

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 | Cyrus Mutunga Kavwele |
| Project title | Time Serious Monitoring of Bush Encroachment by <i>Euclea Divinorum</i> In Ol Pejeta Conservancy Laikipia, Kenya |
| RSG reference | 19422-1 |
| Reporting period | March 2016- March 2017 |
| Amount of grant | £4991 |
| Your email address | cyruskavwele@yahoo.com |
| Date of this report | 13 th March, 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 |
|---|--------------|--------------------|----------------|---|
| 1. To monitor changes in the area under <i>E. divinorum</i> vegetation over time from 1987 to 2016 | | | | Vegetation map from 1987- 2016 generated from Landsat Images have been achieved. New vegetation cover types for the conservancy are now ready for use in other research work <i>E. divinorum</i> has significantly increased over time in the conservancy. |
| 2.To examine topographic features attributable to the change | | | | Elevation and contour lines were developed and overlaid on vegetation. Areas in low elevation had been encroached suggesting that encroachment started from deep valleys spreading outwards. |
| 3. To assess wildlife species diversity and composition in encroached habitats and "non-encroached" habitats. | | | | This objective was adopted after realising the data that was collected could be used to examine species diversity and composition across vegetation types. Infrared motion triggered cameras were used. |
| 4. To examine habitat preference or avoidance by various guild is OPC | | | | This objective was revised form naïve habitat occupancy to a more detailed and involving objective of examining habitat preference or avoidance. Infrared motion triggered cameras were used. Encroached habitats were significantly avoided by all guilds. |

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

Lost two camera traps due to breakage by elephants however I had some surplus and replaced them soonest possible this was realised.

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

- a) *E. divinorum* unpalatable woody species has increased in cover from about 12% in 1987 to nearly 49 % by 2016 as per the images processed and classified. On other hand, *A. drepanolobium* and *A. xanthoploea* reduced in coverage significantly. This was attributed to encroachment and herbivory pressure.
- b) Species diversity and evenness was higher in *E. divinorum* dominated areas whilst lowest in open grassland and *A. drepanolobium* dominated landscapes. As such, this necessitated further research in habitat preference or avoidance by all guilds.
- c) All guilds (trophic levels) within the conservancy avoided *E. divinorum* landscapes significantly as well mixed bushland. On the other hand, *A. drepanolobium* and open grassland covered areas were preferred by all guilds significantly.

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

As at now the community outside conservancy has not been reached out however there are planned presentations in the conservancy as from April where other ranch managers and community will be invited to come listen to findings and share their experiences. However, several research assistants (undergraduate students) participated immensely in this project during data collection and data cleaning with some developing short projects for their undergraduate studies. It's worth mentioning that Earthwatch volunteer Team (from USA) also participated in data collection.

5. Are there any plans to continue this work?

The findings of this work revealed very interesting ecological scenarios that are poorly known hence there is need to pick on those and carry out more research. One of the immediate plan is to establish permanent plots in the conservancy to monitor changes in tree density per unit area where *E. divinorum* is fully established since this is not known tree density is increasing or is constant. Other ecological facets will be researched within the same realm of long term monitoring project. As such, through collaborations with the conservancy, the plan is to apply for joint grants to support this long-term project.

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

This work being my MSc thesis, several copies will be deposited at the Department of Natural Resources and the University Library to provide access by larger group of researchers. Further, two papers are in preparation for publication in peer review journals. Additionally, this work will be presented to communities and conservancies as well as presentations in both national and international conferences.

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 grant was utilised as from March 2016 through to January 2017. The utilised period was within the project period.

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 |
|--|-----------------|---------------|------------|---|
| AA++ Batteries for GPS and Head lamps | 41 | 41 | 0 | Batteries bought were enough for the work |
| Food for research team while in field | 496 | 496 | 0 | Budget enough for the food |
| GPS 1 piece etrex 30 | 310 | 310 | 0 | catered for the GPS and courier services to Nanyuki |
| Portable laptop (core i5, 500HHD) | 448 | 448 | 0 | catered for laptops and operating systems |
| Externa Hard Disk 700gb | 45 | 45 | 0 | well within the budget |
| 42 camera traps hire and associated accessories | 845 | 1012 | -167 | Need to cater for camera failures and breakage by wild animals hence 7 units added. |
| Travels from Karatina - Nanyuki 3 persons @6.99 for 10 trips | 207 | 107 | 100 | Reduced number trips to free up some money for camera trap hiring |
| Conservancy Entry fee | 279 | 279 | 0 | paid once and catered for all days while in the field |

| | | | | |
|--|------|------|----|---|
| Car higher and fuelling for while in the field | 1241 | 1171 | 70 | Minimised fuel usage to free up some money to cater for shortfall in camera trap hiring and the rest went to printing charges |
| Daily sustenance for researchers | 496 | 496 | 0 | Budget enough for the daily sustenance |
| Camping fee | 372 | 372 | 0 | well within the budget |
| Camping gear for researchers | 155 | 155 | 0 | 3 tents bought were bought were enough |
| Stationaries | 28 | 28 | 0 | bought once though some are remaining |
| Printing charges | 28 | 30 | -2 | more printing was done |
| TOTAL | 4991 | 4990 | 1 | All field costs were catered by the requested amount sufficiently |

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

Given that the much-needed collaborations are in place between the conservancy through Ecological Monitoring Unit (EMU) and Principal investigator, there is need to apply for other grants jointly which are significantly higher to support other proposed research work as identified.

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

RF Logo was used in university presentation and also during presentation done recently in OI Pejeta conservancy and will still be used in the other scheduled presentations in the conservancy as from April, 2017.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

I am sincerely grateful to Rufford Foundation for the financial support without which this work would not have been possible. Further, OI Pejeta Conservancy management for cordial working relationships and having allowed me carry out this work in their property. Going forward, I will apply for second grant from Rufford Foundation to support the already identified areas of research.