

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 | Abdullahi Hussein Ali |
| Project title | Range Restoration For The World's Most Endangered Antelope And Local Livelihood Improvements In Southeastern Kenya. |
| RSG reference | 18361-D |
| Reporting period | 2016-2017 |
| Amount of grant | £10000 |
| Your email address | ali@hirolaconservation.org |
| Date of this report | 27 th September 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 |
|---|--------------|--------------------|----------------|---|
| Reduce tree cover through manual removal of trees | | | | This is an ongoing work that will likely take up to 3 years to complete. We have successfully cleared up to 3000 invasive trees and tested the responses of hirola to cleared habitat patches. Our next effort will aim to implement these successes at larger scales through collaboration with local communities. |
| Improve grass cover by reseeding vast areas | | | | This is also an ongoing work that we completed at the experimental level where we tested the ideal conditions under which to restore grasslands. The prolonged drought resulted in the failure of two rainfall seasons. These rainfall seasons were to aid in the germination and vast reseeding of the native grasses. Regardless, we have tested the response of four seeded native grass species (<i>Cenchrus ciliaris</i> , <i>Enteropogon macrostachyus</i> , <i>Eragrostis superba</i> , and <i>Chloris roxburgiana</i>) to five different site preparation methods (tilling, manure application + seeding, seeding, no treatment). Please see results section below. |
| Establishment of anti-poaching units | | | | We have completely achieved this goal with 30 dedicated hirola rangers currently stationed within the hirola's geographic range. |
| Initiate rain water harvesting strategies | | | | We have created six water pans and five different educational meetings on rainfall harvesting strategies, therefore this goal is fully achieved. |

| | | | |
|------------------------------------|--|--|--|
| Organize exchange tour for locals. | | | While we intended to take locals to Laikipia in central Kenya where range restoration is widely practiced, ongoing conflicts between land invading herders and ranchers have forced us to choose an alternative site. As such we took 14 local elders to Nairobi National Park where they have been able to witness various habitat management techniques. This was also a unique opportunity to learn how protected areas (conservancies, parks and reserves) function. |
|------------------------------------|--|--|--|

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

The hirola's range experienced the worst drought spell that persisted from mid-2016 to June 2017. The scarcity and lack of water and pasture led to mass mortalities of wildlife and livestock due to severe habitat degradation. Increased migration of locals in search of water and pasture for their livestock triggered invasions of conservancies, human-wildlife conflicts and inter-clan conflicts. However, we organised workshops and drought emergency intervention measures to cushion wildlife and communities against the prolonged drought. These included the provision of high quality feeds to hirola and other wildlife within the hirola's range, water trucking, creation of water pans and rehabilitation of the existing ones and enhancing community awareness on livestock health, water harvesting and livelihood improvements.

One of our original objectives was to conduct an exchange tour where 10 local elders would visit West Gate community conservancy in Laikipia. However, the conservancies in Laikipia have experienced a series of violent invasions that have resulted in the loss of humans, livestock, wildlife and property. For this reason, we opted for Nairobi National Park that would offer the same experience with regard to wildlife conservation. Insecurity incidences within northern Kenya have been a major concern to our conservation efforts. Most of these incidences are related to the ongoing politics in Kenya that is currently heightened. We however expect things to resume normalcy after the October 2017 elections.



Local Somali elders visiting the Nairobi National park.

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

Habitat Restoration for hirola: Rangeland restoration can improve habitat for



threatened species such as the hirola antelope (*Beatragus hunteri*) that inhabit savannas of eastern Kenya. However, restoration success likely varies across soil types and target restoration species, as well as according to restoration approach. We tested the response of four native grass species (*Cenchrus ciliaris*, *Enteropogon macrostachyus*, *Eragrostis superba*, and *Chloris roxburgiana*) to four different restoration approaches (tilling, manure

application + seeding, seeding, no treatment). We also tested the interaction between planted grass and other functional groups using ANOVA. In each of two soil types, we located three 50 x 20 m treatment blocks. Within each block, were 16 treatment plots that were randomly assigned to one of 16 species-site preparation combinations (4 species * 4 site preparation treatments). Our results suggest total grass

cover was higher in the seeded treatment than the seeding + manure treatment. Both tilling and no treatment did not result in any significant above ground biomass suggesting that lack of seeds rather than soil capping or water availability might be the key mechanism limiting grass growth. There were no statistically significant interactions between the effects of the treatments and the occurrence of other, non-planted, grass species on planted grass cover. In contrast, the Tukey's HSD post hoc paired tests showed significant differences among all treatments. Overall, planted grass species performed better in loam soils (median 45% cover) than in high clay (black cotton) soils (median =40% cover). Similarly planted grasses performed better than other grass species and forbs in both loam and black cotton soils. These experiments are aimed at informing landscape level grassland restoration for hirola, where tree encroachment has suppressed their recovery for nearly three decades. (also see <https://www.youtube.com/watch?v=OeoyUywygd8>). I am presenting this work at the upcoming society for range management meeting in February 2018. This meeting will be held January 28th to February 2nd 2018 at the Nugget Hotel in Sparks, Nevada.

Additionally, we rolled out larger restoration plots in core areas of hirola to test the



effectiveness of applied nucleation in restoring grasslands for hirola. Nucleation plantings is a concept that entails dense plantings of small areas with several species (grass etc.), usually with the several species distributed like stepping stones of varying sizes. Since there is a high cost of planting a large or entire area and given the homogeneity nature of such plantings, applied nucleation has been found suitable in

restoring habitats at the landscape level. From these experiments, we observed less erosion in the areas where we have cut down tree branches and then placed on the ground as carpets. The branches acted as barriers preventing soil erosion in these sites. We also recorded more above ground biomass, forbs and perennial grasses including the planted grasses in the cleared patches compared to the control plots (cleared only and no seeding). Grasses were found to grow beneath the cut tree branches, with fallen trees forming litter under the tree branches. Most importantly, hirola and other grazers (e.g. zebra) were attracted by these restored sites. As such, we quantified the relationship between grass species and two components of hirola habitat use: (i) relative probability of encountering hirola (improved vs not improved), (ii) Actual time hirola spent in each of these sites. Surprisingly, hirola is responding very well to restore habitat and spending 10 times more in improved habitat compared to control sites. Equally seeding alone improved vegetation density by more than three times. While our restoration effort is long-term, manual removal of trees at a larger scale is expected improve the availability of grass by 50% in the next two years. This means in the short and long term, hirola and livestock will have sufficient forage and

improved habitat translating to productive and increased numbers. Cut trees will enhance the soil carbon and quality in general and chopped stumps will provide mulch and reduce rates of evaporation and improve soil moisture. These changes will coincide with the release of the first sanctuary bred hirola into restored areas hence high chance of survival.

Our anti-poaching unit established through the long-term support of the Rufford Foundation and other partners has recruited up to 30 rangers dedicated to the protection of elephants and monitor hirola herds. These scouts have completed trainings on bush skills, survival tactics, security drills and data collection techniques to help monitor hirola herds and curb poaching within the hirola's geographic range. These scouts have patrolled 12000 km within the last 12 months. Additionally, and in collaboration with local agencies, our scouts arrested 15 poachers and have recovered 105 snares in 2016 alone. The elimination of traps and snares by these rangers will ensure survival of hirola and other ungulates. The patrols by scouts will enable apprehension of poachers, hence reduced poaching incidences. In the long term, our anti-poaching team will monitor security incidences in partnership with government and locals thus creating a collaborative approach to find solution to these threats.

Rainwater harvesting strategies: We established six water pans for wildlife and local communities that 100 m x 100 m x 3 m pans (small dams) in three areas. This has provided both water and employments to local communities.

In summary, this project supported through Rufford Foundation has informed the long-term restoration of rangelands for hirola and livestock in the region. With further additional support from the international community, we will scale up this project to allow long-term co-existence of wildlife and livestock production. Additionally, the knock on effect of restored rangelands is likely to enhance better livestock management alongside conservation.

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

Because local communities are the custodian of the hirola and it is habitat in eastern Kenya, we involved local communities in every step of this project. We collaborated with Ishaqbini conservancy, Bura East Conservancy and Sangailu local groups where established demonstration plots that has the potential to impact up to 10,000 pastoralists along the Kenya-Somalia border. Importantly, we provided employments to locals and taught them techniques of restoring rangelands for both livestock and wildlife. The water from our water pans will be shared by wildlife and local communities. The entire project is expected to have a knock on effect for the local communities who depend on livestock. These impacts can last several generations.

5. Are there any plans to continue this work?

Yes. This project is part of a larger programme i.e., hirola conservation programme that focuses on the recovery of the hirola antelope. This project is expected to restore

three hirola community conservation areas and Arawale National Reserve along with areas for communities. These areas represent the last strong holds of hirola and critical areas necessary for long-term conservation of hirola. Further, habitat restoration has been identified as the most important conservation action for hirola and a prerequisite to the recovery of hirola. And because multi-predator control is arguably logistically impossible and unethical, we are focussing on strategies to reverse bush encroachment to open grasslands that historically characterised eastern Kenya. After all, our long-term goal is to convert the encroaching bush into a sustainable business opportunity for the locals through the processing of trees into a certified high-heat, low-emission, compacted logs for use as a cooking fuel. This has worked in other parts of Africa (see for example <http://cheetah.org/what-we-do/habitat-restoration/>). The long-term completion of this project is expected to improve populations of hirola and other wildlife species and eventually improve tourism income for the locals. To ensure further financial sustainability; contacts have been established with the Whitely Funds for Nature, the Darwin Initiative, Wildlife Conservation Network, and the Global Environmental Facility Fund

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

Our work through the hirola conservation programme continues to be the major backbone of hirola conservation in Kenya. Since I started, I have been engaging stakeholders through meetings, school visits and the production of educational materials. Upon the completion of my PhD in 2016, I have submitted all three chapters of my dissertation in top-notch journals including the Journal of Applied Ecology, Ecological Applications and Animal Conservation. My first chapter has already been published in Journal of Applied Ecology while the second one is in Press in Ecological Applications. In collaboration with ZSL, I have compiled the outcome of my entire effort into a hirola survival blueprint currently under review. Further, I am a member of the hirola management committee and I share outcomes through regular meetings and progress reports. Internationally, I have presented this work in several forums including the Pathways conference, Nanyuki, Kenya, the Zoos & aquariums committing to conservation conference, Denver, CO, USA, Wildlife Conservation Network Expo, San Francisco, CA, American Society of Mammalogists, Oklahoma, EDGE conservation fellows and donors conference, UK, Association of Zoos and Aquariums meeting, Phoenix, AZ, USA, the Society for Conservation Biology, Arusha, Tanzania. In 2018 for example, we have already registered for ZACC conference in Jacksonville, Society for Range Management meeting and also for the Rufford small grant conference in Uganda.

We occasionally use the media to share our work and 2016 coverage of our work can be found under the following links:

- The New York times: <https://www.nytimes.com/2017/09/16/world/africa/rare-white-giraffe-kenya.html?mcubz=3>
- The Guardian: <https://www.theguardian.com/environment/2017/sep/14/rare-white-giraffes-spotted-kenya-conservation-area>
- The Conversation: <https://theconversation.com/the-hirola-is-the-worlds-rarest-antelope-heres-how-it-can-be-saved-77486>

- UW Researchers: <https://www.uwyo.edu/uw/news/2017/02/uw-researchers-decline-of-grass-threatens-worlds-most-endangered-antelope.html>
- The Applied Ecologist's blog: <https://jappliedecologyblog.wordpress.com/2017/02/15/why-hirola-are-the-worlds-most-endangered-antelope-and-what-it-will-take-to-save-them-with-somali-translation/?platform=hootsuite>
- Mongabay: <https://news.mongabay.com/2017/02/increasing-tree-cover-threatens-worlds-most-endangered-antelope/>
- The Standard: <https://www.standardmedia.co.ke/article/2001232512/scientist-on-mission-to-save-endangered-antelope-in-kenya>

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

We spent this grant between 2016 and 2017. This slightly exceeds the actual period by one year due to intensive drought that is ravaging the entire horn of Africa region.

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.

| Item | Budgeted Amount | Actual Amount | Difference | Comments |
|--|-----------------|---------------|------------|----------|
| Field operation costs for daily patrols (24 months) | 2000 | 2000 | 100 | |
| Motorbike, motorbike maintenance and fuel | 100 | 400 | 300 | |
| Bush clearing in Mansabubu (northern Arawale), Gababa (southern Arawale), Ishaqbini conservancy, Ishaqbini sanctuary | 400 | 400 | nil | |
| Fencing of site, demarcation of experimental plots | 1000 | 1000 | Nil | |
| Range evaluations: Soil sampling, vegetation sampling, climatic and other assessments | 1000 | 700 | 300 | |
| Seed acquisition and seed bed preparation | 2000 | 2000 | Nil | |
| Purchase of fertilizer and manure preparations | 1500 | 1500 | Nil | |
| Transplanting of seedlings and planting activities | 2000 | 2000 | Nil | |
| Total | 10,000 | 10,000 | | |

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

Since we completed the testing of restoration strategies using multisite experiments, we need to scale up the restoration effort targeting protected areas within the hirola's

geographic range. Following our recent success with experimental testing, we would like implement these concepts at larger scale targeting hirola core concentration areas. These areas will include Bura East Conservancy, Ishaqbini, Gababa and Arawale National Reserve. This landscape level effort will coincide the release of predator proof sanctuary bred individuals and is anticipated to be a safety belt habitat in the long-term. Hirola will continue to rely on conservation intervention for the foreseeable future.

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 typically use RSG logo in all of my work. On average, I get approximately 10 invitations per year to talk about hirola both locally and internationally. I acknowledge the support of RSG in each of these forum (please also see #6 above).

11. Any other comments?

I would like to thank the Rufford Board of Trustees for their continued support. Since my first grant in 2009, I have continued to be at the forefront of hirola conservation of which this would have been impossible without your support. Because of our long-term partnership with Rufford, our impacts on the ground is real and realistic. Again thank you for partnering with us to save the world's most endangered antelope.

