

The Rufford Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Titus Adhola
Project title	Lion-hyaena interactions within a backdrop of human-carnivore conflict in a Samburu pastoralist landscape in northern Kenya: is there hope for co-existence?
RSG reference	19379-1
Reporting period	March 2016 – April 2017
Amount of grant	£5,000
Your email address	adholatitus@yahoo.com
Date of this report	17 th August 2017

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
<p>What kinds of interactions exist between the lion and the spotted-hyaena; and how does this impact on each of their populations in a human-dominated landscape?</p>				<p>No interactions whatsoever were observed during daytime between lions and hyaenas during the entire length of the field study in Samburu. However during the night, hyaenas were observed to visit deserted lion kill sites to scavenge remains of prey carcasses. This was achieved through use of trail cameras/camera traps placed at various strategic lion kill site locations within the Samburu National Reserve. The hyaenas seemed very cautious and apprehensive when approaching deserted lion kills (adult camel, adult oryx, adult impala, elephant calf, cow, and goat); and would only begin scavenging when certain that the lions that made the kill were not in the immediate vicinity. Thus through use of camera traps/trail cameras for night surveillance, the only observed interaction between lions and hyaenas was that of avoidance on the part of the hyaenas.</p>
<p>Does the hunting strategy and/or success of each study species change within the pastoralist communal lands; is it driven by biotic (fear of retaliation by humans, herding practices, wild prey type, abundance and structure) or abiotic (seasonality) factors?</p>				<p>As mentioned earlier, there were no observed interactions between the lions and hyaenas during daytime. Lions generally seem not to occur in prides in Samburu, but as loose coalitions; and occur mainly within the Samburu National Reserve, and its immediate environs. Hyaenas in Samburu on the other hand, tend to occur more on community conservancies, and less within the Samburu National Reserve. Therefore, trying to focus on limited and/or rare actual encounters between the two carnivore species; gathering enough</p>

			<p>data, and making credible conclusions concerning their interactions, within a backdrop of human-carnivore conflict; and within limited time and field resources, was deemed as impractical for Samburu County. Subsequently, modifications and/or changes to the study objectives had to be made after a reconnaissance study of the study area had been done.</p>
<p>What are the key factors that need to be considered in order to enhance tolerance by the Samburu pastoral community to co-exist with the presence of top predators in their communal lands?</p>			<p>This turned out to be a broad study objective that required longer time duration of data collection than previously envisaged at the start of the project. It is however work in progress as the project team works in liaison with key stakeholders that include: the community members themselves, government agencies (National Museums of Kenya, Kenya Wildlife Service and University of Nairobi), local government (Samburu County) and local conservation organisations (Northern Rangeland Trust and Action for Cheetahs in Kenya) to establish ways of facilitating the local communities to develop and implement effective wildlife policy awareness and strategies that will create, raise, develop and sustain desired; awareness, attitudes, ideas, skills, knowledge and behaviour for peaceful co-existence with the large carnivore species (lion, leopard, hyaena, wild dog and cheetah). This will progressively lead towards a de-escalation of human-wildlife conflict through creation and promotion of wildlife management areas and better husbandry practices to deal with livestock depredation.</p>

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Studying lion-hyaena interactions alongside cattle depredation by large carnivores in Samburu County, as originally proposed was found not to be feasible, after actual reconnaissance surveys on the ground (as already explained in the comments sections above for objectives one and two). To that end, the on-going study shifted effort and resources to instead focus on assessing key ecological determinants of depredation by large carnivores, in relation to community practices and perceptions in Samburu, northern Kenya. Consequently, research questions had to be modified to help achieve this new study goal (extensive details on this have been provided under question 5 on a subsequent page in this document).

Initially when demarcating study sites from a virtual map of the study area, movement from one study site to the next seemed pretty straight forward, until we got to the ground! Some of the roads proved near impassable and took a heavy toll on the field car needing constant repairs. On a positive note, those regular car challenges due to the very unforgiving off-roads contributed greatly towards a marked improvement in my driving intelligence and skills in manoeuvring the field car through extremely tricky terrain and/or dry riverbed crossings, during subsequent project field trips in the Samburu 'outback'. In effect, I was transformed into a car mechanic of sorts; improvising solutions to some of the car problems, and going ahead with fieldwork!

A prolonged drought experienced in most parts of Kenya in late 2016/early 2017 led to a spike in human-wildlife conflict, due to cattle depredation by large carnivores. Animals, both domestic and wild, were seriously affected by drought induced mortality. Further to that, the level of insecurity in northern Kenya, reached an all-time high due to violent inter-tribal cattle raids that involved use of deadly weapons, such as guns by pastoralist tribes in northern Kenya (Samburu, Turkana, Pokot, Borana and Maasai). In addition, 2017 being an election year in the Kenyan electoral cycle was not very helpful to the already dicey aforementioned scenario. To that end, all project activities were immediately halted until such conflicts abated. This led to great delays in data collection and study objectives not being fully realised as initially planned for during the commencement of field activities.

3. Briefly describe the three most important outcomes of your project.

I would be more comfortable describing them as expected outcomes since it is still work in progress and they include:

1. The most important initial outcome is that the on-going project was warmly received by the local community. Our project collaborators: Action for Cheetahs in Kenya (ACK) and Northern Rangeland Trust (NRT) made this possible through their relentless networking efforts with opinion leaders, community elders and community members of the various community conservancies in Samburu.

2. The project team is working towards having the capability to correctly determine and map livestock depredation conflict 'hotspots' in Samburu by the large carnivores (lion, leopard, spotted hyaena, striped hyaena, wild dog and cheetah), in relation to key ecological factors and community cultural practices and perceptions. Being able to determine and map livestock depredation conflict hotspots can only take place after a sustained duration of data collection (longer than the time window that was available for this reporting period).
3. Quantifying the diet (livestock vs wild prey) of the large carnivore species in Samburu through analyses of carnivore scat/faeces is also an on-going project activity. The composition of the carnivore diet is directly relevant to the interaction between the animals and humans, and, provides part of the ecological background for our own behaviour in relation to carnivores; for instance, it is possible to deduce from studies of carnivore diet what are the kinds of species that are vulnerable to predation (Bacon et al., 2011; Boitani and Powell, 2012).

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Community education awareness and participation in wildlife conservation in partnership with our local project collaborators (ACK and NRT) is the backbone that will lead to the success in realising our project goals. Five field assistants (three park rangers at the Samburu National Reserve and two community scouts at Meibae Community Conservancy) have participated in the project thus far; benefiting not only through short term employment, but also receiving hands on training to gain and/or improve on their skills on data collection and ecological monitoring work. It has been observed by our project team that members of the Samburu community culturally dispose left overs of slaughtered animals and/or carcasses of their dead animals close to their 'bomas' (temporary areas of residence). We found evidence of carnivore activities close to these said bomas at night (through camera traps and also through physical evidence left behind such as carnivore scat and/or footprints in the subsequent mornings), scavenging the disposed domestic animal remains/carcasses. This practice has the potential to habituate the said carnivores and make them 'problem animals' as they will always have the dangerous tendency to associate areas of human habitation with food opportunities. The project team strives to enlighten boma owners of the possible dangers of this practice at every opportunity.

5. Are there any plans to continue this work?

Yes! For this conservation project to successfully bear fruit, the on-going long term data collection to realise study objectives and community involvement is paramount. It is work in progress to fully integrate project activities with those of our project collaborators through their already established infrastructures of vast community conservation networks in Samburu.

Even though in the course of this project duration, the project executant has worked with three park rangers (two males and one female), only one of them has been consistent and has proved very invaluable courtesy of his excellent tracking capabilities when looking for carnivore kills and scat within the Samburu National Reserve. In the same time duration, one of the community scouts working for ACK has doubled up to assist with my project activities in Meibae under an agreement with ACK, however from July 2017 henceforth forth, ACK identified a good community scout not on its regular payroll, as my field assistant at Meibae for my long term project activities there. I may need to employ an additional scout on a contract basis subject to further successful fundraising to be able to effectively conduct questionnaire surveys in Meibae Community Conservancy.

As intimated earlier, new research questions had to be formulated to be able to achieve the project goal of identifying key ecological determinants of depredation by large carnivores, in relation to community practices and perceptions in Samburu, northern Kenya. These include: (1.) How do seasonal surface-water dynamics influence large carnivore diet and prey preference, based on analyses of carnivore scat?; (2.) How does variation in local habitat influence the perceived and actual rates of livestock depredation by large carnivores?; (3.) What are the levels of tolerance of pastoral communities to the presence of large carnivores in their communal lands – are these levels influenced by community attitudes/perceptions, the ecological and/or cultural significance of the large carnivores, or by the prevailing socio-economic factors?; and (4.) How do human cultural carcass disposal practices across habitats influence livestock depredation rates and patterns?

Through the on-going data collection on carcass disposal patterns (how many dead animals are disposed/species of dead animals disposed/frequency of disposal/proximity of carcasses to bomas) of the members of the Samburu community; the project team will be able to determine whether this cultural practice of disposing animal carcasses close to their bomas significantly contributes to an increase in livestock depredation events by large carnivores. Interviews (using semi-structured questionnaires), of home owners (in every third household within a 10 by 10 km grid along randomly selected transects on a GIS map of the study area) are on-going with a target of being able to conduct at least 50 questionnaire interviews for Meibae Community Conservancy. Our project questionnaires have been designed to complement past surveys already conducted by ACK and NRT. By using those past surveys by NRT and ACK as a baseline, the project team will be able to show changes in attitude over time, and how this can be used to inform and/or complement existing livestock depredation conflict mitigation efforts by NRT and ACK in Samburu.

Ground truthing the study area to produce a GIS vegetation map of Samburu County to be able to correctly determine depredation conflict hotspots is an on-going activity that could not have been possible to accomplish within the time window allocated for this reporting period. Nevertheless, the project executant is optimistic this will be achieved in due course after achieving sustained data collection on vegetation attributes and GPS coordinates of areas where livestock

depredation conflicts have been reported; the circumstances that might have contributed to such incidences; including exact details (whenever possible) of carnivore species responsible, and the nature and extent of damage caused.

6. How do you plan to share the results of your work with others?

- The project executant is a committee member of the National Large Carnivore Conservation Task Force; set up by the Kenya Wildlife Service (KWS) Board of Trustees, to assist KWS in championing the process of developing and implementing large carnivore conservation strategies. My goal is to work with the KWS towards improving on their Counties Community Wildlife Conservation Programmes and initiatives specifically in the area of human-carnivore conflict.
- Periodic technical reports will be made available to all my project sponsors to highlight key updates on the project findings and progress.
- I purpose to publish long term research findings in peer reviewed scientific journals with a preference to open-source scientific journals in order to make my research findings available to a global audience.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

The Rufford Foundation grant was used from March 2016 to April 2017. However due to some challenges and/or circumstances beyond the control of the project team (as explained under questions 2 and 5 above), the project activities are still on going. To this end, achieving sustained data collection alongside the on-going community scout(s)training component; and working towards the attainment of full community ownership of our large carnivore conservation initiative in Samburu; it is recommended that the project should go on for another 5 years at a bare minimum.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used

Exchange rate: £1=Ksh137 as at 23rd March 2016

Item	Budgeted Amount	Actual Amount	Difference	Comments
Rangefinder (1 pc): Bushnell Tour V3 Jolt Standard Edition Golf Laser Rangefinder	200	183	17	The £17 surplus was used to complement digital camera purchase.
Digital Camera (1 pc):	300	387	- 87	Used the surplus £17 from the

Canon Camera SX60 HS with memory card and camera bag				Rangefinder budget line; and, £70 hived off from the maintenance costs budget line to counter this deficit.
Car hire for 60 field days @£50 per day	3000	3000	0	Carefully planned for logistics and effective team work ensured that data collection was maximised effectively during actual field days in Samburu. Any additional car hire costs were covered through complementary budget lines from co-sponsorship.
Car fuel for 60 field days @£15 per day	900	900	0	This allocated budget for fuel was carefully planned for and utilised sustainably for effective data collection during fieldwork. Any additional fuel costs were covered through complementary budget lines from co-sponsorship.
Field Assistants allowance	300	300	0	The field assistants were very cooperative and helpful in conducting project activities.
Maintenance costs (camping fees, food expenses and other miscellaneous)	250	180	70	£70 was hived off from this budget line to help counter the deficit incurred during digital camera purchase. Subsequent maintenance costs were covered through complementary budget lines from co-sponsorship.
External hard disk drive (1 pc): Transcend (1 terabyte capacity) for data backup	50	50	0	For backup of field photos, video and soft copies of field data.
Total	5000	5000	0	

9. Looking ahead, what do you feel are the important next steps?

- At the request of the Senior Warden, Samburu National Reserve, the project executant is in talks with NRT and ACK to conduct an initial workshop in training park rangers (most of them drawn from the local community) on how to collect data on carnivore prey depredation (wild vs domestic) through use of GPS units, and to collect vegetation data to complement project efforts in producing a vegetation map for the Samburu National Reserve.
- The project executant has also placed a request to NRT to be included in its programme of meetings with members of the different community conservancies during its routine operations in Samburu County. The request has been warmly received; and plans are underway to conduct joint

community scout trainings for proper collection of vegetation data attributes, to produce vegetation maps for the various community conservancies in Samburu. It will therefore be an aspect of pooling of resources among project collaborators, to maximise on the yield and quality of data collection; while at the same time promoting a sustained community involvement and participation in our project activities.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes! I have already sent progress reports of my conservation work with the co-sponsorship of Rufford Foundation acknowledged and Rufford Foundation logo included in the front and back pages of the said progress reports to two project co-sponsors: Idea Wild (<http://www.ideawild.org/>) and The French Institute for Research in Africa (IFRA-Nairobi) (<http://ifra-nairobi.net/>) to publicize updates of my research findings through their websites, contacts and networks.

11. Any other comments?

A very big thank you to the Rufford Foundation for giving upcoming conservation practitioners like myself, a chance to make a difference locally; by facilitating through financial sponsorship, the initiation and implementation of sustainable community wildlife conservation projects globally!

