

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	Elsa Bussièrè
Project title	Development of statistical and managerial methods for brown hyaena conservation in agricultural areas where persecution is strong
RSG reference	12336-1
Reporting period	
Amount of grant	£5742
Your email address	elsabussiere@gmail.com
Date of this report	17/04/2016

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

Original objective	not achieved	partially achieved	fully achieved	Comments
Assess the role of smaller protected areas in the maintenance of a viable brown hyaena population on extensive agricultural lands			✓	It quickly became obvious that the brown hyaena population in the Little Karoo maintains itself only thanks to the protected areas. The camera trap survey did not reveal brown hyaena presence on farmland, except holiday farms which are comparable to protected areas from a land use perspective.
Improve carnivore survey methods for the study of elusive species such as the brown hyaena		✓		This objective is partially achieved for now, because it is an objective that will be fully reached once the data analysis process is complete, which is currently in progress.
Promote human-wildlife coexistence	✓			Throughout the data collection process, I was able to collect information about human-wildlife conflict and to provide landowners with insights that might trigger a change of attitude towards carnivores. However, I chose the not achieved column because our real objective was to conduct a questionnaire survey throughout the whole study site but the official data from the surveyor general about the land and its ownership are not usable at this stage. We are in the process of solving this issue to conduct the questionnaire survey at a later stage.
Collaborate with MammalMAP			✓	The camera trap survey collected more than 20,000 mammal photographs that we will submit to MammalMAP through a bulk upload system. MammalMAP played an important role in the revision of the Red List of Mammals of South Africa, Swaziland and Lesotho. I was recommended as an assessor and all brown hyaena and Cape mountain leopard information collected in the Little Karoo was uploaded to MammalMAP and to the Red List.

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

Several unforeseen difficulties arose during the project.

1. Study site

The project was initially meant to take place in the Tswalu Kalahari Reserve in the Northern Cape. Unfortunately, due to logistical problems and the reserve strategies and management, my research team and I came to the conclusion that the chosen site was no longer appropriate, given the research questions we wanted to answer. We therefore decided to continue with the same research project, but on a different site located in the Western Cape, the Little Karoo. The Rufford Foundation was informed of these changes as they took place. Changing study site prompted the change of collaborators; we therefore no longer worked with Dr Ingrid Wiesel.

2. Equipment delivery

Once funding was secured, 60 camera traps were ordered through Global Supplies in South Africa, which imports the equipment from the United States. The delivery was delayed by nearly 2 months, forcing us to postpone the start of fieldwork.

3. Flooding

The 60 camera traps were deployed in October 2013. The first survey (November 2013–January 2014) was aborted because of the January 2014 flood, the largest in the area for 35 years (red dots on Figure 1). Twenty of the 60 cameras were destroyed by the flood. After the flood, camera trapping started again in March 2014, after the cameras were replaced by cameras loaned from the Cape Leopard Trust.

4. Animal Trapping

I received adequate training in April 2014 (World Trapping Conference in Hoedspruit) to be able to use safe trapping methods for the captures of brown hyaenas. Three Iridium collars were purchased and tested. After a 1 year long and exhausting process through CapeNature and the UCT Animal Ethics Committee, all permit requirements were fulfilled. The next challenge was to find a wildlife veterinarian willing to allocate time to the project. The Little Karoo is a very remote area, and few wildlife veterinarians work in the area, the closest being 350 km away.

Three vets showed interest in the project but once the logistical challenges were to be faced, they said they could not commit to the task. In January 2015, I got in touch with Dr Willem Burger, a wildlife veterinarian in Oudtshoorn, who accepted to work with us, accepting the realities and difficulties of working with a shy and elusive animal in a rough environment.

In May 2015, a PhD student from UCT working on jackals accidentally caught a brown hyaena in a leg hold trap. The trap did not cause any injury but the brown hyaena died when anaesthetised. The UCT Animal Ethics Committee became unwilling for researchers to use any type of leg hold traps or foot loop snares. Even though I was still allowed to use these tools, I decided to continue with cages only, to be sure that I would not jeopardise the whole project due to controversial trapping methods. The problem with cage traps is that they leave visual clues and brown hyaenas are wary animals. Ideally we wanted to capture brown hyaenas on holiday farms but these animals refused to walk into cages even months after deployment. In October 2015, we decided to target the brown hyaenas on protected areas and we were then successful.

5. Collaring

The brown hyaenas were fitted with Satellite Iridium GPS collars from Sirtrack. These collars were used extensively around the world and proved to be highly reliable. Unfortunately, three out of five collars got damaged during territorial fights, damaging the VHF and the satellite unit, preventing us from tracking the animals. Being unable to communicate with the device, the drop-off mechanism could not be activated. To retrieve the collars, it is necessary to capture the same animal again. It is particularly challenging as some individuals refused to walk into cages a second time. Currently only one of the three collars was retrieved but we will try again.

These challenges considerably delayed the project which is still ongoing.

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

The project is still at an early stage regarding data analysis and paper submission, which makes it difficult to identify the final outcomes of the project. However, it is possible to say that:

1. A large and unique camera trap dataset was collected, which will allow us to provide essential demographic variables (population density and occupancy map) for the brown hyaena and leopard population, which can then be used to define their conservation status in the Western Cape, South Africa.
2. Using multispecies occupancy models to analyse the camera trap dataset, we will be able to look at space partitioning between sympatric carnivore species and provide guidelines on how to manage problem animals.
3. Testing the performances of Spatially Explicit Capture Recapture models through computer simulations using real animal movement data, we will be able to provide guidelines on how to collect camera trap data when wishing to use such models to estimate population density.

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

The project took place in the Little Karoo, within a 5000 km² where small nature reserves and farmland are juxtaposed. I regularly interacted with the local community as I needed their permission to access their land and collect data. I opportunistically collected information about human-wildlife conflict as I was deploying camera traps, collecting carnivore scats or fitting GPS collars.

Many land owners became assets for the project. Some of them have been living in the area for many years and their knowledge of the region provided us with interesting insights into the evolution of the predator control methods through the years, land use and species presence. They often helped overcome logistical challenges, not hesitating to go out of their way to help whenever it was needed.

I believe through these interactions, I was able to transmit information about brown hyaenas (but also about the other carnivores), regarding their behaviour and use of the landscape. One common perception was that carnivores proliferate and use small territories. Understanding that in a semi-desert environment, carnivores use large territories, is a first step to realise the impact that one farm can have on the presence/absence of a species in the landscape.

I hope we will be able to conduct the questionnaire survey as I believe it will be the most interesting results for the community to have access to. We are also in the process of communicating some of the project results with local magazines that engage with the farming community.

5. Are there any plans to continue this work?

Cape Nature and our partner The Cape Leopard Trust might decide to conduct additional surveys in the area afterwards, and hopefully to implement conservation initiatives based on the foundation of our research work. At this stage, no one from the University is planning to pursue the research project though.

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

Thanks to the collaborations taking place within the project, the means for sharing results are broad.

Peer-reviewed

Results and relevant outcomes will be presented in peer-reviewed papers and scientific conferences; they will be detailed in a research report and summarised in posters. This information will also be presented in popular magazines.

Online access

The National Geographic Conservation Trust has first right on all media material and therefore no website was created and no popular articles were published. The Trust expressed its interest in publishing an article about the project, but only once peer-reviewed papers are published. Once the NG Conservation Trust used the media material, we would like to provide information online about the project, especially via the MammalMAP and ADU websites, as well as their respective Facebook pages. This offers us a good platform to transmit information to the public.

The Animal Demography Unit (ADU) is a leader in atlas projects in South Africa. Through projects like MammalMAP, the ADU is largely developing citizen science, also known as crowd science, crowd-sourced science, or networked science. In other words, scientific research is conducted, in whole or in part, by nonprofessional scientists. Anyone can get involved in these large-scale projects. For such projects to become successful, it is crucial to make use of the new technologies and social media.

Technical work

Greg Distiller, who is part of the research team, works closely with the SECR model developers. The information transfer between them and us aims to become an iterative process with mutually benefit. It will be facilitated by Greg Distiller himself.

Conservation entities

Coral Birss is a mammalian ecologist expert at CapeNature, the government institution with the statutory responsibility for biodiversity conservation in the Western Cape. The project results are and will continue to be incorporated into the Western Cape Biodiversity Assessment Report, and then to the National Biodiversity Assessment Document. The latter helps define the national monitoring initiatives and the objectives of SANBI, the South African National Biodiversity Institute.

Farming Community

We collaborate with local magazines (Landbouweekblad) that target the farming community, to publish popular articles about the project and promote biodiversity-agriculture integration.

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 grant was paid to us in December 2012. The full amount was used to purchase three Satellite Iridium GPS collars in March 2014.

Originally the project was meant to last 3 years, until end of 2015. Due to the numerous challenges and detailed on question 2, we were not able to meet this deadline. Although the project was considerably delayed, we did not give up and aimed to reach all our objectives, and we are still doing so.

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.

Between the moment we received the funds and the moment we spent it, the rand lost value, which decreased our buying power.

Item	Budgeted Amount (1£=R0.0767)	Funds available when grant received (in Rand) (1£=R0.07263)	Actual Amount in Rand when purchased (1£=R0.0569)	Difference	Comments
Iridium GPS collars We can add here the amount which was not spent on the RCD-04 Terminal, because it is now built in the collar.	4157£	R57235	R141389	-R84154 -R69947	15% of this difference is due to the Rand devaluation. The rest is due to a change of product. We did not buy the collars from Followit in Sweden but from Sirtracks in New Zealand. The reason for this: 1-When we budgeted for the Followit collars, we forgot to include the export charges which are 25% of the product value in Sweden. 2-Some colleagues complained about a bad batch of Followit collars. 3-Sirtrack in New Zealand teams up with Global Supplies in South Africa, which gave us someone

					to talk to within the country in any problem was to occur.
VHF Antenna	105£	R1445	R4995	-R3550	The difference is due to the rand devaluation and a change of price. We bought the antenna locally because we were worried about delivery time. We could have bought a cheaper antenna if we ordered abroad.
VHF Receiver	448£	R6168	R8550	-R2382	The difference is due to the rand devaluation.
RCD-04 Terminal	1032£	R14207	-	+R14207	The RCD-04 Terminal was meant to activate the drop-off mechanism built into the Followit collars. When we decided to buy the collars from Sirtrack, we no longer needed the RCD-04 Terminal because the collar drop-off could then be activated from the Sirtrack website.
Total	5742£	R79055	R154934	-R75879	

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

In the Little Karoo, I believe the next important step is to create a larger safe environment for the establishment of a viable brown hyaena population. Currently Sanbona Wildlife Reserve is the only reason why brown hyaenas still occur in the Little Karoo. I believe it is important for CapeNature (and other conservation bodies) to extend the network of protected land, around Sanbona and to prioritise their future land purchases in this perspective.

It might also be important to consider bringing new genes in the population. The long term viability of this population is under threat due to the potential risk of inbreeding depression

Regarding brown hyaenas in general, I believe it is important to assess the hunting abilities of the brown hyaenas and the risk posed to small stock, especially in systems where natural food sources are scarce and the vegetation structure/landscape allows predator ambush.

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?

We did not engage in public communication as we signed an exclusivity contract with the National Geographic Society. Therefore the RSGF did not receive any publicity. However, we did produce brown hyaena and leopard population catalogues for Cape Nature, as conservation tools and the RSGF support was mentioned in the documents. If we engage in public communication in the future, we will give the RSGF publicity and we will use the RSGF logo whenever suitable.

11. Any other comments?

We are very grateful for your generous donation towards the project. My apologies for not sending this report to RSGF sooner. I was not sure about what information I could share, in regards to the contract the team signed with the NG Conservation Trust, and I apologise for not telling you upfront about this issue, especially that in the end, the NG Conservation Trust was fine with me providing you with any materials you may need.

In the coming week, I will send you an updated version of the progress report I wrote to your attention a few months back and which I did not send, for the reasons mentioned above.

We would also like to continue informing you of any project development or publication in the future.

