# 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** | Nikki le Roex |
| **Project title** | Establishing a non-invasive genetic monitoring protocol to infer population size, relatedness and genetic viability of isolated black rhino populations |
| **RSG reference** | 20829-1 |
| **Reporting period** | December 2016 to December 2017 |
| **Amount of grant** | £4815 |
| **Your email address** | nikkileroex@gmail.com |
| **Date of this report** | 19/12/2017 |

**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 |
|---|---|---|---|---|
| Design an optimum protocol for locating and sampling rhino dung | | | | |
| Optimise a non-invasive protocol for the extraction of DNA from black rhino dung | | | | |
| Amplify a microsatellite panel with sufficient power to discriminate between individuals | | | | |
| Use the genetic data generated to determine genetic diversity, levels of relatedness and parentage | | | | Parentage is proving difficult, due to low levels of diversity within the black rhino. However, this is still underway. |

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

The black rhino population showed very low genetic diversity, which made the parentage determination from the microsatellite markers difficult. This analysis is still underway, but for management purposes, the estimation of relatedness is more practically relevant.

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

i. Fresh black rhino dung can be used to extract good quality DNA.

ii. This can be used to provide a minimum population estimate and measures of diversity and relatedness, even in difficult terrain.

iii. For fine-scale calculations of parentage and breeding success, additional or more robust markers may need to be employed, particularly for highly related populations

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

N/A

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

We would like to expand this work to other sections of this reserve, and to other SANParks reserves with small populations of black rhino.

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

This work has been shared with both the general scientific community and rhino management groups via the following presentations:

- Savannah Science Network Conference, March 2017.
- SADEC Rhino Management Group (RMG) meeting, March 2017.
- SANParks South-Western Black Rhino Management Meeting, August 2017.

Thus far, one scientific manuscript has been submitted for publication. Another publication is anticipated.

A final presentation on this study will be presented at the South African Wildlife Management Association (SAWMA) conference in 2018.

**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 Foundation Grant was used over the period of 1 year.

**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 used below: 17.06 ZAR to 1 pound

| Item | Budgeted Amount | Actual Amount | Difference | Comments |
|---|---|---|---|---|
| Field trips | 1491 | 859 | 632 | Field work was completed in fewer trips than anticipated |
| Primers | 425 | 1393 | -968 | Higher quality primers were required |
| Taq | 262 | 703 | -441 | Specialised Taq was needed for the dung-extracted DNA |
| Lab consumables | 0 | 294 | -294 | General lab consumables were not budgeted for separately in the application |
| Genotyping | 2362 | 1554 | 808 | Genotyping was very well multiplexed and thus was more cost effective |

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

Now that the principle has been established, the next step is to find a practical way to scale up this analysis going forward. Additional genotyping may need to be done for parentage.

**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?**

The Rufford Foundation logo was used in the presentations listed above, and was acknowledged as a funding source in the scientific manuscript.

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

**Dr Nikki le Roex** conceptualised the project, performed the sample collection, genetic laboratory work and data analyses

**Prof Justin O'Riain** provided intellectual and logistic support

**John Adendorff** and **Michael Paxton** provided logistical support and field expertise

**SANParks vets Dr Markus Hofmeyr** and **Dr Dave Zimmerman** provided biobank samples and conceptual input

**12. Any other comments?**

No