



Kwando Carnivore Project

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Human-Lion Conflict in the Mudumu South Complex, Zambezi Region, Namibia Report February 2015



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With input from Balyerwa, Dzoti and Wuparo Conservancies

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Background

The Mudumu-South Complex (MSC) lies in the southernmost tip of the east Zambezi Region, Namibia and is made up of national parks, three conservancies and community forests. The MSC is in the heart of the Kavango-Zambezi Transfrontier Conservation area and is important for transboundary movement of many wildlife species including all of the larger carnivores. Namibia is thus a shared custodian of natural resources that it manages and conserves. The Zambezi Region is an especially important area of connectivity of lions, with radio-collared lions in the region often moving from Namibia to Botswana and Angola.

During late 2012/2013, predation on livestock by lions in the East Zambezi Region of Namibia increased dramatically. The rise of human-lion conflict in the Mudumu-South Complex was seemingly in response to lion populations in Nkasa Rupara and Mudumu national parks being at higher than previous numbers. A total of 136 cattle were reported killed by lions in the Mudumu-South Complex during this time. In response 17 lions were killed..

Figure 1 illustrates that the locations where lions killed cattle, which was largely in the cattle farming areas and village areas of the conservancies that lie between the two parks. Most of these incidences seemed to be attributable to lions from Nkasa Rupara National Park. One pride in particular, the Lupala Pride, was 15 individuals strong in early 2012, and by the end of 2013 had been reduced to three individuals through persecution in retribution for killing cattle.

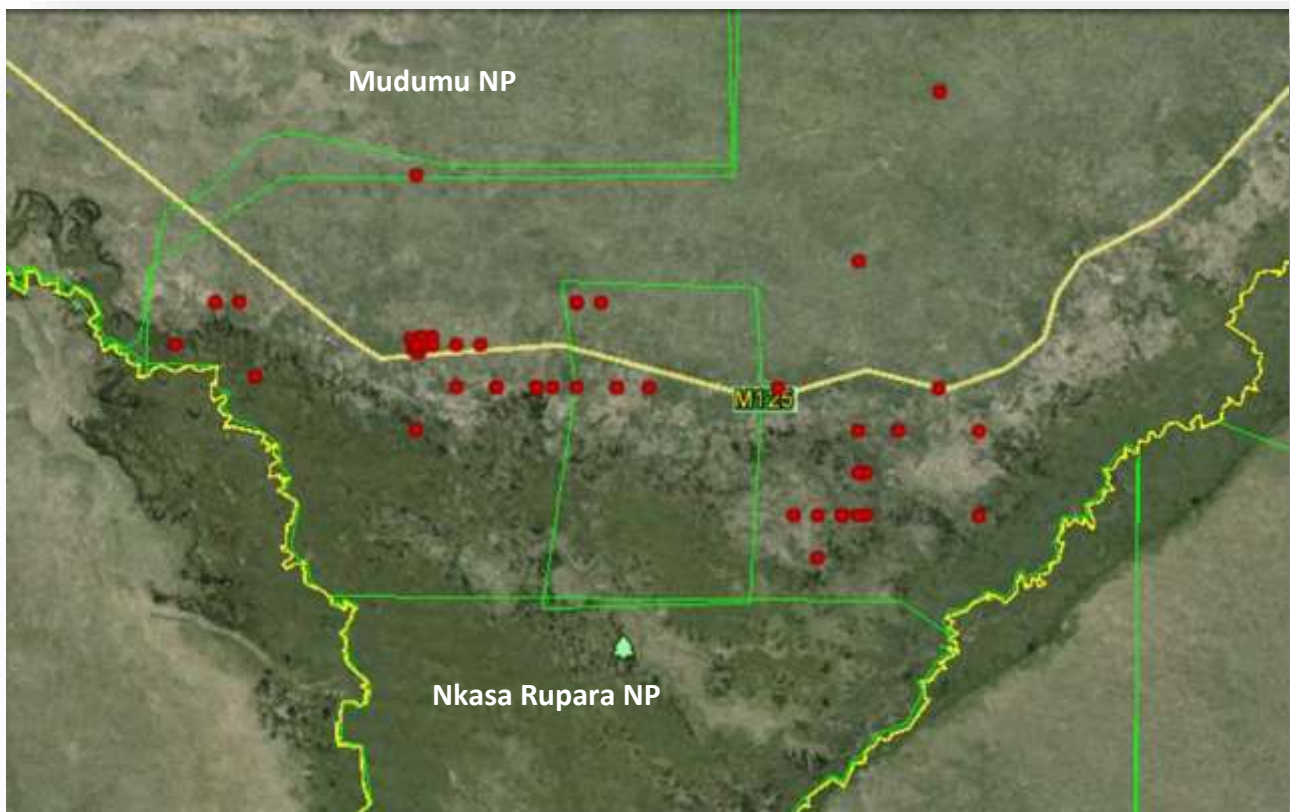


Figure 1. Locations where lions killed cattle in the Mudumu-South Complex during 2013



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Kwando Carnivore Project, supported by Panthera, initiated a process to reduce both the killing of cattle and lions during 2013. These included:

1. Numerous meetings were held with Traditional Authorities, conservancy members, NGO's and the Ministry of Environment and Tourism in order to develop an integrated human-lion conflict mitigation strategy.
2. In November 2013 the first two trial lion-proof kraals were built in the Dzoti Conservancy.
3. Funding was acquired for the construction of 27 lion-proof kraals and other conflict mitigation strategies from Panthera, IRDNC (Millennium Challenge Account, Namibia) and the National Geographic's Big Cat Initiative.

In collaboration with IRDNC (Obituous Siyanga) and the managers of the conservancies, the event book system, which is a community monitoring system, was consulted in order to identify farmers that had lost livestock to lions. Each record of human-wildlife conflict within the event book is based on an incident that had already been thoroughly investigated by the Community Game Guards that traditionally respond to reports of conflict.

The program took off with greater impact in 2014, largely with the building of an additional 27 lion-proof kraals, and the employment by Kwando Carnivore Project of a human-lion conflict mitigation coordinator. The person fulfilling this role is Hans Matiti Fwelimbi, a resident of the Samudono village in the Wuparo Conservancy.

Cattle predation statistics

Comparing the data set from 2013 and 2014, 70% more cattle were killed by lions in late 2012/2013 (n = 136) than in 2014 (n = 60) (Table 1). This is probably mostly accounted for by the higher number of lions in late 2012/2013 than in 2014, with almost the entire Lupala (most offending) pride, having been eliminated by then.

Table 1. Cattle losses to lions per conservancy in the Mudumu South Complex in 2013 and 2014
 (Event Book data from 34 Game Guards)

Conservancy	Balyerwa	Dzoti	Wuparo	Total (%)
No of cattle killed in 2013:				
While kraaled	21	17	15	53 (39%)
While grazing	31	31	20	82 (61%)
No of cattle killed in 2014:				
While kraaled	0	5	3	8 (13%)
While grazing	22	23	8	53 (87%)
Total	74	76	46	196

During 2013/14 196 cows were killed by lions in the Mudumu South Complex. Of these 135 (68%) were killed while grazing unattended. This is a very high proportion, and clearly shows that farmers need to put far more effort into herding/guarding their cattle during the day. However, the relative percentages changed quite dramatically between



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2013 and 2014. In 2013, 53 cattle (39%) were killed inside kraals, whereas this number decreased dramatically to just 8 head of cattle (13%) in 2014, a decline of 380%. In 2013, 61% (n = 82) cattle killed by lions were grazing, whereas in 2014, the proportion killed while grazing had increased to 88% (see Figure 2). Clearly the 29 lion-proof kraals make it more difficult for lions to attack and kill cattle kraaled at night. That means that most of the predation has shifted to cattle grazing unattended either in the day or at night. During 2014 we visited 58 kraals that were erected by the community, not one of which could withstand an attack by lions.

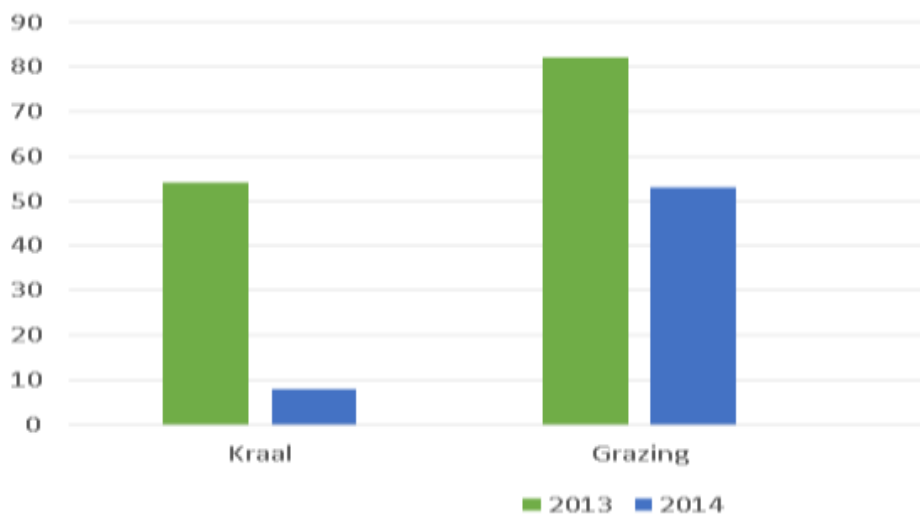


Figure 2. Percentage of cattle killed grazing vs in kraals in the Mudumu-South Complex in 2013 vs 2014.

Seasonality of livestock depredation by lions

Despite the perception that the lion/livestock incidences increase during the wet season this is not the case. The data shows that there is not a strong seasonal effect with lions killing cattle throughout the year (Figure 3). However, especially in 2013 there was a clear peak in June, during which 30 cattle were killed by lions. This was not necessarily a consistent pattern as only 1 cow was killed in June 2014. It is worth noting that during the intensive kraal building months from June to September 2014, only one cow was killed by lions.

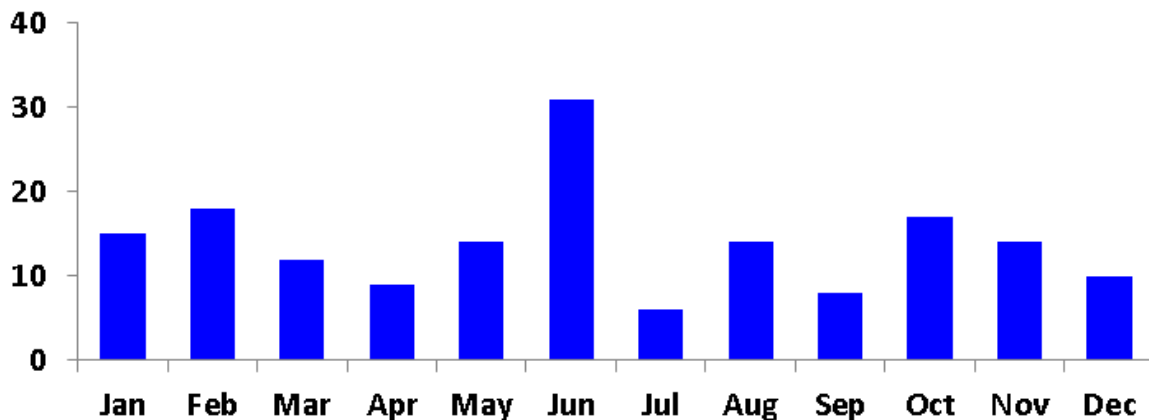


Figure 3. Seasonality of lion predation on cattle in the Mudumu-South Complex, Zambezi Region, during 2013 and 2014.



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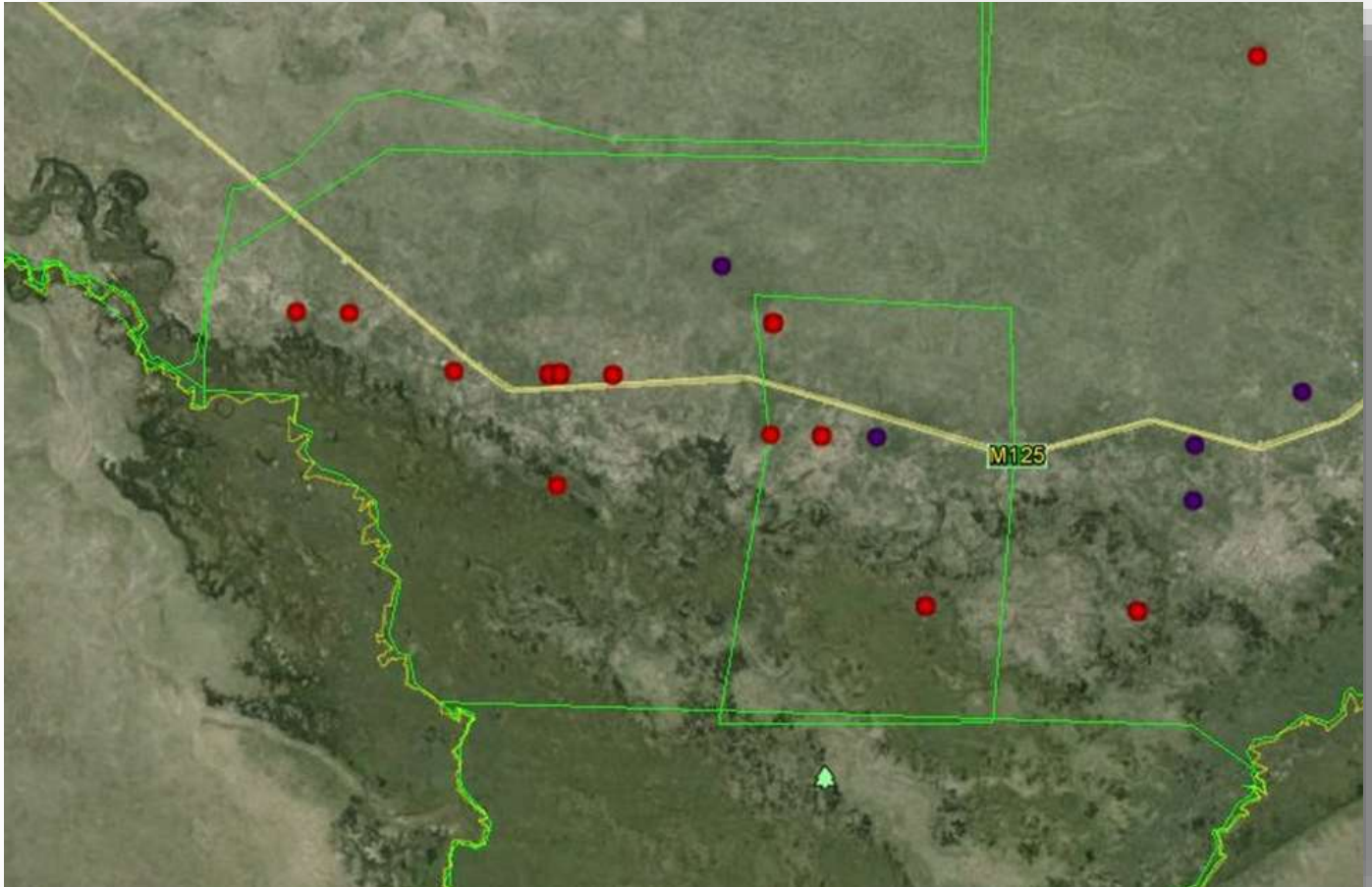


Figure 4. Incidences of lion attack in kraals during 2014 (blue) compared to 2013 (red) in the Mudumu-South Complex.

The shift in predation patterns on cattle in kraals between 2013 and 2014 is clearly depicted in Figure 4, with far fewer and more easterly attacks having taken place. The numerous attacks on kraals at Mbambazi and Samudono villages were not repeated in 2014. Every one of the 2012/13 attacked kraals was replaced with a lion-proof kraal as part of the project.

Activities in 2014

1. Kraal building

Data from the conservancy game guard event book system was collated in September 2013 to identify farmers who had lost the most cattle to lion attack. An important distinction was made between farmers whose cattle had been killed while in a kraal at night, and those killed grazing in the day (Table 1). No amelioration was offered to farmers whose cattle were killed grazing if they were unattended (no herder present). A list of the first 30 farmers to receive lion-proof kraals was compiled with construction planned for late 2013/early 2014. Two trial kraals were built in the Dzoti conservancy in November 2013.



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Due to various unforeseen challenges in early 2014, kraal building recommenced in June and was completed by October. During that time 27 lion proof kraals were built. In total the 29 kraals protect over 3000 head of cattle at night if used effectively and repeatedly. Surveys conducted in Nov 2014 indicate that 93% of farmers are using their kraals. Importantly all did not move their cattle to traditional summer grazing areas, preferring to know that their cattle are safer in the new kraals. The 7% of farmers that were not using their kraals were grazing their cattle in traditional wet season areas, and will use the kraals in the dry season of 2015.

Three sizes of kraals were built; costs incurred and numbers of cattle protected are summarized in Table 2. Kraal sizes depend on number of cattle owned by farmers. For example, 25m x 25m kraals are for less than 100 cattle, 40m x 40m kraals are for more than 100 cattle or where families are willing to share and collectively own more than 100 cattle between family members. Only one 40m x 60m kraal has been constructed where cattle numbers exceeded 300 animals.

Table 2. The number and size of kraals built, average expenditure (in US\$) and number of cattle protected by 29 lion-proof kraals in the Mudumu-South Complex.

	Number of kraals built	Number of cattle protected	Average expenditure
25 x 25 m kraals	24	1850	\$48 000
40 x 40 m kraals	4	795	\$10 000
40 x 60 m kraals	1	371	\$2 500
Total	29	3016	\$60 500

2. Farmer training and community awareness

During the kraal-construction process, the families of the kraal owner were required to assist in the construction. Coster Silelo and Hans Fwelimbi trained over 100 people in kraal construction. Additionally two farmer information days were held, which were attended by over 80 people. The issue over communal grazing and the value of herders was identified here, but the extent of herding is unknown. This will be addressed during 2015.

Hans attended each of the three affected conservancies Human Wildlife Conflict meetings to share KCP's plans of lion conflict mitigation. Over four meetings were held at each of the three conservancies (12 meetings in total) to gather all the data necessary for the kraal locations. Each location was visited for inspection and measurements.

3. Lion surveys / Camera trapping

A large carnivore spoor survey was carried out in Bwabwata National Park in July 2014 and a camera trapping survey was carried out in the Mudumu-North Complexes and in Mudumu National Park. These exercises resulted in a lion population estimate as well as identifying the previously unknown structure of some of the lion prides.



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In the camera trap survey in and around Mudumu National Park and the immediate surrounds, 63 camera stations consisting of two Panthera V4 cameras each were set up in three zones each for two months. A total of 3780 camera trap nights resulted in the identification of the size and structure of the Mudumu pride of lions (see Table 3), as well as provided indication of time spent outside the boundaries of protected areas. Trapping frequency was far higher inside the boundaries of the park and revealed that the lionesses spent more time near the water and in the southern part of the park and that the two pride males spent most of their time in the north of the park and across the boundary moving up to 1 km away from the park boundary in the Mashi Conservancy. Recently lion spoor was observed as far as eight km north of the Mudumu park boundary (*Dan Stephens, pers. comm.*)

Table 3. The size and structure of the Mudumu Pride based on camera trapping data from 3780 camera trap nights.

	Mudumu Pride
Adult male	2
Adult female	4
Sub-adult	-
Large cubs	5 (3 male, 2 female)
Total	11

Camera trapping in Mudumu-South Complex was hampered by the start of the wet season in October, which restricted access to many areas that lions move in the conservancies. We did get some photos of lions moving between the two protected areas, but significant effort will be put into establishing a permanent grid of camera traps across these conservancies once access has improved.

Project partners

- Integrated Rural Development and Nature Conservation (IRDNC) provided the guidance in networking within the community and facilitated all the initial meeting, i.e. the Traditional Authorities, Conservancy Committees, Farmers, Community Game Guards and Ministry of Environment officials from Regional Services and Parks and Wildlife of the Zambezi Region. In addition, they provided significant funding for the construction of lion-proof kraals in Balyerwa and Wuparo conservancies through an MCA-Namibia grant. They also provided funding to support the training of farmers and farmer awareness meetings at the conservancies.
- Conservancies (Balyerwa, Dzoti and Wuparo) contributed all event book data on incidences of lion predation on livestock. This information included number of cattle killed, where they were killed, owner of the cattle and the number of lions involved in the incidents as well as the outcome of any follow up by game guards.



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The conservancies and IRDNC facilitator for the Mudumu South Complex guided the decision making process of allocating lion-proof kraals.

- Ministry of Environment and Tourism (Ortwin Aschenborn and Bright Sanzila) have provided valuable information on locations of collared lions that leave protected areas and roam in cattle areas. This information has been used to inform the farmers to be alert and to provide extra protection for their cattle. MET (Shadreck Siloka) contributed information and support at all the start-up meetings with the conservancies and provided a valuable communication channel with MET Head Office in Windhoek. Despite immense pressure, MET made the critical decision to keep lions off the trophy hunting quota despite ongoing and intense conflict between farmers and lions in the Mudumu South Complex. Matambo Singwangwa partnered in the camera trapping efforts in Mudumu National Park. Our gratitude also goes to the wardens and staff of Mudumu and Nkasa Rupara National Park.
- Mashi and Sangwali Traditional Authorities welcomed the project and gave permission in their respective areas.
- Panthera provided the necessary support and start-up funds in early 2013 when the conflict was on the increase. They provided a vehicle which could be used by the community to respond to farmers and they provided funds through a Zoos Victoria Grant to employ a co-ordinator from within the community. Panthera was the catalyst in the process of establishing a lion-farmer conflict mitigation project and a valued and long-term partner in the mitigation of lion-related conflict in the Zambezi Region and their guidance and ongoing support is critical to the successful outcome of this project.
- National Geographic's Big Cat Initiative provided tremendous financial support towards the building of lion-proof kraals and supporting the team working in the field. Due to this funding we were able to upgrade to lion-proof every kraal that was attacked by a lion during 2012 and 2013.

Provisional Research Findings

- The provisional findings of research activities are that the lion numbers are extremely limited in the Zambezi Region due to conflict with people. Lions have not successfully colonized some of the protected areas like Bwabwata National Park due to conflict with some park residents protecting their cattle. Currently lions exist at about 20% of the potential carrying capacity due to ongoing conflict.
- There is limited connectivity of lions living in the protected areas of Linyanti, Botswana/Mudumu Complexes, Namibia to the protected areas of Sioma Ngwezi in Zambia which can be directly attributed to conflict with farmers in Namibia. Bush meat snaring in southern Sioma, where Zambia borders Namibia is likely to play a role.
- The construction of lion-proof kraals has had a direct impact on the number of livestock that have attacked in kraals. Targeting kraals in hotspots of conflict will significantly reduce cattle losses and retaliatory killing of lions.



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- The extent and effort of livestock protection during grazing hours needs to be quantified. Efforts must focus on promoting communal grazing and livestock protection outside of kraals.
- In order to minimize lion mortality in the Zambezi Region, alternative methods to lethal control must be exercised by the authorities and communities, particularly if lion-related tourism and performance payment incentives are to be implemented.

Goals for 2015

The farming community has responded positively to the kraals with 93% of the new kraal owners no longer moving their cattle during the wet season to very vulnerable kraals far away from the villages. There have been numerous requests from farmers for more kraals, and even some requests for training in improved livestock husbandry and other agricultural techniques.

In 2015 our key interventions planned include:

- 1) Building 20 more lion-proof kraals in known “hotspots” of conflict thus mitigating almost all attacks by lions at night.
- 2) Conduct a pilot study on the “living walls” concept in collaboration with the Directorate of Forestry. Branches of trees that are known for regrowth such as Manketti and Commiphora are used to build kraals. These branches then grow and mesh together forming high-walled kraals to protect livestock that are not visible to predators from the outside.
- 3) Implementing a collaborative response team consisting of Community Game Guards and MET personnel to track and chase lions away from areas of potential conflict.
- 4) In collaboration with MET, NGO’s and the conservancies, establish a network for the rapid communication and sharing of data to prevent, mitigate and manage lion-related conflict.
- 5) Start a broad level education program to encourage farmers to send herders with their cattle while grazing, and
- 6) Trial a performance payment scheme using rates of camera trap images of lions as an incentivizing benefit balanced against measures of proportions of cattle encountered with or without herders.

Acknowledgements

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