

PREDATORS IN THE KUNENE REGION: AN OVERVIEW OF PROBLEMS AND PROSPECTS

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ABSTRACT

The conservancy initiative in the Kunene region is currently working to establish a long-term balance between rural economic development and nature conservation. One of the challenges of this effort is to help conservancy residents manage the “costs” of living with wildlife, especially with predators. This research project attempts to provide a preliminary overview of predator issues in five Kunene conservancies, as well as to analyse and to offer solutions to the conflicts that arise between humans and predators. The methodology for the research was the extensive interviewing of conservancy residents and staff as well as the local MET and NGOs.

The black-backed jackal is the most prevalent and consistent predator of livestock in the Kunene conservancies. Although jackals primarily prey on small stock, which are less valuable than cattle, the amount of predation they cause is greater than that of any other predator. The spotted hyena and leopard are also hunters of livestock in the region. However, these two predators are much more inconsistent in their livestock predation, although they kill cattle and leopards can, on occasion, kill large numbers of small stock. Cheetahs and lions also kill livestock, but on a much substantially limited basis. Farmer’s responses to livestock predation range widely. They use kraals, shepherds and guard dogs to prevent predation and poison, traps, and guns in response to problem animals

Because jackals are responsible for the bulk of livestock predation, efforts to lower their predation would significantly contribute to an improvement in farmers’ attitudes towards predators in general. Firstly, before the issue of livestock predation on conservancies can be thoroughly discussed, more research is needed, primarily to gauge the financial cost of predation. However, some notable suggestion have been made regarding livestock predation. Traditional livestock management that is consistent and intensive offers the best way to prevent predation. Guard dogs can also be an effective tool against predation. They are in use in the Kunene region, but in general are not very effective and a new conservancy guard dog program would be very valuable. Trophy hunting can deal with individual problem animals and additionally would offer a solid opportunity to generate conservancy income.

The economic impact of livestock predation is difficult to calculate. The majority of conservancy residents are dependent upon farming for their primary source of income. Livestock herd sizes in Kunene, for both small stock and cattle, are generally between 31 and 100 animals. Livestock in Kunene are primarily sold and/or bartered on the informal markets, but are also sold on the formal market to Meatco. Prices for livestock vary greatly between markets, but are generally fairly low compared to prices offered in other parts of the country. Average annual losses per household in the region are 4.4 cattle, 18.4 goats, and 9.4 sheep, and equal a total financial loss of N\$ 6430.74. This figure may be slightly inflated, given the ambiguity of herd sizes, loss rates and erratic pricing, but it does provide a rough picture of livestock predation’s impact on rural farmers.

There are several current and suggested institutional responses from the MET, IRDNC and the conservancies themselves that should be highlighted. The new MET program to train Carnivore Management Officers and develop Carnivore Management Plans for Kunene conservancies is of special note and offers a very good platform for future predator management in the region. The IRDNC is in a good position to act as a conduit of information between conservancies and farmers, program facilitator and sponsor of education.

The greatest burden of handling predator and human conflicts rests upon the conservancies themselves. The conservancies can play the key role in the long-term by carrying out monitoring efforts, by offering proactive livestock management advice to farmers, by encouraging communication between farmers and the MET and IRDNC, and by helping farmers to deal with individual problem animals. It would be conducive to the overall efforts of rural economic development and nature conservation if the Ministry of Agriculture, Water and Rural Development could be integrated in project development and implementation to a larger degree. Better livestock management and market opportunities could lower herd sizes while generating greater income for conservancy farmers and leading to more sustainable land use.

1. INTRODUCTION

It is often stated that the primary goal of the conservancy initiative is to balance rural economic development with nature conservation. One of the hurdles to achieving this goal is to help rural residents overcome the “costs” of living with wildlife by allowing them to utilize their natural resources. Considering that the vast bulk of the people in the Kunene region are livestock farmers, one clear cost to them is that of predators killing livestock.

1.1 Purpose of Research

The primary purpose of this research was to provide a preliminary overview of predator management issues in the Kunene region’s communal conservancies. The aim of this overview is to provide preliminary information for the Kunene conservancies that may be used in future research projects and to formulate conservancy policies. The research provides a synopsis of the issues, though still citing specific examples, that can be used as a “stepping stone” for future projects. It has been noted that there is not yet any written work on these issues in Kunene, and this report hopes to fill that void with a broad piece of work.

Specifically, this research project intended to answer the following questions:

1. What issues arise from the interaction between humans and predators on the Kunene conservancies? Both the positive and negative aspects of these relationships will be highlighted and specific examples cited.
2. What are the traditional responses to conflicts with predators?
3. What are the institutional responses of the MET and local NGOs to conflicts between conservancy residents and predators?
4. What is the impact of predators on local income, in terms of both losses and gains?
5. What are possible management solutions to human and predator conflicts that can minimize tensions and provide both economic benefits while guaranteeing conservation?

1.2 Methodology

The primary method of collecting data was to conduct semi-structured interviews with groups of informants in conservancies throughout the Kunene region. These conservancies were Marienfluss, Purros, Sesfontein, Ehirovipuka, and #Khoadi !Hoas. These conservancies were chosen to try to encompass a broad sample across the Kunene region. Interviews were conducted with conservancy farmers, conservancy committee members, Ministry of Environment and Tourism (MET) staff and staff from the NGO Integrated Rural Development and Nature Conservation (IRDNC). In each conservancy, a minimum of five interviews was carried out with the average group size being between five and ten people (see Appendix I, for questionnaire and Appendix II and III for interview summaries).

The interview data was compiled in a final research report. This paper provides an analysis of field level findings in combination with the analysis of secondary data.

2. REPORT ANALYSIS

2.1 Human and Predator Interaction

Livestock predation is the primary interaction that individual farmers of the Kunene conservancies have with predators. It is largely a negative interaction, with not only the loss of livestock but also additional costs for farmers as they are burdened by the material expenses and time needed to respond to predation. Despite this, there are some positive interactions individual conservancy residents and predators. In particular, tourism (both consumptive and non-consumptive) allows the conservancies to derive income from the existence of predators. The Torra Conservancy, for example, following a spate of livestock losses to an individual lion earned income from the sale of this 'problem' male (offered on as a trophy) in August 2001. This was the first time a problem animal had been offered and successfully hunted as a trophy by any conservancy. In addition to trophy hunting, some farmers have applied to MET for permits to sell the skins of problem animals they have shot, but this is not wide spread. Predators also have a cultural value to Kunene residents and are used in traditional ritual practices and their various body parts for medicine. Of more recent origin, predators have an aesthetic value for some. One farmer in the Marienfluss conservancy noted that when possible, it was a treasure for his children to be able to "see the local wildlife," including predators.

At the conservancy level, it could be argued that the general presence of predators is a potential benefit to each conservancy because wildlife, in the long-term, is of value to tourists. High value species such as the predators are particularly important in this regard. In the short-term, however, livestock predation remains a significant cost to conservancy staff and residents. Livestock predation is a contentious issue and much time from staff and committee members must be dedicated to dealing with it. The issue of financial compensation for stock losses is a hot topic of conversation, which sometimes leads to tension between residents and the conservancy committees.

2.2 Predator Summaries

The extent of livestock loss varies from conservancy to conservancy, but in general it has a significant negative impact upon the livelihoods of rural farmers. The amount of predation by different predators also differs greatly. While some of the well-known predators, such as lions, certainly present a threat to livestock in some areas, other less charismatic predators, namely the black-backed jackal, are a more consistent and significant predator in all conservancies.

Kunene communal farmers regard the **black-backed jackal** as the greatest and most constant threat to their livestock. Jackals primarily kill small stock, but occasionally kill newborn calves in the field. Farmers throughout the Kunene region felt that jackal populations are healthy and they consistently live in close proximity to their farms. Jackals present a problem through out the year, but the peaks are during the birthing period (March to May) when jackals are a great threat to newborn and adolescent small stock and during the height of the dry season (July and August).

While other predators draw the ire of farmers because they kill cattle, which are more valuable culturally and financially, jackals provoke much anger since they are such

successful and steady predators of livestock. Indeed, it might even be said that some farmers feel they are in a regular battle of *attrition* with jackals.

Farmers consistently reported that they respectively lose twenty to thirty small stock per year to jackals. These numbers are very plausible considering the consistent presence of jackals and a livestock management system that does not always guarantee the presence of shepherds or effective guard dogs. Furthermore, a good deal of the overall jackal predation occurs during the birthing season, when newborns and juveniles are easy prey, the loss of these newborn may additionally inflate reported losses.

The spotted hyena, leopard and cheetah are the other three predators that have significant presences in the Kunene region. The **spotted hyena** was reported by interviewees in all five of the conservancies to be present and to be predators of livestock. The spotted hyena however, appear to be a very irregular livestock predator with losses generally sporadic. This was the case in all but the Ehirovipuka Conservancy, where spotted hyenas are present in consistently large numbers throughout the year. For the other conservancies, especially Purros and Marienfluss, the spotted hyenas are only occasional visitors to the area, and even then only very occasionally prey on livestock. Despite the low numbers of stock losses, spotted hyenas kill adult cattle, which are the most valuable of all stock. For this reason farmers consider them a substantial problem.

The **leopard** was considered to be a regular predator of stock in all of the conservancies except for #Khoadi //hoas. The leopard is a very secretive, reclusive predator. Like spotted hyenas, leopards are much more inconsistent and sporadic stock predators than jackals. The interesting thing about predation by leopard is the tendency for them to periodically “massacre” large numbers of small stock. Interviewees often reported that they lost large numbers of small stock to leopards. On further discussion it was apparent that this was not consistent predation, but the results of infrequent but significant ‘massacre’. Leopards also periodically kill young cattle and as mentioned above, the loss of cattle is more provocative to farmers than the loss of small stock.

Like the spotted hyena and leopard, the **cheetah** is a much more infrequent predator of livestock than the jackal. Cheetahs are occasional predators of small stock as well as of young calves. Predation by cheetahs is, in general, fairly limited, but certain areas experience more incidents from these predators than others. For instance, the Hoarusib River valley communities north of Purros regarded cheetah as their number one problem and said it had been so for a long time. Furthermore, the MET office in Khorixas reported that many of the residents of conservancies in the southern part of the Kunene region, especially in Torra, made many complaints about cheetah predation.

The **lion** is a risk to livestock mainly, but not exclusively in two conservancies, Sesfontein and Ehirovipuka. In the Sesfontein area, there are periodic problems with lions killing mostly cattle and donkeys. The presence is restricted mainly to the Hoanib River valley, west of Sesfontein and in the southwest of the conservancy, near to Palmwag concession. Though lions are given more attention than other predators in the area, it is noteworthy that overall they are responsible for very little livestock

predation. In the Ehirovipuka Conservancy, most of the complaints were in the central and northern parts, namely the Otjetjekua area, of the conservancy, which borders Etosha National Park. Although lion predation is fairly limited in general, in the winter of 2001, there were a few new cases of lion predation in the Purros and Torra conservancies. These incidents of predation were the first time there had been lions in the Purros conservancy in decades, and though lions do come into the Torra Conservancy periodically, they are not a regular cause of stock loss. In August 2001, a single male lion, considered a 'problem' animal was offered to a trophy hunter by Torra conservancy and sold for N\$ 10,000.00.

Lastly, the **crocodile** is a significant predator of livestock in the Marienfluss Conservancy. Taking livestock to water at the river is dangerous, and area farmers reported that they lose livestock every year to crocodile attacks. The crocodile threat is compounded in the Marienfluss Conservancy since the Kunene River is the major source of water for area farmers, especially during the dry season. It is also of note that since Independence there have been three crocodile attacks on people in the area, two of which were fatal. This is quite significant, and interviewees in the area frequently noted that they were not only afraid for their livestock's safety, but also for their own.

2.3 Predation Seasonality

The highpoint of livestock predation is during the peak of the dry season, between July and August. This makes sense as natural prey is scarcer for predators and subsequently some will look to livestock for food. This is compounded by the fact that livestock must forage further from the villages during this time and are hence provided with less protection by farmers. For instance, cattle during the dry season must travel great distances to search for grazing and during this time farmers are unable to consistently watch them or keep them close to the settlement at night. For small stock, in addition to a higher rate of predation during the dry season, there is a period of intense predation during the birthing season, between March and May. During this season, jackals cause a constant and consistent threat to newborn and juvenile small stock, especially small stock left to wander near to the village during the day.

2.4 Livestock Management

2.4.1 Himba, Herero and Damara Livestock Management

Livestock farming has, for countless generations, formed the economic backbone of many of Namibia's indigenous cultures, including the Himba, Herero and Damara. As such, livestock management has been developed and fine-tuned to ensure the greatest possible level of security for cattle and small stock. Although some traditional management techniques are no longer used, many are still in everyday practice, including various responses, both proactive and reactive, to predation.

Livestock management in the Kunene conservancies is still largely based upon traditional and long established practices. Historically, management practices were centered around nomadic pastoralism with small groups of people moving about seasonally with their livestock to accommodate the low carrying capacity of the land and very limited water supplies (Talevera et al:142). However, in the last several decades, sedentary communities have become more common as permanent water

points have been developed (ibid:143). Although some communities have become more sedentary in their lifestyle, especially the Herero, the seasonal movement of cattle is still common. In many Herero communities, cattle are moved around by household youngsters to accommodate seasonal water points and when grazing is exhausted, while the main household stay in the same location year round (ibid:143). The sedentary trend is also encouraged by the development of schools and permanent sources of paid employment, such as government and tourism.

The Himba, for the most part, still maintain a semi-nomadic or entirely nomadic pastoral lifestyle (ibid: 143). During the rainy season, Himba live near to temporary water points, such as pans, and migrate to permanent water points, such as the Kunene River, during the dry season. Mobility is a key factor of the Himba lifestyle because of the need to move frequently between waterholes and pastures. This is because of the sporadic nature of both grazing land and water points in North Kunene (ibid:143). Many Namibian Himba also still move in and out of Angola in search of grazing land and because of family linkages. Although most Himba are at least still semi-nomadic, they are increasingly setting up permanent communities, such as Etanga and Okangwati (ibid:143).

The Damaras follow the most sedentary lifestyle of large ethnic groups in Kunene. They are considered a sedentary pastoralist society. In the #Khoadi //hoas Conservancy, for instance, the Damara households live in the same house year round. The land in #Khoadi //hoas was given to communal farmers prior to Independence as part of a land redistribution program (under Oldendal commission) and has many permanent water points and metal fenced pastures. Each household has its own grazing land and there is not the seasonal movement of livestock as seen in Herero and Himba communities.

2.4.2 Kraals, Shepherds and Guard Dogs

The use of **kraals** has been a long held practice of livestock management. Kraals have many purposes, such as a holding pen for various uses like milking, but their main purpose has been to provide protection from predators. The use of kraals by the various farmers in this research project differed significantly.

For instance, in the Marienfluss Conservancy, whose residents are Himba and maintain a very traditional, pastoral lifestyle, the use of kraals is a long established traditional practices. Log or brush kraals are built at every settlement to hold livestock. At night, the baby small stock and calves are kept in kraals, but adult livestock sleep in the bush or in the settlement. One reason that the Himba of the Marienfluss do not have larger kraals is because of a general scarcity of wood, and because they move around periodically in search of grazing land. Many of the interviewees in the Marienfluss remarked that they still had predation problems in the kraals at night.

In the Sesfontein area, Herero farmers follow similar practices to the Himba in the Marienfluss. Here also livestock is moved seasonally and kraals and shepherds are used. However, many also use larger kraals and put most, if not all, of their livestock inside at night. Some of these larger kraals also have chutes for vaccinations and loading. Furthermore, some Sesfontein area residents, especially Damaras, are much more sedentary in their farming practices than the Himbas. The Sesfontein area is a

good example of an area that has larger, more commercial farms as well as some smaller, more traditional farms too. For small stock, at the smaller farms only newborn and juvenile small stock are kept in kraals at night, whilst at the larger, more commercial farms the kraals are large enough to accommodate the entire flock.

By contrast, in the #Khoadi !Hoas Conservancy, the residents are Damara and the land was previously commercial farms... Subsequently, there are many fences. Kraals in the #Khoadi !Hoas Conservancy are made out of metal fencing. For cattle, they are generally rectangular with two large holding pens and a smaller corner pen for keeping calves. The small stock are kept in kraals at night. One last interesting note is that because of the extensive fencing in the conservancy, there is much more extensive management of grazing land and the rotation of livestock from paddock to paddock.

The use of **shepherds** is also very varied. There are two types of shepherds, namely family and professional. In times past, family members did extensive shepherding. Most of the time these shepherds were children. Most children today, however attend school and subsequently there is much less shepherding. However, in some conservancies, especially more rural conservancies such as Marienfluss and Purros, the practice of familial shepherding continues, but to a lesser degree than in the near past. The cattle in general are not shepherded. The only time that they are accompanied is when they are herded back to the village, to water points, or to new grazing land.

In Marienfluss, Purros and parts of Sesfontein, family shepherds are more common than in Ehrovipuka and #Khoadi !Hoas. School children are commonly used to shepherd stock. Professional shepherds are used by a minority of farmers in the Sesfontein and #Khoadi !Hoas conservancies. These professional shepherds are generally conservancy locals, though in both conservancies there are some Owambo and Angolans who migrate seeking employment.

Overall, the use of shepherds, both family and professional is dwindling and where it is still practiced it is sporadic at best. There are a number of reasons for this. The first, as previously mentioned, is that most children now attend school and can't be shepherds all the time. Also, most farmers do not have the money to hire professional shepherds. Finally, many farmers are themselves unwilling to shepherd their flocks unless there is significant predation occurring. This decreasing use of shepherds is perhaps inevitable, but nonetheless unfortunate since farmers stated frequently that when a shepherd was present, their losses were almost nonexistent.

The use of **guard dogs** is a third traditional approach to predation. Dogs are plentiful in the conservancies. However, the vast bulk of these dogs are not guard dogs and only stay nearby the settlements. Only in the Sesfontein and #Khoadi !Hoas conservancies are guard dogs very common. In the Marienfluss, Purros and Ehrovipuka conservancies, guard dogs were occasionally used, but most farmers do not have them. The most common reason cited for not having guard dogs was a lack of knowledge of how to train and manage them.

In the Sesfontein and the #Khoadi !Hoas conservancies, the guard dogs did not enjoy very good reputations. The main reason guard dogs have a bad reputation was

because most farmers thought they were ineffective. Predation still occurs when dogs are present, the dogs sometimes start to kill livestock themselves and the attentiveness of the dogs is not very good. However, although guard dogs are far from perfect, a consistent cliché could be heard from farmers, “anything is better than nothing.” Lastly, farmers throughout the conservancies noted their interests in finding ways to get better dogs or to learn how to train dogs to be more efficient themselves.

2.5 Reactive Responses

The use of kraals, shepherds and guard dogs are the most traditional methods of mitigating predation. In addition to these methods, which are all pre-emptive, there are newer and for the most part reactive measures; such as the use of poison, traps and guns to shoot problem animals once predation has already transpired. The use of these reactive responses is also very varied between conservancies.

Poison is a very contentious issue and its usage in the Kunene conservancies is somewhat controversial. On the one hand, it appears that in many conservancies it is not very

prevalent at all, such as in the Marienfluss and Purros. In the other conservancies, most farmers said they did not use it but a few said they did use it and thought that others did as well. It should be noted that while the use of traps and guns was discussed quite freely, interviewees discussing poison were commonly more reserved. This is probably because there is so much confusion over what was legal, who allowed its usage, when it could be used, how it could be bought, etc. This ambiguity means that it is difficult to tell how much poison is in circulation in the Kunene conservancies.

However, since the majority farmers and conservancies appear not to use it, the reasons for this should be listed. Firstly, most farmers said that it was both difficult to buy and expensive. Secondly, many farmers said that the Directorate of Veterinary Services or the MET prohibited them from using it. Others said they could only get it from village headmen and this was difficult. Still others said that a police permit was needed and this was very hard to get. Lastly, many farmers, especially in #Khoadi !Hoas, said they didn’t use it because it was dangerous for their livestock. Those who did use it said they bought it in larger towns, like Outjo, or were given it directly from their headmen who received it from the government. Poison is available to communal farmers through the Directorate of Veterinary Services (DVS) in Outjo, but its distribution is restricted and farmers must apply for it.

The use of metal jaw **traps** is much clearer than that of poison. In the Purros, Marienfluss and parts of the Sesfontein conservancies, jaw traps are used very rarely, if at all. However, in other parts of the Sesfontein Conservancy and in the Ehrovipuka and #Khoadi !Hoas conservancies, jaw traps are used extensively. The reason for the difference in usage between these two groups of conservancies is unclear. One possibility is that the overall accessibility to traps is easier in the conservancies closer to larger towns or that there is more acceptance of traps as predation management tools. Of the farmers who used traps, the majority said that the traps were very ineffective and they rarely caught jackals, which are the primary target.

Lastly, the use of **guns** to shoot individual problem animals also varies. In the remoter conservancies, namely Purros and Marienfluss, the use of guns is very limited. Farmers in these areas do not have many guns and if they do, they often do not have ammunition. However, in the Sesfontein and Ehirovipuka conservancies and to a lesser degree in the #Khoadi !Hoas Conservancy, the use of guns to shoot problem animals is much more widespread. In all three of these areas, farmers reported shooting jackals, hyenas, cheetahs, leopards and even lions. Lions have been shot in both the Sesfontein and Ehirovipuka conservancies in the past few years. As of May 2001, in the Ehirovipuka Conservancy, there are seven skins waiting in the conservancy office for MET permits.

It is worthwhile to discuss the varying degrees of responsiveness to predators. In the more remote conservancies, namely Purros and Marienfluss, the overall response to predation is fairly limited. In these conservancies, for the most part, farmers accept some losses and try to protect themselves by putting out more shepherds or using kraals more frequently. The use of poison, traps, and guns is very limited. It is also interesting that these areas are not very commercialized and most farms use their livestock for personal consumption and only rarely sell meat to the odd visitor or make the long trip to an auction.

On the other hand, the Sesfontein, Ehirovipuka, and #Khoadi !Hoas conservancies see a much greater use of traps, poison and guns in response to predation. These conservancies have, or had until the recent Meatco boycott, regular access to livestock buyers and the farms overall are much more commercialized than the farms in Purros and Marienfluss. The difference overall is accessibility. Accessibility to regular livestock markets and to poison, guns, and traps means that the whole dynamics of livestock management are different. Elephant complaints are investigated consistently, and DRM staff scare problem elephants away from settlement areas when need be. Lion reports are also routinely investigated in the Ehirovipuka and Sesfontein conservancies. In the Ehirovipuka Conservancy, individual lions found outside of the Etosha fence are herded back through the fence by Etosha staff. In the Sesfontein Conservancy, lion reports are forwarded to the DRM headquarters in Windhoek. From there, it is decided how to respond for example whether, to send out the game capture unit. In both of these conservancies, there is a bit of a race between the DRM and farmers. If farmer's complaints are not responded to quickly enough, then DRM staff are likely to find lions already shot by farmers, as has been the case in both of these conservancies in recent years (most recently in Ehirovipuka in May 2001).

Aside from lions, the DRM response to livestock predation is limited. Reports of problem animals are recorded in a logbook. If transportation and staff are available, then an investigation is carried out to determine what type of predator it was and how many livestock were killed. Jackal reports are ignored, but cheetah, spotted hyena and leopard reports are investigated.

2.6 Institutional Responses

For this research project, Ministry of Environment and Tourism (MET)- Directorate of Resource Management (DRM) officers in Khorixas, Sesfontein, and Opuwo were interviewed. The DRM response to predation in the Kunene conservancies is varied. Primarily, the two problem animals in order of priority are elephants and lions. Due to limited manpower and transportation, it is impossible to investigate all complaints

about problem animals and subsequently, these two species are given preference. This is not to say that other predators, such as spotted hyenas and leopards, are completely ignored, but about them are investigated less frequently and only if people are traveling in that direction anyway or if the location is close to the office.

DRM staff routinely conducts the investigations of farmer's applicants for permits to sell skins. These permit applications are relatively few in number (in May 2001, the Ehrovipuka conservancy was waiting on permits for seven skins). DRM regional staff reported that the application process is very long. Once regional offices process the applications, they are submitted to headquarters. From there, the waiting period for approval can be long, from a few months to over a year.

The responses to predator conflicts from NGOs, namely that of the IRDNC, is to act as a conduit of communication for farmers to the DRM, to facilitate activities within the conservancies and between conservancies and the DRM, and to encourage educational programs with other NGOs. All conservancy staff reported that they forwarded farmer's complaints directly to the DRM regional offices in Opuwo or Khorixas. Event facilitation is geared towards training programs and special events while the educational programs entail sending groups to visit NGOs like the Cheetah Conservation Fund.

2.7 Impact on Income

There is an impact on local incomes resulting from predation.

2.7.1 Dependence on Livestock Income Levels and Herd Sizes

The results of a socio-economic baseline survey conducted in 1999 for the IRDNC provide some insight into the dependency of Kunene conservancy residents on livestock income and the average sizes of communal farm livestock herds. This survey was carried out in five conservancies, Torra, Sesfontein, Omatendeka, Omburo and Ehrovipuka. In the Sesfontein and Torra conservancies, roughly 45% of the interviewees considered communal farming to be their primary income (Socio-economic Baseline Survey, pgs 5, 11). In both the Ehrovipuka and Omatendeka conservancies, this figure was over 90% (pgs 16, 21). Lastly, in the Omburo Conservancy, 58% of the residents viewed farming as their primary source of income (pg 27). In all of these conservancies, the large majority of residents own livestock even if they do not derive their primary income from it (pgs 5,11,16,21, 27).

The size of livestock herds per household in the Kunene region is varied. It should also be noted that precise numbers for herd sizes are difficult to acquire given the sensitive nature of questioning farmers about the topic. However, the IRDNC Socio-economic Baseline Survey provides a good general picture of herd sizes for the Kunene conservancies. In the Torra and Sesfontein conservancies, the large majority of cattle herds contain fewer than thirty animals (pgs 5, 11). In the Omatendeka, Ehrovipuka and Omburo conservancies, the majority of cattle herds are between 11 and 100 animals, with most of these herds between 31 and 100 animals (pgs 16, 21, 27). In all of these conservancies, the large majority of small stock herds are between 11 and 100 animals, with the largest number of herds being between 11 and 30 except for the Omatendeka Conservancy where the largest number of herds are between 31 and 100 (Pgs 5, 11, 16, 21, 27). Sheep numbers are generally much lower than those for goats and very few flocks have more than 30 sheep (pgs 5, 11, 16, 21, 27).

2.7.2 Predation Rates

The IRDNC Socio-economic Baseline Survey also provides valuable data about predation losses to Kunene communal farmers. In the Torra and Sesfontein conservancies roughly two-thirds of farmers had lost livestock in the last year to predators (pgs 8, 14) while in the Omatendeka, Ehirovipuka and Omburo conservancies, over 90 percent of farmers had lost livestock (pgs 19, 25, 30). The average losses for all five conservancies were 4.4 cattle, 18.4 goats, and 9.4 sheep per household (pgs 8, 14, 19, 25, 30). It should be noted that while such numbers are usually inflated slightly through exaggeration they do show general loss rates and provide a picture of predation in the Kunene region for communal farmers.

2.7.3 Livestock Marketing and Prices

The selling of cattle in Kunene is either through the formal market, namely at Meatco regional auctions, or through the informal market, which supplies meat for local demand and to private livestock buyers (Farming Systems, pg 254). There is reluctance by many Kunene farmers to engage in the active marketing of livestock because of cultural and religious beliefs, and many farmers prefer to sell or barter cattle on the informal market (Farming Systems, pg 255). This preference to use informal markets is compounded by other factors as well. Kunene communal farmers, through the Communal Farmers Union, are currently boycotting Meatco primarily because of the widely held belief that Meatco gives unfair prices. Additionally, many farmers only sell cattle when facing financial stresses, such as school fees or hospital bills, and the informal market provides a more consistent opportunity to sell or barter livestock than Meatco auctions, which are only periodic throughout the year and only when boycotts are not underway (Livestock Marketing, pg 57).

It is notable that in the informal markets, especially in the more rural ones, livestock sellers have very little bargaining power (because of dependence on a limited number of buyers and the desperation to sell when facing financial stress) and prices are much lower than those provided by Meatco (Livestock Marketing, pg 57; Farming Systems, pg 274). The pricing of cattle also differs between Opuwo and more remote informal markets. For instance, in Opuwo, the average price (late '98 and '99) of live cattle was N\$448.33, N\$164 for goats and N\$ 151 for sheep (Livestock Marketing, pg 45). In Okangwati, (northwest of Opuwo) the average price (late '98 and '99) of live cattle was N\$ 540, N\$ 104 and N\$ 100 for sheep (Livestock Marketing, pg 61). In contrast, a look at a Meatco auction held in late-1998 showed that the average price for cattle was N\$ 734 (Farming Systems, pg 274). Another auction held in late-1998 in Opuwo yielded average prices of N\$ 540 for cattle (Farming Systems, pg 273).

Many Kunene residents prefer to barter for goods if they do not need cash immediately, but bartering prices are usually lower than cash prices, both on the formal and informal markets (Livestock Marketing, pgs 44, 60). For example, in Opuwo one goat is tradable for one bag of maize meal worth N\$ 70 or one box of Okandjembo liquor worth N\$ 83 (Livestock Marketing, 45). Furthermore, one cattle in Opuwo is tradable for one bag of maize meal and one bag of sugar worth N\$ 480 (Livestock Marketing, pg 45). In Okangwati, one goat is tradable for one crate of Lion Lager valued at N\$40 (livestock Marketing, pg 61). Lastly, one cattle in

Okangwati is tradable for three bags of maize meal valued at N\$ 332 (Livestock Marketing, pg 61).

Furthermore, some of the southern conservancies which are south of the Red Line, especially #Khoadi !Hoas, have much more consistent access to livestock markets that offer higher prices. In #Khoadi !Hoas, communal farmers have the option to sell at the Kalkrand auction or to commercial farmer middlemen. Farmers in #Khoadi !Hoas reported that cattle would sell for a minimum of N\$ 800 and go to over N\$ 1400.

2.7.4 Economic Impact

Given the inherently ambiguous, varied and fluctuating nature of livestock pricing in Kunene, especially considering the informal market and the current Meatco boycott, it is very difficult to calculate financial losses to communal farmers from predation. However, it is possible to provide a very broad picture of losses. For this analysis, Opuwo informal market prices are used since it is a major market center for the region and the informal market is the preferred market for most farmers. Given losses of 4.4 cattle, 18.4 goats, and 9.4 sheep, the total financial loss would be N\$6430.74 per household.

Although this figure does provide an idea of losses it is probably high given that some households do not have all three types of livestock, the inherent but marginal exaggeration in interview responses, and the general ambiguity of both livestock prices and loss rates. Furthermore, considering that many Kunene residents, especially the Himba, rely heavily on their livestock for their food supply, the loss of livestock has a noticeable impact. This is especially the case for farmers who rely on trading livestock for maize meal. Lastly, considering that the large majority of Kunene residents are communal farmers and dependent on livestock as their primary source of income, livestock predation is significant.

The level of predation should be put into context of the overall mortality rates of livestock in Kunene. The overall mortality rate (predation, disease, drought, natural death, etc.) should be around three percent per annum (Livestock Marketing, pg 163). However, for North Kunene, the mortality rate is much higher than this, which means that the region lost N\$ 4.4 million in cattle alone in 1999 (Livestock Marketing, pg 163). Data is unavailable for Kunene, but in the North-Central communal areas disease, drought, and stock theft comprise roughly 90 percent of calf mortalities alone (Livestock Marketing, pg 172). While Kunene does have more predators than the North Central area, disease is certainly the largest factor in the region's excessive mortality rate (Livestock Marketing, pg 163).

Lastly, the dynamics of Kunene's herd management and off-take rates are lopsided. It is estimated that North Kunene has a cattle population of 189,000 head, but the region realistically should have only 129,000 head of cattle to avoid overgrazing (Livestock Management, pg 170). This fact is compounded because North Kunene has a relatively low off take rate (cattle sold or bartered per year or used for personal consumption), but a high mortality rate (Farming Systems, pg 196). North Kunene could improve its current livestock management practices by lowering mortality rates, especially through disease prevention, while increasing off take rates (Farming Systems, pg 196).

2.7.5 Positive Financial Impact

Currently, the positive impact of predators on local income is very limited and isolated to a few cases. Namely, some farmers in the Ehirovipuka Conservancy have permit applications pending to allow them to sell problem animal skins. For these individuals, some income from predators would be generated, though it is unknown if this would compensate them fully for their livestock losses.

Lastly, the collective impact of predators on income is also very limited currently. In a general sense, predators are natural resources for communities and as such contribute to the overall value of the conservancy. Currently, trophy hunting and eco-tourism schemes are being developed to benefit from predators, and it is hoped income derived from these schemes will have an impact on individual incomes as well as the general conservancy income. As mentioned before, the Torra Conservancy shot a problem animal lion in August 2001. This was the first time a predator problem animal had been trophy hunted in a Kunene conservancy.

2.8 Management Solutions

The following suggestions are those of the author, but take into account the viewpoints of conservancy residents and committee members, the MET, and NGOs. It is hoped that these suggestions will be used as a point of departure to take forward thinking on predator issues in the Kunene region.

2.8.1 Research

To begin with, it is important to note the need for more research into the general topic of predator/ human relationships on the Kunene conservancies. This research project was limited and only provided a basic and preliminary overview of the issues. However, its limitations provide insights into topics needing further investigation.

Most importantly, there is a need to quantify the costs to farmers of livestock predation. This quantification of costs is crucial since it is the only way to really gauge how endemic predation is and how exactly it affects conservancy resident's incomes. This research project was able to show the general themes of predation in the conservancies, but precise economic data and analysis is needed.

This economic analysis should be included in a general research project of conservancy resident's incomes. As livestock is the economic base for most of the resident's of the Kunene conservancies, it is important to document precisely the financial impact of livestock predation. Furthermore, other parallel issues should be documented at the same time. These issues include livestock losses due to drought, disease and theft. Interviewees often mentioned these three issues and their inclusion in further research would help to put predation into perspective. Additionally, it would be helpful to policy makers to have research covering possible utilization schemes for predators. These schemes could include trophy hunting and eco-tourism.

Lastly, there is a need for a long-term monitoring project. The MET Predator Research Program has noted this need and has recently begun a long-term monitoring project of predators in the Kunene conservancies. This project is very worthwhile since exact population data, distribution and movement will provide very useful

information to the conservancies about how to manage and utilize their predator populations.

2.8.2 Livestock Management- Improving Existing Practices

- A lot of small stock predation occurs when the goats and sheep are very young. During this time, when the young are still suckling their mothers, it would be very helpful if they were kept closer to the village. If young small stock are still suckling their mothers (which is for the first several months) and not eating grass yet, they should be kept in a kraal the whole day since there is no need for them to wander outside of the village. Once the young animals do need to start eating grass part of the time, their time outside of the village could be limited to just a morning or an afternoon under the watch of a person. This limited time would make it easier for a person to accompany them. Once the young are capable of only eating grass (around four to five months of age), then their protection falls under general herd management.
- In the remoter conservancies, many farmers said they suffered losses even in their kraals, which were made of small logs or brush. The only solution is to build *stronger and securer kraals*. Other conservancies, like #Khoadi !Hoas, commonly had metal fence kraals and reported that losses inside these kraals were rare. Hence, metal fence kraals are a suggestion for farmers who can afford to buy them. A small length of metal perhaps six meters, would be enough to make a small kraal for baby small stock and would be transportable.
- The use of shepherds and kraals for adult small stock is trickier. Shepherds are very effective and, if financially possible, are a good investment. However, since for many farmers a professional shepherd is an impossibility, any shepherding by family members is best given in the early mornings and late afternoons since these are the times when jackals are the most active. It is apparent that kraals are not so important for adult small stock. Most farmers said their stock gave birth to offspring out in the veldt. This makes newborn stock very vulnerable and relocate the newborn to the kraals is a dangerous activity for the adult stock. Aside from this period of time, there is not a lot that farmers can do unless they are willing to shepherd their cattle as some do for their small stock. If shepherding is possible, the most effective times to do so are during the dry season months. Lastly, if possible, it is very helpful to herd cattle back to the safety of the settlement at night. Fortunately, cattle predation by cheetah, spotted hyenas, and lions is much more sporadic than is jackal and cheetah predation for small stock.

2.8.3 Trophy Hunting

Trophy hunting can provide a useful opportunity to handle both individual problem animals as well as generate to significant amounts of money. While individual farmers can earn some money through selling skins, a problem animal shot by a trophy hunter would generate much more income for communities. Currently, the process for securing permission to shoot a problem animal is cumbersome, making it difficult to find a hunter in time to shoot a specific problem animal. This process could be streamlined by allowing conservancies a problem animal quota, thereby allowing trophy hunters immediate access to a specific problem animal.

There are difficulties inherent in this idea, such as how to guarantee that only genuine problem animals are killed, but with very limited numbers and thorough oversight from the MET, the idea could be fruitful for everybody. The IRDNC and other NGOs could also play a crucial role by helping to facilitate the trophy hunting itself or providing some of the oversight to help ensure only genuine problem animals are killed. The income generated from these problem animal trophy hunts could then be used for compensation or to facilitate other predator programs.

The recent trophy hunting of a lion in the Torra Conservancy offers a glimpse of how future trophy hunting of problem animals could work. The interaction of the MET, IRDNC, and conservancy staff to identify the problem animal and then find a trophy hunter highlighted that it is possible to use trophy hunting as an outlet to deal with problem animals. The key points of consideration in future trophy hunting operations are the identification of the problem animal and the timely location of a hunter.

2.8.4 Guard Dogs

One of the clearest needs for the Kunene conservancies is a guard dog program.

Given

that the black-backed jackal is responsible for the most livestock predation throughout the Kunene region and that most of the jackal kills are small stock, guard dogs are a natural solution to a large amount of predation. Guard dogs have been used to great success throughout the world and provide an effective preventative measure for livestock predation. Of particular note is the Cheetah Conservation Fund, which has run a very successful program in Namibia with Anatolian Shepherds.

In the Kunene conservancies, many farmers do have guard dogs, though in some conservancies, like Purros and Marienfluss, most do not. Farmers, in general, felt that these dogs are very ineffective as guards. The main reason cited for this ineffectiveness was a lack of proper training and the lack of the right breed of dog. Lastly, many farmers suggested that they would be very eager to learn how to train proper guard dogs and to acquire the right breeds.

There are several possibilities for a guard dog program for the Kunene region. An ideal opportunity would be to start one or two small businesses to raise guard dogs of a suitable breed. The resultant puppies could then be sold, or given, to area farmers. Conservancy staff that are trained in guard dog management could then guide individual farmers through the training process and offer long-term advice. It is important to note that the program need not be a big one initially, and that one or two breeding pairs would be suitable to start with.

Such a program would go a long way towards not only reducing livestock predation, but also showing the conservancies' willingness to actively help combat predation. Furthermore, a guard dog program would not only prevent jackal predation, but would also help to lower predation by other larger predators, particularly by the cheetah. Lastly, if efforts can be made to lower jackal predation, the author feels that the conservancy members' attitudes towards predators would be greatly improved on the whole since jackals account for so much of livestock predation.

2.8.5 MET-DRM

The MET-DRM is in a key area of responsibility and can and does play a very crucial role in conservation efforts in the Kunene region. There are a few areas of activity that deserve special attention.

- The DRM can play a key role in training. Conservancies are very keen to help in the monitoring of their wildlife populations to help ensure good management. Under the new MET program, “Training of community game guards in large carnivore management and monitoring- combining traditional tracking skills with modern technology” select conservancy staff are being trained to monitor conservancy predator populations, assist with trophy hunting, and offer livestock management advice. These conservancy staff members, Carnivore Management Officers (CMOs), will provide a valuable tool for conservancies to monitor and manage their predators. Furthermore, Carnivore Management Plans are being developed for the long-term management of each respective conservancy’s predators.
- It is one suggestion that in addition to monitoring populations and advising about livestock management, these CMOs should also dedicate parallel efforts to extensively record livestock predation. This is a general goal of game guards in the conservancies, but more often than not, numbers are not kept of livestock lost. These CMOs are in an ideal position to then fill in this gap, especially since they go on regular patrols and have the greatest amount of regular contact with farmers and are trained in predator issues.
- The consultative role of the DRM is also of special importance. This is especially so for determining long-term management plans as well as for adjusting off-take plans. The quota system is crucial to allowing conservancies to trophy hunt problem animals and the close interaction of DRM staff with conservancy staff on this issue is very important.
- One area of DRM responsibility that is in need of improvement is the permit office. Farmers, conservancy staff, and Kunene DRM staff all reported that the length of the application process for permits to sell skins is impracticable. Often, skins are left to disintegrate in boxes while their applications crawl along. Local DRM staff do investigate and forward applications to DRM headquarters fairly quickly, but from there the process seems to break down. It would be very beneficial to the DRM’s reputation in the conservancies if this process could be shortened or decentralized.
- Throughout the farmlands bordering Etosha, there is often stated a need for a more secure fence. In the Ehirovipuka Conservancy, farmers greatly lamented that lions and spotted hyena went back and forth with a good deal of regularity. The DRM and DVS are aware that the Etosha fence is over thirty years old and falling apart, but there is no money available to replace it entirely. Subsequently, a continual patching effort is underway. It is a fair suggestion from the Ehirovipuka Conservancy farmers that the DRM put more effort into patrolling the fence and patching holes, especially during the rainy season. Furthermore, there is a need to investigate other methods of fencing. There are experimental sections of electrical

fencing, and if these experiments prove successful, then it would be helpful to expand the program.

- Individual problem animals present one more area that could be improved. Undoubtedly it is impossible to respond to all reports of problem animals. Indeed, there is no real need to respond to every report anyway since many incidents are isolated ones. However, it would be helpful to conservancy farmers if the DRM would respond more quickly to problem individuals that become consistent killers of livestock. There have been several examples of predation where the DRM was slow to respond (most recently one particular cheetah and several lions in the Torra Conservancy). If the DRM does not act, then certainly the farmers will shoot predators.
- Many farmers feel marginalized by DRM staff when they go on patrol. Farmers in all of the conservancies, especially in the more remote ones, noted that often DRM staff would drive by and never stop to talk to them about what was happening in the area. It is a simple suggestion, but it would be very helpful for the DRM's reputation if staff on patrol made a greater effort to communicate with farmers. Furthermore, it is obvious that the local farmers are a great source of information anyway, and as such, staff on patrol should approach them more often to find out how the local wildlife is doing.

2.8.6 NGOs

There are a number of NGOs that work with the communal conservancies of the Kunene region. The IRDNC is the largest and most influential of these NGOs. There are three main themes that the IRDNC currently emphasizes when talking about predators: communication, facilitation, and education. These are very valuable activities. There are several areas that could use further development in the future.

Firstly: Since the IRDNC has regular contact with the conservancies and the DRM it would be helpful if IRDNC staff could communicate with more urgency to the DRM about specific problem animals. The IRDNC, as a larger organization, is in a better position than a conservancy committee to encourage the DRM to respond quickly to an individual problem animal that is causing extensive damage. The IRDNC also has more developed contacts and lines of communication.

Secondly: The facilitation of events is a useful area. One area that could be developed could be the facilitation of predation prevention plans. This could be through the training of conservancy staff to act as advisors or through area workshops with farmers. The IRDNC has a lot of experience in training programs and outreach, and livestock management is an area that could be developed specifically.

Education is the third theme, and although quite a lot is already there, there is always room for improvement. Other Namibian NGOs could play a more active role in education. The Kunene conservancies have well-developed youth groups, and outreach from NGOs to these groups would be very positive. There are a number of

issues that are worthwhile and include poison control, livestock management, and general predator ecology.

2.8.7 Conservancy

While other organizations play important roles, the conservancies themselves are in the key position of balancing the costs of livestock predation with the need to conserve predators. This balance is a long-term project, and at the moment the foundations for it are still being laid. Of note are several important jobs for conservancies:

Firstly: One of the most important jobs of the conservancy is to monitor predator populations. Most conservancies already have very effective game guard programs. With the introduction of training programs, like the MET “Training of community game guards in large carnivore management and monitoring” program, the usefulness and versatility of the area’s game guards will be greatly increased. The ability of conservancy staff to monitor predator populations is also enhanced by the long-term cooperation of the conservancies with both the MET and local NGOs. Lastly, it should also be restated that there is a need for a long-term monitoring of livestock predation. This monitoring could also be done through the CMO and other game guards and would provide very important data to the conservancies for determining the costs of living with wildlife.

Secondly: In conjunction with the conservancies monitoring efforts is the need for proactive advice to farmers concerning livestock management aimed at preventing predation. The MET “Training of community game guards in large carnivore management and monitoring” program also focuses on training CMOs in livestock management. Along this same line, if a guard dog program were introduced, then conservancy staff, perhaps the CMOs, could advise farmers about the training and maintenance of their dogs. Overall, there is a strong need and also a desire from farmers to have more input from the conservancy about how their numbers of losses can be lowered.

Thirdly: An area that conservancies can play a crucial role in is communication. Most conservancy staffs already act as middlemen between farmers and the DRM. This is a very important role and its continued use should be encouraged. Additionally, it would be helpful to conservancy residents if there were more feedback from outside specialist organizations and individuals, and through the conservancy staff is the only way that this can be done most of the time.

Fourthly: The conservancies can play a greater role in helping to deal with individual problem animals. Primarily, the most important help that should be offered is to first help identify problem individuals and then help with communication. This communication should be mainly to the DRM, but also to interested NGOs. Once individuals are identified and the information passed on, then various responses can begin. These responses should be open to substantial debate and worthy of further

research. They could range from trapping and relocating individuals, encouraging or helping the farmer to shoot the individual, offering livestock management advice, or arranging for the individual to be shot by a trophy hunter (such as what happened in Torra Conservancy in August 2001). Undoubtedly, there are a good number of problem individuals that cause a lot of livestock predation, and if the conservancy can help to control these individuals, it would help greatly overall.

Fifthly: It should be highlighted that the CMOs can play a pivotal role in helping conservancies deal with predator issues. From monitoring predator populations and livestock predation amounts, advising farmers about useful livestock management techniques, facilitating communication between farmers and all other interested parties, to helping to identify and deal with problem individuals, the CMOs can carry out a lot of good work. This work is crucial to helping conservancies come to a long-term balance between the costs and benefits of living with predators for. In larger conservancies with fulltime game guards it would be advisable that one or more game guards to be dedicated solely to predator issues.

2.8.8 A Coordinated Effort

It is apparent that the economic development of the Kunene region and the conservation of wildlife are intricately linked to farm management. Furthermore, it is also apparent that there is a need for broader efforts to increase economic productivity and offer more sound land use management. The Northern Regions Livestock Development Project developed in the ; Ministry of Agriculture, Water and Rural Development, makes some very worthwhile suggestions in its report, “Livestock Marketing in Northern Communal areas in Namibia” that are useful for the general discussion of livestock management in Kunene:

Mortalities can be reduced,

- Pasture management can be improved,
- The type of livestock can be marketed towards consumer demand,
- The off-take rate can be increased,
- The general herd size per household can decrease, but wealth increase,
- Existing water points can be made permanent, and
- Infrastructure such as roads can be developed (pg 170).

The overall goal of livestock management in Kunene should be the reduction of stock numbers to a more sustainable level for the long-term and the reduction of mortality rates. Ideally, this could be accomplished while also improving the market opportunities for area farmers to increase their income and herd off take rates. The reduction of mortality rates could be carried out through efforts to reduce predation, but also through veterinary efforts to lower losses to diseases. This goal is conducive to the overall goal of the conservancy initiative since it would lead to more sound land use (by curbing overgrazing and easing pressure on water points) as well as greater income generation. In order to achieve such a goal the efforts of both the Ministry of Agriculture, Water and Rural Development, as well as other farming organizations such as the Communal Farmers Union, and institutions like the various NGOs, MET and the conservancies themselves could be integrated to a greater degree.

2.9 Conclusion

The conservancy initiative in the Kunene region is currently working to establish a long-term balance between rural economic development and nature conservation. One of the challenges of this effort is to help conservancy residents manage the “costs” of living with wildlife, especially that of predators. This research project attempted to provide a preliminary overview of predator issues in five Kunene conservancies as well as to analyze and offer solutions to the conflicts between humans and predators. The methodology for the research was the extensive interviewing of conservancy residents and staff as well as the local MET and NGOs.

Cheetahs and lions also kill livestock but less frequently than the black backed jackals. Farmer’s responses to livestock predation range from the varied use of kraals, shepherds and guard dogs to prevent predation to using poison, traps, and guns in response to problem animals. If efforts can be made to lower jackal predation, overall attitudes towards predators would be greatly improved on the whole since jackals account for so much of livestock predation, and consistent predator of livestock in the Kunene conservancies. Although jackals primarily prey on small stock, which are less valuable than cattle, the amount of predation they cause is greater than that of any other predator. The spotted hyena and leopard are also hunters of livestock in the region. However, these two predators are much more inconsistent in their livestock predation.

There are a number of suggestions as to how the level of livestock predation can be curbed. Firstly, more research is needed, primarily to gauge the financial cost of predation. Secondly, traditional livestock management that is consistent and intensive offers the best way to prevent predation. Thirdly, guard dogs are in use in the Kunene region, but in general are not very effective and a new conservancy guard dog program would be very valuable. Fourthly, trophy hunting is one option to deal with individual problem animals and would offer a solid opportunity to generate conservancy income as well.

The economic impact of livestock predation is difficult to calculate. The majority of conservancy residents are dependent upon farming for their primary source of income. Livestock herd sizes in Kunene, for both small stock and cattle, are generally between 31 and 100 animals. Livestock in Kunene are sold and/or bartered on the informal markets primarily, but also on the formal market to Meatco. Prices for livestock vary greatly between markets, but are generally fairly low compared to prices offered in other parts of the country. Average losses per household in the region are 4.4 cattle, 18.4 goats, and 9.4 sheep, and equal a total financial loss of N\$ 6430.74. This figure may be slightly inflated, given the ambiguity of herd sizes, loss rates and erratic pricing, but it does provide a rough picture of livestock predation’s impact on rural farmers.

There are several current and suggested institutional responses from the MET, IRDNC and the conservancies themselves that should be highlighted. Firstly, the new MET program to train Carnivore Management Officers and develop Carnivore Management Plans for Kunene conservancies is of special note and offers a very good platform for future predator management in the region. The IRDNC is in a

good position to act as a conduit of information between conservancies and farmers, program facilitator and sponsor of education.

The greatest burden of handling predator and human conflicts rests upon the conservancies themselves. The conservancies can play the key role in the long-term by carrying out monitoring efforts, offering proactive livestock management advice to farmers, encouraging communication between farmers and the MET and IRDNC, and lastly by helping farmers to deal with individual problem animals. Lastly, it would be conducive to the overall efforts of rural economic development and nature conservation if the Ministry of Agriculture, Water and Rural Development could be integrated to a larger degree in project development and implementation. This is because better livestock management and market opportunities could lower herd sizes while generating greater income for conservancy farmers and leading to more sustainable land use.

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APPENDIX

I: Interview Questions:

1. Which predators do you see in the area? Which of these predators kill livestock?
2. Regarding the livestock killed, for each respective type of predator:
 - a) What type of livestock are they?
 - b) What age are they when killed?
 - c) What sex are they?
 - d) How many are killed per year? (Note that a “year” is often relative.)
 - e) Where are they when killed?
 - f) What time of the day is it normally when they are killed?
 - g) How can you tell which type of predator was the perpetrator?
3. What time of the year do you have the most problems with predators and how does this relate to rainfall levels and game numbers?
4. What types of preventative measures do you take to protect your livestock? Explain?
 - a) Kraal?
 - b) Shepherd?
 - c) Guard dog?
5. How do you respond to predator problems?
6. Do you report predation incidents to the MET and local NGOs and do they respond to these reports?
7. How do livestock losses affect your livelihood?
8. What are possible solutions to the problem of livestock predation?
9. How do you feel about living near predators given that they can kill livestock but also that you live on a conservancy?

The interviews were always carried out at the farmer’s settlement, except in the case of Ehirovipuka where the interviews were at a conservancy meeting held at a local school. The interview group sizes ranged from one farmer to twenty. On average, most groups were roughly five people. The interviews lasted anywhere from forty-five minutes to a little under two hours.

In addition to conservancy farmers, conservancy staff and committee members were also interviewed. At these interviews, the discussion focused on institutional responses to livestock predation and suggestions about future courses of action. Furthermore, MET officers were interviewed in Khorixas, Sesfontein, and Opuwo to garner their insights into predator issues in their areas of jurisdiction. Lastly, the IRDNC was also interviewed to gather its opinions of the issues.

II: Critique of research methodology and final report:

Most rural residents in the Kunene do not keep records of their own losses and were unable to give very detailed responses to interview questions. Furthermore, the MET, the respective conservancies, and assorted NGOs also do not monitor livestock predation extensively so overall there is a lack of reliable numerical data.

On the positive side, the final report does provide a good overview of predator issues on the Kunene conservancies. In the respective conservancies, a wide sampling of communities was taken and the interviewing itself was extensive. This resulted in an accurate portrayal of the concerns farmers have with predators as well as a solid overview of the various types of predation and the responses to that predation. The author was unable to gather detailed numerical data about livestock predation and hence could not quantify for the reader how endemic livestock predation is and how exactly it impacts on rural incomes.