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# IMPROVING LIVESTOCK HUSBANDRY BENEFITS LIVELIHOODS AND CONSERVATION

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## 1. Introduction

Lion killing resulting from depredation of livestock is one of the chief causes of the drastic and ongoing decline in lion populations across Africa (Ogada et al., 2003). In the past century, the population and geographic range of the African lion (*Panthera leo*) has declined by more than 75 % (Schuette et al., 2013). At the same time, the loss of livestock to large carnivores threatens the tenuous livelihoods of pastoralists such as the Maasai of the Amboseli ecosystem of southern Kenya. Despite this conflict, the Amboseli ecosystem is widely regarded as an exemplar of livestock-carnivore coexistence, with Maasai herders tending thousands of grazing livestock amidst a suite of large carnivores.

Lion Guardians is a conservation organisation, founded in 2006, that supports culturally appropriate long-term solutions for people and lions to coexist in pastoral areas of East Africa. Since 2007, they have been working in the Amboseli ecosystem, where they employ a team of more than 50 Maasai *Ilmurran:* traditional warriors tasked with defending their commu-

nities, including from lions that kill livestock. Now, instead of killing lions, these lion guardians work to mitigate lion conflict using a diverse toolbox. This includes monitoring and reporting to communities on lion locations, intervening in potential lion hunts, identifying problem lions and otherwise promoting tolerance and coexistence (Jablonski et al., 2020).

By working with communities to understand their challenges and support holistic solutions, Lion Guardians has established a track record of significant reductions in lion killing, along with attendant increases in lion populations, compared to other conflict mitigation strategies (Dolrenry et al., 2016; Hazzah et al., 2014). However, their work is challenged by lost livestock: temporarily untended animals that are highly likely to be attacked by carnivores, often leading to retaliation. Lion Guardians staff estimate that lost livestock account for > 80 % of lion attacks on livestock in the Amboseli ecosystem.

Recognising that lost livestock present a major challenge to lion conservation, and believing their
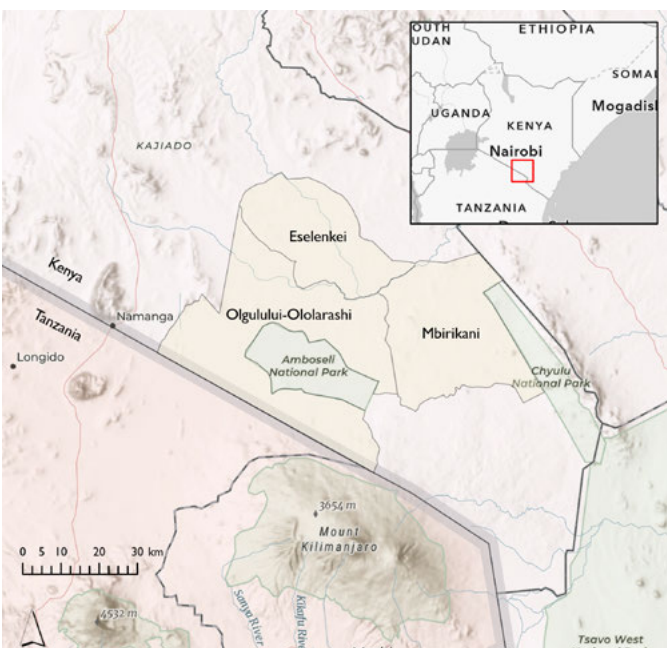
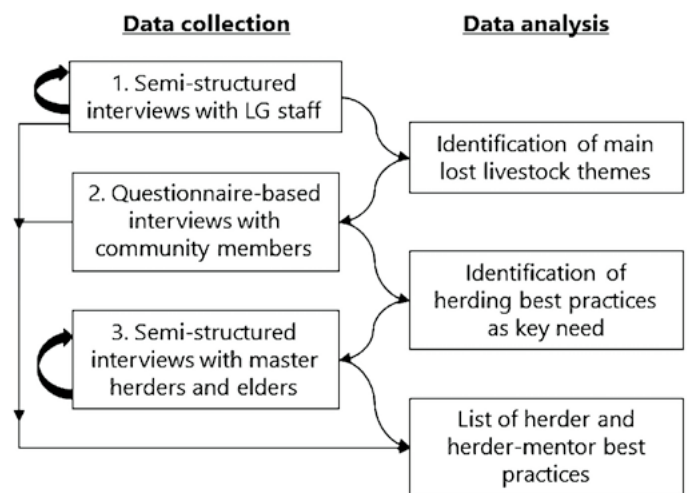Fig. 1 Location of the study area, including the three Maasai group ranches



Fig. 2 The iterative data collection and analysis process, wherein each stage built upon what came before. Stages one and three were internally iterative, such that the conversation evolved as we proceeded. The data analysis column shows the key finding from each stage but is not comprehensive. All data collection stages informed the generation of herder and herder-mentor best practice lists.

numbers to be increasing, in 2017 Lion Guardians embarked on a project to increase understanding of the causes of lost livestock in the Amboseli ecosystem. They understood that they had to start with the local Maasai community and focus on improving livelihood outcomes if they were to achieve their goal of identifying win-win solutions for both pastoralists and lions. Ultimately, Lion Guardians believes that secure livestock-based livelihoods, supported by effective husbandry practices, are the best way to

ensure the long-term viability of lion populations outside protected areas – a necessity if the species is to survive (Dolrenry et al., 2014; Ogada et al., 2003).

In this article, we summarise the outcomes of this project (for full details, see Jablonski et al., 2020) and describe the Master Herder programme that Lion Guardians launched in 2020 as a result of the findings. Though the work of cultural revitalisation fundamental to Master Herder is painstaking, and largely driven by the community, this nascent

programme nonetheless provides insights for carnivore conservation, community-based natural resource management and pastoral livestock production.

## 2. Study areas

The project was implemented within group ranches of the Amboseli ecosystem, which are pastoral lands collectively owned and managed by the Maasai in a landscape of semi-arid grasslands and savannas (Fig. 1). We focused work on three group ranches: Eselenkei (748 km²), Mbirikani (1,229 km²) and Olgulului-Ololarashi (1,427 km²). Lion Guardians has had a long-term presence on each of these group ranches, with active guardian territories covering most of the area. Maasai herders on these ranches manage a total of more than 100,000 cattle, sheep, and goats, guiding the animals each day to forage and water while protecting them from lions, spotted hyenas (*Crocuta crocuta*), leopards (*Panthera pardus*), cheetahs (*Acinonyx jubatus*) and other carnivores. People and livestock also share the landscape with numerous wild herbivores, including zebra (*Equus quagga*), wildebeest (*Connochaetes taurnius*), Thompson's gazelle (*Eudorcas thomsonii*), Grant's gazelle (*Nanger granti*), giraffe (*Giraffa camelopardalis*) and elephant (*Loxodonta africana*). The presence of both diverse and abundant wildlife alongside significant livestock and human populations makes this ecosystem one of the world's great examples of coexistence between people and wildlife.

## 3. Methods

We studied lost livestock in the Amboseli ecosystem using constructivist qualitative methods within an iterative, interactive and pragmatic framework. We collected data in three different stages (Fig. 2), identifying different questions and different participants as our knowledge of the phenomenon advanced and we reached thematic saturation (Denzin and Lincoln, 2018; Saldaña, 2011). We also worked to adhere to guidelines for responsible research practice in indigenous communities (David-Chavez and Gavin, 2018), including Maasai staff and community members in every step of the process. The research was conducted with an exemption under Colorado State University IRB Protocol 204-18H, granted due to measures that guaranteed the anonymity of participants.

In stage one of data collection, we conducted semi-structured interviews with 21 Lion Guardians staff members, including 15 field-based lion guardians. The goal of this stage was to build a baseline level of understanding of lost livestock and their drivers. All but three participants in this stage were local Maasai. For stage two of data collection, we used a flexible, questionnaire-based survey to interview a diverse set of 80 Maasai community members, traveling across the three group ranches. In stage three, using our findings from the first two stages, we focused in on lengthy semi-structured interviews with 12 community-identified master herders from across the area. All data were collected in 2017–2019.

## 3. Results & Discussion

In stage one interviews with Lion Guardians staff we identified two core themes related to lost livestock. The first of these was declining herder skill and dedication, which many participants noted was the main driver of lost livestock issues on the group ranches. The key lesson of this theme was that increasing elementary education among Maasai children, along with more diversified adult livelihoods, had led to a lack of trained herders in the area. The second core theme that emerged was a decreased capacity to search for lost livestock. Because at least some lost livestock are inevitable, the search for lost livestock has long been a part of Maasai community life. However, our participants noted that both young warriors and older adults were now less able to assist in searches, for a variety of reasons.

With stage two focusing on specific questions related to these two core themes, we were able to increase our understanding of broader community perceptions of these phenomena. We found that 75 % of participants felt that lost livestock was a problem in their communities and 53 % felt that it was increasing in frequency. Only 16 % of respondents said that lost livestock was neither a problem nor increasing. When it came to identifying causes of lost livestock, herder-related causes stood out, with 55 % of participants citing herder skill and dedication and 31 % saying that lack of skilled herders was an issue (multiple responses were possible). Others identified more

concrete concerns such as dense vegetation and widely dispersed forage, which can exacerbate herder-related challenges. Responses were mixed regarding the search for lost livestock, with "unsure" being the most common response to whether the capacity to search had changed.

Integrating the results of the first two stages of data collection, we decided to focus in on herding skills. Our conversations had revealed that an increase in school attendance had created a gap in the transmission of traditional herding knowledge and the enthusiasm that attends that transmission. We could see that there was a living generation of elders who had learned to herd through a long apprenticeship with older generations, but that their knowledge was in danger of dying with them as the youth showed little interest in it. We thus decided during stage three to speak with master herders, both elders and young

adults, who had been identified by their communities during the first two stages as being particularly knowledgeable, adept and dedicated.

Because we had learned that herder mentorship is an essential component of effective herding, we identified both herder and herder-mentor best practices (Table 1). It is important to acknowledge that some are somewhat superficial and that there are surely practices that are difficult to describe because we sought to distil complex, culturally-embedded knowledge. Nevertheless, this set of practices captures the knowledge held by our master herders to the best of our abilities. If we could ensure that all herders in the Amboseli ecosystem were using these practices, we are confident that lion-livestock conflict would be greatly reduced and that livestock and pastures would be more productive.

**Table 1** Herder and herder-mentor best practices.

| Herder best practices | Herder-mentor best practices |
|---|---|
| **Value and know your herd** | **The right herder for the right herd** |
| • Know the matrilineal houses | • No more than 200 cows per good herder (use assistants) |
| • Focus on markings/colours | • Strategic splitting/mixing of herds |
| • Track breeding status and health | • Place bells on indicator animals |
| • Know your leaders and laggards | • Give herders a phone |
| • Use bells on indicator animals | • Paid herders rewarded with livestock for good performance |
| **Have a morning routine** | **Mentorship** |
| • Awaken early | • Start young to inspire passion for livestock |
| • Examine the herd – are all animals present and healthy? | • Assign a mentor for each herder |
| • Update potential laggards | • Guide young herders through learning with different animals and ages |
| • Discuss the daily route | • Train on bush skills and predator awareness |
| | • Spend the time needed to make a good herder |
| **Keep the herd close (physically and mentally)** | **Have a morning routine** |
| • Carry a stick and be active | • Discuss and observe herd health |
| • Position strategically | • Discuss the grazing route |
|   • Lead through dense brush | • Trust the herder |
|   • Push away from water from the back | • Walk out with herder, observe the herd while walking |
|   • Be at side/middle in open areas | |
|   • Always stay in sight of herd | |
| • Keep herd as close together as pasture allows | |
| • Whistle all day | |
| • Shout in dense areas | |
| • Count/identify animals regularly, especially when arriving at pasture | |
| • Be predator aware | |
| • Report lost livestock immediately | |
| **Return early with full bellies** | **Have an evening routine** |
| • Count/identify carefully | • Meet herders as they come in, walk in with herd |
| • Monitor laggards | • Count/identify livestock |
| | • Check for full bellies |
| | • Review the day, discuss pasture condition |
| **Have an evening routine** | **Respect grazing committees and restricted areas** |
| • Review the day – be honest | • Follow rules |
| • Report pasture conditions | • Report violations |
| • Count the herd and observe health | • Provide input to leaders |

## 3. Master Herder programme

In 2020, Lion Guardians launched a Master Herder programme aimed at promoting these best practices among herders and herder-mentors in the group ranches of the Amboseli ecosystem. The overall aim is to have a roster of master herders available across the landscape, with some working continuously and others called on in times of greater need.

A master herder's daily duties include a morning routine of traveling to check in with local livestock herders at their homes to identify any pressing needs, then significant time traveling to visit herders in the field and provide advice, training and mentoring. The master herders pay particular attention to 'hotspots': areas where livestock congregate or are otherwise easily lost, such as watering areas. They also focus on known weaker herders, assisting them in learning their trade and navigating difficult situations. This field work requires a strong knowledge of local herds and herders – a difficult task in an extensive landscape.

In the evening, master herders do rounds to check in with local herds and ensure that all livestock have made it home safely. If animals are lost, the master herder will assist in finding them. Other tasks of the master herders include informing herders about the location of lions (learned from their lion guardian colleagues), especially those known to target livestock, and aiming to be first responders to incidences of lion attacks on livestock, working hand-in-hand with the local lion guardian to intervene to prevent retaliation.

Over the course of two years of implementation, the Master Herder programme has grown to utilise master herders as 'jacks-of-all-trades' capable of addressing programmatic needs as they emerge in high-conflict areas. Currently, ten master herders are employed working in the Amboseli ecosystem. To assess the effect of master herders, Lion Guardians has developed a 'tension rating' to analyse the impact of master herders, using the following ratings:

1. depredations occur but there is high community tolerance, gaps between depredations, and no immediate threats to lions;
2. depredations of medium to high frequency, high threats to lions, active hunts;
3. high frequency depredations, low community tolerance, high tension (translocations required, threats, hot hunts, political challenges).

Though assessment of such complex phenomena is difficult and impacts are likely to occur over a long period of time, Lion Guardians has already recorded a slight overall decline in tension (–0.03 rating points) in areas covered by master herders, albeit with a limited number of data points.

## 3. Conclusion

In this project, we sought to identify the causes of, and potential solutions to, lost livestock, which is a major driver of carnivore conflict in the Amboseli ecosystem. Working in the local pastoralist communities to understand this phenomenon, we learned that the key factor leading to lost livestock is the skill and dedication of livestock herders, which appeared to be declining as livelihoods and lifestyles changed.

Ultimately, we learned that the education of herders is an essential component of traditional Maasai culture and that effective herding requires a long-term apprenticeship. As herders progress from managing young sheep and goats to large herds of cattle, they learn much more than herding skills. Through a lifelong conversation with their elders and their environment, they learn the proper place of the herd, and herder, in the world. They also gain a deep appreciation for Maasai culture. The loss of herding skills therefore threatens much more than livelihoods.

The practices that constitute effective herding simultaneously ensure that livestock find quality forage, that pastures are properly managed and that threatening encounters with potential predators are limited. By employing master herders to promote a best practice herding culture on the group ranches of the Amboseli ecosystem, Lion Guardians is therefore supporting social, economic and ecological resilience. They are also providing a practical example of Despret and Meuret's (2016, p. 35) contention that, "there are some places on Earth where the cosmos passes through the mouths of sheep" or, in this case, cattle.

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