

## **Inventory, mapping and increased awareness of the brown hyena and other large predators in the Sperrgebiet and surrounding areas, Namibia.**

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### **Introduction**

Namibia launched a large carnivore ATLAS programme several years ago with great success. Good data regarding carnivore occurrence and density was obtained through sighting forms, but the southern region of Namibia was extremely underrepresented. Our project aimed to start filling this gap, but we also saw the necessity to include small to medium sized carnivores in our project. We wanted to provide data and information regarding carnivore occurrence and relative density for parts of the SKEP region through the distribution of farmer questionnaires and sighting forms to all interested parties. A long-term goal is further to create awareness about carnivores in general and to establish knowledge about local attitudes towards different carnivore species to be able to identify educational necessities.

### **Methods**

The study took place in the Karas region in Namibia encompassing the Sperrgebiet itself and parts of the Luderitz, Bethanie, Keetmanshoop and Karasburg districts between February 2004 and January 2005. Questionnaires were sent to 231 farms in these districts and sighting forms were distributed in the entire study area. The questionnaire consisted of five parts (see appendix I) with the following subjects and related questions: (A) general information, (B) carnivores in general, (C) wildlife (non carnivores) and livestock, (D) carnivores and livestock and (E) domesticated dogs.

The questionnaire was sent out in May 2004 and some questions required information regarding occurrences during the past 12 months. As not all questionnaires were sent back immediately, we define the 12 months period to represent the year 2003.

Sighting forms were icon based differentiating between visual and spoor sightings and including habitat information (see Appendix II). A map was printed on the back page, where the sighting could be marked in addition or instead of the recorded GPS location. Carnivores included in our study were brown hyena, spotted hyena, cheetah, leopard, black backed jackal, caracal, Cape fox, bat eared fox, aardwolf and the category "others" where usually African wild cat occurrence was recorded.

The awareness programme included the establishment of an Environmental Information Centre in Luderitz and presentations at schools. School questionnaires were given to the teachers to be filled in and sent back to the project.

Mapping for carnivore signs took place on occasion in inland areas of the Sperrgebiet. Areas were mapped for brown hyena signs such as latrines, dens, resting sites and paste marks and other carnivore signs and the GPS position of these locations was recorded.

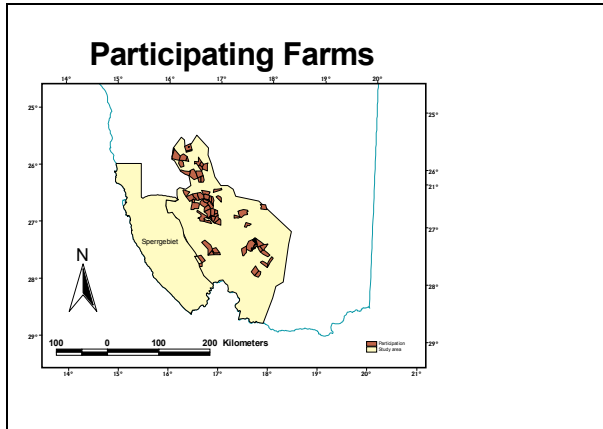
Data were entered in Microsoft Excel spreadsheets. Spatial data was analysed and displayed in ArcView.

### **Results**

#### **Carnivore questionnaire**

A total of 38 farmers replied to our questionnaire. This summed up to 46 farms out of the entire study area (Map 1). We will present the results in the same order the questionnaire was designed, starting with part (A) General Information.

The predominant habitat type on farms was open plains, followed by mountains and gravel plains (Figure 1). The number of waterholes ranges from two to over 20 per farm. The number of carnivore species occurring on farms ranged from two species to 10.



Map 1: Study area and location of participating farms.

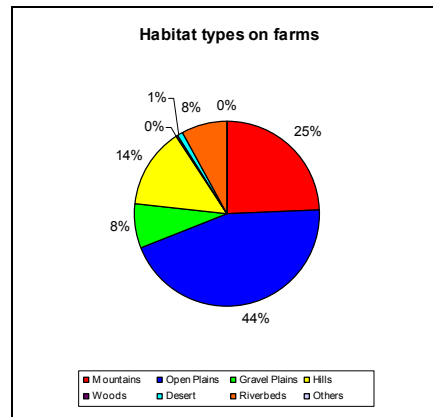
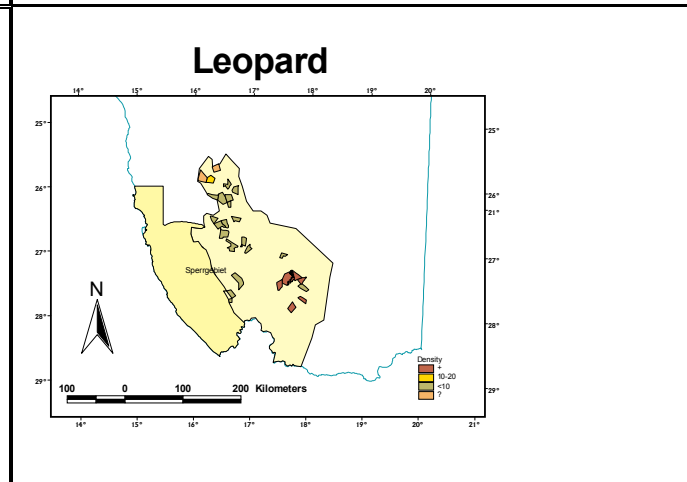
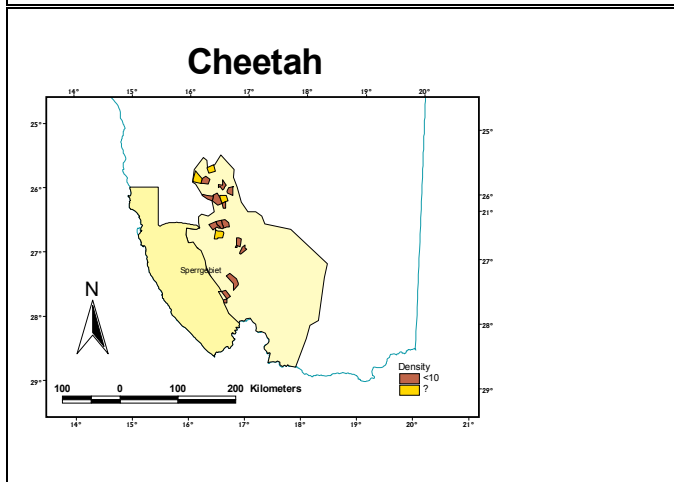
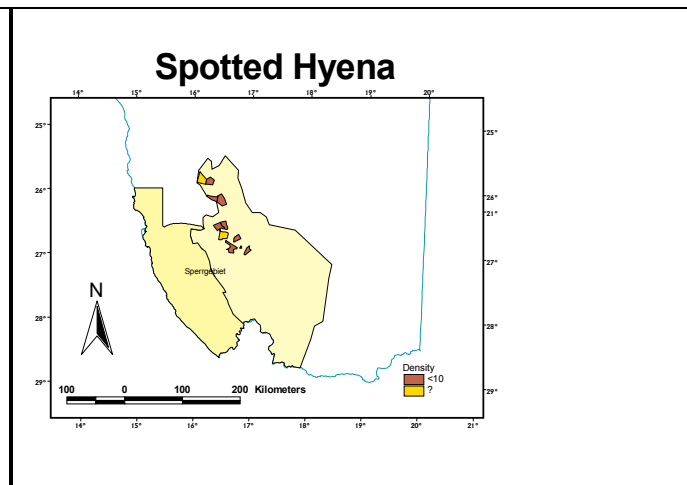
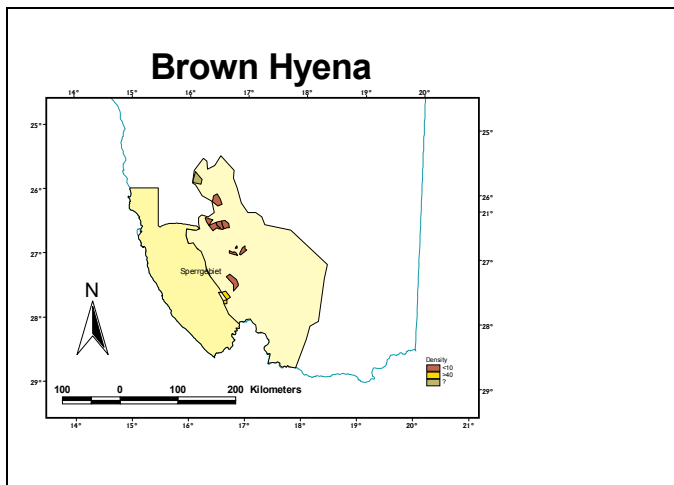
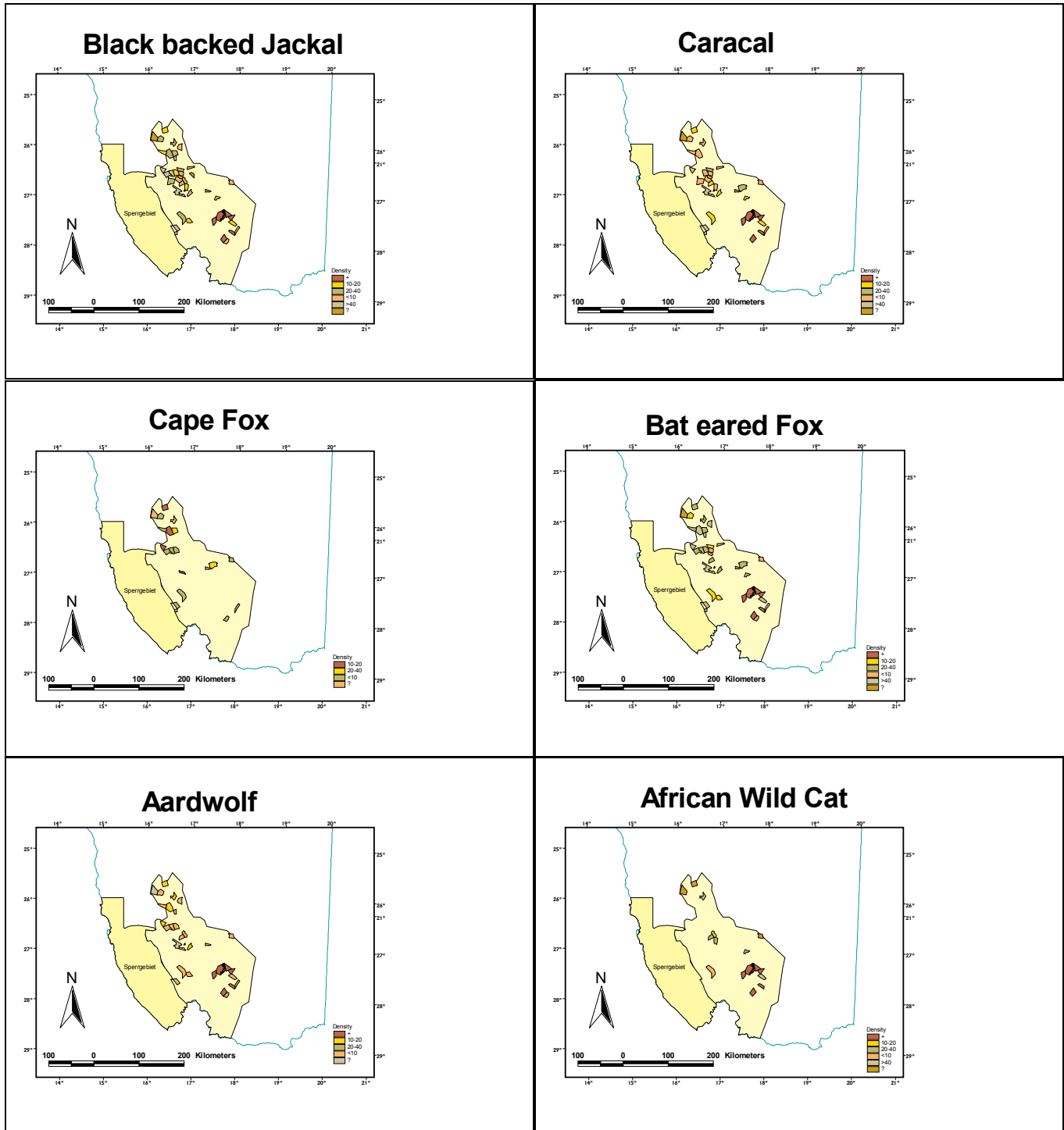


Figure 1: Habitat types on farms

In part (B) “Carnivores – General”, the farmers were asked for information about the occurrence of the different carnivore species on their farm and to estimate their numbers in giving categories (<10, 10-20, 20-40, >40). The following maps (Map 2) illustrate the results of this part of the questionnaire.





Map 2: Carnivore occurrence and density on farmland (“+” occurrence, but no density estimate given; “?” density unknown)

Large carnivore species occurred on 30 to 60% of the farms, whereas small to medium sized carnivore species occurred in over 50 to 100% of the farms (Figure 2) with the exception of the African wild cat, which did not have its own category in the questionnaire and might therefore be underrepresented.

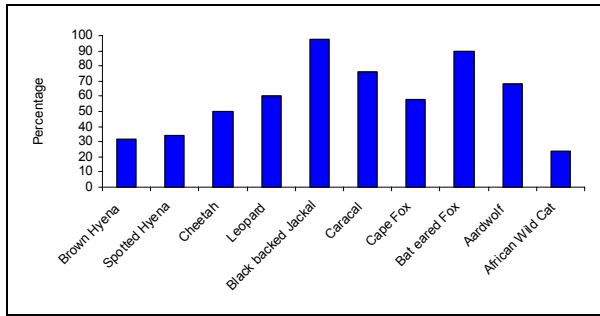


Figure 2: Percentage of carnivore species occurring on farms

Large carnivores occurred in lower numbers on farms than small to medium sized carnivores. Their sightings and sightings of their signs occurred less frequently (monthly to less than once per year) than those of small to medium sized carnivores (daily to weekly).

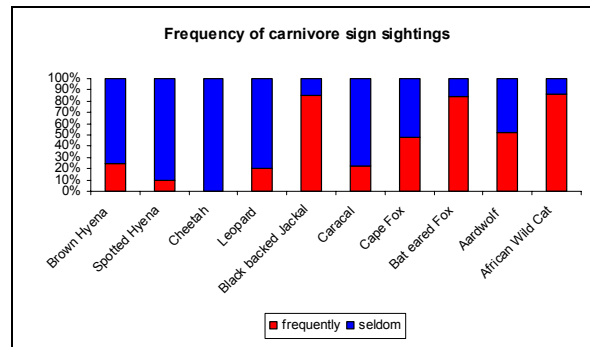
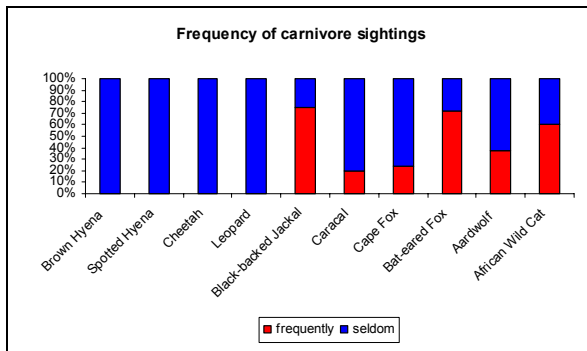


Figure 3: Frequency of carnivore sightings and their signs.

The trend in the number of large carnivore species was decreasing to stable, whereas the number of small to medium sized carnivores was stable to increasing. All carnivores were associated with open plains and mountains, but riverbeds seemed to play an important role as well.

Part (C) of the questionnaire included questions about livestock and non-carnivorous wildlife on the farms. Kudu, gemsbok, springbok, klipspringer and steenbok occurred on 70 to 90% of the farms, whereas ostrich and duiker were less evenly distributed. Springbok population size was estimated to be the highest, followed by gemsbok and kudu (Figure 4).

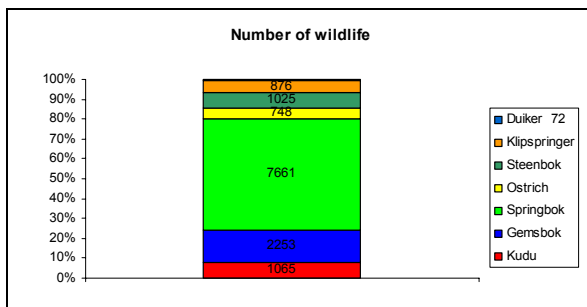


Figure 4: Total number of wildlife (non-carnivore) on participating farms.

All wildlife was seen regularly with the exception of the duiker, which was only seldom seen. Kudu, gemsbok and springbok were hunted on some of the farms. A total of 45 kudu, 101 gemsbok and 320 springbok were hunted in 2003.

Livestock on the majority of farms consisted of cattle, sheep and goats (Figure 5). Sheep numbers were highest with 67%, followed by goats (16%) and cattle (10%).

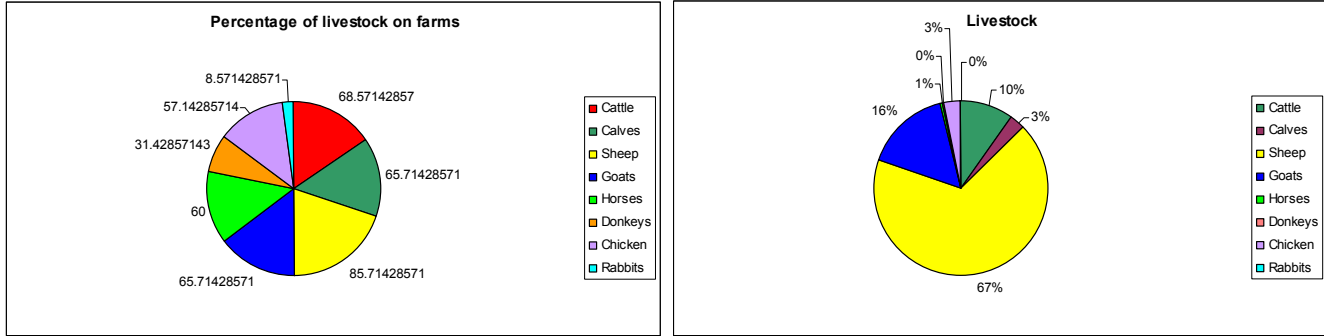


Figure 5: Livestock on farms and proportion of livestock in total.

All farms experienced a variety of livestock loss causes for their main commercial livestock (Figure 6: cattle, calves, sheep, goats). Nevertheless carnivore related mortality during 2003 was estimated to play a major role in livestock losses for calves, sheep and goats (Figure 7).

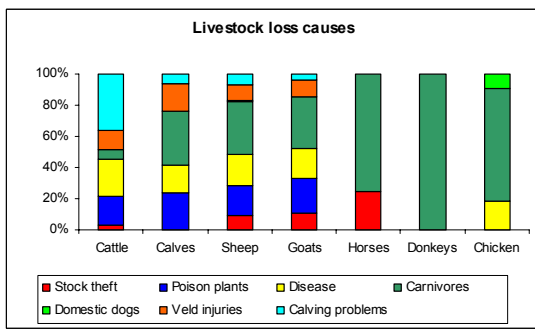


Figure 6: Proportion of livestock loss causes per species on participating farms.

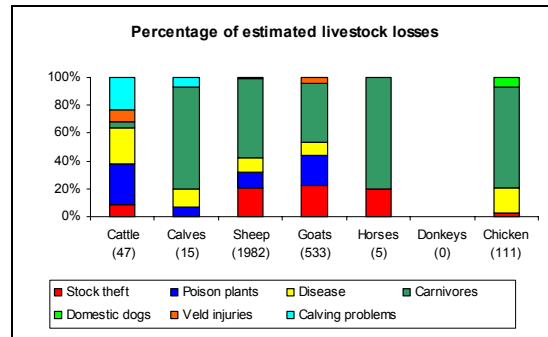


Figure 7: Percentage of estimated livestock losses during the year 2003 on participating farms (total number of mortality).

Part (D) consisted of carnivore and livestock related questions. Both large carnivores, cheetah and leopard, were considered a medium to high risk, whereas both hyena species were predominantly regarded as low risk carnivores (Figure 8). Black backed jackal, caracal and African wild cat were even regarded to be a higher risk to livestock than the two large carnivore species.

This attitude was also reflected in the answer to the question whether the farmers would like to see certain carnivore species population increase, decrease or to remain stable. The majority of farmers preferred to see the black backed jackal, caracal and African wild cat populations decrease, whereas the majority of farmers would like to see the population size of all other carnivores to remain stable or even to increase (Figure 9).

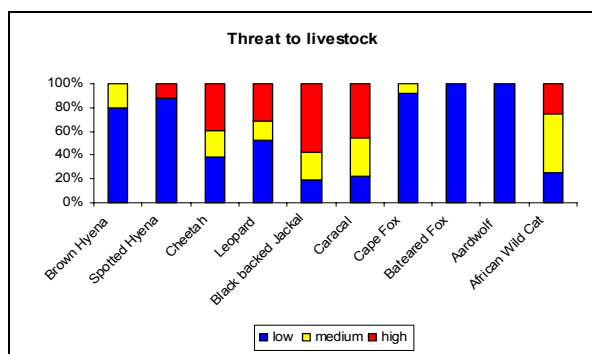


Figure 8: Carnivores considered threat to livestock by farmers.

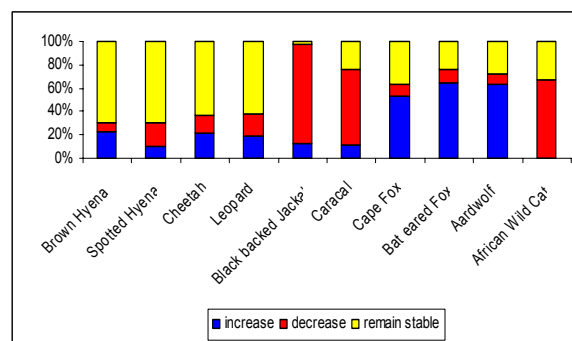


Figure 9: Question (D2): "Would you like to see the population increase, decrease or remain stable?"

Black backed jackals, caracals and African wild cats were also the carnivore species hunted most on farms (Table 1).

Table 1: Carnivore species hunted on farms and number of carnivores killed during the past 12 months.

	Brown Hyena	Spotted Hyena	Cheetah	Leopard	Black backed Jackal	Caracal	Cape Fox	Bat eared Fox	Aardwolf	African Wild Cat
No. Farms	1	1	0	0	25	10	3	1	1	3
Total number	1	1	0	0	219	52	6	2	2	50

According to the farmers, spotted hyena, cheetah, leopard, black backed jackal, caracal and African wild cat were mostly known as species killing livestock (Figure 10). In absolute numbers black backed jackals, caracals, African wild cats and leopards caused the majority of livestock damage in the year 2003.

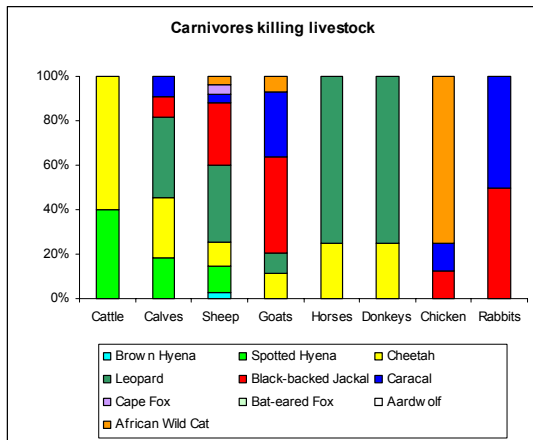


Figure 10: Carnivores known to kill certain livestock species.

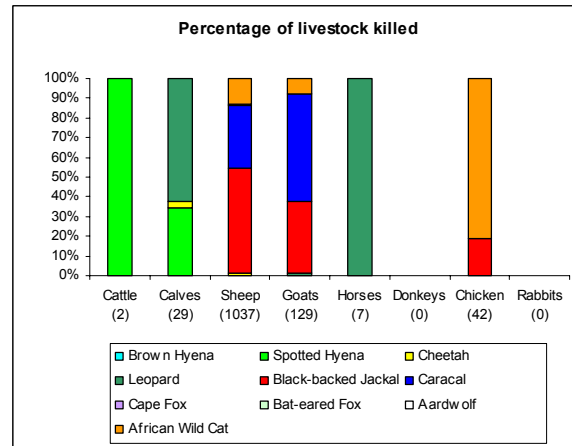


Figure 11: Proportion of livestock killed by carnivores.

These results were also reflected in the attitude of the farmers towards certain carnivore species. Small to medium sized, livestock threatening carnivores were shot, poisoned and trapped. Surprisingly, for large, livestock threatening carnivores, non lethal removal was considered as an option, but they were also shot, poisoned and trapped. This positive trend of non lethal carnivore removal is also shown in the importance of carnivore conservation for farmers. Although many carnivores seem to cause livestock related problems, the majority of farmers expressed a positive attitude towards carnivore conservation.

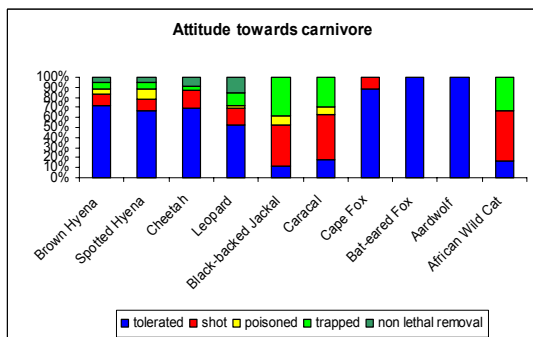


Figure 12: Attitude of farmers towards carnivore Species.

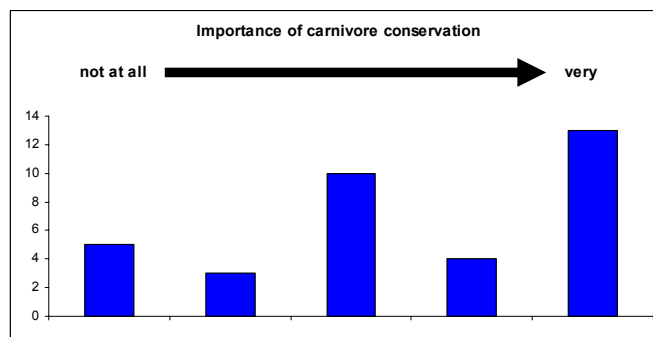


Figure 13: Importance of carnivore conservation to farmers.

In part (E) “Domesticated Dogs” our main aim was to obtain information about possible disease transfer between domesticated dogs and wild carnivores. 99 dogs were distributed over 30 farms. Table 2 shows the vaccination schedule for these dogs. On only half of the farms were dogs vaccinated at all.

Table 2: Vaccination frequency of 99 domesticated dogs on 30 farms.

Frequency	Distemper	
	Rabies	Parvovirus
yearly	16	11
2-5 years	3	
>5 years		1

**Sighting forms**

Response to the distributed sighting forms was poor, except for the Sperrgebiet area, where mining personnel participated regularly. Brown hyenas were reported regularly there and we included the entire data set including incidental sightings and monitoring projects from 1997 in this analysis.

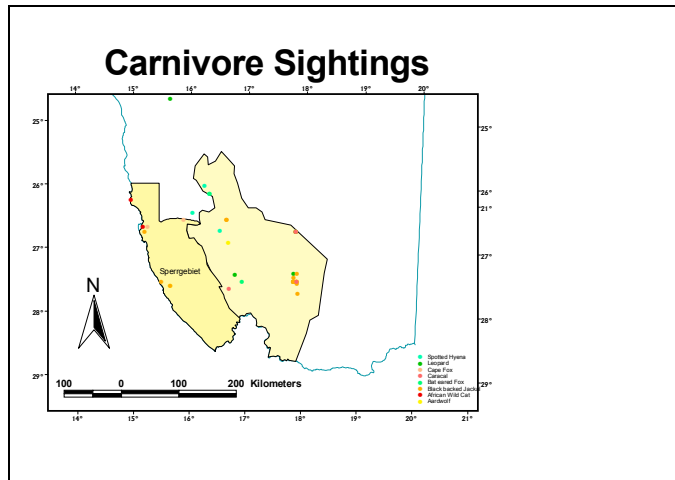


Figure 14: Carnivore sightings in the study area in 2004.

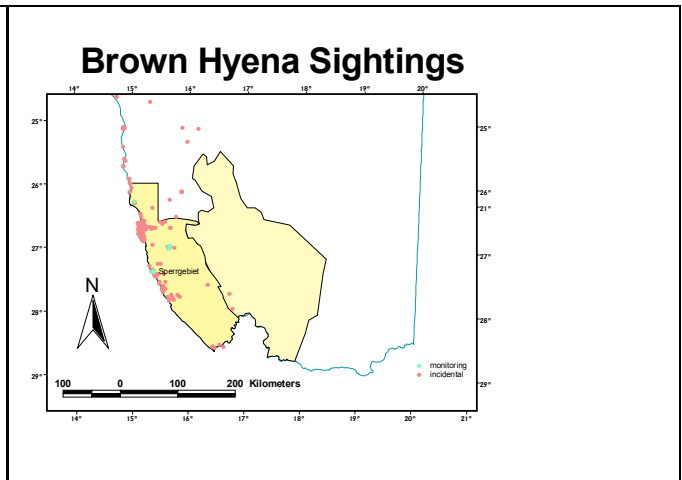


Figure 15: Brown hyena sightings between 1997 and 2004.

African wild cat sightings were extremely interesting, as they were seen closer to the coast than previously expected. Brown hyena sightings concentrated along the coast of the Sperrgebiet, as most of our long-term studies have been taking place there and the majority of human activity is found there.

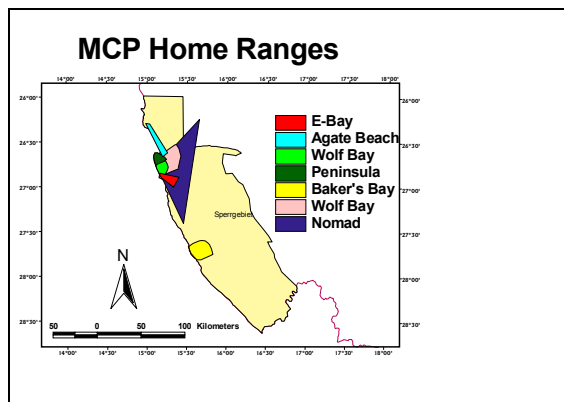


Figure 16: Minimum convex polygon (100%) home range estimates for brown hyenas of different clans.

Table 3: MCP home range estimates for brown hyenas of four different clans

Clan	MCP (100%) in km <sup>2</sup>	Method
E-Bay	180	radio telemetry
Agate Beach	230	radio telemetry
Wolf Bay	160	GPS telemetry
Peninsula	140	GPS telemetry
Baker's Bay	460	GPS telemetry
Wolf Bay	695	GPS telemetry
Nomad	2590	radio telemetry

To illustrate the area that the Brown Hyena Research Project covers at present, home ranges of animals of four different clans are presented in Figure 16 including an estimate for a nomadic living male.

## Mapping

Mapping took place during the entire study period. Figure 17 shows the location of brown hyena and black backed jackal dens and brown hyena latrines found between 1997 and 2004. The location of a total of 539 brown hyena latrines 422 resting sites, 61 black backed jackal dens and 58 brown hyena dens was recorded.

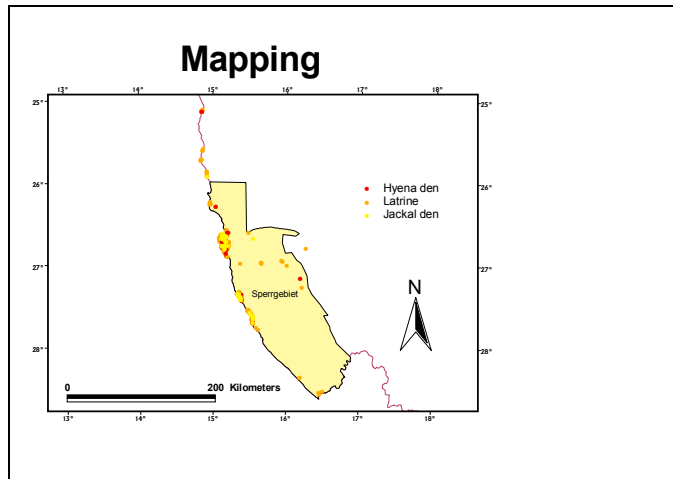


Figure 17: Location of carnivore signs.

## Awareness and education

### 1. Environmental Information Centre (EIC)

The EIC opened on the 1<sup>st</sup> of February 2004 at the Lüderitz Waterfront. We displayed the following posters and exhibits in the showroom:

- Carnivores in general
- Brown hyena in general
- Brown hyena research
- IUCN hyena awareness
- Animals around Lüderitz
- African Penguin Conservation Project
- Geological information of Lüderitz area
- Brown Hyena Research Project pamphlets
- Brown hyena skull
- Footprints of brown hyena and jackal
- Radio and GPS collars
- Rocks in connection with geological map
- Shark eggs
- Agates and other gems

### 2. School presentations

We visited two schools in Lüderitz and Aus and started collaborating with the Aus Multipurpose Centre. Schools participating in their programme visited our project to learn about carnivores in general. We did outdoor presentations at an old, abandoned brown hyena den site. Questionnaires were given to the teachers, including the following questions:

1. What is a carnivore?
2. What is a scavenger?
3. What kind of wild carnivores do you know of?
4. What does the word prey mean?
5. What is a habitat?
6. What is a territory?
7. What kind of wild carnivores do you find where you live?
8. Why are carnivores important?

Four schools participated in the questionnaire and the answers to the questions were satisfactory.

## Summary

This report serves to show the first results of the carnivore inventory, mapping and increased awareness project. It is clearly impossible to carry out a complete study in the duration of one year. Also the dependence on the participation of the farmers makes such a project a rather long term venture. Nevertheless we gained valuable and unique data from the questionnaire and sighting form project, which will be included in the Namibian Carnivore ATLAS programme.

Generally it has to be said, that the results of the questionnaire represent the assessment and opinion of the participating farmers. Some data has to be verified and confirmed, but most of the participants seemed to have a clear idea about carnivore related issues on their farms.

A positive outcome is that although the majority of farmers experience major problems with carnivores, their general attitude towards carnivore conservation is positive. This is something to build on. A lot more time should be spent in visiting farms and in staying in regular contact with farmers to learn from each others experiences and to be able to work on misconceptions regarding carnivores – large and small.

We will continue with this project, distributing sighting forms and keeping the Environmental Information Centre going. More time will be spent in education at schools and we will try to promote other environmental activities around Lüderitz.

The data set is available to every interested & affected party and we will be more than happy to analyse parts of the questionnaire in more detail on request.



**APPENDIX (I)**

**CARNIVORE QUESTIONNAIRE FOR SOUTHERN NAMIBIA  
(VRAE LYS OOR DIE ROOFDIERE VAN SUIDELIKE NAMIBIË)**

Please tick appropriate boxes or fill in requested information.

(Vul asseblief die inligting in vir die onderstaande vrae en merk die betrokke items in die tabelle. *Belangrik: "Lewende hawe" verwys na alle gedomestiseerde diere (vee, hoenders, konyne, ens.) waarmee op u plaas geboer word (kommersieel of vir self onderhoud).*)

**PART A: GENERAL INFORMATION** (if you want to stay anonymous, please give approximate position of farm area)

**AFDELING A: ALGEMENE INLIGTING** (as u anoniem wil bly, verskaf asseblief die posisie van die area waarin u plaas geleë is)

Your name (Naam): \_\_\_\_\_ Gender (Geslag): male/female (manlik/vroulik) Date (Datum): \_\_\_\_\_  
 The farm's name (Naam van u plaas): \_\_\_\_\_ Size of farm (Grootte van plaas): \_\_\_\_\_ ha/unknown (onbekend)  
 Owner/Farm Manager/Other (specify) (Eienaar/ Plaas voorman/Ander (spesifiseer)): \_\_\_\_\_  
 District (Distrik): \_\_\_\_\_ Telephone number (Telefoon nommer): \_\_\_\_\_  
 Postal address (Pos adres): \_\_\_\_\_ Fax number (Faks nommer): \_\_\_\_\_  
 e-mail address (e-pos adres): \_\_\_\_\_

Average number of people living on farm (Gemiddelde getal mense wat op die plaas bly): \_\_\_\_\_  
 Latitude (Breedtegraad): \_\_\_\_\_ Longitude (Lengthgraad): \_\_\_\_\_

**Percentage of habitat types on farm (Persentasie van habitat tipes op die plaas):**

Mountains (Berge)	Open plains (Oop vlaktes)	Gravel plains (Gruis vlaktes)	Hills (Heuwels)	Woods (Woude)	Desert (Woestyn)	Riverbeds (Rivierbeddings)	Others (Ander)

Number of waterholes/boreholes on farm (Getal watergate/boorgate op die plaas): \_\_\_\_\_

**PART B (AFDELING B): CARNIVORES – GENERAL (ROOFDIERE – ALGEMEEN)**

**1. Which species of carnivore occur on the farm (Watter roofdier spesies word op u plaas aangetref)?**

Brown Hyena (Bruin hiëna)	Spotted Hyena (Gevlekte hiëna)	Cheetah (Jagluiperd)	Leopard (Luiperd)	Black-backed Jackal (Rooi jakkals)	Caracal (Rooikat)	Cape Fox (Silwer jakkals)	Bat-eared Fox (Bakoorjakkals)	Aardwolf	Others (Ander) - Specify

**2. Estimated number of carnivores on the farm ('n Skatting van die getal roofdiere op u plaas)?**

	<10	10-20	20-40	>40
Brown Hyena (Bruin hiëna)				
Spotted Hyena (Gevlekte hiëna)				
Cheetah (Jagluiperd)				
Leopard (Luiperd)				
Black-backed Jackal (Rooi jakkals)				
Caracal (Rooikat)				
Cape Fox (Silwer jakkals)				
Bat-eared Fox (Bakoorjakkals)				
Aardwolf				
Others (Ander) -specify				

**3. Are carnivore numbers increasing, decreasing, stable or unknown (Neem die getal roofdiere toe, af, stabiel, onbekend)?**

	Increasing (Neem toe)	Decreasing (Neem af)	Stable (stabile)	Unknown (onbekend)
Brown Hyena (Bruin hiëna)				
Spotted Hyena (Gevlekte hiëna)				
Cheetah (Jagluiperd)				
Leopard (Luiperd)				
Black-backed Jackal (Rooi jakkals)				
Caracal (Rooikat)				
Cape Fox (Silwer jakkals)				
Bat-eared Fox (Bakoorjakkals)				
Aardwolf				
Others (Ander) -specify				

**4. In which habitat type do the carnivore species occur on the farm (In watter habitat tipes kom die roofdiere voor op u plaas)?**

	Mountains (Berge)	Open plains (Oop vlaktes)	Gravel plains (Gruis vlaktes)	Hills (Heuwels)	Woods (Woude)	Desert (Woestyn)	Riverbeds (Rivierbeddings)	Others (Ander)
Brown Hyena (Bruin hiëna)								
Spotted Hyena (Gevlekte hiëna)								
Cheetah (Jagluiperd)								
Leopard (Luiperd)								
Black-backed Jackal (Rooi jakkals)								
Caracal (Rooikat)								

	Mountains (Berge)	Open plains (Oop vlaktes)	Gravel plains (Gruis vlaktes)	Hills (Heuwels)	Woods (Woude)	Desert (Woestyn)	Riverbeds (Rivierbeddings)	Others (Ander)
Cape Fox (Silwer jakkals)								
Bat-eared Fox (Bakoorjakkals)								
Aardwolf								
Others (Ander) - Specify								

5. How often are carnivores seen (Hoe gereeld word die roofdiere gesien)?

	daily elke dag	weekly weekliks	monthly maandeliks	once per year (een keer per jaar)	less than once per year (minder as een keer per jaar)
Brown Hyena (Bruin hiëna)					
Spotted Hyena (Gevlekte hiëna)					
Cheetah (Jagluiperd)					
Leopard (Luiperd)					
Black-backed Jackal (Rooi jakkals)					
Caracal (Rooikat)					
Cape Fox (Silwer jakkals)					
Bat-eared Fox (Bakoorjakkals)					
Aardwolf					
Others (Ander) - specify					

6. How often are their spoor or other signs seen (Hoe gereeld word roofdiere spore of ander tekens van hulle aanwesigheid opgemerk)?

	daily elke dag	weekly weekliks	monthly maandeliks	once per year (een keer per jaar)	less than once per year (minder as een keer per jaar)
Brown Hyena (Bruin hiëna)					
Spotted Hyena (Gevlekte hiëna)					
Cheetah (Jagluiperd)					
Leopard (Luiperd)					
Black-backed Jackal (Rooi jakkals)					
Caracal (Rooikat)					
Cape Fox (Silwer jakkals)					
Bat-eared Fox (Bakoorjakkals)					
Aardwolf					
Others (Ander) - specify					

### PART C (AFDELING C): WILDLIFE (NON CARNIVORES) AND LIVESTOCK (WILD (NIE-ROOFDIER) EN LEWENDE HAWE)

1. What wildlife (non carnivores) is in the farming area (Watter wild (nie- roofdiere) kom op u plaas voor)?

Kudu (Koedoe)	Gemsbok	Springbok	Ostrich (Volstruis)	Steenbok	Klipspringer	Common (Gewone) Duiker	Others (Ander)

2. What is their approximate number (Wat is die getalle na beraming)?

Kudu (Koedoe)	Gemsbok	Springbok	Ostrich (Volstruis)	Steenbok	Klipspringer	Common (Gewone) Duiker	Others (Ander)

3. How often are they seen (Hoe gereeld word hulle gesien)?

	daily daaglik	regularly gereeld	often dikwels	seldom skaars	never nooit
Kudu (Koedoe)					
Gemsbok					
Springbok					
Ostrich (Volstruis)					
Steenbok					
Klipspringer					
Duiker					
Others (Ander)					

4. What species are hunted on the farm and how many were killed last year (Watter spesies word gejag op die plaas en hoeveel is verlede jaar suksesvol gejag)?

	Number hunted (Getal gejag)	Method used (Methode)
Kudu (Koedoe)		
Gemsbok		
Springbok		
Ostrich (Volstruis)		
Steenbok		
Klipspringer		
Duiker		
Others (Ander)		

5. What livestock is on the farm (Watter lewende hawe kom voor op die plaas)?

Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)

6. What is their approximate number (Hoeveel van hierdie lewende hawe is na beraming op u plaas)?

Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)

7. What livestock loss causes do you experience on your farm (Indien u verlies aan lewende hawe het op u plaas, wat is die oorsake hiervan)?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Stock theft (Diefstal)									
Poison plants (Giftige plante)									
Disease (Siektes)									
Carnivores (Roofdier aanvalle)									
Domestic dogs (Rondloper honed)									
Veld injuries (Beserings in die veld)									
Calving problems (Probleme met goboorte)									

8. What are the estimated stock losses during the last 12 months (Hoeveel diere het u verloor gedurende die afgelope 12 maande)?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Stock theft (Diefstal)									
Poison plants (Giftige plante)									
Disease (Siektes)									
Carnivores (Roofdier aanvalle)									
Domestic dogs (Rondloper honed)									
Veld injuries (Beserings in die veld)									
Calving problems (Probleme met goboorte)									

9. What livestock management techniques are you currently practising? Please distinguish between during day (mark with D) and at night (mark with N) (Watter metodes gebruik u huidiglik om u lewende hawe te bestuur? Onderskei asb tussen dag bestuur (merk met 'n D) en nag bestuur (merk met 'n N)).

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Calving season (Kalf/lammer seisoen)									
Kraaling young calves (Jong diere in krale)									
Stocking rate (Aankope van lewende hawe)									
Bringing livestock close to home (Vee bly naby huis)									
Grazing rotation (Roteer weiding)									
Shepherding* (Vee wagters)									
Wire kraals (Draad heining krale)									
Thorn kraals (Doringtak krale)									
Stick kraals (Houtlak/stok krale)									
Guarded by dogs (Beskerming deur honed)									
Free roaming (Diere beweeg vry)									
Others (Ander)									

\* guarded by people

**PART D (AFDELING D): CARNIVORES AND LIVESTOCK (ROOFDIERE EN LEWENDE HAWE)**

1. Which carnivore do you consider a low, medium or high threat to your livestock (Watter roofdiere beskou u as 'n bedreiging (laag, medium of hoog) vir u vee)?

	low laag	medium	high hoog
Brown Hyena (Bruin hiëna)			
Spotted Hyena (Gevlekte hiëna)			
Cheetah (Jagluiperd)			
Leopard (Luiperd)			
Black-backed Jackal (Rooi jakkals)			
Caracal (Rooikat)			
Cape Fox (Silwer jakkals)			
Bat-eared Fox (Bakoorjakkals)			
Aardwolf			
Others (Ander) -specify			

2. Would you like to see the population increase, decrease or remain stable (Sou u verkies dat die populasie roofdiere toeneem, afneem of konstant bly)?

	increase toeneem	decrease afneem	remain stable konstant
Brown Hyena (Bruin hiëna)			
Spotted Hyena (Gevlekte hiëna)			
Cheetah (Jagluiperd)			
Leopard (Luiperd)			
Black-backed Jackal (Rooi jakkals)			
Caracal (Rooikat)			
Cape Fox (Silwer jakkals)			
Bat-eared Fox (Bakoorjakkals)			
Aardwolf			
Others (Ander) -specify			

3. What species are hunted on your farm, which methods are used and how many were killed during the last 12 months (Watter spesies word gejag op u plaas, watter jag metodes word gebruik en hoeveel is gedurende die afgelope 12 maande suksesvol gejag)?

	hunted -yes/no gejaag – ja/nee	Method Metode	Number killed Getal gedood
Brown Hyena (Bruin hiëna)			
Spotted Hyena (Gevlekte hiëna)			
Cheetah (Jagluiperd)			
Leopard (Luiperd)			
Black-backed Jackal (Rooi jakkals)			
Caracal (Rooikat)			
Cape Fox (Silwer jakkals)			
Bat-eared Fox (Bakoorjakkals)			
Aardwolf			
Others (Ander) -specify			

4. Does carnivore cause problems with domestic stock (Veroorsaak roofdiere probleme met u lewende hawe/vee)?

	yes ja	no nee
Brown Hyena (Bruin hiëna)		
Spotted Hyena (Gevlekte hiëna)		
Cheetah (Jagluiperd)		
Leopard (Luiperd)		
Black-backed Jackal (Rooi jakkals)		
Caracal (Rooikat)		
Cape Fox (Silwer jakkals)		
Bat-eared Fox (Bakoorjakkals)		
Aardwolf		
Others (Ander) -specify		

5. Which species of domestic animal are killed (Watter van u lewende hawe of enige ander gedomestiseerde plaasdiere word gevang deur roofdiere)?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Brown Hyena (Bruin hiëna)									
Spotted Hyena (Gevlekte hiëna)									
Cheetah (Jagluiperd)									
Leopard (Luiperd)									
Black-backed Jackal (Rooi jakkals)									
Caracal (Rooikat)									
Cape Fox (Silwer jakkals)									
Bat-eared Fox (Bakoorjakkals)									
Aardwolf									
Others (Ander) -specify									

6. How many have been killed during the last 12 months (Hoeveel is deur roofdiere gevang gedurende die afgelope 12 maande)?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Brown Hyena (Bruin hiëna)									
Spotted Hyena (Gevlekte hiëna)									
Cheetah (Jagluiperd)									
Leopard (Luiperd)									
Black-backed Jackal (Rooi jakkals)									
Caracal (Rooikat)									
Cape Fox (Silwer jakkals)									
Bat-eared Fox (Bakoorjakkals)									
Aardwolf									
Others (Ander) -specify									

7. Which species of wildlife (non carnivore) are killed (Watter van u wild spesies (nie-roofdier) word deur roofdiere gevang)?

	Kudu (Koedoe)	Gemsbok	Springbok	Ostrich (Volstruis)	Steenbok	Klipspringer	Common (Gewone) Duiker	Others (Ander)
Brown Hyena (Bruin hiëna)								
Spotted Hyena (Gevlekte hiëna)								
Cheetah (Jagluiperd)								
Leopard (Luiperd)								
Black-backed Jackal (Rooi jakkals)								
Caracal (Rooikat)								
Cape Fox (Silwer jakkals)								
Bat-eared Fox (Bakoorjakkals)								
Aardwolf								
Others (Ander) -specify								

8. How many have been killed during the last 12 months (Hoeveel van u wild (nie-roofdier) is gedurende die afgelope 12 maande gevang)?

	Kudu (Koedoe)	Gemsbok	Springbok	Ostrich (Volstruis)	Steenbok	Klipspringer	Common (Gewone) Duiker	Others (Ander)
Brown Hyena (Bruin hiëna)								
Spotted Hyena (Gevlekte hiëna)								
Cheetah (Jagluiperd)								
Leopard (Luiperd)								
Black-backed Jackal (Rooi jakkals)								
Caracal (Rooikat)								
Cape Fox (Silwer jakkals)								
Bat-eared Fox (Bakoorjakkals)								
Aardwolf								
Others (Ander) -specify								

9. What is your attitude towards the carnivore (Wat is u houding teenoor roofdiere)?

	tolerated (verdra)	shot (skiet)	poisoned (gebruik gif)	trapped (vang)	non lethal predator removal* (verwydering sonder dood maak*)	threat to humans (Bedreiging vir mense)	hunted for food (gejag as voedsel bron)	given food (verskaf kos aan)	Others (Ander)
Brown Hyena (Bruin hiëna)									
Spotted Hyena (Gevlekte hiëna)									
Cheetah (Jagluiperd)									

	tolerated (verdra)	shot (skiet)	poisoned (gebruik gif)	trapped (vang)	non lethal predator removal* (verwydering sonder dood maak*)	threat to humans (Bedreiging vir mense)	hunted for food (gejag as voedsel bron)	given food (verskaf kos aan)	Others (Ander)
Leopard (Luiperd)									
Black-backed Jackal (Rooi jakkals)									
Caracal (Rooikat)									
Cape Fox (Silver jakkals)									
Bat-eared Fox (Bakoorjakkals)									
Aardwolf									
Others (Ander) -specify									

\* e.g. live capture to NGO (e.g. to Africat, CCF) (bv. Lewendig gevang vir NGO (bv aan Africat, CCF))

10. How important is the idea of carnivore conservation to you (Hoe belangrik is die idee van roofdier bewaring vir u)?

1            2            3            4            5  
not at all            very  
glad nie            baie belangrik

### PART E ( AFDELING E): DOMESTICATED DOGS (GEDOMESTISEERDE HONDE)

1. How many dogs do you keep on your farm (Hoeveel honde is op u plaas)? \_\_\_\_\_

2. Do you provide additional food for the dogs (Verskaf jy kos aan die honde)? Yes/no            ja/nee

3. Are your dogs vaccinated (Is jou honde in ge-ent teen siektes)?

Vacc. Schedule (Inenting skedule)	Rabies Hondsdoelheid	Distemper Hondesiekte	Parvovirus	Other Ander
Yearly (jaarliks)				
every 2-5 years (elke 2-5 jaar)				
> 5 years (> 5 jaar)				

4. How many dogs do you have with livestock (Hoeveel honde hou u aan by u lewende hawe)? \_\_\_\_\_

















5. Which livestock is guarded by dogs (Watter lewende hawe word beskerm deur honde)?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Guarded (Beskerm)									
Number of dogs (Getal honde)									

6. Does the dog stay permanently with the livestock (yes/no) (Bly die hond/e permanent saam met die lewende hawe (ja/nee))?

	Cattle (Beeste)	Calves (Kalwers)	Sheep (Skape)	Goats (Bokke)	Horses (Perde)	Donkeys (Donkies)	Chicken (Hoenders)	Rabbit (Konyne)	Others (Ander)
Guarded (Beskerm)									
Number of dogs (Getal honde)									

(II)

		<h3 style="text-align: center;">Carnivore Monitoring Project</h3> <p style="text-align: center;">Please assist the Project by recording all observations, both direct and spoor observations seen in southern Namibia. All collected data will be dealt with according to the Brown Hyena Research Project's data policy.</p> <p style="text-align: center;">Please send forms to: Brown Hyena Research Project, P. O. Box 739 Lüderitz, Tel.: 063-202114, Fax: 063-202117, e-mail: strandwolf@iway.na</p>																					
Date:		Name																					
Time:		Address																					
<p><b>Please tick appropriate box and fill in requested information.</b></p>																							
Location (e.g. name of farm and please also mark on back page):																							
GPS reading		S			E																		
<table border="1"> <tr> <th colspan="2">Observation</th> </tr> <tr> <td>Visual</td> <td>Spoor</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>		Observation		Visual	Spoor					Please fill in only one sighting form per observation!			<table border="1"> <tr> <th colspan="3">Age of spoor</th> </tr> <tr> <td>days</td> <td>weeks</td> <td>months</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>		Age of spoor			days	weeks	months			
Observation																							
Visual	Spoor																						
																							
Age of spoor																							
days	weeks	months																					
<b>Species</b>																							
																							
Brown Hyena	Spotted Hyena	Cheetah	Leopard	Aardwolf	Black-backed Jackal	Caracal																	
		?		<b>Numbers</b>																			
Bat-eared Fox	Cape Fox	Other (specify)		Adult	Young	<b>Total</b>																	
<b>Habitat where carnivore was seen</b>																							
Mountains	Plains	Riverbed	Hills	Woods	Desert	Other																	
<b>Behaviour</b>																							
<b>General information</b>																							