

## The Rufford Foundation Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

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**Josh Cole, Grants Director**

Grant Recipient Details	
<b>Your name</b>	Morgan Pfeiffer
<b>Project title</b>	Ranging behaviour of Cape Vultures ( <i>Gyps coprotheres</i> ): implications for wind turbine placement, Eastern Cape Province, South Africa
<b>RSG reference</b>	16361-1
<b>Reporting period</b>	October 2014-October 2015
<b>Amount of grant</b>	£3232
<b>Your email address</b>	Morgan.pfeiffer@gmail.com
<b>Date of this report</b>	23/10/2015

**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. Identify the foraging range and habitat use of adult Cape vultures from breeding colonies near the proposed wind energy development zones in the Eastern Cape Province.		X		Foraging range and habitat use were identified for four adult vultures and one juvenile vulture near wind development areas. Although the aim was to target an additional 9 more adults, they proved too difficult to catch. Therefore, the additional GPS units were deployed on pre-fledged Cape Vulture chicks in September 2015. Data collection is ongoing.
2. To understand how wind conditions, land use, and topography effect vulture flight in regards to different vulture flight modes.			X	A species distribution model was built using the tracking data from five Cape vultures. Wind, land use, topography, and movement mode were some of the predictor variables used in model creation. We identified how the predictor variables influence the probability of the vultures flying at a height of risk of colliding with wind turbine blades.
3. To create a risk assessment model for the proposed wind-turbine zones in regards to resident breeding Cape vultures.			X	Although the risk assessment model included not just breeding adults, but non-breeding birds and juveniles we consider this objective achieved. The risk assessment is even more valuable with including vultures of different ages.
4. Outcomes of the research in terms of publications and presentations.			X	Our journal article detailing previous ranging behaviour of Cape vultures was accepted into Koedoe and was published May 2015. A journal article on the Cape vulture risk assessment map has been drafted for PLOS ONE and is currently undergoing revision by all co-authors. Two reports (progress and final report) to the Eastern Cape Province government were submitted.

				<p>The risk assessment map was presented at the Annual Birds of Prey Conference of the Endangered Wildlife Trust, and the Birds and Renewable Energy Forum. Also two presentations were given to two local bird clubs. A seminar titled "Flight Behaviour of an Endangered African Vulture Species; Implications for Wind Energy Development" at the University of KwaZulu-Natal highlighted our work.</p>
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**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

Two walk-in cage traps were built at different locations in the study area in an attempt to capture vultures. Despite the traps being generously baited with dead livestock by the local farmers, no vultures fed on carcasses inside the trap; as documented by motion-activated camera traps. Two air-powered net launchers were also tested; however numerous technical errors prevented the capture of vultures using this method. Leg-hold traps were also tested, but capture attempts were affected by feral dogs.

Through our collaboration with a post doc from the University of Marburg, Germany and Ezemvelo KZN Wildlife, we obtained movement data for two Cape vultures that moved through the study area. This increased our sample size to five individuals. On October 15<sup>th</sup> 2015, the research was presented at the Birds and Renewable energy forum, which was sponsored by BirdLife South Africa and the Endangered Wildlife Trust. Following the meeting, a private wind energy company also made available movement data for two more Cape vultures that have moved through the study area (increasing our sample size to 7). This data still needs to be incorporated into the model.

In the last week of September 2015, a climbing field trip was conducted to place nine GPS transmitters on Cape vulture chicks at the largest Cape vulture colony in the Eastern Cape (Colleywobbles). We were successful at deploying all units. Once the vultures start to fly in mid-November 2015, their data will also be incorporated into the risk assessment model, making the model more robust.

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

1. The risk assessment model/map is the first for the Cape vulture. It details the probability of Cape vultures being in the area and flying at risk height of collision with wind turbine blades. Not only can this model be used by government and industry to help guide the placement of wind turbines, we observed relationships between flight height and behaviour of the vultures that has not been documented before.

2. The fitting of GPS units to Cape vulture chicks is also a first. Not only will this provide more data on flight height of the vultures, but we can investigate chick mortality. Any mortalities caused by power line infrastructure will be communicated with the NGO Endangered Wildlife Trust who have a working relationship with Eskom, the major power supplier. Dangerous power lines can be marked in order to prevent future mortalities. The fitting of units also created lots of community engagement. Community leaders were involved in the naming of the vulture chicks and have designated a day in September to celebrate vultures every year.

3. The continuation of long-term research on the movement ecology of Eastern Cape vultures through the recruitment of new students. The creation of the risk assessment map will be included as a chapter in my PhD, however there are other questions that can be investigating using our Cape vulture movement data set. A master's student at Nelson Mandela Metropolitan University will use that data set to further investigate the flight behaviour of juvenile Cape vultures.

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

A local community Cape vulture colony monitor was identified from our project. He is a local man who has a good standing in the community and has a passion for the vultures. We passed his details along to the relevant government and NGO agencies. He can be trained to count the Cape vultures throughout the year to provide population estimates. Also, he can conduct education programmes in the schools about the importance of vultures in the ecosystem. His salary can be provided by the government and NGO agencies.

Numerous meetings were held with the community on the status of our research in an effort to keep them informed. During those meetings, ideas were bounced off about the plans for a vulture restaurant to attract tourists and photographers to the area as a form of income for the community. We provided contacts for the community to help further develop these initiatives.

**5. Are there any plans to continue this work?**

Yes. There is a master's student who will be starting in 2016 using the collected vulture movement data for her research. The use of roosts still needs to be investigated. We were surprised at the number of roosts that were used by five vultures during the study period ( $n = 97$ ). The student will look at site fidelity and age differences in regards to use of roosts. The results of this year's research will be submitted to PLOS ONE, and at least one more full length journal article and two short notes will be produced by the middle of next year.

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

A journal article is being drafted for the journal PLOS ONE. The title of this manuscript is "Flight Behaviour of an Endangered African Vulture Species; Implications for Wind Energy

Development". Other journal articles to be drafted will be submitted to international peer reviewed journals. One article will investigate how cliff characteristics and nest density effects the breeding success of the cliff nesting Cape vulture. Two short notes will be drafted on the presence of toxins in the blood of Cape vultures and on the regurgitation of glass and plastic from a vulture chick. This year, a total of two presentations were given at scientific conferences and two presentations were given at local bird clubs. A seminar titled "Flight Behaviour of an Endangered African Vulture Species; Implications for Wind Energy Development "at the University of KwaZulu-Natal highlighted our work.

**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 used within one year (October 2014 – October 2015). The objective was to capture vultures as soon as possible; however this did not occur until September of 2015. The funds, though, were used throughout the year to cover running costs of the project including failed capture attempts.

**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 South African Rand = 0.048 British pound conversion factor on 23/10/2015.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Thomas River Field Accommodation for five people	£0	£244.45	+244.45	Although no accommodation was budgeted for, we used a small amount to cover accommodation that was suitable for five people.
Food for Field work	£323	£492.25	+169.25	Since we were under budget for other items, we used some funds for food.
Equipment for vulture traps	£126	£50.21	-75.79	As most traps were already built, only maintenance fees were required.
Nelson Mandela Metropolitan University Movement Ecology Course	£0	£72.61	+72.61	To help with analysis, we used some funds for a one week workshop applicable to our research.
Pay for a local guide to help with vulture captures	£0	£38.72	+38.72	We were amazed by the enthusiasm of one of the local community members

				and wanted to thank him for his services
Avian Blood Sexing Tests for vultures	£0	£53.68	+53.68	Blood sexing of the vultures was needed to help with analysis.
Diesel and vehicle maintenance	£2783	£2565.56	-217.44	Vehicle expenses fluctuated, but the funds did help cover the costs of the multiple round trips to the study sites. A total of 744,545 km were covered since January.
<b>Total</b>	<b>£3232</b>	<b>£3517.48</b>	<b>+285.48</b>	Extra costs were covered by the Gay Langmuir bursary, BirdLife South Africa, and the University of KwaZulu-Natal.

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

The completion of the risk assessment model using all seven birds is of utmost importance. This tool is needed to help guide the placement of wind turbines in the Eastern Cape Province of South Africa. When the model is completed, it could be ground checked and validated using observational data and radar. The master's project will build upon the current research and help us unpack the movement ecology of the Cape vulture in the Eastern Cape.

### 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. The Rufford Foundation was acknowledged in our May 2015 Koedoe publication. The Rufford Foundation logo was present in all presentations given this year (n = 4). Two presentations were given to bird clubs in Pietermaritzburg and Howick KwaZulu-Natal, South Africa. The Bird of Prey Conference hosted by the Endangered Wildlife Trust in Ithala Game Reserve in KwaZulu-Natal, South Africa was attended in March 2015 and the Rufford Foundation logo was displayed in the presentation. The Rufford Foundation logo was also displayed at the BirdLife South Africa and Endangered Wildlife Trust Bird and Renewable Energy Forum in October 2015. Lastly, the Rufford Foundation logo was displayed at the seminar titled "Flight Behaviour of an Endangered African Vulture Species; Implications for Wind Energy Development "at the University of KwaZulu-Natal.

### 11. Any other comments?

We are extremely grateful to the Rufford Foundation for their support. Last year's field work was extremely difficult and disheartening from not capturing vultures. The grant was

awarded at a time when vehicle troubles plagued us (having to replace gear boxes) and morale was low. So not only did the grant provide much needed financial support, it lifted our spirits and helped us start 2015 with a positive attitude. Our hard work finally paid off, with a successful capture of Cape vultures in September 2015. Now as we get to the end of 2015 and look to 2016, we are hopeful with the start of a master's project and the completion of my PhD.