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	Dedan Ngatia
Project title	Assessing Domestic Dog (*Canis familiaris*) demography and Rabies Disease burden in rural communities, Kenya: Implications for conservation of Wild carnivores
RSG reference	21575-2
Reporting period	After one year- July 2018
Amount of grant	£4997
Your email address	dedan.ngatia@gmail.com
Date of this report	16th August 2018

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
Assess domestic dog demography within study sites				I managed to conduct questionnaires in all these sites, and I hope to publish this work in a peer-reviewed journal.
Rabies burden surveillance				Although we visited all the dispensaries for this, there is still need to get more real time bite information. There also exists a gap on identifying rabies deaths on humans. I'm planning to work closely with the public health department on this.
Conduct Rabies Vaccination Campaign				9,313 domestic dogs vaccinated! Education done and communities well involved in this. It was a great success
Extended education programme				Local communities were reached during the rabies campaign where primary schools in these regions were also involved
Modelling				We have already collected all the data needed for this, and we are working to compute our models and screen the serum samples for data to use in our planned paper soon. I'm working with Adam Ferguson on this

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

In 2016, there was an outbreak of the canine distemper virus (CDV) that wiped out a large population of both domestic and wild dogs in Laikipia County and surrounding environs. This outbreak was assumed to have come from domestic dogs since happened during a period where there was a huge political upheaval in the country as a result of the 'the then' forthcoming national elections. As a result of this, there was massive movement of people to the southern parts of the country in search of good pasture together with their dogs, and then, the outbreak happened.

Unfortunately, the outbreak came right after the 2016 rabies vaccination campaign causing a misconception that our vaccines were causing death to domestic dogs while in real sense the cause of this was CDV. Though we engaged on community mobilisation using public address systems combined with education to help create

awareness on this, our 2017 campaign was affected where there was low turnout from the affected communities compared to the previous years. All the same, the bit we did on education and awareness creation was really helpful and through this, we are able to educate people on the differences between both rabies and canine distemper and how we can work together to control their spread.

Running the project this year was way easier since I had already established good grounds and connections with the communities and other important decision making figures in the society. Furthermore, the combination of vaccination campaign and rabies surveillance continues to add quality to our, giving us data that we can use to evaluate our effectiveness and success.

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

I was able to survey about 200 households, 86 in Il Motiok, 84 in Koija and 30 in Lekiji (Lekiji is the smallest village with less than 50 households). This data has enabled me to estimate the domestic dog demography in this regions as well as understand the rabies burden with the help of the dog bite data that we are collecting. Regions with many dog bite records mean that the people in those communities are more exposed to rabies than communities with lesser bites. From the three communities, we have managed to achieve a 50% coverage with the vaccinations and this is a huge step towards our goal of achieving 70% coverage in all the communities.

In the year 2017, we were able to vaccinate 9,313 dogs, doubling our effort from the previous year (2016 - 4530 dogs). This was a great milestone to the campaign since we were able to not only vaccinate more dogs (and cats) but also extend our coverage within Laikipia County. In 2017, we managed to establish the campaign in 14 new communities and the goal is to extend our coverage and scope every year. I hope to establish a similar study in all the communities which benefitted from the campaign last so as to be able to measure our impact and understand our stand in terms of vaccinating 70% of the dogs in Laikipia so as to eradicate rabies by 2030. On a positive note, the Government of Kenya was keenly excited by our ability to combine research and the vaccinations and went ahead to list our campaign as a pilot study with a goal of using our model in all other counties ion the country. Similarly, I was shortlisted in the National Rabies Elimination Coordination Committee.

I was also able to get data from 26 clinics randomly selected around Laikipia County. This data will be useful in estimating the rabies risk as well as understand approximately how many cases go unreported. This will be achieved by comparing this data with that from the households as well as data from the government's health information system. As far as the preliminary results are concerned, there appears to be a correlation between remoteness and exposure to rabies where the more remote communities are having huge number of dog bite records.

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

I have benefitted from having worked in the communities for the past 3 years. This way, it has been so easy for me to choose who to work with while at the same time engaging the communities more directly compared to last year. During the surveys and questionnaire administration, I worked with local community members who assisted in translation as well as educating the community members on the importance of our activities. During this period, I was able to hire nine different local research assistants, offering them free training on administration of questionnaires etc.

The local members were also key during the vaccinations since they assisted in selecting the vaccination stations based on the accessibility of these sites. From each of the 26 communities that benefited from the vaccinations, I was able to hire two assistants whom I involved in creating awareness on the campaign and community mobilisation. Together, we identified vaccination centres and decided on the most appropriate days and time to conduct the campaign. Our goal with this was to create ownership of the campaign by the locals where they would value it as their own thus enabling willingly participation.

Vaccination of domestic dogs around Laikipia was also a great and most important benefit for the local communities. Having their dogs vaccinated against rabies reduces the chances of contracting rabies particularly for these communities that are constantly moving with their livestock and dogs which in the process interact with other domestic dogs as well as wildlife, increasing the chances of contracting rabies. In addition to this, we offered extra drugs such as multivitamins and ivermectin which controls both internal and external parasites.

5. Are there any plans to continue this work?

Although there exist multiple ways of assessing dog demographics through use of models and already existing information e.g. census surveys, carrying out specific household surveys in every community still remains the most effective method of assessing population. In intend to continue with the household surveys and rabies surveillance in the clinics and dispensaries around to better understand our coverage in terms of vaccinating the 70% required to eradicate rabies in an area. With the goal of the campaign being to extend the coverage to cover the whole Laikipia County, it's also my goal to extend the surveillance and the demographics study as well, to be able to compute our success and effectiveness. I also plan to engage the government in supporting the clinics/dispensaries that lack the human rabies vaccines due to deficiency of the necessary facilities and come up with strategies in which we can establish viable alternatives for such cases.

I also hope to widen the scope and expand the coverage of the Laikipia Rabies Vaccination Campaign by establishing more partnerships and vaccinating more communities all over Laikipia.

Lastly, in the light of the recent CDV outbreak, I am preparing a proposal that will help us understand the outbreak and how similar occurrences can be avoided in future. By the fact that the blame lies on domestic dogs at the moment, I will work to help connect all the events (which include domestic dogs dying, wild dogs dying, small carnivores dying and the mass movement of people) to help show the cause of the outbreak and model to come up with strategies to curb such future occurrences.

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

So far, I have already made several presentations both nationally and internationally, including during my recent visit at Washington DC. Similarly, my work has been featured in several national magazines and blogs.

I plan to share my findings with the local communities through workshops on rabies education as well as training the local communities on dealing with rabies and dog bite cases and the importance of getting their domestic dogs vaccinated. I plan to use presentations, visuals and demonstrations acquired during my study to communicate this information. Similarly, I have plans in place to extend the education program in primary schools and get my results out.

I sit at the Kenya National Rabies Elimination Coordination Committee and the committee is keen to learn on my results. Although I have already shared my campaign report with them, I will pass the results of the research work during our regular meetings so as to raise more attention from the Kenyan government and hopefully get more support for our work. The same information will be shared to the county government of Laikipia since they are also keen in eradicating rabies in Laikipia County by 2030.

I'm at the same time preparing to publish this work in a peer reviewed journal by the end of this year.

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

I started this project in mid-July 2017 and I expected to conclude this work at the start of June 2018 so as to have ample time for generating a report for this. All the same, because of extending the LRVC last year, I was forced to push the completion of this project further with a month. We had issues with national security during the election period towards end of last year that forced everything to a halt.

All the same I have completed my work safely, with an extension of a month.

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 British Pound= Kshs 133.41

Item	Budgeted Amount £	Actual Amount £	Difference £	Comments
Questionares printing and other supplies (Printing charge, printing papers, pens and writing pads)	**£187**	**£187**	0	
Field assistants salaries; 6 assistants@ 3.5*6 days per month*10 months	1260	1260	0	
Rabies ELISA/Antibody test; @3.7 persample* 200 samples	740	740	0	
travel to health clinics @22.5permonth*10 months	225	251	26	The Director of Mpala Research centre allowed me to pay subsidized cost for the bench fees so as to be able to balance my cost. He has been way supportive to this work!!
Active surveillance network supplies @150	150	160	10	
Bench fee at Mpala Research Center	899	659	0	Subsidized by the Director!!
petrol fuel) 2-fillups a month @119.9*10months	1199	1413	214	Similarly, the Director gracefully allowed a subsidized payment on the bench fee.
Camera /Canon-SX530 - HS-9779B001-PowerS hot) @187	187	187	0	
Animal control pole @60	60	60	0	
Tshirts; 20 pieces @4.5	90	90	0	

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

Although rabies remains a key problem disease in my study area, sporadic outbreak of other viruses e.g. CDV are having huge negative impacts on our campaign and work and it's thus important that I/we extend our work and try understand the sporadic outbreaks, their sources and their relation to our study species e.g. domestic dogs and other carnivores. This will enable us to kill two birds with a single stone. More importantly, there is a great need to understand last years CDV outbreak and it's relation to domestic dog and other animal species involved in this.

Scientifically, domestic dogs are known to be the core reservoirs of CDV where a lot of studies have shown the spread of this virus from domestic dogs as the source.

Eradicating rabies from Laikipia County remains a main focus with this work. I therefore look forward to expanding the vaccination campaign and putting more emphasis in vaccinating all dogs that have been vaccinated in previous years in addition to doubling last year's vaccination efforts. In two months' time, the 2018 campaign will kick off with a target of 15, 000 dogs and hoping to reach out to at least 10 more new communities. But on the same regard, similar studies on dog demographics and rabies surveillance will need to be established to compliment the campaign and show its effectiveness.

I also want to establish a system of health education in regards to domestic dogs around the local communities so as to fight the myths and misconceptions of various diseases that affect domestic dogs such as canine distemper virus and rabies. I plan to involve most of the primary schools in this region while at the same time targeting local bazaars and community meetings.

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?

I used the Rufford Foundation logo on all the rabies vaccination campaign banners. The banners were used throughout the campaign period and during awareness raising events. During my conference presentations, both nationally and internationally, I used the Rufford logo to show and appreciate the enormous support that I have received from the foundation since the start of this work.

I also presented my work to various other platforms in the course of the project such as the Mpala Research Centre, the Kenya ministry of health as well as the pathways conference. In all these presentations, I acknowledged the Rufford Foundation as a major supporter of my work.

Similarly, I plan to include the logo in all my reports and in future presentation and workshops.

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

I, **Dedan Ngatia**, was the overall project leader and coordinator. I ensured that data was collected within the set time frame and ensured the costs of the project were fully accounted for by my team members who had various roles. I was also in charge of the rabies vaccination campaign and coordinated the team which was comprised of veterinarians, volunteers as well as community members. During the research work, I was leading a team of 4 participants in this work while during the LRVC campaign, I was leading a group of 40-60 volunteers in the campaign every week for 6 weeks.

Dr Adam Ferguson provided guidance in terms of getting the right type of data for scientific analysis. He was also helpful in the implementation of this work and helping develop questionnaires.

Wangechi Kiongo was my main research assistant. She coordinated the local community members I hired and assisted in data collection from the households and the clinics/hospital surveys. She was also responsible for data entry and part of the analysis.

James Lompoyo provided security during the household surveys as well as assistance in translations whenever language was a barrier. Mpala Research Centre allowed me to use James since he has a lot of experience working in the communities while also, he resides in one of the communities that we visited.

Joseph, Richard and Simon were community liaison members and they guided us during the data collection. They contributed towards selecting the geographic areas that would be viable for our study. They made sure the local chiefs were aware of our projects and visited the villages beforehand so as to make it easier for us during our study.

12. Any other comments?

The Rufford Foundation supporting in my work has been an eye opener and a game-changer as well. As a result of this support, there is now more awareness in the communities and the Government of Kenya has similarly reached out to us with interests in what we are doing.

It is my hope that this project will continue to make a difference and impact on people both directly and indirectly.

I believe that working further with Rufford will be really helpful for this success. Thank you so much for supporting this work and helping protect people, wildlife and livestock from this deadly virus.

Very much appreciated!