

# CONSERVATION of the AFRICAN WILD DOG in NAMIBIA

Human-Wild Dog Conflict on Communal Lands  
- Okakarara District, Otjozondjupa -



Supported by:



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## EXECUTIVE SUMMARY

**The African Wild Dog Series** represents a list of publications spotlighting conservation issues relevant to Namibia's most endangered large carnivore, the African Wild Dog (AWD). Over the next three years written reports and other media will be published on social and ecological aspects of AWD conservation. The Wild Dog Project, in association with the Namibian Nature Foundation, regional NGOs, the public sector and the farming community of Otjozondjupa and Omaheke, will provide the ongoing research that unravels the complexities of AWD conservation in a multiple tenure land system.

The main objective of this report is to provide a background on human-wild dog conflict in the ovaHerero pastoralist communities of Okakarara District. The area, also known as Okakarara District, is part of the National Community Based Nature Resource Management Programme. With a focus on the impact of predators on livelihoods in relation to other stock loss causes, the report highlights the important influence effective livestock management practices can have on pastoralist farming incomes.

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## 1.0 INTRODUCTION

### 1.1 Carnivores

There is increasing concern about the status and distribution of terrestrial carnivore populations throughout the world<sup>1</sup>. Carnivores are the focus of intense attention and resources in conservation biology. In terms of species lists and classification schemes carnivores are often classified in the following categories: indicator species that reflect critical environmental alteration; keystone species that play a pivotal role in the ecosystem; umbrella species that require large home ranges, thus if protected, will protect many other species; flagship species that are popular and attract much interest; and vulnerable species that are most likely to become extinct. Carnivores also compete with humans for dwindling space and environmental resources.

Many classic examples of successful conservation biology involve carnivores. Problems of genetics, reintroductions, management, animal behaviour and behavioural ecology, ecology, and policy all use carnivores as basic test cases in the literature. If we can sort out complex conservation challenges facing carnivores, we are bound to be able solve problems of other taxa<sup>2</sup>.

### 1.2 Role of Carnivores in the Ecosystem

#### *Ecological:*

Predators are a key component in any balanced ecosystem. As top of the food chain they perform an important role in regulating populations of prey species, removing weak, old and diseased animals, thus maintaining the fitness and health of prey species. When large carnivores are removed from an area there is a reduction of competition regulating the populations of smaller predators and their numbers increase. A good example of this is the high density of Black-backed Jackal (*Canis mesomelas*) observed in Okakarara District. Often population numbers of these smaller predators becomes very hard to control and predation on small stock increases significantly.

#### *Cultural:*

In many part of Africa large carnivores feature prominently in traditional tales and form part of the rich cultural heritage inherited by many rural and tribal communities.

#### *Economic:*

Tourism plays an increasingly significant role in income generation and poverty alleviation across much of the developing world, where relatively intact natural environments are attracting ever-greater numbers of international tourists. When coming to Africa most tourists are keen to see large carnivores, especially endangered ones. This provides the opportunity for areas containing large predators to benefit financially from these animals under the right circumstances. There is also scope for selling hunting licences to shoot trophy or problem animals.

### 1.3 The African Wild Dog (*Lycaon pictus*)

The African wild dogs (AWD) reflects many critical conservation problems common to carnivores in general. Their decline has been well documented over the past 30 years<sup>3</sup>. Formerly distributed throughout 39 sub-Saharan countries, today between 3000-5000 animals remain in perhaps 14 countries, only 6-7 of which contain populations >100 individuals. The isolated northeast of Namibia is estimated to contain between 355-601 individuals but only 5% of their range is within protected areas<sup>4</sup>. This suggests that the long-term survival of the

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<sup>1</sup> e.g. Schaller, 1996;

<sup>2</sup> Gittleman *et al*, 2001

<sup>3</sup> Woodroffe & Ginsberg, 1997

<sup>4</sup> Stander, 2003

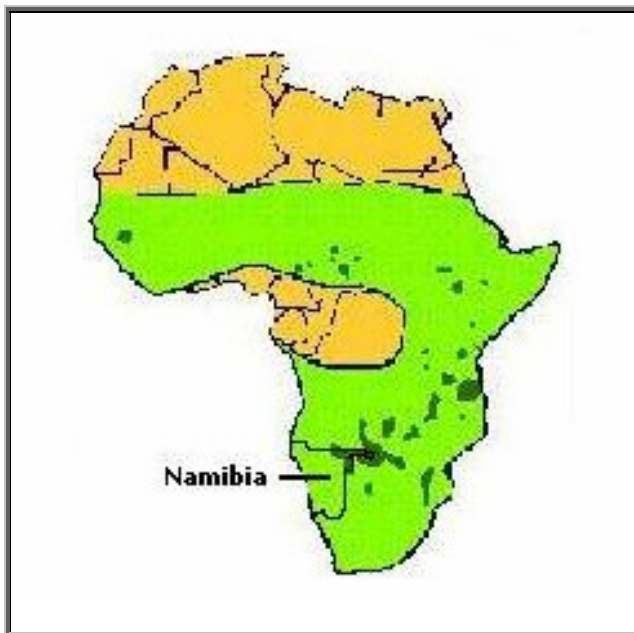
species depends on the maintenance of viable and connected populations both within and outside protected areas, and across National boundaries.

The AWDs decline reflects the expansion of human population and the associated fragmentation of habitat available to wildlife. Because AWD live at low densities (average 1 AWD / 200km<sup>2</sup>) and have large home ranges (average > 2000sq km / pack)<sup>5</sup>, even 'fragments' covering thousands of km<sup>2</sup> will not support viable populations. Packs often range beyond the borders of parks into land taken over for livestock farming. Thus even normally protected populations are subject to road kills, disease contracted from domestic dogs and depletion of wild prey. Like other large predators, they kill livestock under some circumstances, and have been shot, snared and poisoned in most livestock areas irrespective of legal protection<sup>6</sup>. A review of data collected from farmlands within 50km of Waterberg Plateau Park in the past year illustrates the effect of human-induced mortalities well: from sightings of 27 individuals, 15 AWDs have been shot and 4 drowned in the Grootfontien-Omatoko canal. These figures are by no means comprehensive as many deaths will certainly remain unreported as is the case for predators in general.

Although numerous research projects have focused on the natural history and behavioural ecology of AWD in their remnant strongholds, little research has been conducted on arid habitat populations under multiple land use tenure systems. Furthermore, rigorous data are deficient on economic impacts of livestock predation in comparison to other forms of stock loss.

Recent sightings of transboundary activity in packs composing 52 and 44 animals respectively further emphasise the urgent need for research and the development of innovative management strategies for AWD in arid areas where subdivision of land and conflict with farmers are major threats to their survival.

Carnivore-human conflict impacts significantly on AWDs, so it is essential to achieve a better understanding of the genuine impact of predators, particularly endangered predators, and to find ways of mitigating the conflict. Only by evaluating the impact is it possible to determine the management strategies most likely to halt or reverse AWD decline to extinction in Namibia.



**Figure 1:** Historical & present distribution of AWD. Light green shading represents past distribution and dark green shading represents present distribution<sup>6</sup>.

Although Namibia contains one of only 6-7 populations greater than 100 individuals, dedicated research and conservation efforts are only just beginning.

<sup>5</sup> Stander, 2004 (*pers comms*)

<sup>6</sup> Woodroffe, 1999a

## 2.0 HUMAN-CARNIVORE INTERACTIONS

### 2.1 Background

There is little doubt that humans influence the behaviour of carnivores and many other animals. For carnivores, even within protected areas, conflicts with humans are usually the most important cause of adult mortality<sup>7</sup>. The problems we face in the area of human-carnivore interactions raise numerous troubling and difficult questions with emotions and passions running high within many stakeholder groups<sup>8</sup>. Carnivores are frequently perceived as competitors to humans and, historically, human and wild carnivore interactions have involved conflict and misunderstanding. Because of their large body size and high trophic position, large carnivores require extensive home ranges and large prey populations. Thus only vast, relatively intact ecosystems can support viable populations and it is extremely difficult to maintain large enough areas for these animals. As a consequence, these species are the first to suffer when human populations expand and utilise relatively untouched habitats<sup>9</sup>.

With the strengthening of the conservation ethic in the twentieth century, carnivores are no longer perceived simply as 'vermin', but as key and valuable parts of the ecological community. This change, however, is not necessarily taking place among people living near wild carnivores. Carnivores that 'spill-over' from the edges of protected areas into rangelands managed for farming often come into conflict with human neighbours and sour the relationship between local communities and conservation agencies<sup>3</sup>. However, policies and practices have recently moved away from 'fortress conservation' to embrace the idea of involving local communities in the process of conservation. This involves a broad spectrum of objectives and activities, from those designed to support protected areas or species, for example through community education, to those where rural development can be achieved through the use of the resources, with conservation of these resources a secondary benefit<sup>10</sup>.

This move towards community-based conservation is clearly crucial for carnivore conservation. If a problem exists between human and carnivore communities then seeking 'solutions' that do not involve the local communities is futile, as only the local communities have the ability to improve the situation by changing their own behaviour. Thus, as conservationists seek a tolerant co-existence between carnivores and humans there can be no movement towards this state without human involvement<sup>3</sup>.

### 2.2 Problems Arising Between Humans and Large Carnivores

Carnivores come into conflict with humans for a number of reasons. People see carnivores as a direct threat to human life, but predation on humans is actually quite rare. The greatest source of human-carnivore conflict is competition for resources, whether for land, man's domestic animals, his crops or for prey species<sup>3</sup>. In addition to these rational reasons for carnivore persecution by humans, it has been suggested that the urge to kill carnivores is in our instinctive repertoire, like hatred for snakes<sup>11</sup>.

**Predation by carnivores on livestock** is the root of deeply ingrained hatred for carnivores throughout the world, with every domestic species from chickens to cattle being affected. A number of factors contribute to this situation. First, thanks to human protection, domestic animals exhibit little effective anti-predator behaviour, making them particularly vulnerable to predators<sup>12</sup>. In addition, livestock compete with wild herbivores for resources and can thus reduce the abundance or alter the distribution or behaviour of wild prey, thus changing the pattern of wild carnivore predation<sup>3</sup>.

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<sup>7</sup> Woodroffe & Ginsberg, 1998

<sup>8</sup> Berkof, 1998a

<sup>9</sup> Sillero-Zubiri & Laurenson, 2001

<sup>10</sup> Barrow *et al.*, 2000

<sup>11</sup> Kruuk, 1976a

<sup>12</sup> Kruuk, 1972a

Although farmers consistently express the most negative attitudes towards large carnivores<sup>13</sup>, large carnivores often constitute a minor problem compared with smaller carnivores such as black-backed jackals (*Canis mesomelas*). Feral dogs (*Canis familiaris*) are also a severe cause of domesticated stock loss but blame is often apportioned to their wild relatives<sup>14</sup>.

**Carnivore-livestock conflict has been exacerbated by changes in husbandry methods.**

In Southern Africa domesticated animals are rarely guarded or herded while grazing and are thus more vulnerable to predators. Furthermore, stockmen have lost the tradition of coexistence with large predators and modern protective legislation is not matched by a positive co-operative attitude<sup>15</sup>.

The ever-increasing **conflict over land** leads to habitat loss and fragmentation resulting in increased contact and problems between people and carnivores.

Carnivores can act as reservoirs of disease for humans, with rabies being the classic case. But attempts made to control rabies have been largely unsuccessful<sup>16</sup>. It should be noted, however, that even where wild carnivores are rabies reservoirs, **domestic dogs still account for 98% of disease transmission events to humans and livestock**<sup>3</sup>.

### **2.3 Human-Wild Dog Conflict**

With strong predatory instincts, large visible pack formations that are highly mobile and killing techniques that are broadly misinterpreted as indiscriminate and cruel, farming communities have persecuted AWD with extreme prejudice for more than 100 years.

Although human-induced persecution remains the most important threats faced by AWD populations, many of the circumstances that bring people into conflict with AWD are poorly known. There are a number of key questions that, when better understood, will provide valuable information to assist with the mitigation of conflict between AWD and humans. This is especially the case for populations that use livestock areas on the borders of protected areas, and for those that persist outside protected areas<sup>3</sup> such as is the case in most of NE Namibia.

Key questions include:

1. How serious are the economic losses caused by AWD predation on livestock?
2. What is the attitude towards AWD in areas AWD use regularly? Does the local attitude reflect the real losses that AWD cause?
3. Can husbandry techniques be modified to mitigate losses to AWD in areas where predation on livestock is serious?

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<sup>13</sup> e.g. Kellert, 1985

<sup>14</sup> Cozza *et al.*, 1996.

<sup>15</sup> Breitenmoser, 1998a

<sup>16</sup> Aubert, 1993



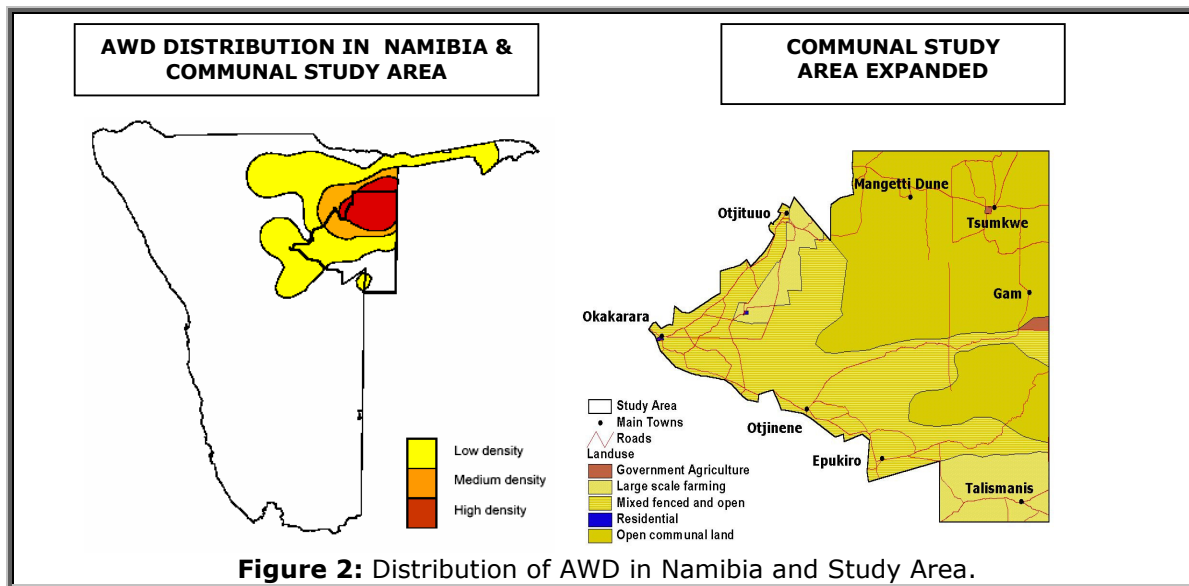
## 3.0 RESEARCH AND BACKGROUND

### 3.1 The Wild Dog Project

The Wild Dog Project (WDP) in the Otjozondjupa and Omaheke regions of Namibia has its origins in the communal cattle and small-stock farming Herero community in eastern Namibia. This area is part of the central Kalahari system, a semi-arid savanna with no perennial surface water. People and their livestock are restricted to the western areas with boreholes and pipelines, and to the few ephemeral drainage lines that flow eastwards towards the Okavango system in Botswana. Large areas in the east are uninhabited or with very low population density (Figure 5). This area supports what is thought to be the last remaining populations of AWD in Namibia (Figure 2).

The WDP aims to link social and ecological approaches to conservation, working closely with people, looking at ways of reducing conflict, trying to find ways of optimising benefits from AWD through tourism, while understanding their ecology and movement patterns within the zone of actual and potential conflict.

This project has been strongly requested by communal communities in the east of Namibia. Human-wild dog conflict is amongst their top priority issues. Project support is endorsed by the emerging conservancies in Otjozondjupa and will be conducted in close collaboration with, in support of, and supported by the national community base natural resource management (CBNRM) programme. The communal conservancies don't only see AWD as a problem, but an opportunity to improve people's livelihoods. AWD have been listed as both an asset and a threat during recent consultations with the emerging communal conservancies in Otjozondjupa and the Namibian Development Trust, an NGO working in the area to support CBNRM development.



### **3.2 Project Objectives**

- To understand the driving mechanisms behind human-AWD conflict;
- Develop an education and awareness programme to reduce human-AWD conflict;
- To collect baseline data on other factors affecting AWD conservation;
- Develop incentive-driven conservation programmes for AWD in Namibia;
- Investigate options for practical management strategies to mitigate other conservation threats to AWD in Namibia.

### **3.3 Wider Implications**

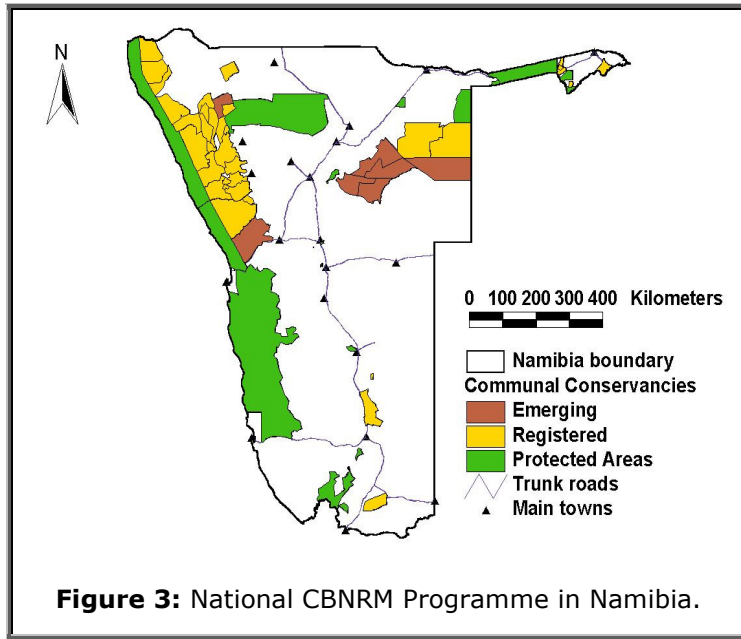
The central study area is also part of a national Community Based Natural Resource Management CBNRM programme. This programme, through national policy and recent legislative reform, works to create incentives for communal farmers to conserve, manage and benefit from wildlife and tourism.

The programme has three broad objectives:

- To rebuild and sustainably manage wildlife and other indigenous biodiversity;
- Generate income, diversify and improved livelihoods for communal farmers;
- Empower and build capacity for management and development skills, to help poor rural people break out of rural poverty and pro-actively determine their own futures.

The programme is implemented through a "Conservancy" approach. This requires people in an area to come together and actively indicate their interest in forming a conservancy, to register their members, to elect a representative committee, to determine the boundaries of their area, and to draft a conservancy constitution. Once all this is done to the satisfaction of the MET, the conservancy is registered and notification is published in the Government Gazette, setting out the details of the conservancy and its boundary co-ordinates. Conservancies are typically between 200,000 - 700,000 hectares in size, each with between 200 and 2,000 households.

To date 31 rural communities have gained legal status as Communal Area Conservancies. These registered conservancies incorporate nearly 100,000, managing an area of nearly 8m ha. A further 50 communities are in the process of establishing conservancies, potentially including another 10m ha of land and involving a further 100,000 rural people. The programme is active in 11 national regions.



Part of the CBNRM programme involves extensive and ongoing consultations with community members, traditional authorities (chiefs and headmen), elected Councilors, government staff, etc. Arising from these consultations in the Otjozondjupa region, it became clear that one of the main problems being faced by communal farmers was that of predation of their stock by large predators. Anecdotal reports suggested the most significant predator by far in this area was the AWD.

## 4.0 COMMUNAL FARM SURVEY

### 4.1 Introduction

There is considerable variation across demographic and socio-economic groups in attitudes towards wild animals, the majority of people endorse widely ecocentric values<sup>17</sup>. Farmers, who grew up in a society based around livestock production, the elderly, people with less education, and rural inhabitants often express negative attitudes towards carnivores, while younger, better educated, and urban people often express more positive attitudes towards carnivores<sup>18</sup>. Much of the controversy surrounding coexistence of farming communities and carnivores stems from a perceived impact on their livestock, and hence livelihoods. Not surprisingly, the negative attitudes towards large carnivores are most typically found in these groups whose economic interests are threatened by such animals<sup>19</sup>. It was on this premise that the emerging communal conservancies of Okakarara District requested assistance with what they described as 'a AWD problem'. Little reliable data was available on the effects of AWD on livestock with much of the evidence being based on anecdotal tales of mass slaughter and rampaging packs of AWD, killing indiscriminately.

With the development of the National CBNRM programme in the eastern communal lands it was decided that the four emerging communal conservancies in the area (Ozonahi, Okamatapati, Okondjatu and Otjituuu) would provide a good basis for conducting both qualitative and quantitative surveys on human-wild dog conflict. The resulting data will be used as a basis for the development of an environmental education programme assisting in the mitigation of human-wild dog conflict and more broadly, assisting with human-wildlife conflict and the sustainable use of carnivores in Namibia.

The central hypothesis in this survey was that depredation by AWD on livestock was minimal in comparison to other predators and that the impact of predators in general was low in relation to other stock loss causes. We also investigated the attitudes of farmers towards AWD and other predators, while calculating the difference in perceived impact on income from actual impact across a range of livestock loss causes. Data on livestock husbandry techniques was also collected and analysed.

### 4.2 Study Area<sup>20</sup>

The four emerging communal conservancy areas in Okakarara District (total area 18,951km<sup>2</sup>) lie at the western edge of the Kalahari basin. Much of the land is covered with windblown sand and is generally flat, varying between 1300 and 1500m above sea level.

The region contains no permanent rivers. Dry omuramba drainage lines carry water for very short periods after heavy rains and almost all water for people and livestock comes from underground supplies, pumped from boreholes or piped in from groundwater reserves. Rains fall in summer, especially in the early months of the year and vary from 350-450mm annually (Figure 4). There is significant variation in annual rainfall from year to year with much water lost to evaporation and many showers too light to benefit plant growth.

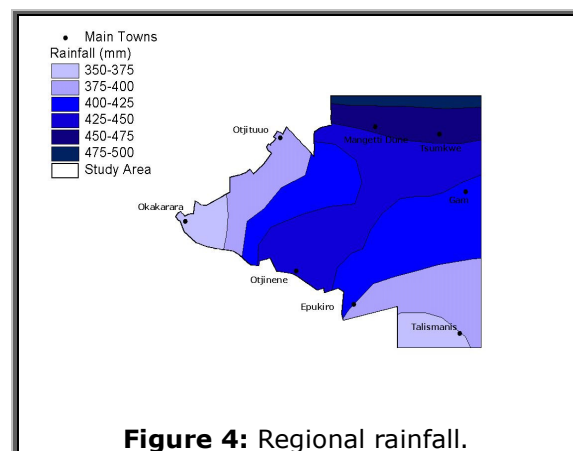


Figure 4: Regional rainfall.

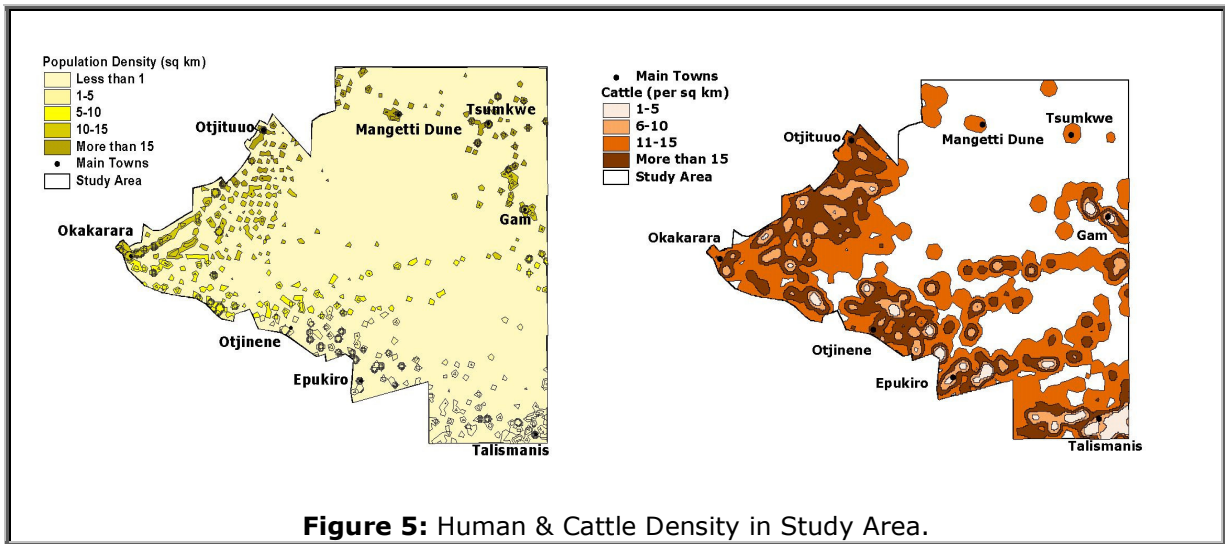
<sup>17</sup> Kellert, 1996

<sup>18</sup> Kellert, 1991, Bjerke *et al*, 1998.

<sup>19</sup> Bjerke & Kaltenborn, 1999.

<sup>20</sup> Mendleson & Obeid, 2002

Savanna woodland is the dominant vegetation type but bush encroachment and associated desertification from overgrazing is prominent in many established livestock farming areas to the south and west. Land use and the regions economy are dominated by livestock farming, especially cattle and small stock ranching. Many very large areas are fenced as exclusive farms with the majority of the population struggling to survive in the corridors between these areas. Household wealth varies significantly and many of the countries poorest people live in this area. Crop farming is seldom productive. The areas are occupied by c.20,000 people, represented by the majority Herero and minority San communities. Much of the population is centred around the piped water network and within 5 km of the gravel roads linking the administrative centres. These areas also correspond approximately with highest livestock density (Figure 5). Communities are divided into 'villages' containing typically between 1 and 20 households, each encompassing core and extended family members.



**Figure 5:** Human & Cattle Density in Study Area.

Historically (circa pre 1880) the majority Herero people were semi-nomadic pastoralists, living in large family units in loosely bound communities. Herero people farmed cattle for status and wealth and small stock for the supply of meat. Localised movements allowed people and their livestock to follow rains and grazing pastures. Formalised education was not considered important and the young assisted with farming activities and closely shepherded livestock to and from grazing areas<sup>20</sup>. The San communities roamed across the region for many thousands of years prior to the arrival of Europeans and other African tribal group, living a largely hunter-gatherer existence.

The recent history of Herero pastoralism starts with the German colonialism of Namibia that led to dispossession of well watered grazing lands and subsequent social, economic and ecological marginalisation of the Herero to the semi-desert of the Kalahari in eastern Namibia where the farming community had to adjust to a harsh environment. The availability of limited water supplies concentrated communities in smaller areas, thus increasing localised overgrazing, land degradation and desertification. The dominant knowledge associated with local communities<sup>21</sup> no longer held. The most productive labour was 'appropriated' for white farms and public works projects<sup>22</sup>. Husbandry methods in this hostile environment were based on trial and error. Under the South African apartheid regime subsequent labour laws and limited development in Hereroland did little to assist with effective rangeland management and improved livestock husbandry methods<sup>23</sup>. With the advent of a modern education system the existing shepherding 'workforce' left for schooling. The minority San are a largely marginalised people in Okakarara District, with few locally recognised land rights. Most have been absorbed into the farming community as cheap labour, many paid well below the minimum wage as directed by central Government.

<sup>21</sup> Murombedzi, 1998

<sup>22</sup> Gewald, 1999

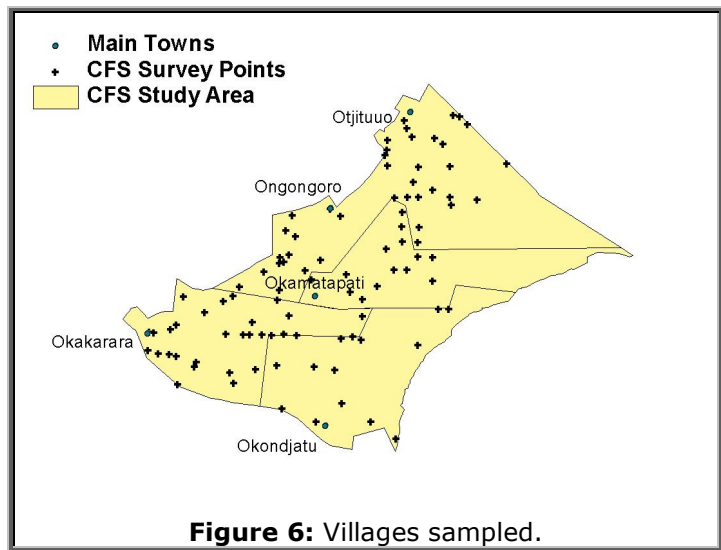
<sup>23</sup> Kossler, 1997.

### 4.3 Methodology

Data were collected through a combination of qualitative and quantitative research approaches utilising current and historical records held by the Ministry of Agriculture, Water and Rural Development, Directorate of Veterinary Services and local Agricultural Extension Officers along with data from a questionnaire survey of communal farmers in Okakarara District.

A sample of 99 villages was randomly selected from the total number of 270 settlements identified in Okakarara District. Fifty-five of the interviews were carried out by WDP staff and forty-four by staff from Cheetah Conservation Fund, the partner organisation in this survey.

Following a pilot stage in which sample questionnaires were field tested for practical and theoretical considerations, one household was randomly selected from each sampled village and the head of the household asked if he/she would like to participate in a communal farm survey researching farming and livestock management, along with issues relating to wildlife and nature conservation. The survey included both closed and open-ended questions that allowed for discussion on and around a topic of particular interest to the interviewee. Interviews were conducted in OtjiHerero where necessary with the assistance of a trusted translator and took between 25-45 minutes to conduct.

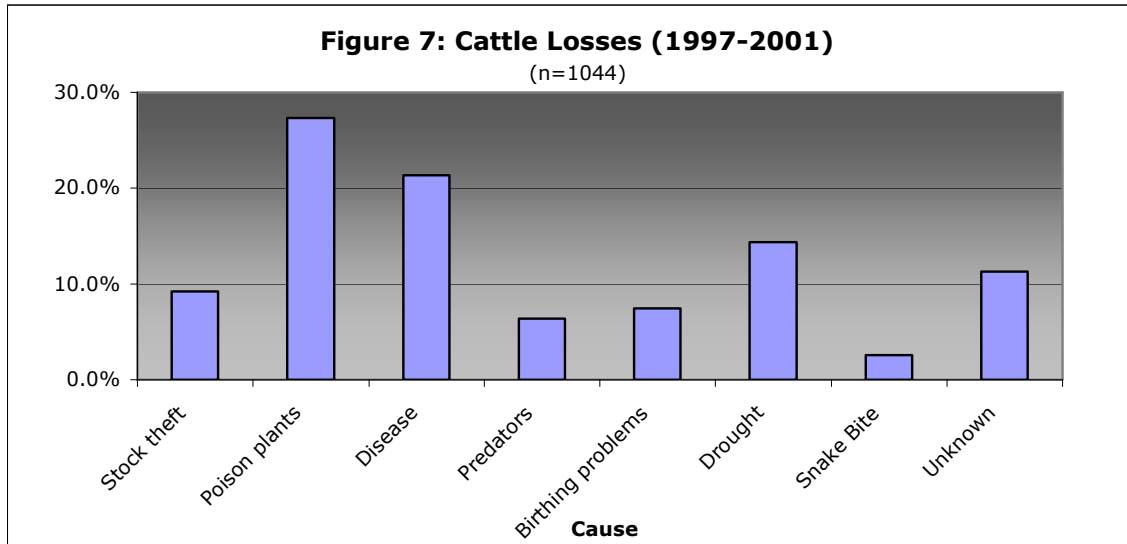


Certificates, with contact details in English and OtjiHerero, were handed out following the conclusion of the interview to acknowledge appreciation for taking part in the survey and to promote the WDP and Cheetah Conservation Fund.

## 4.4 Results

### 4.4.1 Cattle Losses 1997-2001:

Data collected from the Directorate of Veterinary Services (DVS) provides an indication of the impact of cattle loss over a four year period prior to this survey (Figure 7). DVS did not record losses to small stock.

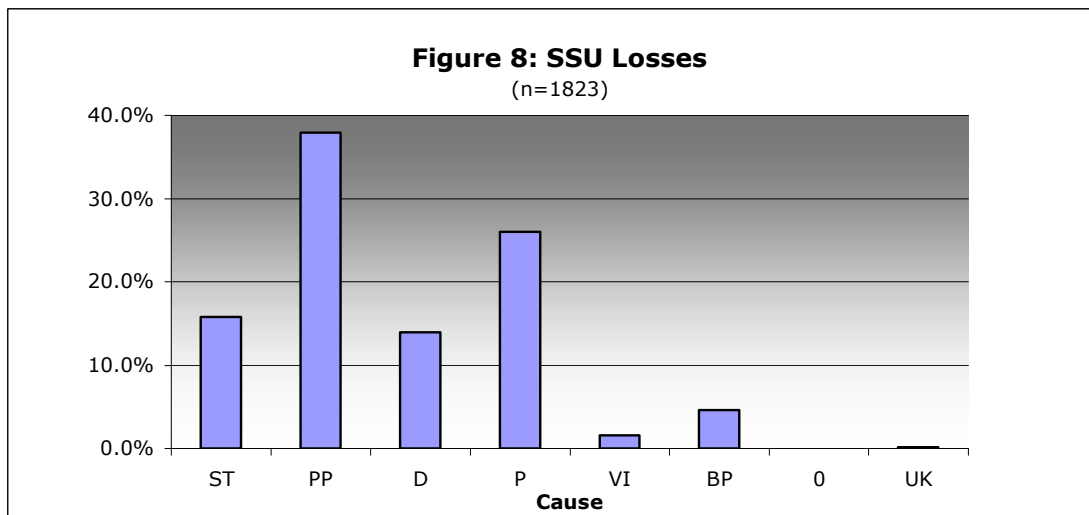


### 4.4.2 Livestock Losses 2002-3:

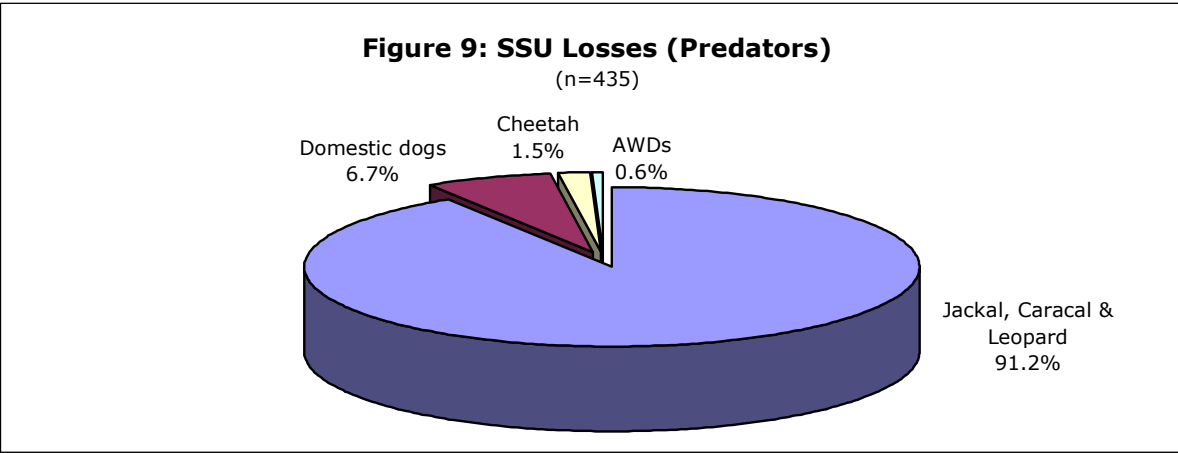
In total 84 respondents provided information on their livestock losses in a 12 month period to July 2003, summarised below in Figures 8-11 and Table 1 (overleaf).

#### Small Stock Units (SSU):

For SSU the major cause of loss is poisonous plants (38%) followed by predators (26%). The major predators of small stock are Black-backed Jackal and Caracal (*Felis caracal*). For every SSU lost to AWD over 250 die by ingestion of poisonous plants and 11 are killed by domestic dogs.

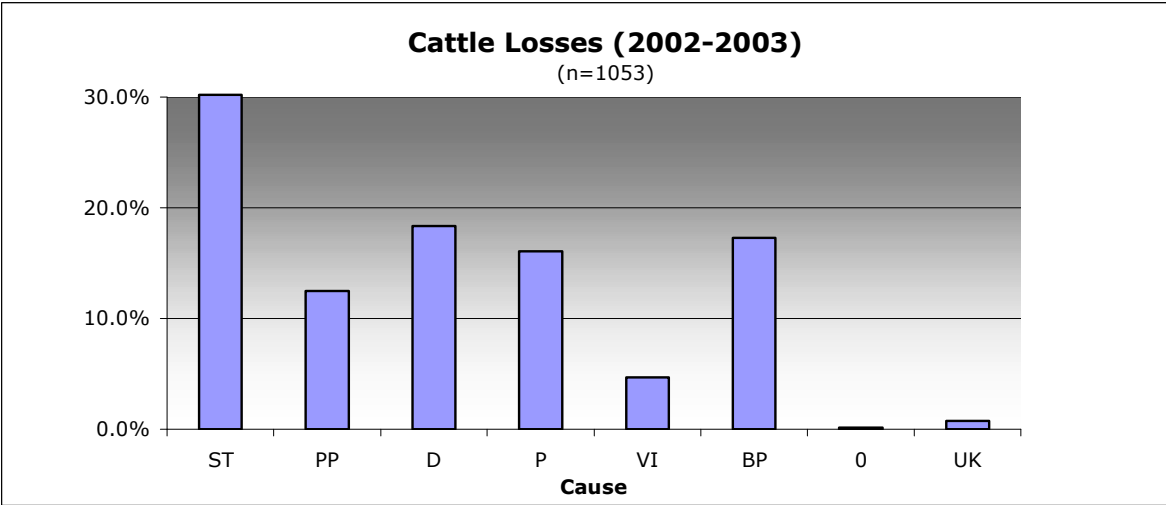


[Key: ST=Stock Theft, PP=Poisonous Plants, D=Disease, P=Predators, VI=Veld Injuries, BP=Birthing Problems, O=Other, UK=Unknown]



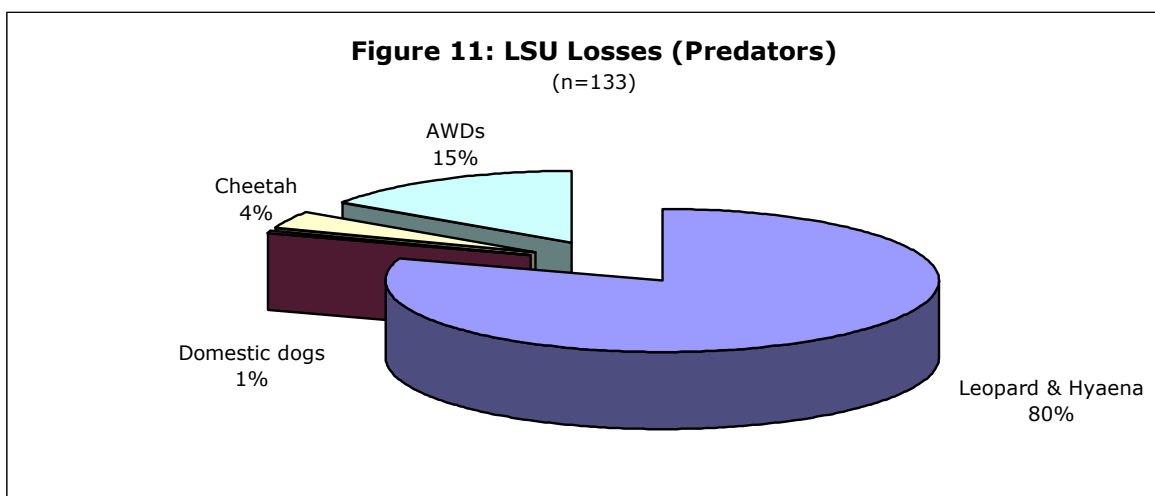
**Large Stock Units (LSU):**

The major causes of LSU loss are stock theft (30%) followed by disease (18%). Predators accounted for 16% of losses from which AWD account for approximately 1 in every 6 of predator kills. Leopard (*Panthera pardus*) and hyaena (*Crocuta crocuta / Hyaena brunnea*) account for the largest percentage of LSU predation. If we compare the impact of stock theft with that of AWD we can calculate that for every LSU killed by AWD, 30 are stolen.



[Key: ST=Stock Theft, PP=Poisonous Plants, D=Disease, P=Predators, VI=Veld Injuries, BP=Birthing Problems, O=Other, UK=Unknown]





It is interesting to note that for the whole of Okakarara District over a 4 year period the DVS recorded losses of 1044 animals, whilst in a 12 month period our survey recorded 1053 cattle losses when sampling approximately one in every 20 homesteads.

**Table 1: Livestock Numbers & Losses at Homestead Level.**

	<b>Total Livestock Numbers</b>	<b>Average Herd Size/ Homestead</b>	<b>Total Losses</b>	<b>Average Losses / Homestead</b>	<b>Average lost to Predators</b>	<b>Average losses to AWD</b>
<b>SSU</b>	5757	68.5	1823	21.7	5.6	0.03
<b>LSU</b>	6842	81.5	1053	12.5	2.0	0.3

#### 4.2.3 Trends in LSU Losses:

While 'Drought' and 'Snake Bite' was not included in our survey as causes of livestock loss we can see that there has been some considerable changes in causes of loss for LSU. The most significant increase is stock theft, with a jump of over 20% (Table 2).

**Table 2: Changes in Cattle Losses**

<b>LOSS CAUSE</b>	<b>IMPACT: 1997-2001 (%)</b>	<b>IMPACT: 2002-3 (%)</b>	<b>CHANGE (%)</b>
STOCK THEFT	9.2	30.2	+21
POISONOUS PLANTS	27.3	12.5	-14.8
DISEASE	21.4	18.4	-3
PREDATORS	6.4	16.1	+9.7
VELD INJURIES	0	4.7	+4.7
BIRTHING PROBLEMS	7.5	17.3	+9.8

#### 4.2.4 Actual V Perceived Impact on Livestock-Based Incomes:

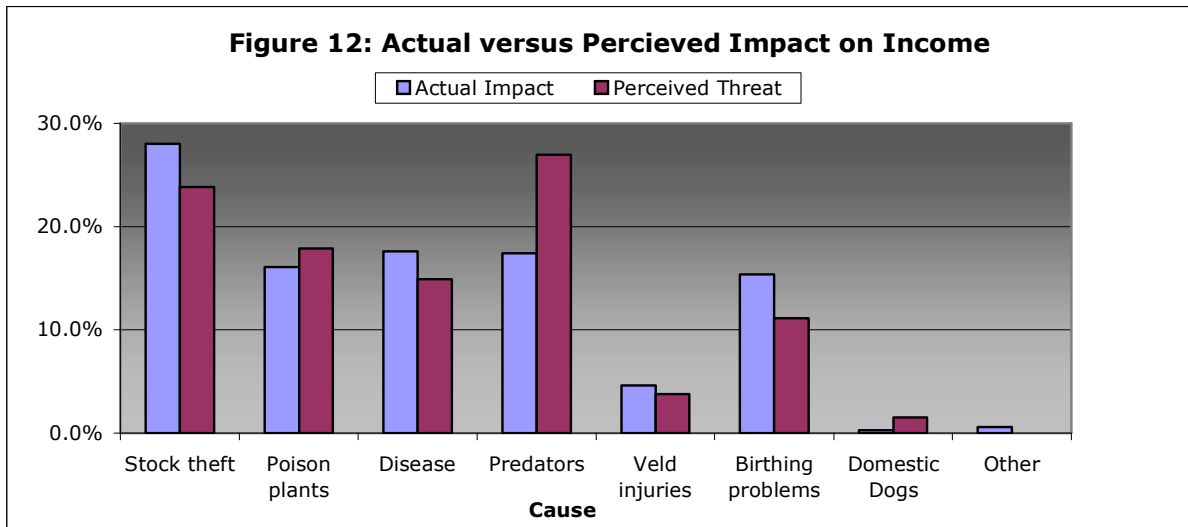
Livestock sales dominate household income in our study area (65% of respondents stated livestock sales to be their main income source). While this figure differs from other research<sup>24</sup> suggesting a figure of 36%, it is nevertheless clear that livestock losses will impact significantly on incomes.

<sup>24</sup> Mendleson & Obeid, 2002.

With 39% of respondents stating they kept no written records of livestock sales, births and deaths, vaccinations or feed, and the remaining 61% claiming to keep some or all of the above records, it is clear that there will be a discrepancy between perceived and actual threats to farmers whose main income is derived from livestock sales.

Respondants were asked to estimate the impact of each livestock loss cause on their income. The data was then compared to the value of actual losses (at current market price of 1 SSU valued at approximately 10% of a LSU).

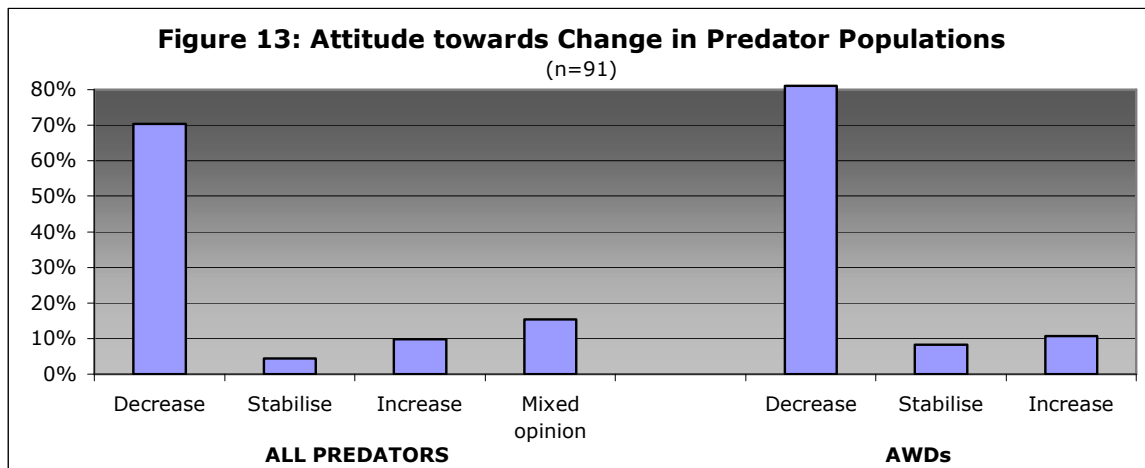
Data from the chart shows a close association between many of the actual and perceived threats with 7 from 8 causes being within 5%. The average variation is just 3.2%. The notable exception is that of predators with approximately triple the average variation between actual impact and perceived threat at 9.6%.



#### 4.2.5 Attitudes towards predators

Interviewees were asked if they wanted to see the population of group of locally present predators increase, decrease or remain the same. They were then asked the same question for AWDs.

While 11% more respondents (81%) wanted AWD populations to decrease than that for a suite of other local predators, it is interesting to note that more respondents wanted AWD populations to stabilise or increase (14.3% versus 19%).



Notable quotes included:

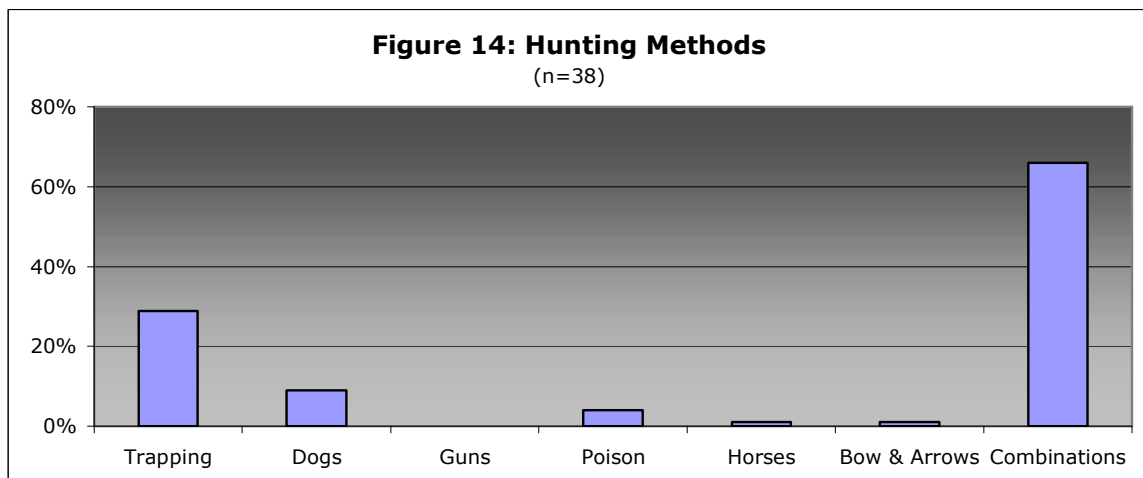
- *"..predators are part of the natural environment and meant to be in the veld, no one has the right to remove them."*
- *" In a changing world predators can benefit the community....they attract tourists."*
- *"..we want our kids to see them as they (predators) feature in traditional stories"*
- *"It's hard to differentiate between theft and predation....hard to know the culprit"*
- *"More predators means more predation on livestock, we don't want them."*
- *"Predators can increase if their benefits outweigh the costs of livestock losses."*
- *"They kill our only source of income and are a management problem, we cannot farm with them."*
- *"Shepherding reduces predation."*

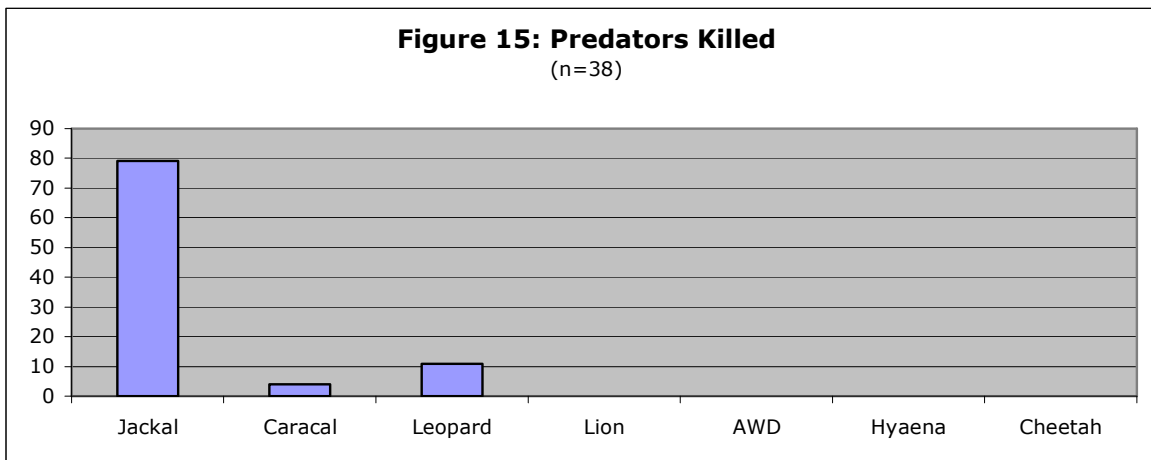
#### **4.2.6 Human-Induced Depredation of Predators:**

A total of 38 interviewees acknowledged that they had taken part in some form of hunting of predators during a 12 month duration to the start of the survey. In all cases the main reason quoted for such activities was a reaction to, or prevention of, the perceived or genuine impact of predators on livestock and hence income and livelihoods.

##### *Hunting:*

A broad array of methods were adopted for different species. Poison was effective at killing Jackal (although data on kills of non-target species is unavailable) as was trapping. Dogs were also used to hunt Jackal but more commonly for Caracal and Leopard in conjunction with traditional 'ongungu' or hunting sticks. Leopard were also hunted on horseback in conjunction with dogs and/or guns, ongungu or on one occasion bows and arrows.





**Successful Kills:**

Jackal represent the vast majority of predator kills (79/94) in the past 12 months. It should be noted that responses are very likely to be conservative and accurate figures will be very hard to obtain.

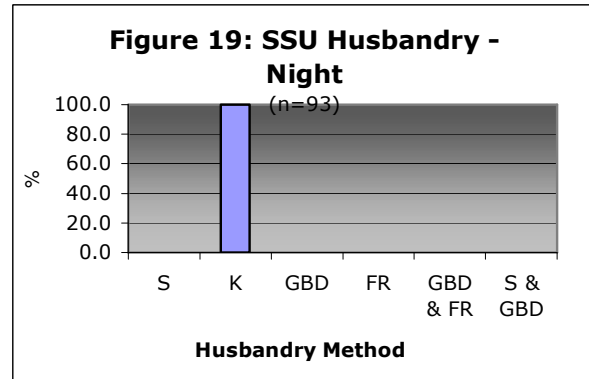
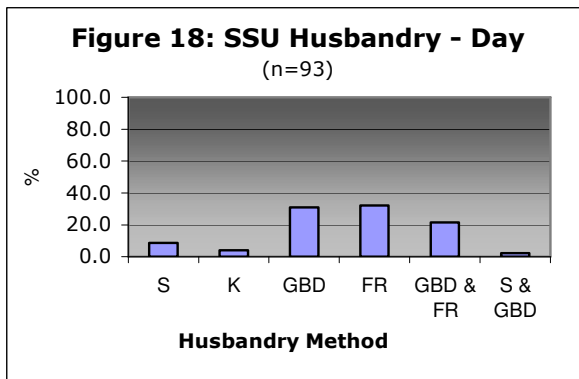
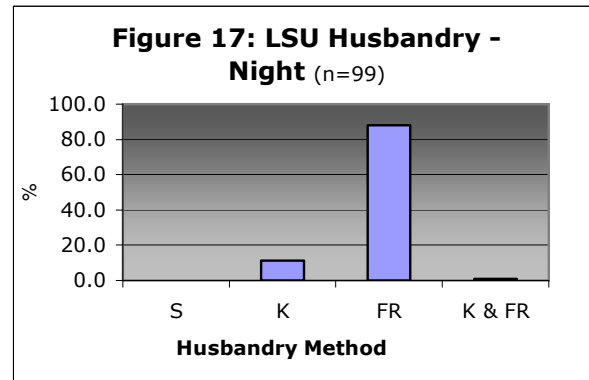
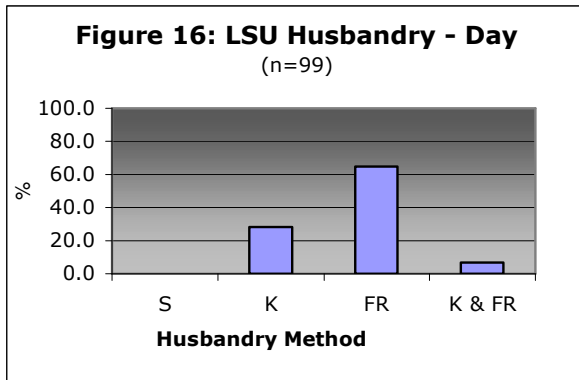
**AWD:**

While many farmers were quoted as having tried to kill AWD we found no evidence in this survey that any attempts had been successful. In general the farmers would chase AWD away from livestock grazing areas on horseback but be forced to pull up the chase when approaching fence lines that the AWD ducked under. During general conversations in the community it was noted that there had been successful killings of AWD but that these cases had occurred when the dogs were denning. Burning logs had been forced down the den holes, killing any animals remaining underground. On one occasion a farmer had run over four AWD in his car when finding a pack resting by the road.

#### 4.6.7 Livestock Husbandry:

We can see from the data presented below (Figures 16-19) that large stock are not shepherding, either during day or night and roam freely while grazing. Kraaling does occur, and is seen as a way of managing animals while milking and to give them any additional attention they may need such as vaccinations and deworming.

While all small stock are kraaled at night (Figure 18) there is considerable variation in husbandry techniques during the day with just over half of the herds either roaming the veld freely or in the company of guarding dogs (Figure 19). Only one in ten homesteads provide any shepherding for their small stock herds during daylight.

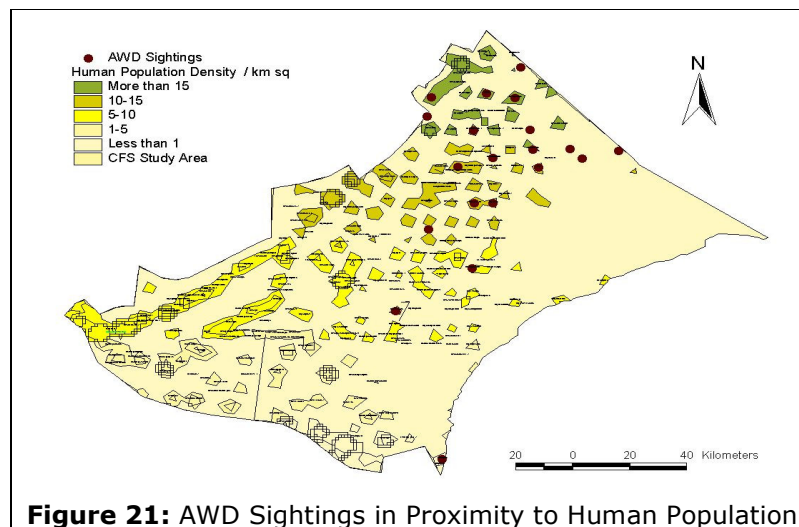
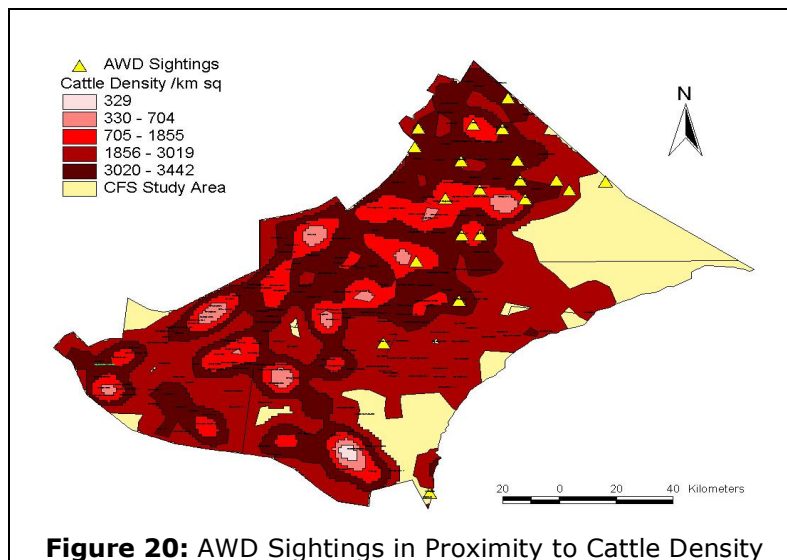


**Key:** S = Shepherded, K = Kraaled, FR = Free Roaming, GBD = Guarded by Dogs.

#### 4.6.8 AWD Sightings:

Although the survey sites only revealed 21 AWD sightings in the past year, many more were reported to MET Okakarara (data available in Lines, 2003a).

While at this stage it is very hard to estimate how many individual AWD or packs these sightings represent. Speculation suggests one pack between 15-20 individuals moving in the central eastern regions of Otjituuo and 2-3 other packs between 3-8 individuals moving in southern areas of Otjituuo and northern central Okamatapati. A further pack of approximately 20 AWDs are moving in the central/southern region of Okamatapati and south into Okondjatu (Figure 20). Further dispersing groups of 1-2 individuals have been observed in a broad area across NE Otjituuo, bordering Tsumkwe District and the commercial farming areas along with more central and southern areas. Considerable movement between communal and freehold farming areas takes place.



Although there is a degree of common sense to the suggestion that AWD sightings would coincide with areas habituated by people it is somewhat surprising, based on previous literature,<sup>25</sup> to see that most sightings coincide to areas of higher human population density (>15 people/km<sup>2</sup>) that also coincides with areas of highest cattle density. Further research is required to understand this phenomena further.

<sup>25</sup> eg Woodroffe, 2000.

## 6.0 CONCLUSION

### *Husbandry and Stock Losses:*

It has been shown that certain methods of livestock husbandry adopted in rural Africa have a very significant effect on predation rates by large carnivores, even in areas with high densities of lion, leopard, cheetah, hyaena and AWD<sup>26</sup>. These include the effective kraaling of livestock at night, the presence of guarding/herding dogs with the livestock and the presence of herders with livestock while grazing. In general where livestock is kept close to human habitation we observe reduced losses to predators. It has been generally suggested that such intensive husbandry is largely responsible for the low levels of depredation on livestock by large carnivores on the livestock of semi-nomadic pastoralist Maasai communities in E. Africa.

While a more intensive approach to livestock husbandry has proved to reduce losses to predators, other associated benefits are also obtained, including more rapid detection of disease outbreaks, injured animals, birthing problems, bulling effectiveness, poisonous plants in grazing areas and, very importantly, reduced stock theft.

Herding of cattle requires the employment of labour, sometimes from outside the local area, and hence increased labour costs. The increase in production costs, while the benefits appear uncertain, may be unacceptable to pastoralists<sup>27</sup> which goes some way to explaining why the tradition of shepherding livestock has faded in recent years. It is a well worn argument that, in common pool or open access systems where rangeland productivity is generally low, for livestock ranching to be profitable, production costs must be minimised. That means letting the livestock range freely and unattended in the veld. I argue that it is precisely this method of husbandry that results in increased livestock losses and therefore reduced income from sales and the desire to overstock areas – a somewhat self-perpetuating vicious cycle of poor veld and stock management. When livestock is 'lost' in the veld the cause is rarely identified with any certainty. If the cause of stock loss is correctly determined, you can make the appropriate management decisions best suited to the specific problem, saving time, money and decreasing production costs.

In times of drought, and in situations where overstocking occurs, many animals in poor health die, get scavenged on and then predators are blamed for their demise.

Wherever stock is allowed to roam freely and predators exist in these areas there is a common response to blame predators for a disproportionate level of predation – essentially making the predator a scapegoat for poor management and a wide variety of losses. This is particularly the case for highly visible predators such as AWD that roam over vast areas in packs and leave large amounts of spoor in the veld. Repeatedly ranchers responded that they or their 'trusted' staff hadn't actually seen AWD attacking their stock, but had observed their spoor and come to the conclusion that AWD were responsible. It is not unreasonable to make the assumption that in some cases generally poorly paid 'trusted' staff were perhaps poaching stock and blaming AWD or other predators as shown in other studies<sup>28</sup>.

### *Conflict with Predators:*

It is largely this commonly held misconception that predators are responsible for a disproportionate level of stock loss that results in the negative attitudes of farmers towards a sustainable coexistence, their general hostility towards predators, and their attempts to remove the 'threat' from farming areas.

Control mechanisms for larger predators have resulted in the practical extinction of lion from the study area. Other large carnivores, with the exception of leopard can be considered scarce – due in part to low densities of suitable natural prey species (wild game) and relatively high densities of people. The reduction of larger predators in the area has caused an imbalance in the ecosystem and allowed smaller predators such as Jackal to increase in population dramatically, with a subsequent rise in small stock losses. Substantial attempts to control of

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<sup>26</sup> Ogada, M.O, 2001.

<sup>27</sup> Kakuja-Matundu, 2002.

<sup>28</sup> Rasmussen, 1999.

this population, as demonstrated by human-induced depredation, has been largely ineffective as Jackal respond to human depredation by breeding more frequently and having larger litters (ref.).

*Human-Wild Dog Conflict:*

While data indicates that AWD are only responsible for ~0.7% of small stock losses to predators (< 0.2% of all small stock losses) and 15% of large stock losses to predators (<2.5% of all large stock losses) they suffer from a major public relations crisis indicated by an 81% desire in the farming community to see an already very low population density reduced further or eliminated completely. It is to the benefit of AWD that much of the farming areas are cattle fenced and local communities lack the resources (communications, guns and vehicles) to effectively hunt down packs moving through their areas.

The areas where wild dogs are seen most commonly represent the first significant point of contact with humans because this is the interface area between unpopulated (by humans) habitat and higher human density.



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## APPENDICES

### Appendix 1: Communal Farm Survey Questionnaire

Respondent No:..... Date:.....

Conservancy name:..... Conservancy member:.....

Farm name:..... Ave. no. of people on farm:.....

No. of homesteads on farm:..... Ave. no. of people in homestead:.....

Owner / Farm Manager / Other (specify)..... Gender:.....

What other sources of income does the homestead have:.....

Lat (deg, dec deg):..... Long (deg, dec deg):.....

#### Section 1: Livestock Management Practices.

		Cattle	Sheep	Goats	Horses	Donkeys
1.1	What are your average livestock numbers?					
1.1.1	Average numbers sold last year?					
1.2.1	What husbandry methods do you use in the day? Shepherded					
1.2.2	Wire kraals					
1.2.3	Thorn kraals					
1.2.4	Stick kraals					
1.2.5	Guarded by dogs					
1.2.6	Free roaming					
1.2.7	Don't know					
1.2.8	No answer					
1.3.1	What husbandry methods do you use at night? Shepherded					
1.3.2	Wire kraals					
1.3.3	Thorn kraals					
1.3.4	Stick kraals					
1.3.5	Guarded by dogs					
1.3.6	Free roaming					
1.3.7	Don't know					
1.3.8	No answer					
1.4	What grazing management to you use?					
1.5.1	How many times a year do you deworm?					
1.5.2	How many times a year do you dip livestock?					
1.5.3	How many times a year do you vaccinate?					
1.6.1	Do you report disease?					
1.6.2	If yes, what diseases?					
1.6.3	Who do report disease to?					
1.7	What records do you keep?					

1.6.2 Do you use the FAN meat blue file? Y / N

1.6.3 How useful do you find the FAN meat management scheme?.....

1.6.4 How confident are you with your farm management?.....

1.6.5 Additional comments:.....

**Section 2: Domesticated dogs.**

- 2.1 How many dogs do you keep on your farm? .....
- 2.2 Do you provide additional food for the dogs? Y / N
- 2.3 Are your dogs vaccinated? Y / N

		Rabies	Distemper	Other
2.3.1	What are they vaccinated for?			
2.3.2	How often are they vaccinated?			
2.3.3	Who vaccinates the dogs?			

- 2.4 Do you have dogs with your livestock? Y / N

If Yes:		Cattle	Sheep	Goats
2.4.1	Which livestock?			
2.4.2	How many dogs?			
2.4.3	What sizes are the dogs? s,m,l			
2.4.4	Does the dog herd the livestock? Y/N			
2.4.5	Does it stay permanently with the livestock? Y/N			

Additional comments:.....  
 .....

**Section 3: Livestock losses.**

		Stock theft	Poison plants	Disease	Predators	Domestic dogs	Veld injuries	Calving problems
3.1	What livestock loss causes do you experience on your farm?							
3.2	Rank them from highest to lowest threat to livestock (1-7)							
3.3.1	Est. 12 month losses to:							
3.3.2	Cattle							
3.3.3	Calves							
3.3.4	Sheep							
3.3.5	Goats							
3.3.6	Horses							
	Donkeys							

Additional comments:.....  
 .....

**Section 4: Wildlife (non-predators)**

		Kudu	Oryx	Eland	Steenbok	Duiker	Warthog	Vulture	Ostrich
4.1	What wildlife do you see on your farm?								
4.2	How often are they seen?*								
4.3	What species are hunted on your farm?								
4.4	How many were killed last year?								
4.5	What methods are used?*								
4.6	Have populations increased, decreased or stabilised in the past 2 yrs?*								
4.7	Would you like to see populations increase, decrease or remain stable?*								

[Poisons used .....

Additional comments.....  
 .....

**Section 5: Predators - general**

		Cheetah	Leopard	Lion	Caracal	Wild dog	Jackal	Spotted Hyaena	Brown Hyaena
5.1	What predators have you SEEN on your farm in the past 12 months?								
5.2	How often do you see them?								
5.3	Rank them from highest threat to livestock (1) to lowest threat (8)								
5.4	Which livestock do they kill								
5.5	What species are hunted on your farm?								
5.6	How many were killed last year?								
5.7	What methods are used?								
5.8	Have populations increased, decreased or stabilised in the past 2 years?								
5.9	Would you like to see populations increase, decrease or remain stable?								

[Poisons used .....

What are the circumstances surrounding stock loss to:

- 5.10.1 Cheetah: .....
- 5.10.2 Leopard: .....
- 5.10.3 Lion: .....
- 5.10.4 Caracal: .....
- 5.10.5 Wild dog: .....
- 5.10.6 Jackal: .....
- 5.10.7 Spotted Hyaena: .....
- 5.10.8 Brown Hyaena: .....

Additional comments.....  
 .....

**Section 6: Cheetah** (to be filled out if seen on farm in past 12 months).

Date	No cheetah	No. Adults	No. cubs

Additional comments.....  
 .....  
 .....  
 .....  
 .....

**Section 7: Wild dogs** (to be filled out if seen on farm in past 12 months).

Date	No. wild dogs	No. Adults	No. cubs

Additional comments.....  
 .....  
 .....  
 .....  
 .....

## **Appendix 2: Surveyed Villages**

<b>ID</b>	<b>Settlement</b>	<b>Latitude</b>	<b>Longitude</b>	<b>ID</b>	<b>Settlement</b>	<b>Latitude</b>	<b>Longitude</b>
4	Braamfeld	18.63485	-20.13297	122	Okovimboro	17.45705	-20.65814
7	Eakarombe	17.96060	-20.32398	124	Okozombuka	18.29450	-20.08539
9	Ehungiro	18.53405	-21.03602	125	Okozonduzu	18.04038	-20.90767
12	Ekuenje pos 2	18.42598	-20.96478	128	Omakaa	17.70218	-20.49622
18	Freedom square	18.88747	-20.01615	130	Omapumba	18.17782	-20.72773
22	Hollywood	18.04710	-20.58972	131	Omarindi	18.57155	-19.67736
23	Homeland	18.76197	-20.48295	137	Omaundjiro	18.52882	-20.00728
26	Matutura	19.01377	-19.86197	144	Ombujombande	18.29730	-20.60925
31	Ohamuheke	18.01658	-20.72472	145	Okuapa	18.01455	-20.47573
32	Ohorongoombaranga	18.10355	-20.59593	146	Ombujomenje	17.91052	-20.53773
33	Ojikuvare	18.81053	-19.66084	149	Ombujovakuru	17.57970	-20.68430
36	Okaheke	18.06963	-20.25160	151	Omingondo	17.82692	-20.42705
37	Okahitua	17.66613	-20.71055	152	Omirunga	18.49552	-19.80353
38	Okahitwa	17.66000	-20.73000	155	Omungondouvineja	18.49185	-20.22625
40	Okahuakoupiu	18.52667	-20.31582	157	Omungondo-uovineja	18.49185	-20.22625
41	Okahumba	18.48703	-19.82639	158	Omitiomire	18.56517	-20.63432
44	Okakarara	17.46174	-20.58148	162	Omupanda	17.50135	-20.67317
46	Okamangongua	18.26698	-20.74365	164	Omutumbondundu	18.69435	-20.26197
47	Okamatako	18.38165	-20.61400	165	Ondekeremba	18.62921	-20.19745
49	Okamboora 1	18.09787	-20.17363	168	Onderombua	18.45225	-20.38522
50	Okamboora 2	18.05572	-20.14888	170	Ondjamo	18.74722	-19.94305
53	Okamburaso	18.38890	-20.44228	172	Ondjombojomungondo	18.58305	-20.00488
54	Okamteteue	17.81343	-20.75472	173	Ondjombojotjitu	18.84438	-19.69364
55	Okamututjindo	18.02657	-20.40115	176	Ondombapa	18.62783	-20.26042
63	Okapandaroma	18.56133	-20.06850	177	Onduzukorumongo	18.58072	-20.31660
65	Okaperongo	18.69367	-20.36293	178	Ongombabapa	18.78159	-19.65479
66	Okarakanua no 2	17.89868	-20.59197	180	Ongongoro	18.24805	-20.05425
67	Okarindi	18.34667	-20.59983	182	Ontjinakui	18.13890	-20.31813
68	Okarindi kondjamo	17.61255	-20.43011	185	Orukango 2	18.76957	-19.87427
69	Okarindindjombo	17.92357	-20.74072	187	Orukango	18.60237	-19.74885
71	Okarundu	17.78582	-20.44890	188	Orukangoromungondo	18.60982	-19.94115
75	Okaruikondera	18.77397	-20.03797	192	Orutjiva	18.03107	-20.26190
76	Okarumatera	17.87152	-20.59115	194	Otjase	17.79480	-20.58927
77	Okarupuka	17.85507	-20.38703	196	Otjekongo	18.73691	-19.77912
80	Okatamba	17.95235	-20.59295	211	Otjitemunua	18.71947	-20.48397
82	Okatembakotjikango	17.99441	-20.59584	217	Otjiurutjokatjove	18.63308	-20.00490
86	Okatjiparanga	18.58033	-19.71020	221	Otjiviaketambo	18.76197	-20.48295
87	Okatjombe	17.58474	-20.80497	226	Otjondundu	18.69288	-19.97387
88	Okatjongeama	18.62983	-20.63562	229	Otjoruhari	18.33620	-20.41033
92	Okatuhoro 1	18.31952	-20.33528	235	Otjozonguti	18.56208	-20.19625
94	Okatumuama	18.49881	-19.76075	236	Otukumbomeva	18.20715	-20.27303
	Okatuuu	17.55493	-20.56838	240	Outa	17.57912	-20.55100
96	Okauarongo	18.55942	-20.13103	247	Ovoozu	17.48367	-20.58233
97	Okauha	18.02837	-20.28643	248	Ozondema	18.04693	-20.28032
102	Okazaunduka	18.38165	-20.61400	250	Ozongombo	18.63253	-20.28032
106	Okomita	18.49707	-19.87208	253	Ozongombo 1	18.63253	-19.87598
108	Okomumbonde pos	17.82828	-20.79960	256	Plot 15	18.18766	-20.96441
112	Okomutenja	18.21602	-20.40228	257	Riempan	18.08466	-20.08394
114	Okondunda-zongonda	18.02002	-20.44472	259	Tuzu-Tuzu	18.70165	-19.75425
118	Okousaona	18.38822	-20.51262				
120	Okoutjove	18.06930	-20.51162				



