CITES to uplist the lion to Appendix I, and restrict trade in lion trophies sparked extensive debate among African range states, and highlighted the need to achieve pan-African consensus on the way forward for lion conservation. The proposal was withdrawn and range states agreed that a series of regional lion conservation workshops should be held. IUCN- The World Conservation Union was asked to organise workshops which would bring together stakeholders to develop regional lion conservation strategies.

The Eastern and Southern African Lion Conservation Workshop that developed the Eastern and Southern African Lion Conservation Strategy was held in January of 2006 in Johannesburg, South Africa. The regional strategy set out six strategic objectives:

- 1) *Management:* To ensure effective conservation management of lions, their habitats, and wild prey
- 2) *Mitigation:* To minimise and where possible, eliminate human-lion related conflicts
- 3) *Socio-economics:* To equitably distribute the costs and benefits of long-term lion management
- 4) *Policy and land use:* To develop and implement harmonious, comprehensive legal and institutional frameworks that

provide for the expansion of wildlife - integrated land use, lion conservation and associated socio-economic benefits in current and potential lion range

- 5) *Politics: To ensure that global policies better reflect the will and intent of regional and national sustainable use policies and practices.*
- 6) *Trade: To prevent illegal trade in lions and lion products while promoting and safeguarding sustainable legal trade.*

The regional lion conservation strategy is situated at the regional level and range states were tasked to domesticate it by developing national lion conservation strategies. Lions and spotted hyaenas are at different levels of conservation planning as there is not a regional conservation strategy for spotted hyaenas. The global status survey and conservation action plan for hyaenas (Mills and Hofer 1998) provides a detailed account of global hyaena distribution and conservation needs.

1.4 Goal of the lion & hyaena conservation-planning workshop

The main purpose of the workshop was to develop a National Conservation Strategy for lions and spotted hyaenas in Kenya. It was developed in a participative and consensus driven process involving partners to ensure that the plan is jointly owned by stakeholders so as to facilitate its implementation.

The process involved grouping the participants in various working groups that were organized and governed by common rules to enable timely and prompt formulation of the strategy. The group work revolved around three conservation questions:

***Where are we now?
Where do we want to go?
And how can we get there?***

This was important in assessing the status, defining the goals and agreeing on what actions should be taken to accomplish the set goals. Discussions were centered on four main themes: gaps, threats, constraints and enabling conditions.

1.5 Biology and Conservation needs of Lions

Lions (*Panthera leo*) are more social than most other cat species, which are usually solitary by nature. They live in prides composed of 3 to 30 individuals, including related adult females and their young. A pride's home range may be as small as 20 km² in the best habitat and over 400km² where the prey density is low. Each pride has its own social dominance hierarchy in which the weakest male ranks above all females. If new males defeat resident males, resident males will leave the pride and typically never return. Lions communicate with each other in a wide variety of ways. The most important is through body contact. Lions of the same pride greet each other by rubbing their cheeks together. Sometimes this is prolonged into neck and body rubbing as well. Lions are nocturnal and are reputed to rest for up to 20 hours a day.

Lions breed year-round and are usually polygynous. It is estimated that lions copulate 3,000 times for every cub that survives over one year. One oestrus out of every 5 results in a litter and lions mate approximately 2.2 times per hour for the 4-day oestrus period (Estes, 1993). Male lions control the reproduction of many females when they rule over a pride. Males form coalitions with each other to increase their chances of pride takeover. The fierce competition among males and the social structure of a pride have led to infanticide by both males and females. Successful males that takeover prides have, on average, about 2 years before another younger, stronger coalition will replace them. Pride takeover battles are often violent leading to severe injury or death of the losing lions. It is to the successful male's reproductive advantage to kill the suckling cubs of the defeated males. A nursing lioness that loses her cubs will come back into oestrous within 2 to 3 weeks.

Female lions keep their cubs in hiding until they are about 8 weeks old. The cubs are weaned at between 7 and 10 months, however they are dependent upon adults in the pride until they are at least 16 months old (Estes, 1993; Schaller, 1972). Females are mainly responsible for care of the young. Females nurse their own young, but will also nurse the young of their female relatives in the pride if the young are of approximately the same age. Cub mortality is lowest when related females in the same pride synchronously reproduce and cross-suckle. Since synchronous reproduction is common in prides, cubs are often raised in crèches where the entire pride helps to raise several litters. (Estes, 1993; Urban and West, 2002)

In ecosystems, the lion is an important species as it is a "top predator" in the food chain. In this capacity, lions impact the numbers of its preyed-upon species, which include buffalo, zebra, wildebeest, impala, warthog and hartebeest. Lions also impact the carnivore sector on an inter-specific competition level with other large carnivores impacted by their proliferation (e.g. competition with

cheetahs and wild dogs). Lions also directly kill other large carnivores. Therefore, it is important to closely monitor the status of the lion.

Since lions are at the top of the food chain, they have no natural enemy except man and to a limited extent the wild dog. The main threats to lion's proliferation include reduction in lion range and numbers due to human population growth. Indiscriminate killing of lions driven primarily by lion-human conflict and depletion of their prey is the most prevalent and serious threat in Eastern and Southern Africa. Habitat conversion to agriculture, urban sprawl, infrastructure development and livestock encroachment also rank as significant threats.

The African lion is classified as vulnerable by IUCN and listed in CITES Appendix II. In Kenya the lion is listed as a protected animal in the 1986 act under Schedule I part I.

1.6 Biology and Conservation needs of spotted hyaenas

Spotted hyaenas are hunters and scavengers, and can chase lions away from both their own kills and lion kills. Spotted hyaenas are intelligent, noisy and gregarious, living in groups of as few as five or as many as 80 individuals. Spotted hyaenas are highly unusual among mammals because females in this species are socially dominant to males, the reverse of the situation in most mammalian species. They produce unusually small litters relative to dogs or cats; spotted hyaenas give birth to 1 or 2 cubs (very rarely 3) at a time, and the mother typically feeds her young with rich milk for many months, often for over one year.

Spotted hyaenas frequently compete with the lion for kills (Kruuk 1972a, Schaller 1972a, Bearder 1977, Eaton 1979). Dominance relations between the spotted hyaena and competing species are not absolute but depend on the numerical presence of both parties. For instance, lions usually displace spotted hyaenas at kills. However, if the hyaena group size is large and the ratio of the number of spotted hyaenas to the number of female and sub adult lions exceeds four, hyaenas are often able to displace lions from kills unless a male lion is present (Cooper 1991). A single spotted hyaena usually dominates a cheetah, leopard (but not always), striped hyaena, brown hyaena, any species of jackal, and an African wild dog (but not a pack) (Kruuk 1972a, Eaton 1979, Mills 1990).

“Spotted hyaenas are hunters and scavengers, and can chase lions away from both their own kills and lion kills.”

The threats to the survival of spotted hyaenas include reduction in range and numbers due to human population growth. Indiscriminate killing of spotted hyaenas driven primarily by conflict, ignorance/misconceptions and depletion of their prey are the most prevalent and serious threats. Habitat conversion and livestock encroachment also rank as significant threats.

Hyaenas are reputed to be cowardly and timid but they can become bold and even dangerous to man, attacking human beings sleeping in the open and causing serious mutilation or death. It is also widely and erroneously believed to be hermaphroditic. The total world population size of the spotted hyaena is well above 10,000 individuals, several subpopulations exceed 1000 individuals and its range well exceeds 20,000km². The spotted hyaena is classified by IUCN as lower risk (conservation dependent) (IUCN 2000).

“The threats to the survival of spotted hyaenas include reduction in range and numbers due to human population growth. Indiscriminate killing of spotted hyaenas driven primarily by conflict, ignorance/misconceptions and depletion of their prey are the most prevalent and serious threats.”

1.7 The Kenya National Workshop

The Kenya national workshop on conservation planning for lions and spotted hyaenas was held from 18th to 20th February 2008 at the Kenya College of Communications Technology (KCCT), Nairobi. It was attended by 73 participants and facilitated by the chairs of IUCN/SSC Cat and Hyaena Specialist Groups.

1.8 Structure of the strategy

The executive summary highlights the

main considerations in lion and spotted hyaena national conservation strategy.

Chapter 1 provides the background to conservation planning for large carnivore conservation in Kenya and situates the planning within the global, regional and national settings. Chapters 2 and 3 presents details of the distribution and status of lions and spotted hyaenas, in Kenya. Chapter 4 analyses the threats to both species.

Chapter 5 illustrates the development of the conservation strategy. The list of participants, agenda for the workshop and logical framework table are presented in Appendix 1, 2 and 3 respectively.



Figure 1.1: Participants of the lion and spotted hyaena workshop



Chapter 2

2.0 The Distribution and Status of Lions in Kenya

2.1 Historical Distribution and Status of Lions

Lions historically occurred from the Cape to the Mediterranean wherever suitable prey existed, except in desert and rain forest, and in biblical times or later throughout the near and middle east as far as west Greece and as far east as India, where a few lions still persist in Gir forest. Lions were eliminated from the North and South Africa by the end of the 19th century, except for the area that is now Kruger National Park. Since then, this cat has been shot or greatly reduced over much of Africa along with other big game. However, in savannah and plains habitats where wild herbivores still abound, it is the most numerous large carnivore next to the spotted hyaena (Richard Estes, 1991), reaching a density of 38 lions/100km² in Ngorongoro crater and 26/100km² Nairobi National Park.

Lions occur in a number of Kenya's protected areas, with large populations in the Maasai Mara and the Tsavo complex. In addition, there are still important lion populations outside protected areas in Laikipia and Masailand. Their status elsewhere is poorly known.

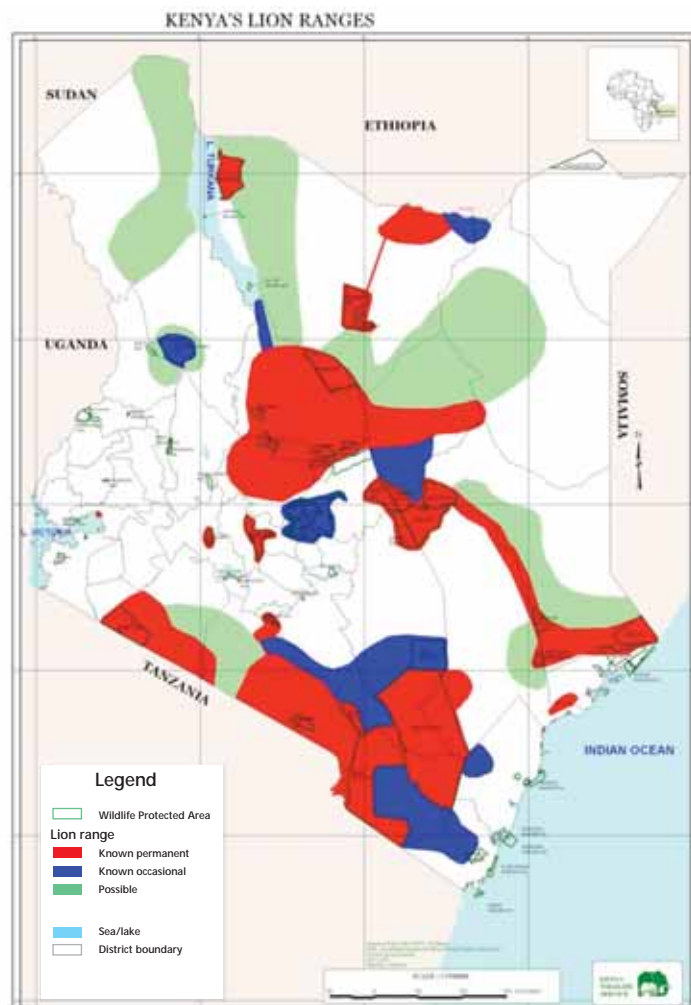
2.2 Current Distribution and status of lions

2.2.1 Categories of current geographical range

Areas of known current lion distribution were mapped (Figure 2.1). These areas were judged to fall into 3 categories based on sightings.

- 1) Known permanent: this represents areas where Lions are known to be present
- 2) Known occasional: represents areas lions are known to inhabit sporadically; lions may not be resident in these areas, therefore these areas could be corridors
- 3) Possible range: land where lions may still be resident, but where residency has not been confirmed. These represent areas where lion populations can be sustained.

Figure 2.1: Current lion distribution across different range categories



2.2.2 Status of lions in Kenya

Table 2.1 below shows that the lion's permanent range in Kenya is 18% of the total area of the country. In these areas, lions are known to be resident. A possible population that covers most of northern Kenya, eastern Kenya and part of Rift valley accounts for about 16% of the total area. The lion range that may hold a population that is occasionally resident, transient or otherwise not confirmed permanent occupies 6% of Kenya.

Table 2. 1: Status of lions in Kenya

Lion Area	Count	Total km ²	Total Area of Kenya km ²	% Occupied
Known occasional	8	34965.3040	582646	6.001123152
Known Permanent	13	108513.7520	582646	18.62430223
Possible	7	97658.1730	582646	16.76115051

Estimates of lion numbers in Kenya

The total lion population in Kenya was estimated to be 2,749 (Chardonnet, 2002), and 2,280 (Bauer & Van Der Merwe 2004).

Table 2. 2: Estimates of lion numbers in Kenya in 2008

Region	Estimated No. of lions
Masailand	825
Tsavo	675
Laikipia	230
Meru	40
Samburu/Isiolo	100
Northern Kenya	100
TOTAL	1970

The numbers in table 2.2 are based on Packer's estimate for Tsavo, and Living with Lions estimates for all other areas except for Meru which were provided by KWS. Estimates for Samburu/Isiolo and northern Kenya are little more than guesses, and the Masailand estimate may be high.

2.3 Conclusion

The majority of the lions in Kenya are found in Masai land, Tsavo and Laikipia regions. Lions can be a serious threat to livestock, taking cattle as well as smaller stock. Their large size and aggressive demeanour allow them to stampede cattle out of bomas, and can also make them difficult for people to chase away. In Laikipia, lions are the most important predator of livestock on commercial ranches. Preliminary data suggest that predation on livestock may be most

severe when wild prey are diminished in numbers. This might limit their capacity to re-establish themselves in areas supporting high livestock densities. While substantial lion populations do occur in large protected areas in Kenya, studies in southern Africa have shown that lions inhabiting protected areas of comparable size are still threatened by conflicts with people occurring on reserve borders. Hence, there is little room for complacency about the lions' status in Kenya.

There is a small amount of indirect evidence to implicate lion predation in local declines of prey species of conservation concern, such as Grevy's zebra and Lelwel hartebeest, although data quality is

variable. All such evidence comes from areas where wildlife populations are heavily modified by human activities including livestock farming, fencing, and predator control. It is likely that these factors are the ultimate cause of such ungulate declines, since the same species coexisted with lions

and other predators for centuries before human modification of ecosystems. Hence, while short term conservation of numerically viable populations of prey species might, under some circumstances, involve some form of lion management, conservation of ecologically functional prey populations (i.e. those able to sustain natural levels of lion predation) should be the long term goal. This may require substantial ecosystem restoration efforts.

Given lions' declining status and, additionally, their extremely high value to the tourism industry, KWS should seek at least to stabilise Kenya's lion population. In some areas – particularly parts of Masailand – restoration efforts may be needed to maintain viable and well-connected populations. Numerically viable populations of lions occur at natural densities, subsisting on comparatively natural unmanaged prey populations, in the Masai Mara and Tsavo. There are very few (if any) areas where natural lion densities coexist with Grevy's zebra or Lelwel hartebeest and restoration of such ecosystems would be a valuable long-term goal.

“Lions can be a serious threat to livestock, taking cattle as well as smaller stock. Their large size and aggressive demeanour allow them to stampede cattle out of bomas, and can also make them difficult for people to chase away.”

Chapter 3

3.0 The Distribution and Status of Spotted Hyenas in Kenya

3.1 Historical Distribution

Historically spotted hyenas were widespread throughout Africa, south of the Sahara. Spotted hyenas are present in all habitats except the most extreme desert conditions, where it is present at densities lower than those of brown hyenas in the south (Mills 1990), tropical rainforests, and the top of alpine mountains.

In Kenya, spotted hyenas were widespread throughout the country but they are now virtually extirpated in areas under agriculture and along the entire coast. They are rare in populated shore areas along Lake Victoria and in the wider Nairobi area. It was sighted, however, in the centre of Nairobi City in the early 1990's. They occur in most of Kenya's parks, but their distribution elsewhere is poorly known. Spotted hyenas are present in all major protected areas including Maasai Mara Game Reserve, Aberdares National Park, Nairobi National Park, Tsavo National Park, Samburu Game Reserve, Marsabit Game Reserve, and Amboseli National Park.

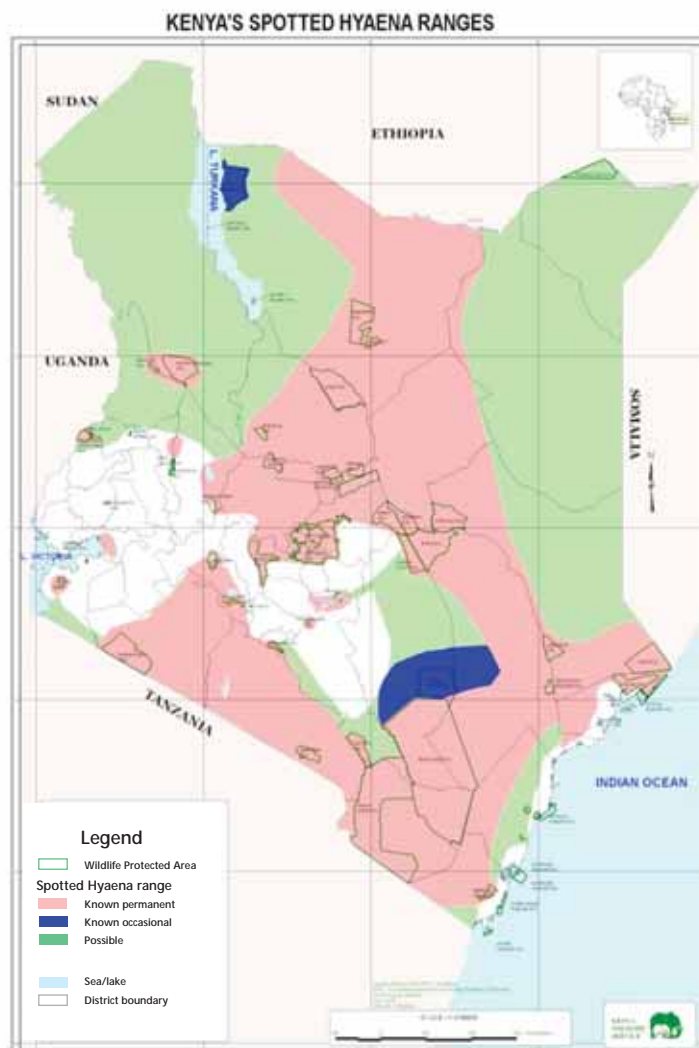
Their numbers are severely depleted outside protected areas.

3.2 Categories of current geographical range

Areas of known current spotted hyena distribution were mapped based on sightings. These areas were grouped into 3 categories (Table 3.1)

- 1) Known permanent: this represents areas where spotted hyenas are known to be present
- 2) Known occasional: represents areas spotted hyenas are known to inhabit sporadically; the hyenas may not be resident in these areas.
- 3) Possible range: land where spotted hyenas may still be resident, but where residency has not been confirmed. These represent areas where spotted hyenas populations can be supported. This area covers most of northern and eastern Kenya.

Figure 3.1: Current hyaena distribution across different range categories





3.2.1 Status of spotted hyaenas in Kenya

Table 3. 1: Status of spotted hyaena

Spotted hyaena Area	Count	Total km ²	Total Area of Kenya km ²	% Occupied
Known occasional	2	10564.606	582646	1.81
Known permanent	9	247886.104	582646	42.54
Possible	7	249237.12	582646	42.78

Permanent resident populations of spotted hyaenas occupy 42.54% of the total area of Kenya. Occasional areas where spotted hyaenas have been recorded/sighted to inhabit comprise another 1.8% of Kenya. An additional 42.78% of Kenya could support viable spotted hyaena populations, but residency of the species in these areas has not been confirmed. These areas include north eastern Kenya, eastern Kenya and part of Rift Valley province.

Table 3.2 below shows an estimate of spotted hyaena numbers in conservation areas in Kenya. The gaps in the data available here illustrate that the spotted hyaenas' distribution in Kenya is very poorly known.

Table 3. 2: Spotted hyaena estimates by conservation areas

Conservation Area (CA)	Inside protected area		Outside protected area		Sum	
	Min	Max	Min	Max	Min	Max
Eastern CA	?	?	?	?	?	?
Western CA	63	?	?	?	64	?
Tsavo CA	?	?	?	?	?	?
Southern CA	?	?	?	?	?	?
Mountain CA	500	?	1	?	501	?
Central Rift CA	10	30	40	80	50	120
Coast CA	1	?	?	?	1	?
Northern CA	?	?	?	?	?	?
Kenya Total	574	30^a	41	80^b	616	120^c

^a594, ^b81, ^c686 when minimum estimates are included

Mills and Hofer (1998) estimated the number of spotted hyaenas in Kenya to be about 2000-4000 individuals.

3.3 Conclusion

Spotted hyaenas are disliked in community areas where they are often the most serious predators of livestock. However, dense, well-constructed bomas successfully exclude them, and domestic dogs are also effective deterrents. Diligent herding and good bomas appear to provide the key to preventing livestock losses to hyaenas.

Spotted hyaena predation has been blamed for declines of Lelwel hartebeest and also for low recruitment in some rhino populations. However, there is no direct evidence for hyaenas' role in either decline. Spotted hyaenas also have a dynamic competitive relationship with lions, with anecdotes suggesting that intensive control of lions leads to local increases in hyaena abundance. Such interactions between populations are poorly understood but may mean that predator control can have surprising and unintended consequences for patterns of predation on both wild and domestic ungulates.

Spotted hyaenas' distribution in Kenya is poorly known. The existing reserve network might be sufficient to protect them in the medium term. However, their limited ability to recover in cleared areas makes them particularly reliant on conservation efforts. In addition, hyaenas are impressive, complex, intelligent, social animals which could – with improved education of tourists and local Kenyans – be of much greater value to tourism than they are at present. Natural densities of hyaenas and lions coexist in the Mara and in Tsavo, and these areas are large enough to support numerically viable populations.

“Spotted hyaenas also have a dynamic competitive relationship with lions, with anecdotes suggesting that intensive control of lions leads to local increases in hyaena abundance.”



4.0 Threats to lions and spotted hyaenas populations in Kenya

4.1 Introduction

An assessment of the threats and potential threats to lions and spotted hyaenas was critical in formulating objectives of the strategy. Participants from different regions were asked to list threats facing the species' in their areas to enable formulation of mitigation measures to achieve the species' conservation objectives.

4.1.1 Ignorance and misconceptions (Spotted hyaenas)

More myths have arisen in regard to hyaenas than perhaps any other animal in Africa (Glickman 1995). They are portrayed in a negative light in Western art and literature, they are mocked and derided by Hollywood producers, and they are feared and hated by many Africans today. This dark public image, born largely of ignorance, currently represents one of the most serious obstacles to the conservation of spotted and other hyaenas (Mills & Hofer 1998).

4.1.2 Human-Lion and Spotted hyaena Conflicts

Both lions and spotted hyaena are becoming extremely rare outside protected areas. Their numbers are threatened by both direct and indirect persecution. These species are threatened directly when they are killed due to threats on human beings and livestock. Indirectly, they are killed when they get into snares set for other species. Poisoning, snaring for ungulates and spearing, all are major threats. Poisoning is perhaps the single greatest threat to carnivores and scavenging birds.

4.1.3 Reduction in wild prey base (Both species)

Due to human population growth people have encroached into wildlife areas thus reducing the area where wild herbivores range. This coupled with competition for pasture with domestic stock and illegal hunting by the communities has led to reduction in wild prey numbers.

4.1.4 Habitat loss & anthropogenic activity (Both species)

Habitat loss due to land use changes and human encroachment into areas that were previously occupied exclusively by wild animals is having a major impact on the range size for hyaenas and lions. Recent work has found that anthropogenic activity has significant effects on the behaviour of spotted hyaenas (Boydston et al 2003; Kolowski et al. 2007)

4.1.5 Disease (Lions)

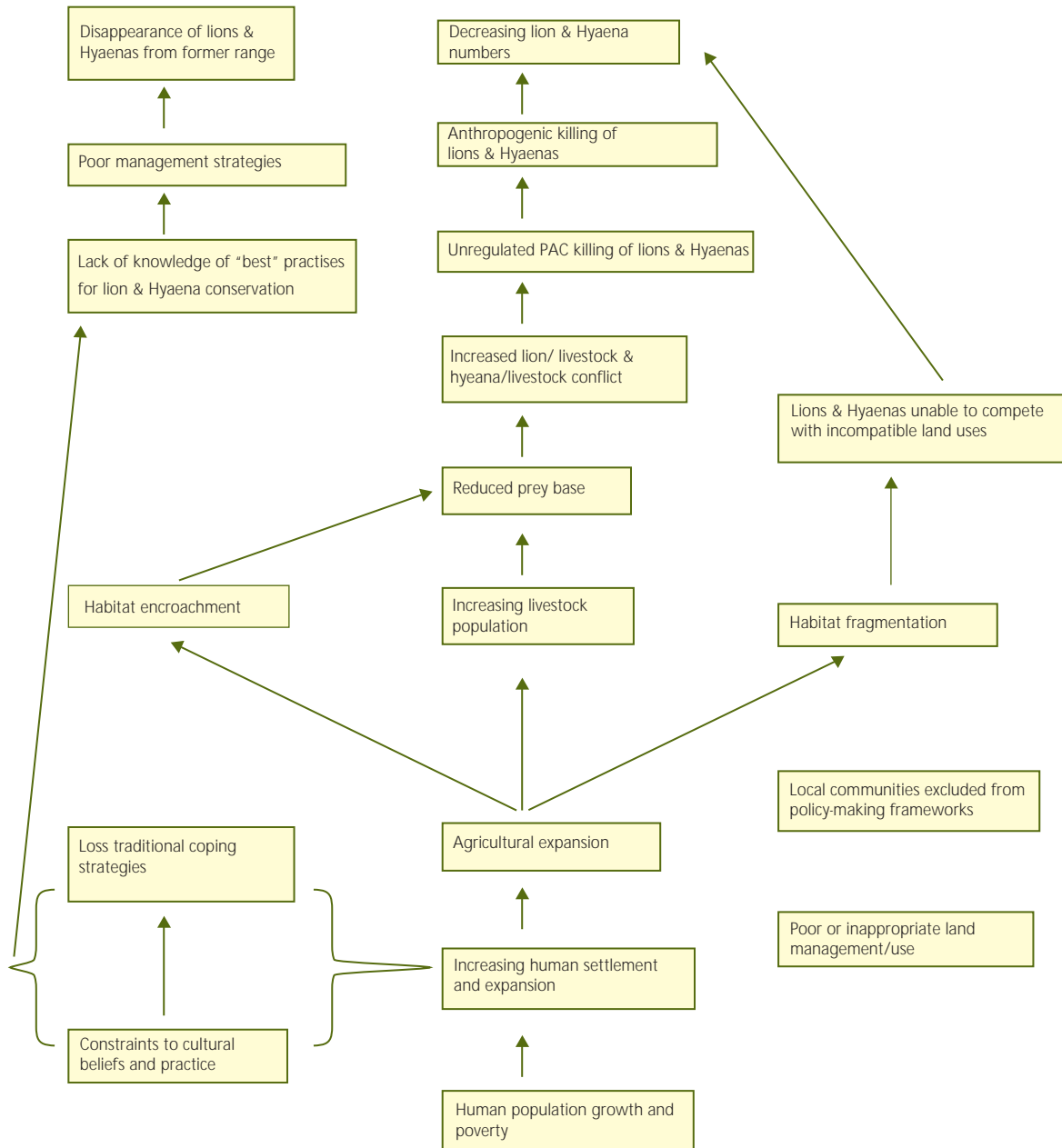
Diseases like Canine distemper being the most common disease to affect lions has wiped out many populations and Feline Immunodeficiency Virus (FIV) infects several species of felines including lions. There has been one epidemic of CDV in lions - the Serengeti in the 1990's that killed 30% of the lions and an unknown proportion of hyaenas (probably just youngsters) but is the only recorded case. The Serengeti lion population recovered within a few years. FIV does indeed occur at high rates in nearly all lion populations, but there is absolutely no evidence that it does them any harm. Wild carnivores all around the world live with FIV and it has no clinical manifestations. TB (Tuberculosis) has been found in Kruger's lions, but there is no evidence that it has affected numbers at all. Rabies occurs in hyaenas, but there is only marginal evidence that it affects population numbers, except possibly on a local scale. Thus, disease seems to be a very small conservation issue for lions and hyaenas

4.2 Problem tree

Threats to lion and spotted hyaena populations, causes of declines, gaps i.e. missing knowledge, constraints on conservation measures to recovery the populations and enabling conditions i.e. strengths and opportunities to conserve the species were combined to formulate a problem tree as shown below:

“Both lions and spotted hyaena are becoming extremely rare outside protected areas. Their numbers are threatened by both direct and indirect persecution.”

Figure 4.1: Problem tree summarizing threats facing both species



4.4 Conclusion

Recognizing and understanding threats facing the survival of lions and spotted hyaenas are very important in formulating the conservation plan. The above data indicates that threats faced by lions and spotted hyaenas are very similar; hence

conservation activities instigated for either species will benefit both species. Consequently, participants in the process decided to formulate a single strategy to cater for both species.

5.0 Strategic plan For lion and spotted hyaena conservation in Kenya

5.1 Background

The strategic plan for conservation of lions and spotted hyaenas was developed in line with a programme to manage and conserve all of Kenya's five large carnivores and their prey species. This plan was formulated by carnivore conservation stakeholders in a process that was participatory with all participants injecting their expertise to the exercise in order to develop a strategy that will cater for both species and the needs of various interest groups.

5.2 Structure of the strategic plan

The strategic plan has five key components as shown below.

- 1) A long-term vision for the species conservation. This represents the ideal situation over the next 50 years

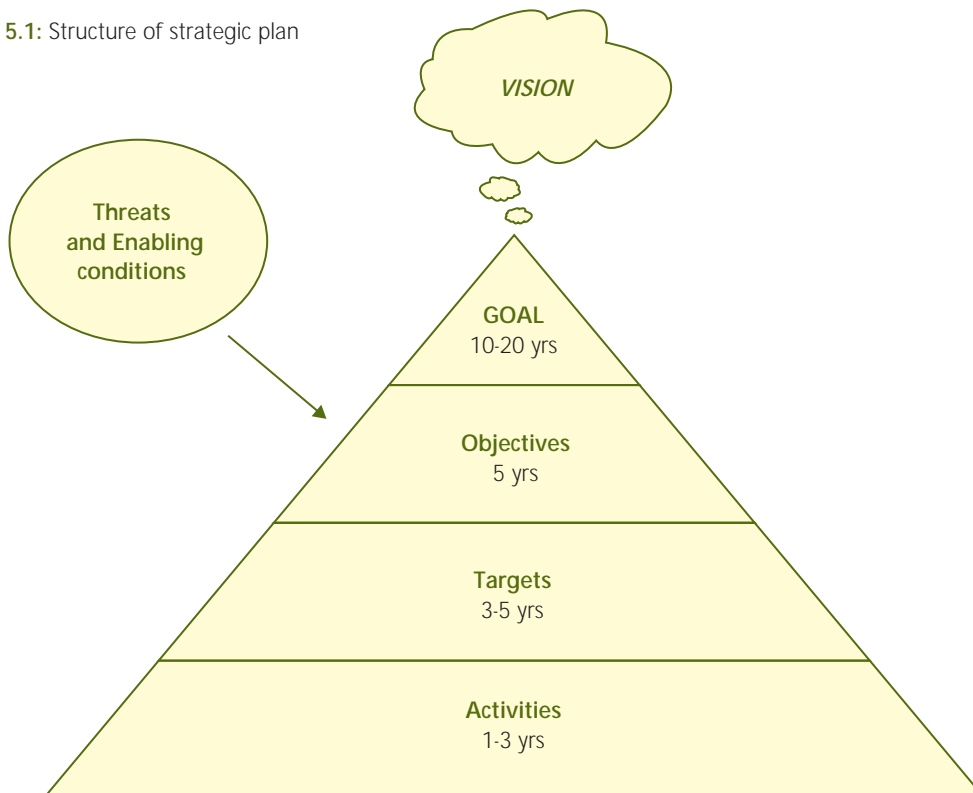
- 2) A medium term goal. This represents the ideal situation regarding the species in the medium-term (about 10 years). The Strategy/Action Plan was expected to contribute to the achievement of the Goal, but not to assume full responsibility for it. The goal is different from the vision in that it is more realistic and measurable.

Goal

To restore and maintain robust and connected populations of lions, spotted hyaenas and their wild prey, while minimizing conflict and maximizing benefits to local communities.

- 3) Objectives
 - Four strategic objectives addressing the threats faced by the species and the present enabling conditions to the species conservation were developed. A timeline of approximately 5 years was set to achieve the objectives and these objectives were designed to take up the ideas and aspects expressed in the vision and the goal. These objectives are:
 - a) Knowledge and information
 - b) Education and awareness
 - c) Land use and conflict
 - d) Policy and legislation

Figure 5.1: Structure of strategic plan



To meet these objectives, the focal points agreed upon were:

- a) To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyaenas in Kenya
- b) To change negative perception on the species
- c) To enhance conservation education in learning institution
- d) To create awareness on ways of coexistence of man and the species'
- e) To advocate and lobby for a national land use policy that integrates socio-economic development and conservation of habitat for lions, hyaenas and their prey
- f) To minimize human - lion and hyaena conflict
- g) To develop and implement conservation and management policy on lions and hyaenas in both protected areas and non-protected areas
- h) To develop a policy framework on incentives to local communities and landowners to actively participate in the conservation and management of lions and hyaenas.

- i) To implement and enforce law on illegal killing of lions and hyaenas
- j) To establish an institutional framework to coordinate research, information collection, data storage and dissemination on lions and hyaenas

4) Targets

Several **targets** to address each objective were developed as standards by which the achievement of the goal and objectives will be judged. These targets were defined as a result or outcome of an activity or action. They were designed to be specific, measurable, attainable, relevant and time-bound.

5) Activities

These are the activities set to reach the targets for the set objectives. Each activity within the plan was assigned an actor(s) best suited to carry it out.

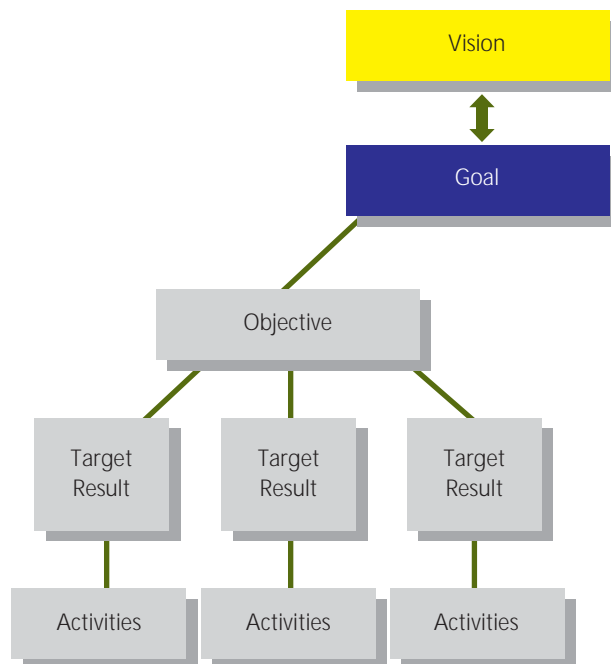


Figure 5.2: The above strategic plan structure was used in the western and southern Africa lion conservation strategy workshop; the same structure was used in formulating lion and spotted hyaena conservation plan for Kenya.

5.3 National strategy and action plan for the conservation of lions and spotted hyaenas in Kenya

Vision

To sustain viable and functional populations of lions and hyaenas in healthy ecosystems as a world heritage benefiting the people of Kenya

Goal

To restore and maintain robust and connected populations of lions, spotted hyaenas and their wild prey, while minimising conflict and maximising benefits to local communities.

Knowledge and Information

Objective 1: To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyaenas in Kenya.

Target 1.1. *Creation of a carnivore liaison office at KWS*

Activity 1.1.1. Deploy carnivore liaison officer.

Timeline: 6 months,
Actor: Deputy Director, Biodiversity Research and Monitoring.
Indicator: Person deployed.

Target 1.2. *Standardised database and protocols for data collection on spotted hyaenas and lions established, institutionalised and implemented within 2 years.*

Activity 1.2.1. Employ a consultant / carnivore liaison person to make recommendations / produce a zero draft (of standardized methods for population size, distribution, conflict etc).

Timeline: 1 year.
Actor: Deputy Director, Biodiversity Research and Monitoring,
Indicator: Person in place.

Activity 1.2.2. Stakeholder Meeting/workshop to discuss recommendations

Timeline: 1 year.
Actor: Head of Species Conservation and Management Department
Indicator: Proceedings of meeting held and report produced (including standardized methods).

Activity 1.2.3. Implement recommendations and operationalise database.

Time line: 2 years.
Actor: Carnivore liaison officer,
Indicator: Database in place, protocol for database use/structure, and initial report on database.

Activity 1.2.4. Integrate lion and spotted hyaena data collection into KWS routine patrols.

Timeline: 2 years.
Actor: Field assistant directors, carnivore liaison officer.
Indicator: Completed patrol data sheets.

Target 1.3. Current and accurate distribution and abundance of lions and hyaenas in Kenya established.

Activity 1.3.1. Identify gaps in information on lions and spotted hyaenas in Kenya, consolidate current knowledge of distribution and abundance.

Time line: 1 year.
Actor: Carnivore liaison office.
Indicator: Current status of knowledge report.

Activity 1.3.2. Carry out census or survey to determine distribution and abundance of lions and spotted hyaenas in areas where information is inadequate.

Time line: 2 years.
Actor: Carnivore liaison officer to co-ordinate.
Indicator: Updated species distribution and abundance report.

Target 1.4. Capacity building program established to work toward lion and hyaena conservation within 3 years.

Activity 1.4.1. Draw terms of reference

Time line: 6 months
Actor: Deputy Director, Biodiversity Research and Monitoring, large carnivore management committee
Indicator: A list of Terms of References.

Activity 1.4.2. Assess current needs in terms of personnel, financial and equipment.

Time line: 6 months.
Actor: To be done by the Deputy Director with the assistance of the carnivore management committee.
Indicator: Assessment report.

Activity 1.4.3. Carry out training, hiring of people and procurement of required equipment.

Time line: 1 year.

Actor: Deputy Director, Biodiversity Research and Monitoring.

Indicators: Training report, people hired and deployed and an equipment list.

Target 1.5. *Lion/hyaena conservation program integrated within KWS conservation education program.*

Activity 1.5.1. To develop information package (lions and spotted hyaena conservation) to be integrated with the education curriculum.

Time line: 2 years.

Actor: KWS Conservation Education Dept, IUCN hyaena Specialist Group

Indicators: Education packages. 2 years.

Activity 1.5.2. Implement in conjunction with the education department developed lion and spotted hyaena conservation packages. Messages should be area-specific.

Time line: 3 years.

Actor: Carnivore liaison officer.

Indicators: Publication of material in the public domain. 2 years.

Target 1.6. *Management oriented research on lions and spotted hyaenas promoted or enhanced.*

Activity 1.6.1. Mandatory research meeting of all ongoing carnivore research and conservation programs in Kenya.

Time line: 1 year.

Actor: KWS head of species department.

Indicator: Proceedings of meeting.

Activity 1.6.2. Arrange for regular meeting to undertake inventory and strengthen and establish collaborations between various conservation institutions concerning lions and spotted hyaenas.

Time line: 1 year.

Actor: Large Carnivore Liaison officer.

Indicator: Regular meeting taking place, meeting reports.

Activity 1.6.3. Undertake targeted research projects based on identified gaps

Time line: 5 years.

Actors: KWS, Independent researchers, Institutions, universities, NGOs.

Indicator: At least one project undertaken.

Education and Awareness

Objective 2: To work with communities to enhance awareness and promote coexistence with the two species

Target 2.1. *Manual on coexistence with lions and hyaenas (and all large carnivores) developed, availed and distributed to communities within 3years.*

Activity 2.1.1. Constitute a team and draw terms of reference to develop a coexistence lion/hyaena manual

Timeline: 1 year.

Actor: KWS large carnivore management committee.

Indicator: TORs, Coexistence Manual developed.

Activity 2.1.2. Sensitisation of communities and relevant stakeholders, launch and distribution of the manual

Timeline: 2 years.

Actors: KWS large carnivore WG, KWS field managers, civic leaders, public and private conservancies, provincial administration.

Indicators: Sensitisation workshops, meetings and barazas, number of manuals distributed.

Target 2.2. *Outreach program developed and implemented in lion and hyaena ranges areas in three years.*

Activity 2.2.1. Development of an outreach plan for the species range

Timeline: 3 years.

Actors: KWS Education, WCK, Large carnivore committee, relevant stakeholders.

Indicators: Plan developed containing messages, budget, work plan, number of groups reached, map of areas covered or reached.

Target 2.3. *Existing community conservancies within lion and hyaena ranges supported in four regions within 3 years.*

Activity 2.3.1. Carry out training needs assessment and conduct participatory training as necessary

Timeline: 2 years.

Actors: Lead KWS, CBOs, Conservancies, and NGOs.

Indicators: Conservancies supported, Conflict reports.

Objective 3: To change negative perceptions on the species

Target 3.1. *Knowledge base (inclusive indigenous) on ecology conservation status of the 2 species established in one year*

Activity 3.1.1 Collect, collate package and disseminate indigenous technical knowledge on the species

Timeline: 2 years.

Actors: Lead-KWS, Large carnivore management committee.

Indicators: Information Communication & Education materials developed & availed.

Target 3.2. *Linkage with local institutions (inclusive of Community Based Organizations) and media formed within one year.*

Activity 3.2.1. Hold sensitisation seminars and form linkages media, local institution and legal fraternity

Timeline: 6 months.

Actors: Lead-KWS, Large carnivore management committee.

Indicators: Number of seminars, establish website, media programs (Radio/TV), local forums.

Objective 4: To enhance conservation education in learning institutions.

Target 4.1. *School outreach programs reviewed to incorporate lion and hyaena conservation issues in 6 months*

Activity 4.1.1. Review existing conservation education programs to incorporate lion and hyaena issue more prominently

Timeline: 6 months.

Actors: Conservation education groups, KWS, WCK Community conservancies.

Indicators: Number of reviewed conservation education curriculum within each programme

Target 4.2. *Information base on lion and hyaena packaged and implemented for various levels of formal education in 2 years*

Activity 4.2.1. Collect, collate package and disseminate all information on the two species for various levels of formal education

Timeline: 2 years.

Actors: Large carnivore management committee, KWS education, KIE.

Indicators: Number of institutions adopting the information, curriculum.

Land use and Conflict

Objective 5: To advocate and lobby for a national land use policy that integrates socio-economic development and conservation of habitat for lion, hyaena and their prey.

Target 5.1. *Prepare and develop a wildlife conservation proposal to be presented to the National land use review committee for integration.*

Activity 5.1.1. Identifying potential lion and spotted hyaena conservation areas using available information

Time line: 1 year.

Actors: KWS, Researchers, Conservation NGOs, Local Authorities, Private Conservancies and Local communities.

Indicators: up dated database.

Activity 5.1.2. Mapping of the lion and hyaena conservation units.

Timeline: 1 year.

Actors: KWS.

Indicators: Lion hyaena Conservation unit Maps generated.

Activity 5.1.3. Identify socio economic activities within conservation units and their surrounding

Timeline: 1 year to run concurrently.

Actors: KWS, Researchers, Conservation NGOs, Local Authorities, Private Conservancies and Local communities.

Indicators: Detail Socio economic Reports generated.

Activity 5.1.4. Compile and present of the report to the National Land Use policy Review Committee

Timeline: one year to run concurrently.

Actors: KWS.

Indicators: Document presented to the committee.

Objective 6: To minimize human - lion/hyaena conflict and related issues.

Target 6.1. *Reduce human –lion/hyaena conflict by 50% in 3 years*

Activity 6.1.1. Establish conflict database.

Timeline: 1 year.

Actors: KWS, private landowners, local authorities.

Indicator: Integrated database established.

Activity 6.1.2. Improve livestock husbandry technique (predators' proof boma, improve herding efficiency)

Timeline: 3 years.

Actors: Livestock sector, community, conservation agencies, KWS.

Indicators: Reduced livestock loss to hyaena and lion as indicated in conflict database.

Activity 6.1.3. Establish effective mobile PAC units in conflict hot spot

Timeline: 1 year.

Actor: KWS.

Indicators: Number of mobile PAC units established in hot spots established.

Target 6.2. *Reduction of number of predators (Lions/ hyaenas) killed indiscriminately within 3 years*

Activity 6.2.1. Education and awareness on socio economic and cultural and ecological values e.g. availing some lion skins from PAC and natural mortality for cultural use

Timeline: 3 years.

Actors: KWS, communities' Provincial administration NGO, CBO.

Indicators: Reduced number of lion and hyaena killed indiscriminately.

Activity 6.2.2. Provide policy direction on consolation for livestock lost to large carnivores

Timeline: 2 years.

Actors: GoK, KWS, NGO, private conservancies, community group ranches.

Indicators: Scheme established and gazetted.

Activity 6.2.3. Advocate and lobby for the ban on harmful pesticides and promote use of alternatives

Timeline: 2 years.

Actors: GoK, KWS, NGO, private conservancies, community group ranches pesticide, control board.

Indicators: Ban effected.

Target 6.3. *Disease surveillance and monitoring system established by 3rd year*

Activity 6.3.1. Undertake literature review of diseases prevalent in conservation units

Timeline: 3 years.

Actors: KWS, Director Veterinary of services, and CBO, communities.

Indicator: Report on disease exists.

Activity 6.3.2. Sampling and analysis of lion/ hyaena and domestic canids

Timeline: 3 years/

Actors: KWS, Director Veterinary of services, and CBO, communities, Universities, Research Projects

Indicator: Area sampled and number of report.

Activity 6.3.3. Intervention (disseminate, prevention, treatment and control)

Timeline: 3 years.

Actors: KWS, Director Veterinary of services, and CBO, communities.

Indicator: Disease prevalence known.

Policy and legislation

Objective 7: To develop and implement conservation and management policy on lions and hyaenas in both protected areas and non-protected areas

Target 7.1. *Policy guidelines on conservation and management of Lions and hyaena developed and gazetted into subsidiary regulations within one (1) year*

Activity 7.1.1. Review for adoption policy guidelines developed by the large carnivore taskforce

Timeline: 3 months.

Actors: Kenya wildlife Service and large carnivore taskforce.

Indicators: Reviewed document for adoption.

Activity 7.1.2. Establishment of a carnivore management committee and its ToR's

Timeline: 3 months.

Actor: Kenya Wildlife Service and Large Carnivore Taskforce.

Indicators: Carnivore management Committee established and its ToR's.

Activity 7.1.3. Gazettement of the necessary subsidiary policy guidelines for conservation and management of lions and hyaenas

Timeline: 1 year.

Actor: Kenya Wildlife Service, Attorney General and Minister responsible for wildlife.

Indicators: Rules and regulations gazetted.

Target 7.2. *Conservation area-specific management plans for Lions and spotted hyaenas developed within 2 years and replicate the principles for site-specific areas.*

Activity 7.2.1. Develop management plans for lions and hyaenas for the 8 conservation areas

Timeline: 1 year.

Actors: Kenya Wildlife Service, carnivore committee and stakeholders.

Indicators: Eight conservation area management plans developed.

Activity 7.2.2. Develop at least two site-specific management plans in each conservation area

Timeline: 2 years.

Actors: Kenya Wildlife Service, carnivore committee and stakeholders.

Indicators: At least 16 site-specific management plans developed.

Target 7.3. *Within 2 years, guidelines on Incentives to local communities and landowners to actively participate in the conservation and management of lions and hyaenas be developed.*

Activity 7.3.1. Review the current incentive programmes aimed at improving them based on lessons learnt.

Timeline: 2 year.

Actor: Kenya Wildlife Service, carnivore committee and stakeholders.

Indicators: A document detailing viability of different incentives produced (review).

Target 7.4. *International cooperation on conservation and management of cross border (shared) populations of Lions and hyaenas promoted*

Activity 7.4.1. Establish linkages with the existing cross-border fora to enhance lion and hyaena conservation

Timeline: 1 year.

Actor: Kenya wildlife Service.

Indicators: Meetings take place, meeting reports written.

Activity 7.4.2. Periodically meet with conservation authorities across borders to discuss lions and hyaenas conservation issues

Timeline: Quarterly meetings.

Actors: Kenya wildlife Service, Lusaka Taskforce, EAC, Provincial Administration and EAC equivalents

Indicators: Meetings taken place, meeting report written.

Target 7.5. *Reduced availability and usage of furadan and other poisons and provide alternatives within a given time*

Activity 7.5.1. Liase and lobby for a ban for use of furadan and other poisons and use of alternative pesticides

Timeline: 2 years.

Actor: Kenya wildlife Service,

carnivore Management Committee, KARI, Ministry of Agriculture, HCDA, Flower Council, Pharmacy and poison Board. Regular Meetings taking place.

Indicators: Regular Meetings taking place.

Activity 7.5.2. Education and awareness on usage of harmful pesticides

Timeline: 2 years

Actors: Kenya wildlife Service, carnivore Management Committee, KARI, Ministry of Agriculture, HCDA, Flower Council, Pharmacy and poison Board.

Indicators: Awareness campaigns and meetings.

Objective 8: To establish an institutional framework to coordinate research, information collection, data storage and dissemination on lions and hyaenas/ large carnivores.

Target 8.1. *Relevant information on Lions and spotted hyaenas collected, analysed and stored in a database*

Activity 8.1.1. Within the specific sites initiate or establish and maintain monitoring programme to determine population trends, distribution and movements.

Timeline: 2 years.

Actors: Carnivore liaison officer and stakeholders.

Indicators: Monitoring programmes initiated on all sites.

Activity 8.1.2. Conduct research and establish threats status and interactions between and within the two species and with humans.

Timeline: 2 years.

Actor: KWS and stakeholders.

Indicators: Reports on threats and interactions.

Activity 8.1.3. Document all information from conducted research/survey and monitoring programmes and store it in a database.

Timeline: 2 years.

Actor: Carnivore Liaison Office.

Indicators: Database established and maintained.

Target 8.2. *Information on Lions and spotted hyaenas disseminated to enhance their conservation and management*

Activity 8.2.1. Disseminate relevant information to stakeholders for adoption, conservation and management of the two species.

Timeline: 2 years.

Actors: Carnivore Liaison Office.

Indicator: Relevant information disseminated.

Activity 8.2.2. Actively manage the population of the two species based on best available scientific information.

Timeline: 2 years.

Actors: KWS and stakeholders.

Indicators: Viable populations and reduced conflict.

Chapter 6

6.0 Implementation of the national strategy

This national strategy was developed within the context of a programme to develop conservation plans for all of Kenya's five large carnivores. Many of the activities recommended in this strategy will also benefit striped hyaenas which face similar direct and indirect threats.

Implementing this strategy will require a focus on lands outside protected areas, since lions and spotted hyaenas have a wider distribution on 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 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., 2007) – would be of great benefit in protecting lions and spotted hyaenas.

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

“Since KWS is the only wildlife authority in Kenya, it is the appropriate body to oversee implementation of the national strategy.”



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Annex I

1.0 Striped hyaena biology and conservation needs

1.1 Introduction

Striped hyaenas easily constitute the least well known and studied of the six large carnivores native to Kenya. Apart from superficial similarities in appearance, striped hyaenas differ from spotted hyaenas in virtually every aspect of their biology. Among the greatest threats to striped hyaenas, the general ignorance about the basic biology of the species is so extensive that it is nearly impossible to develop comprehensive conservation plans specifically targeting the species which can fully account for their ecological requirements. However, striped hyaenas do share with spotted hyaenas and lions three main threats to their continuing persistence in viable populations in Kenya: habitat loss, reductions in prey base and indiscriminate killing by humans. Given the overlaps in threats to striped hyaena conservation and those to spotted hyaena and lion conservation, but also in light of the lack of information available on the species, KWS elected to address their aim of developing a national strategy for the species by appending that strategy here to the National Strategy for Lion and Spotted hyaena Conservation.

1.2 Biology of striped hyaenas

Striped hyaenas are almost exclusively solitary nocturnal foragers and feeders in Africa (Kruuk 1976, Wagner 2006). They hunt small mammals including grants gazelles, but also scavenge off discarded livestock carcasses (Leakey et al. 1999, Wagner 2006) and lion and spotted hyaena kills (Kruuk 1976, Wagner 2006). Where available, small vertebrates, invertebrates, and fruit and vegetable matter may constitute a significant part of the striped hyaena diet (Flower 1932, Harrison 1968, Ilani 1975, Kruuk 1976, Macdonald 1978, Leakey et al. 1999, Wagner 2006). Cubs will accompany their mothers on foraging forays by 6-12 months of age (Kruuk 1976, APWagner unpublished data).

Striped hyaenas will use open areas while foraging at night, but they actively seek out heavy vegetative cover, rocky depressions, or caves for resting during the day (Rosevear 1974, Kruuk 1976, Rieger 1979a, Leakey et al. 1999, A.P. Wagner pers. obs.). Striped hyaenas will forage and otherwise travel in areas frequented by humans, but largely avoid them on a temporal scale due to their nocturnal habits (Rosevear 1974, Kruuk 1976, Mendelsohn & Yom-Tov 1987, Wagner 2006).

Striped hyaenas can form spatial groups of up to four individuals which share a large common range (~70 km²: Wagner et al. 2007a). In Laikipia, these groups consisted of up to three adult males, but never included more than

one adult female. Adults within multi-male groups are typically unrelated or distantly related (Wagner et al. 2007b). In the south rift where food resources are likely higher and ranges are smaller, multiple females may share ranges. In each case, striped hyaenas within groups rarely encounter one another.

Breeding in striped hyaenas is aseasonal and gestation lasts about 90 days (Pocock 1941, Ronnefeldt 1969, Heptner & Sludskii 1972, Skinner & Ilani 1979). Sexual maturity is reached at 2-3 years (Rieger 1979b). Litter sizes in the wild range from 1-4 cubs (Skinner & Ilani 1979, Wagner et al. 2007b) and cubs will nurse for 8-12 months (Kruuk 1976, APWagner unpublished data). Cubs are reared in dens and mothers provision cubs with food that they carry back to the den (Kruuk 1976, Davidar 1990). There is also some evidence indicating that relatives may act as helpers in raising cubs.

As there are no long-term studies of striped hyaenas in the wild, there are no data on average life spans for the species outside of captivity. However, in Laikipia, probabilities of survival for adult hyaenas over two years of age were estimated at 0.89 for survival to one year post-identification and only 0.47 for the probability of surviving three years after a hyaena was first identified (Wagner 2006).

1.3 Conservation needs of striped hyaenas

The striped hyaena is classified by the IUCN as Lower Risk (Near Threatened). Negative human perceptions of the species persist throughout its range and humans are consistently indicated as the major source of mortality (Hofer 1998a), accounting for 50% of recorded deaths in Laikipia (Wagner 2006). Striped hyaenas are often killed when spotted hyaenas are the intended target (Wagner 2006). Habitat destruction and poisoning are viewed as particularly serious threats in Kenya.

Striped hyaenas are subordinate to lions and spotted hyaenas and there is suggestive evidence that competition with spotted hyaenas may be important in circumscribing the habitat used by striped hyaenas (H. Kruuk pers. comm.).

As a simple lack of differentiation in the appearance of spotted hyaenas, striped hyaenas and aardwolves results in significant

challenges on multiple fronts for the conservation of striped hyaenas, it is important to highlight the physical differences between these species. At ~30kgs, striped hyaenas are considerably larger than aardwolves (~9kgs), but smaller than spotted hyaenas. Like aardwolves, but unlike spotted hyaenas, the muzzle of a striped hyaena is pointed, they have long, pointed ears, and they have a pronounced dorsal mane (which they will hold erect when excited) and a long tail with long, coarse hairs. Spotted hyaenas are most readily differentiated from striped hyaenas by the dramatically different spotted pelage, completely lacking any striped patterns. Striped hyaenas are also generally silent and thus are considerably quieter than spotted hyaenas. The skull of striped hyaena

current status and distribution of striped hyaenas is largely unknown. Only Egypt and Kenya are estimated to have populations of striped hyaenas over 1,000 and these two countries alone account for 51-82% of the total African population estimate (Mills and Hofer 1998). Throughout its range, the current distribution is likely composed of isolated small populations.

Striped hyaenas are present in some protected areas in Kenya, including Tsavo, Samburu NR, and Lake Nakuru NP. However, the vast majority of striped hyaenas in Kenya appear to reside outside of parks, including the Magadi area, Laikipia and Samburu districts, the Lake Turkana region, and a small part of Kajiado District north of Maasai Mara NR (Hofer & Mills 1998a, Wagner 2006). Throughout its range, the striped hyaena occurs at low densities. Estimates of striped hyaena abundance are complicated by the remarkably limited amount of information available

“Striped hyaenas are subordinate to lions and spotted hyaenas and there is suggestive evidence that competition with spotted hyaenas may be important in circumscribing the habitat used by striped hyaenas”

differs from that of a spotted hyaena in being slightly smaller in size, being less massive in overall build (Rosevear 1974), and having a slightly lower profile of the sagittal crest. Compared with the spotted hyaena, the upper molar is much larger, as much as twice or more the size of the first premolar (Rosevear 1974, Coetzee 1977). Aardwolves differ significantly from striped hyaenas in having a finer coat showing far fewer, clearer, and more regular, stripes. The cheek teeth in the aardwolves are rudimentary.

1.4 Distribution and status of striped hyaenas in Kenya

The striped hyaena has a very large range extending from Africa, north of and including the Sahel, and including much of East and North-east Africa, through the Middle East, Caucasus, Central Asia, and the Indian subcontinent. Due to a general lack of understanding of the species and the lack of differentiation of striped hyaenas from both spotted hyaenas and aardwolves, the

on the species. The only estimate of striped hyaena density in Kenya was 0.03 per km² in Laikipia district (Wagner 2006).

1.4.1 Categories of current geographic range

Areas of known current striped hyaena presence were mapped based on sightings. These areas were grouped into 3 categories (Table I).

- 1) Known permanent: this represents the few areas where striped hyaenas are known to be present.
- 2) Known occasional: represents areas where striped hyaenas are known to inhabit sporadically; striped hyaenas may not be permanent residents in these areas.
- 3) Possible range: land where striped hyaenas may still be resident, but where residency has not been confirmed, largely due to lack of differentiation from spotted hyaenas. This area covers vast sections of northern and eastern Kenya.

Figure I: Current striped hyaena distribution across different range categories.

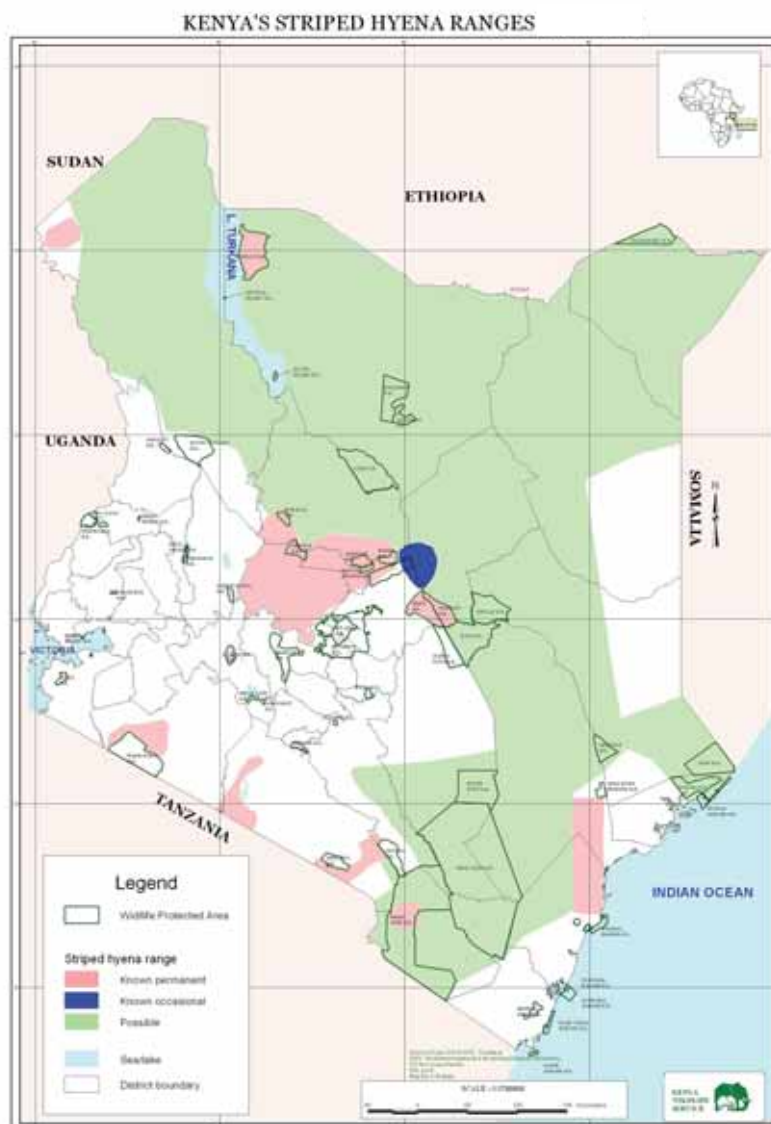


Table I: Status of striped hyaenas in Kenya

Striped hyaena Area	Count	Total km ²	Total Area of Kenya (km ²)	% Occupied
Known occasional	1	1825.86	582646	0.31
Known permanent	9	31449.90	582646	5.39
Possible	1	341918.8	582646	58.68

Known resident populations of striped hyaenas constitute only 5.39% of the total area of Kenya. An additional 0.31% of Kenya represents the areas in which striped hyaena sightings have been recorded, but in which permanent populations are not confirmed. A much larger area of 58.86 % represents the area of Kenya which could possibly support striped hyaena population but residency of striped hyaenas in this area has not been observed.

1.5 Threats to striped hyaena populations in Kenya

Assessment of the threats and potential threats specific to striped hyaenas was not conducted at the workshop. However, such threats are largely overlapping with those to lions and spotted hyaenas as follows:

1.5.1 Ignorance and misconceptions

Striped hyaenas are rarely differentiated from spotted hyaenas by the general public. As such, the myths that plague the public image of spotted hyaenas also affect the image of the striped hyaena. Thus, as with spotted hyaenas, ignorance represents one of the most serious obstacles to the conservation of striped hyaenas (Mills & Hofer 1998).

“Particular attention should be paid to ensuring the survival of the species in pastoral areas by identifying ways to reduce human-carnivore conflict through promotion of methods that ensure adequate numbers of prey persist and/or methods that reduce livestock killing by carnivores.”

1.5.2 Human-Carnivore Conflicts

Striped hyaena populations outside protected areas likely represents the majority of their overall population in Kenya. As with lions and spotted hyaenas, their numbers are threatened by both direct and indirect persecution. Striped hyaenas are threatened because they are sometimes killed due to perceived or real threats on livestock by striped hyaenas themselves. The likely larger threat to the species stems from the combination of the lack of differentiation from spotted hyaenas and the use of non-targeted lethal means such as poisoning in reaction to threats posed by spotted hyaenas.

1.5.3 Habitat loss & anthropogenic activity

Habitat loss due to land use changes and human encroachment into areas that were previously occupied exclusively by wild animals is having a major impact the wildlife prey base available to striped hyaenas. These ecosystem changes likely force striped hyaenas to scavenge more from human originated refuse, livestock carcasses, and unguarded livestock, thereby enhancing the probability of conflict with humans, or altogether eliminating striped hyaenas from these areas.

1.6 Conclusion

Because they exist outside of formally protected areas in regions where pastoralism is the norm and the potential for human-carnivore conflict is very high, striped hyaena populations in Kenya are exceptionally vulnerable to human population growth, habitat destruction, and poisoning. Particular attention should be paid to ensuring the survival of the species in pastoral areas by identifying ways to reduce human-carnivore conflict through promotion of methods that ensure adequate numbers of prey persist and/or methods that reduce livestock killing by carnivores. As with other large carnivores, dense, well-constructed livestock bomas successfully exclude striped hyaenas, and domestic dogs also appear to be effective deterrents.

Striped hyaenas' distribution in Kenya is very poorly understood, but the known range does indicate that existing reserve network is unlikely to be sufficient to protect the species. Thus, conservation efforts focused outside of the reserve network is likely key for their survival in Kenya. In general, the threats faced by striped hyaenas, lions, and spotted hyaenas are very similar, hence conservation activities instigated for the larger and better known species, particularly outside of the reserve network, will likely benefit striped hyaenas.

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Appendix II: Workshop Agenda

Day 1 – Monday 18th February 2008

Chair: Dr. Samuel Kasiki, Kenya Wildlife Service

- 9:00 **Official welcome**
Mr. Benjamin Kavu for Dr. Julius Kipng'etich, Director, Kenya Wildlife Service
- 9:10 **Introductions**
All participants
- 9:30 **Goals and expected outputs from this meeting**
Patrick Omondi, Kenya Wildlife Service
- 9:45 **Background, goals, agenda and outputs from this meeting, in the context of the range-wide strategy for lion conservation**
Dr. Urs Breitenmoser, IUCN/SSC Cat Specialist Group
- 10:00 **Biology and conservation of lions in Kenya – an overview**
Dr. Laurence Frank, Living with Lions
- 10:30 **Biology and conservation of spotted hyaenas in Kenya – an overview**
Dr. Stephanie Dloniak, Mara Carnivore Conservation Project
- 11:00 **COFFEE**

Chair: Moses Litoro, Kenya Wildlife Service

- 11:30 **Tools for surveying carnivores at the national level – experience from Kenya**
Dr. Mordecai Ogada, National Museums of Kenya
- 12:00 **Conserving lions in isolated semi-porous ecosystems**
Geoffrey Chege
- 12:30 **Introduction of captive bred Lions to the wild.**
David Mascal

13:00 LUNCH

Brief presentations on lion and hyaena conservation from Conservation Areas

Chair: Michael Kipkeu, Kenya Wildlife Service

14:00 – 14:40

Eastern Conservation Area - *Daniel Onsembe*

Western Conservation Area - *Fredrick Tamoooh*

Tsavo Conservation Area - *Moses Kenana*

Southern Conservation Area - *Bernard Ngoru*

Chair: Robert Muasya, Kenya Wildlife Service

14:40 – 15:20



Mountain Conservation Area - *Israel Makau*

Central Rift Conservation Area - *Joseph Edebe*

Coast Conservation Area - *Nassir Amiyo*

Northern Conservation Area - *S. Mwavita*

Chair: Benjamin Kavuu, Kenya Wildlife Service

15:20 Present distribution information for lions and spotted hyaenas in Kenya

Dr. Charles Musyoki, Kenya Wildlife Service

Facilitators: Instructions

15:40 TEA

16:10 Update distribution information for lions and spotted hyaenas

Working groups

17:10 Present regional threats to lions and adapt them to the national level for lions and spotted hyaenas

Facilitators: Instructions

Working groups for different topics

18:30 END OF FIRST DAY



Appendix II: Workshop Agenda

Day 2 – Tuesday 19th February 2008

09:00 Present final problem tree for Kenya
Facilitators with participants

09:30 Present regional strategy - vision, goal, and objectives
Facilitators

10:00 Define national vision and goal
Facilitated discussion

10.30 COFFEE

11:00 Translation of regional strategy into national action plan for lions and spotted hyaenas – Review of the regional objectives and definition of the national objectives

Working groups

12:30 LUNCH

14:00 Presentation and discussion of the objectives

Working groups

14:45 Definition of the national targets

Working groups

16.00 TEA

16.30 Presentation of the national targets
Working groups

17.30 **END OF SECOND DAY**



Day 3 – Wednesday 20th February 2008

09:00 Development of specific activities (site-specific where appropriate)

Working groups

10:00 Development of activities (cont.) – add indicators

Working groups

10.30 COFFEE

11:00 Development of activities (cont.) – add actors and time lines

Working groups

12.30 LUNCH

14:00 Present, review, discuss, and finalise log frame for national action plan

Working groups

15:00 TEA

15:30 Discussion of way forward and assignment of tasks (including preparation of report)

Facilitated discussion involving all participants

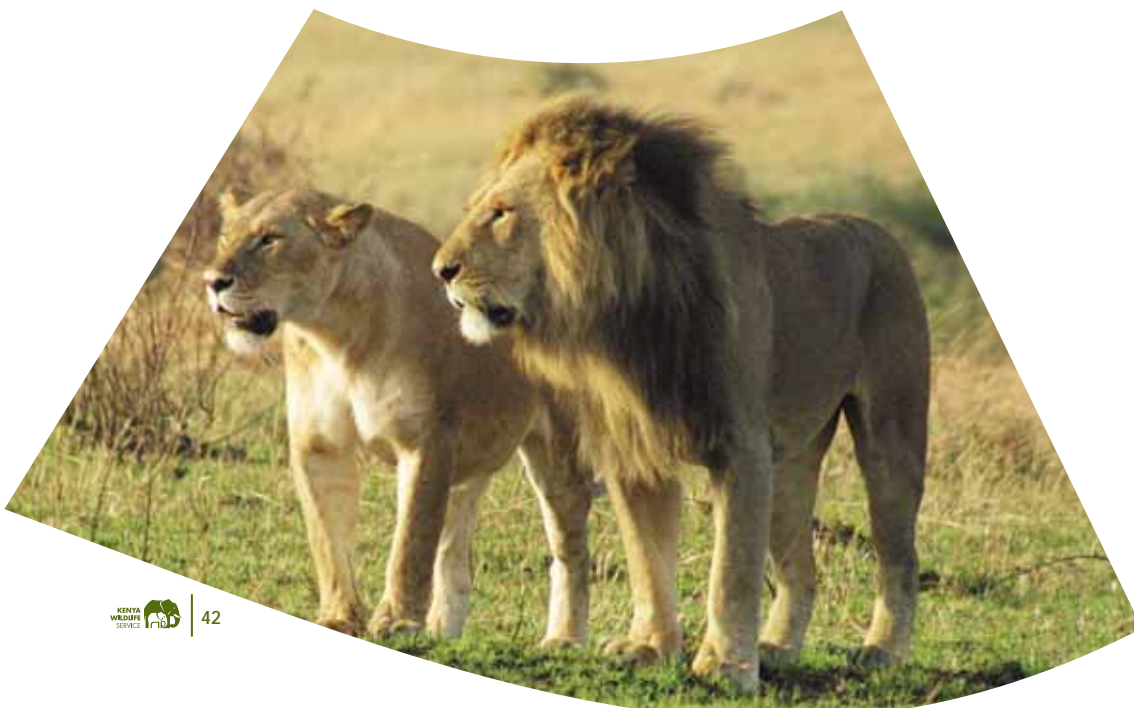
16:50 Remarks from USAID

Charles Oluchina

17:00 Closing statement

Dr. Julius Kipng'etich Director, Kenya Wildlife Service

END OF MEETING





Appendix III: Strategic Plan Logical Framework

Vision
To sustain viable populations of lions and hyaenas in healthy ecosystems as a world heritage benefiting local communities and the people of Kenya
Goal
To restore and maintain robust and connected populations of lions, spotted hyaenas and their wild prey, while minimizing conflict and maximizing benefits to local communities.

Objective	Target	Activity
1. To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyaenas in Kenya.	1.1. Creation of a carnivore liaison office at KWS.	1.1.1. Deploy carnivore liaison officer. <i>Timeline:</i> 6 months, <i>Actor:</i> Deputy director, biodiversity research and monitoring. <i>Indicator:</i> Person deployed.
	1.2. Standardised database and protocols for data collection on spotted hyaenas and lions established, institutionalised and implemented within 2 years.	1.2.1. Employ a consultant / carnivore liaison person to make recommendations / produce a zero draft (of standardized methods). <i>Timeline:</i> 1 year. <i>Actor:</i> Deputy director, biodiversity research and monitoring, <i>Indicator:</i> Person in place.
		1.2.2. Stakeholder Meeting/workshop to discuss recommendations <i>Timeline:</i> 1 year. <i>Actor:</i> Head of species department <i>Indicator:</i> Proceedings of meeting held and report produced (including standardized methods).
		1.2.3. Implement recommendations and operationalise database. <i>Time line:</i> 2 years. <i>Actor:</i> Carnivore liaison officer, <i>Indicator:</i> Database in place, protocol for database use/structure, and initial report on database.
	1.2.4. Integrate lion and spotted hyaena data collection into kws routine patrols. <i>Timeline:</i> 2 years. <i>Actor:</i> Field assistant directors, carnivore liaison officer. <i>Indicator:</i> Completed patrol data sheets.	
1.3. Current and accurate distribution and abundance of lions and hyaenas in Kenya established.	1.3.1. Identify gaps in information on lions and spotted hyaenas in Kenya, consolidate current knowledge of distribution and abundance. <i>Time line:</i> 1 year. <i>Actor:</i> Carnivore liaison office. <i>Indicator:</i> Current status of knowledge report.	



Objective	Target	Activity
<p>1. To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyaenas in Kenya.</p>		<p>1.3.2. Carry out census or survey to determine distribution and abundance of lions and spotted hyaenas in areas where information is inadequate. <i>Time line:</i> 2 years. <i>Actor:</i> Carnivore liaison officer to coordinate. <i>Indicator:</i> Updated species distribution and abundance report.</p>
	<p>1.4. Capacity building program established to work toward lion and hyaena conservation within 3 years.</p>	<p>1.4.1. Draw terms of reference <i>Time line:</i> 6 months <i>Actor:</i> Deputy director, biodiversity research and monitoring, large carnivore task force (to be confirmed). <i>Indicator:</i> a list of Terms of References.</p>
		<p>1.4.2. Assess current needs in terms personnel, financial and equipment. <i>Time line:</i> 6 months. <i>Actor:</i> To be done by the deputy director with the assistance of the carnivore task force. <i>Indicator:</i> Assessment report.</p>
		<p>1.4.3. Carry out training, hiring if people and procurement of required equipment. <i>Time line:</i> 3 years. <i>Actor:</i> Deputy director, biodiversity research and monitoring. <i>Indicators:</i> Training report, people hired and deployed and an equipment list.</p>
	<p>1.5. Lion / hyaena conservation program integrated within KWS conservation education program.</p>	<p>1.5.1. Work with the education department to develop information package (lions and spotted hyaena conservation) to be integrated with the education curriculum. <i>Time line:</i> 2 years. <i>Actor:</i> KWS Conservation Education Department, Wildlife Clubs of Kenya <i>Indicators:</i> Education packages. 2 years.</p>
<p>1.5.2. Implement in conjunction with the education department developed lion and spotted hyaena conservation packages. Messages should be area-specific. <i>Time line:</i> 2 years. <i>Actor:</i> Carnivore liaison officer. <i>Indicators:</i> Publication of material in the public domain. 2 years.</p>		



Objective	Target	Activity
<p>1. To ensure effective and efficient data collection, and utilization of information in the conservation and management of lions and spotted hyenas in Kenya.</p>	<p>1.6. Management oriented research on lions and spotted hyenas promoted or enhanced.</p>	<p>1.6.1. Mandatory research meeting of all ongoing lion and spotted hyena research programs in Kenya. <i>Time line:</i> 1 year. <i>Actor:</i> KWS head of species department. <i>Indicator:</i> Proceedings of meeting.</p>
		<p>1.6.2. Arrange for regular meeting to undertake inventory and strengthen and establish collaborations between various conservation institutions concerning lions and spotted hyenas. <i>Time line:</i> 1 year. <i>Actor:</i> Large Carnivore Liaison officer. <i>Indicator:</i> Regular meeting taking place, meeting reports.</p>
		<p>1.6.3. Undertake targeted research projects <i>Time line:</i> 5 years. <i>Actors:</i> KWS, Independent researchers, Institutions, universities, NGOs. <i>Indicator:</i> At least one project undertaken.</p>
<p>2. To work with communities to enhance awareness and promote coexistence with the two species.</p>	<p>2.1. Manual on coexistence with lions and hyenas developed, availed and distributed to communities within 3years.</p>	<p>2.1.1. Constitute a team and draw terms of reference to develop a coexistence lion/hyaena manual <i>Timeline:</i> 1 year. <i>Actor:</i> KWS large carnivore working group. <i>Indicator:</i> TORs, Coexistence Manual developed.</p>
		<p>2.1.2. Sensitisation of communities and relevant stakeholders, launch and distribution of the manual <i>Timeline:</i> 2 years. <i>Actors:</i> KWS large carnivore WG, KWS field managers, civic leaders, public and private conservancies, provincial administration. <i>Indicators:</i> Sensitisation workshops, meetings and barazas, number of manuals distributed.</p>



Objective	Target	Activity
<p>2. To work with communities to enhance awareness and promote coexistence with the two species.</p>	<p>2.2. Outreach program developed and implemented in lion and hyaena ranges areas in three years.</p>	<p>2.2.1. Development of an outreach plan for the species range. <i>Timeline:</i> 3 years. <i>Actors:</i> KWS Education, WCK, Large carnivore group, relevant stakeholders. <i>Indicators:</i> Plan developed containing messages, budget, work plan, number of groups reached, map of areas covered or reached</p>
	<p>2.3. Existing community conservancies within lion and hyaena ranges supported in four regions within 3years.</p>	<p>2.3.1. Carry out training needs assessment and conduct participatory training as necessary <i>Timeline:</i> 2 years. <i>Actors:</i> Lead KWS, CBOs, Conservancies, NGOs. <i>Indicators:</i> Conservancies supported, Conflict reports</p>
<p>3. To change wrong perceptions on the species.</p>	<p>3.1. Knowledge base (inclusive indigenous) on ecology conservation status of the 2 species established in one year.</p>	<p>3.1.1 Collect, collate package and disseminate indigenous technical knowledge on the species <i>Timeline:</i> 2 years. <i>Actors:</i> Lead-KWS, Large carnivore working group. <i>Indicators:</i> Information Communication & Education materials developed & availed.</p>
	<p>3.2. Linkage with local institutions (inclusive of Community Based Organizations) and media formed within one year.</p>	<p>3.2.1. Hold sensitisation seminars and form linkages media, local institution and legal fraternity <i>Timeline:</i> 6 months. <i>Actors:</i> Lead-KWS, Large carnivore working group. <i>Indicators:</i> Number of seminars, establish website, media programs(Radio/TV), local forums.</p>
<p>4. To enhance conservation education in learning institutions.</p>	<p>4.1. School outreach programs reviewed to incorporate lion and hyaena conservation issues in 6 months</p>	<p>4.1.1. Review existing conservation education programs to incorporate lion and hyaena issue more prominently <i>Timeline:</i> 6 months. <i>Actors:</i> Conservation education groups, KWS, WCK Community conservancies. <i>Indicators:</i> Number of reviewed conservation education curriculum within each programme</p>



Objective	Target	Activity
4. To enhance conservation education in learning institutions.	4.2. Information base on lion and hyaena packaged and implemented for various levels of formal education in 2 years	<p>4.2.1. Collect, collate package and disseminate all information on the two species for various levels of formal education <i>Timeline:</i> 2 years. <i>Actors:</i> Large carnivore working group, KWS education, KIE. <i>Indicators:</i> Number of institutions adopting the information, curriculum.</p>
5. To advocate and lobby for a national land use policy that integrates socio-economic development and conservation of habitat for lion, hyaena and their prey.	5.1. Prepare and develop a wildlife conservation proposal to be presented to the National land use review committee for integration.	<p>5.1.1 Identifying potential lion and spotted hyaena conservation areas using available information <i>Time line:</i> 1 year. <i>Actors:</i> KWS, Researchers, Conservation NGOs, Local Authorities, Private Conservancies and Local communities. <i>Indicators:</i> up dated database.</p>
		<p>5.1.2. Mapping of the lion and hyaena conservation units. <i>Timeline:</i> 1 year. <i>Actors:</i> KWS. <i>Indicators:</i> Lion /hyaena Conservation unit Maps generated.</p>
		<p>5.1.3. Identify socio economic activities within conservation units and their surrounding <i>Timeline:</i> 1 year to run concurrently. <i>Actors:</i> KWS, Researchers, Conservation NGOs, Local Authorities, Private Conservancies and Local communities. <i>Indicators:</i> Detail Socio economic Reports generated.</p>
		<p>5.1.4. Compile and present of the report to the National Land Use policy Review Committee <i>Timeline:</i> one year to run concurrently. <i>Actors:</i> KWS. <i>Indicators:</i> Document presented to the committee.</p>
6. To minimize human - lion/ hyaena conflict and related issues.	6.1. Reduce human –lion/hyaena conflict by 50% in 3 years	<p>6.1.1. Establish conflict database. <i>Timeline:</i> 1 year. <i>Actors:</i> KWS, private landowners, local authorities. <i>Indicator:</i> Integrated database established.</p>



Objective	Target	Activity
<p>6. To minimize human - lion/ hyaena conflict and related issues.</p>	<p>6.1. Reduce human –lion/hyaena conflict by 50% in 3 years</p>	<p>6.1.2. Improve livestock husbandry technique (predators’ proof boma, improve herding efficiency) <i>Timeline:</i> 3 years. <i>Actors:</i> Livestock sector, community, conservation agencies, KWS. <i>Indicators:</i> Reduced livestock loss to hyaena and lion as indicated in conflict database.</p>
		<p>6.1.3. Establish effective mobile PAC units in conflict hot spot <i>Timeline:</i> 1 year. <i>Actor:</i> KWS. <i>Indicators:</i> Number of mobile PAC units established in hot spots established.</p>
	<p>6.2. Reduction of number of predators (Lions/hyaenas) killed indiscriminately within 3 years</p>	<p>6.2.1. Education and awareness on socio economic and cultural and ecological values eg availing some lion skins from PAC and natural mortality for cultural use <i>Timeline:</i> 3 years. <i>Actors:</i> KWS, communities’ Provincial administration NGO, CBO. <i>Indicators:</i> reduced number of lion and hyaena killed indiscriminately.</p>
		<p>6.2.2. Establish national Consolation scheme <i>Timeline:</i> 2 years. <i>Actors:</i> GoK, KWS, NGO, private conservancies, community group ranches. <i>Indicators:</i> Scheme established and gazetted.</p>
		<p>6.2.3. Advocates and lobby for the ban on harmful pesticides and promote use of alternatives <i>Timeline:</i> 2 years. <i>Actors:</i> GoK, KWS, NGO, private conservancies, community group ranches pesticide, control board. <i>Indicators:</i> Ban effected.</p>
	<p>6.3. Disease surveillance and monitoring system established by 3rd year.</p>	<p>6.3.1. Undertake literature review of diseases prevalent in conservation units <i>Timeline:</i> 3 years. <i>Actors:</i> KWS, Director Veterinary of services, and CBO, communities. <i>Indicator:</i> Report on disease exists.</p>



Objective	Target	Activity
<p>6. To minimize human - lion/ hyaena conflict and related issues.</p>	<p>6.3. Disease surveillance and monitoring system established by 3rd year.</p>	<p>6.3.2. Sampling and analysis of lion/ hyaena and domestic canines <i>Timeline:</i> 3 years <i>Actors:</i> KWS, Director Veterinary of services, and CBO, communities. <i>Indicator:</i> Area sampled and number of report.</p>
		<p>6.3.3. Intervention (disseminate, prevention, treatment and control) <i>Timeline:</i> 3 years. <i>Actors:</i> KWS, Director Veterinary of services, and CBO, communities. <i>Indicator:</i> Disease prevalence known.</p>
<p>7. To develop and implement conservation and management policy on lion's and hyaenas in both protected areas and rangelands.</p>	<p>7.1. Policy guidelines on conservation and management of Lions and hyaena developed and gazetted into subsidiary regulations within one (1) year</p>	<p>7.1.1. Review for adoption policy guidelines developed by the large carnivore taskforce <i>Timeline:</i> 3 months. <i>Actors:</i> Kenya wildlife Service and large carnivore taskforce. <i>Indicators:</i> Reviewed document for adoption.</p>
		<p>7.1.2. Establishment of a carnivore management committee and its ToR's <i>Timeline:</i> 3 months. <i>Actor:</i> Kenya Wildlife Service and large Carnivore Taskforce. <i>Indicators:</i> Carnivore management Committee established and its ToR's.</p>
	<p>7.1. Policy guidelines on conservation and management of Lions and hyaena developed and gazetted into subsidiary regulations within one (1) year</p>	<p>7.1.3. Gazettement of the necessary subsidiary policy guidelines for conservation and management of lions and hyaenas <i>Timeline:</i> 1 year. <i>Actor:</i> Kenya Wildlife Service, Attorney General and Minister responsible for wildlife. <i>Indicators:</i> Rules and regulations gazetted.</p>
<p>7.2. Conservation area-specific management plans for Lions and spotted hyaenas developed within 2 years and replicate the principles for site-specific areas.</p>	<p>7.2.1. Develop management plans for lions and hyaenas for the 8 conservation areas <i>Timeline:</i> 1 year. <i>Actors:</i> Kenya Wildlife Service, carnivore committee and stakeholders. <i>Indicators:</i> Eight conservation area management plans developed.</p>	



Objective	Target	Activity
<p>7. To develop and implement conservation and management policy on lion's and hyenas in both protected areas and rangelands.</p>	<p>7.2. Conservation area-specific management plans for Lions and spotted hyenas developed within 2 years and replicate the principles for site-specific areas.</p>	<p>7.2.2. Develop at least two site-specific management plans in each conservation area <i>Timeline:</i> 2 years. <i>Actors:</i> Kenya Wildlife Service, carnivore committee and stakeholders. <i>Indicators:</i> At least 16 site-specific management plans developed.</p>
	<p>7.3. Within 2 years, guidelines on Incentives to local communities and landowners to actively participate in the conservation and management of lions and hyenas be developed.</p>	<p>7.3.1. Review the current incentive programmes aimed at improving them based on lessons learnt. <i>Timeline:</i> 2 year. <i>Actor:</i> Kenya Wildlife Service, carnivore committee and stakeholders. <i>Indicators:</i> A document detailing viability of different incentives produced (review).</p>
	<p>7.4. International cooperation on conservation and management of cross border (shared) populations of Lions and hyenas promoted.</p>	<p>7.4.1. Establish linkages with the existing cross-border fora to enhance lion and hyena conservation <i>Timeline:</i> 1 year. <i>Actor:</i> Kenya wildlife Service. <i>Indicators:</i> Meetings taken place, meeting reports written.</p>
		<p>7.4.2. Periodically meet with conservation authorities across borders to discuss lions and hyenas conservation issues <i>Timeline:</i> Quarterly meetings. <i>Actors:</i> Kenya wildlife Service, Lusaka Taskforce, EAC, Provincial Administration and EAC equivalents <i>Indicators:</i> Meetings taken place, meeting report written.</p>
	<p>7.5. Reduced availability and usage of furadan and other poisons and provide alternatives within a given time</p>	<p>7.5.1. Liaise and lobby for a ban for use of furadan and other poisons and use of alternative pesticides <i>Timeline:</i> 2 years. <i>Actor:</i> Kenya wildlife Service, carnivore Management Committee, KARI, Ministry of Agriculture, HCDA, Flower Council, Pharmacy and poison Board. <i>Indicators:</i> Regular Meetings taking place.</p>



Objective	Target	Activity
<p>7. To develop and implement conservation and management policy on lion's and hyenas in both protected areas and rangelands.</p>	<p>7.5. Reduced availability and usage of furadan and other poisons and provide alternatives within a given time</p>	<p>7.5.2. Education and awareness on usage of harmful pesticides <i>Timeline:</i> 2 year. <i>Actors:</i> Kenya wildlife Service, carnivore Management Committee, KARI, Ministry of Agriculture, HCDA, Flower Council, Pharmacy and poison Board. <i>Indicators:</i> Awareness campaigns and meetings.</p>
<p>8. To establish an institutional framework to coordinate research, information, collection, data storage and dissemination on lions and hyenas/large carnivores.</p>	<p>8.1. Relevant information on Lions and spotted hyenas collected, analysed and stored in a database</p>	<p>8.1.1. Within the specific sites initiate or establish and maintain monitoring programme to determine population trends, distribution and movements. <i>Timeline:</i> 2 years. <i>Actors:</i> Carnivore liaison officer and stakeholders. <i>Indicators:</i> Monitoring programmes initiated on all sites.</p>
		<p>8.1.2. Conduct research and establish threats status and interactions between and within the two species and with humans. <i>Timeline:</i> 2 years. <i>Actor:</i> KWS and stakeholders. <i>Indicators:</i> Reports on threats and interactions.</p>
		<p>8.1.3. Document all information from conducted research/survey and monitoring programmes and store it in a database. <i>Timeline:</i> 2 years. <i>Actor:</i> Carnivore Liaison Office. <i>Indicators:</i> Database established and maintained.</p>
	<p>8.2. Information on Lions and spotted hyenas disseminated to enhance their conservation and management</p>	<p>8.2.1. Disseminate relevant information to stakeholders for adoption, conservation and management of the two species. <i>Timeline:</i> 2 years. <i>Actors:</i> Carnivore Liaison Office. <i>Indicator:</i> Relevant information disseminated.</p>
<p>8.2.2. Actively manage the population of the two species based on best available scientific information. <i>Timeline:</i> 2 years. <i>Actors:</i> KWS and stakeholders. <i>Indicators:</i> Viable populations and reduced conflict.</p>		

Appendix IV: Large carnivore task force members

National Large Carnivore Task Force Members

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

