The Return of the Herder in Northern Botswana – A Concept Note

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Background

Maintaining healthy wildlife populations within the Okavango Delta and mitigating conflicts along its edge is a high priority for connectivity within the KAZA TFCA. Considering that local communities of people (LCs) live in the corridors of TFCAs, the success and functionality of TFCAS will hinge on the degree to which conflict is reduced and livelihoods enhanced by conservation activities. In the last 2 years lions killed 291 livestock ($80,814) in 5 villages bordering the northern Delta (see Fig. 1 below). Livestock losses triggered the retaliatory killing of at least 5 lions, including 2 immigrants from Namibia's protected areas. In some exceptional instances, farmers have used poison to kill lions and from a conservation perspective, this has potential to completely wipe out Botswana and Africa's vultures with unimaginable ecological consequences. Thus, high levels of conflict are to be expected.

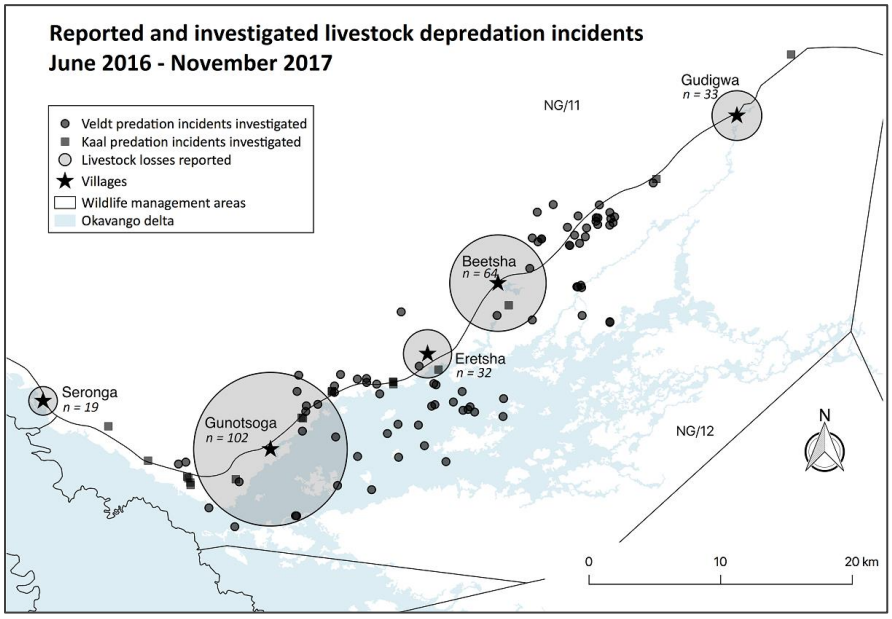

Figure 1: Map of livestock depredation locations during 2016 and 2017.

Research by the CLAWS Conservancy shows that cattle numbers have increased by 76% since 2006, numbering 16,500 heads in 2017. Less than 10% of cattle herds are protected during the day and only 4.4% of livestock owners currently employ herders. The average kraaling rate for cattle in the area is 40%, leaving many herds vulnerable to depredation by lions. Risk is highest when cattle venture far from villages (>4.0 km), following the Delta's flood waters into tourism concessions where most lions occur. Here, they also interfere with wildlife tourism objectives.

The Return of the Herder

Communities in northern Botswana were agro-pastoralists traditionally. In recent generations, young boys started attending school, thereby leaving the task of herding unattended. Adults ascribe little status to the position and traditionally fulfill other roles in securing family subsistence. Today, most livestock herds roam unattended, which is the key driver of conflict and measurable environmental degradation. Through CLAWS partnerships with the African Centre for Holistic Management and the Okavango Research Institute (ORI), we have hosted 2 Herder Training Courses. These courses not only train local herders in eco-literacy, rangeland restoration from overgrazing and techniques for reducing lion conflict, but they also emphasize the importance of the herder as the keeper of environmental health and traditional culture.

Participants take pride in knowing that their ancestors knew the best ways of living in a changing and challenging landscape. To incentivize the return of sustainable herding practices, herding needs to be professionalized and linked with employment creation while exploring innovations in the beef market to develop wildlife-friendly production methods with commodity-based trade.

Assessing Commodity Based Trade (CBT) for Environmental Health

Recent developments in disease screening may allow rural livestock owners to slaughter their livestock at mobile abattoirs providing improved market access. We must first assess the interest of villagers in CBT and propose a comprehensive, holistic approach. With colleagues from ORI, we will determine the feasibility of an environmentally friendly option for livestock husbandry tied to better market value. There is great potential to market beef as (1) wildlife friendly, herded beef, and (2) grass fed, healthy beef (it is known scientifically that grass fed beef has higher Omega 3 fatty acid content than feed lot beef, reducing the risk of heart disease and cancer. With hundreds of lodges in northern Botswana, there is an extensive local market for beef from our herding program, which will greatly improve prices for cattle sales. Ultimately, as commodity-based trade concepts become internationally accepted, our herded beef could be sold internationally at premium prices to niche markets specializing in environmentally friendly and healthy foods. Such market advances will likely result in positive feedbacks on acceptance of herding by LCs, who will then see the strong financial advantages of herding.

The Pilot Herd – Proof of Concept

Our herder training program has facilitated 2 week-long herder training courses in Beetsha and Eretsha villages already. Recently, Eretsha participants and village leadership presented the concept of communal herding to other community members. Following several meetings, the village decided to test a communal herding approach, confirming 800 heads of cattle (i.e. 62% of the total standing herd; see Table 1 for a breakdown by ownership) while another 150-200 are expected to be added by other owners. This is a first step toward combining unattended herds by hiring professional herders to improve local rangelands and protecting livestock against predators. The pilot herd presents a unique opportunity for proof of concept across the larger region. It can provide the much-needed impetus for improved livestock husbandry and protection in the eastern panhandle. Successful establishment of a pilot herd will result in wider replication throughout the region.

The communal herding approach aims at improving rangeland conditions, cattle health and productivity, while reducing losses from lions and other predators. Following identification of suitable grazing areas, the herd will be moved through the landscape in a planned and controlled fashion. The herd will be accompanied by six full-time herders from Eretsha who will be co-selected by the research team and the Village Development Committee. Cattle will be protected during night hours using a strong mobile boma. This pilot herd will also receive satellite trackers that will provide real-time, automated text alerts when cattle are in dangerous proximity to collared lions. Further, communal herding needs to be linked with commodity-based trade focused on predator-friendly and healthy beef livestock herding practices.

Table 1: Eretsha communal herding participants – October 2018.

Owner	Cattle number	Location	Interviewed
1	8	Eretsha village	Oct-18
2	62	Eretsha village	Oct-18
3	37	Eretsha village	Oct-18
4	146	Katapa CP	Oct-18
5	222	Samunyenge CP	Oct-18
6	20	Twaimango CP	Oct-18
7	180	Eretsha village	Oct-18
8	16	Eretsha village	Oct-18
9	7	Moyagogo CP	Oct-18
10	30	Kwaga CP	Oct-18
11	68	Kwaga CP	Oct-18
Confirmed	**796**		
Expected	**950**	Eretsha + all surrounding cattle posts	

Key Benefits

1) Improved cattle condition/health/productivity under sustainable production;
2) Job creation;
3) Improved cattle security, including theft control;
4) Restoration of rangeland condition and creation of nutrient hotspots;
5) Value-added, wildlife-friendly cattle production;
6) Community-based management of grazing lands; and most importantly
7) Conflict reduction and coexistence of livestock and carnivores

Monitoring

The pilot herd will be monitored intensively by CLAWS researchers and ORI faculty. For proof of concept, pilot herd data will be compared with relevant control groups of unsupervised cattle. Performance indicators and other variables include:

1) Livestock movements via GPS-tracking;
2) Rangeland condition (grasses);
3) Livestock losses to predators and other causes;
4) Cattle productivity (e.g. weight gain, condition, meat yield, inter-calving interval, calving rates, mortality); and
5) Disease prevalence.

NB! A scientific rationale and monitoring methodology are appended to the concept note.

APPENDIX

Scientific Project Rationale

Conflict between livestock and large predators is a widespread problem facing conservationists in Sub-Saharan Africa. Livestock form an important livelihood and cultural activity for local communities of people (LCs) living around protected areas and losses of cattle and goats to predators can represent a major economic shock to individual households. The general consequence is that LCs retaliate against predators either by shooting or poisoning them, with the latter having devastating consequences for not only large carnivore populations but also for other species occupying critically important ecological niches in African savannas, such as vultures. This is a trend across Africa with both lion and vulture populations declining greatly (Ogada et al. 2016). Urgent solutions are required to avoid decimation of Africa's vultures and further large declines of the lion population, not to mention declining wildlife populations as a whole (Craigie et al. 2010; Fynn & Bonyongo 2011).

Another concern is that large livestock populations left to forage without management generally result in degradation of rangeland, including loss of productive high-quality grasses and overall declines in forage availability, especially during the dry season. Degradation of rangeland can result in population crashes during droughts, rendering rangeland an unstable and less suitable system for both livestock and wildlife (Walker et al. 1987; Fynn & O'Connor 2000).

Finally, protected areas are becoming increasingly isolated and dysfunctional as human land use activities transform landscapes around protected areas in a manner that no longer enables wildlife free movement between critical seasonal ranges and habitats (Western et al. 2009; Fynn et al. 2011; Fynn et al. 2016). Conservation strategy has erred by focusing too much attention within protected areas, ignoring maintenance of critical habitat for wildlife outside protected areas with the sad consequence that savanna ecosystems have become fragmented and dysfunctional for wildlife relative to their unfragmented past (Western et al. 2009). One of the major reasons why ecosystems are becoming fragmented is that LCs living around protected areas have been side-lined by conservationists, ignoring their livelihood needs and the challenges that they face by conflict between wildlife and their livelihood activities. In general, conservationists have misunderstood a critical feature of conservation landscapes; that these landscapes are not just ecological systems but socio-ecological systems, where the mechanistic drivers determining the functioning and ultimate state of the ecosystem are not only ecological in nature but also local and international human factors (Du Toit 2010; Sayre et al. 2013). If conservation strategy continues to ignore socio-economic factors influencing the functioning of ecosystems human-wildlife conflict will only increase, attitudes of LCs towards conservation objectives will become increasingly resentful, precipitating a downward spiral of the ecosystems biodiversity over time. Consequently, there is urgent need to reverse the trend of ecosystem fragmentation and loss of biodiversity, which will only be achieved by

developing strategies that promote co-existence of wildlife and people around protected areas and promote integration of LCs into the decision making processes and management of greater conservation landscapes.

Critically, livelihoods of LCs must benefit from ecosystem services and economic activities generated by greater conservation landscapes if wildlife conservation is going to have a productive and sustainable future (Norton-Griffiths & Said 2010). Human-wildlife conflict only becomes a true conflict with negative consequences for wildlife when the livelihoods of LCs suffers severe negative cost:benefit ratios (Norton-Griffiths & Said 2010). People are willing to accept some damage to property and livelihoods if the benefits of living with wildlife greatly exceed the costs. Where this key factor has been largely ignored by policy makers and conservationists, wildlife has declined greatly, as the case of Kenya's wildlife clearly testifies (Norton-Griffiths & Said 2010).

Herding of livestock with the objectives of (i) improving management of livestock to restore rangeland condition (Odadi et al. 2017; Fynn et al. 2017), and (ii) minimize depredation by lion, provides a key way forward to reduce human-wildlife conflict, reduce poisoning of vultures and lions and improve livestock productivity. Herding allows one to move the livestock according to functional heterogeneity of resources in different habitats thereby improving overall intake of energy and nutrients and minimizing weight loss during the dry season and droughts (Owen-Smith 2004; Hobbs et al. 2008; Hopcraft et al. 2010; Fynn et al. 2016). Herding also enables managers to create functional heterogeneity through grazing some areas short (short grassland is higher quality and more digestible than taller grassland) and leaving ungrazed areas as reserves of forage for the dry season, as well as through the creation of nutrient hotspots through concentration of dung by overnight corralling (Fynn et al. 2016; Tyrrell et al. 2017).

Taken as a whole then, developing herding programs with community livestock around protected areas is one of the most promising strategies for promoting biodiversity conservation in African savannas because it has the potential to reduce losses of livestock to predators (direct conflict reduction), improve habitat for both livestock and wildlife (improve livelihoods and wildlife habitat) and involve LCs in wildlife conservation activities and economic benefit flows from greater conservation landscapes (improve livelihoods and attitudes of people to conservation objectives). A key point is that conservation-oriented livestock herding programs have the potential to expand wildlife habitat beyond the boundaries of protected areas thereby restoring ecosystem connectivity and function; this point has major implications for improving the functioning of corridors for wildlife dispersal and migration in Transfrontier Conservation Areas (TFCAs), which currently are operating very poorly, jeopardizing the viability of TFCAs. The TFCA concept is built upon creating larger conservation landscapes with wildlife movement between different protected areas within a specific TFCA but these movement corridors are often only present on maps but in reality do not operate on the ground. Livestock herding

programs have the potential to make wildlife dispersal areas and movement corridors in TFCAs functional.

Proposed Work

The villages of Gunotsoga, Eretsha and Beetsha in the eastern Okavango Panhandle of Botswana occur at the interface of large wildlife populations and human livelihood activities, such as crop farming and raising livestock (Grobe et al. 2013). Severe conflict has developed as a consequence of lion depredation of livestock (Grobe et al. 2013) leading to retaliation killings and poisoning events, killing not only lions but many vultures also. A collaborative project between CLAWS (Communities Living Among Wildlife Sustainably) and ORI (Okavango Research Institute), aims to address the livestock-carnivore conflict problem in the eastern Okavango Panhandle through the development of a livestock herding program. The program has already received a good foundation through the running of livestock herding and rangeland management courses at the villages of Beetsha and Eretsha, initiated and funded by CLAWS and run by the Africa Centre For Holistic Management (ACHM) with additional lectures by Dr Richard Fynn at ORI. As a result a Kgotla meeting at Eretsha recently gave the go ahead for a herding program to be initiated using several herds at Eretsha. This is a major step forward because the most difficult part of livestock herding programs is to get community members to start herding. According to ACHM trainers once the rest of the community sees the benefits they mostly want to join. This first herding initiative in Botswana could be a historic moment that revolutionizes thinking about conservation strategy and human-wildlife interactions.

Monitoring the Effectiveness of the Program

Several key indices will need to be monitored to gauge whether herding is achieving its goals for conservation and the livelihoods of LCs.

(i) Monitoring of rangeland condition: This will be done using permanently marked 2x2m plots in which all grasses are identified and given aerial cover values. This approach has been shown to be very effective in detecting change in grassland composition and diversity overtime (see Koerner et al. 2014; Burkepile et al. 2017). In addition to monitoring of grassland at fixed locations, randomly placed transects will used. A 100m tape measure will be laid out in a randomly chosen location and at every 10m mark, the number of tufts of each grass species will be counted within a 0.25 x 0.25m quadrat. Both fixed plots and randomly located transects will be done in the major vegetation types of the region (Sandveld, Mopane, Acacia grassland and wetland).

(ii) Monitoring of cattle performance: Several indices of cattle performance will be monitored comparing herded animals vs. free ranging. Cattle performance will be determined using (a) weight gain over the annual cycle (wet season, early dry season and late dry season), (b) visual estimates of condition using condition scores according to the method of Rasby et al. (2014) over the annual cycle, (c) conception rates per 100 animals, (d) birth rates per 100 animals, (e) calf size at birth, (f) death rates per 100 animals.

(iii) One of the most obvious indices for the objectives of the herding program will be numbers depredated by lions. This is a major variable influencing livelihoods of LCs and retaliation killings of lions.

(iv) Finally, considering the known performance of wetlands as dry season ranges of both wildlife and livestock across Africa, especially for reducing weight loss over the dry season and mortality during droughts (Fynn et al. 2015), we will monitor the performance of herds in regions with access to excellent floodplains (Eretsha region) with herds fragmented by fencing/land use from adjacent wetlands (Habu region). Separate studies are ongoing in both regions and collaborations will be set up between students working in the two regions to compare cattle performance in areas where cattle are herded with access to the full range of functional seasonal resources, including woodlands and floodplains (Eretsha region) with the area where cattle only have access to woodlands (Habu region).

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