

## The Rufford Small Grants Foundation

### Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants 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.

**Josh Cole, Grants Director**

#### Grant Recipient Details

<b>Your name</b>	Morris Gosling
<b>Project title</b>	Conservation of Hartmann's mountain zebra in Namibia
<b>RSG reference</b>	8529-2
<b>Reporting period</b>	September 2010 – February 2012
<b>Amount of grant</b>	£5,962
<b>Your email address</b>	<a href="mailto:morris.gosling@ncl.ac.uk">morris.gosling@ncl.ac.uk</a>
<b>Date of this report</b>	24 March 2012

**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
Extend study from Gondwana Canon Park/Fish River canyon NP to five additional sites.		✓		The mountain zebra project was continued in Gondwana Canon Park and further studies were established in Naukluft NP, NamibRand NR, Neuhoof Reserve and Buellsport Guest farm. A proposal for pilot work in Etosha NP was submitted but no response was received.
Publicise mountain zebra conservation using Namibia Nature Foundation website.		✓		A mountain zebra webpage was established and maintained; it outlines conservation issues with project details and progress reports.
Develop individual recognition system.			✓	An improved recognition system using 13 stripe characters has been developed and implemented. These characters have been coded for a total of 1,641 mountain zebras at the five main study sites.
Mark-recapture estimates of mountain zebra populations.			✓	Estimates have been carried out in four of the study sites (the study at Neuhoof is at too early a stage) and the results passed to park managers. A first estimate of the northern region of Gondwana CP (ca 20,000 ha) gave an estimate of 287+/-16 in late 2011 (the dry season). However 371 individuals were known to be alive in 2011. This difference contrasts the numbers of animals present when the estimate was carried out with the size of the source population whose members sometime visit the area.
Comparing road transects with mark-recapture approaches.		✓		Results for Gondwana CP show that trends from road transect counts and mark-recapture estimates are similar. The distance sampling assumptions of road transect counts are generally violated due to mountain zebra escape behaviour but they are a useful quick indicator of numbers. Mark-recapture is more reliable for detailed models and for conservation management.

Develop networks of camera traps and test new cameras.		✓		Networks of cameras have been established in cooperation with park managers and are ensuring better sampling distributions for mark-recapture and for detecting population movements. No camera traps can prevent motion blurring in infra-red mode but placing cameras at water holes overcomes this problem. Modern camera traps produce excellent information for population monitoring.
Employ and improve body condition measures.		✓		Body condition measures have been used systematically and animals have remained in good condition suggesting all populations are below carrying capacity. The only animals that have become thin are lactating females.
Carry out survivorship analysis.		✓		Continued analysis of survivorship, including long-term data from Gondwana CP: for example, of 78 individuals identified in 2005, 49 (63%) were alive in 2011 giving an annual mortality rate of about 6%. A year of birth is assigned to all new individuals under 2 yrs old and these are being used for standard estimates of birth rates. All of these data will be used in Population Viability Analysis.
Investigate the interaction of mountain and plains zebra in relation to the threat of hybridisation.	✓			I continued monitoring interactions between male mountain zebra and plains zebra in Gondwana CP and NamibRand. Three MZ males attached themselves to PZ breeding groups. Ecological overlap occurred at particular seasons at both of these sites. A request to do pilot work in Etosha received no response. In a visit to Etosha I was told that there was extensive hybridisation and this is supported by genetic investigation. Hybridisation may be the most important conservation threat to MZ.

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

The main disappointment over the period of the grant was the failure to get access to Etosha NP to carry out pilot work on hybridisation between mountain and plains zebra. I submitted a research

application and made repeated contact but was unable to get a response from the Etosha Ecological Institute whose permission is required to do research in the Park. I visited the Park and obtained some background information (see my report) and plan to collaborate with conservation geneticists in forthcoming research. I am also in the process of contacting senior staff in the Ministry of Environment to help draw attention to this important matter and will bring it to the attention of the chair of the IUCN Equid Specialist Group so that they can include it in their imminent reassessment of mountain zebra conservation status.

Apart from this matter, difficulties mainly consisted of the usual problems of coordinating a project in remote areas and keeping camera traps functioning against the various challenges of damage by baboons, oryx and various kinds of equipment failure. Buying and keeping a 4x4 vehicle running is extremely expensive in Namibia and Rufford funding has been extremely helpful in respect of running costs.

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

- (a) Developing an individual recognition system that can be used to monitor large numbers of animals in mountain zebra populations and designing and carrying out mark-recapture estimates of populations in protected areas. These techniques have transformed the knowledge available to park managers for conservation management and have clarified the distinction between 'resident' and 'source' populations. Resident animals are those which are present at any one time and source populations are the wider populations from which these are drawn. This distinction is important because population conservation may thus depend on conservation measures, and threats, in a far wider area than the protected area itself.

These and other developments in the project are publicised in the Namibia Nature Foundation website: [www.nnf.org.na/NNF\\_pages/mountainzebraproject.htm](http://www.nnf.org.na/NNF_pages/mountainzebraproject.htm)

- (b) Extending the study to additional protected areas including some that are adjacent to existing areas to help generalise the techniques used, to provide comparative information and give information about population movement, a vital aspect of mountain zebra conservation ecology.
- (c) In spite of the failure to carry out research on hybridisation in Etosha NP as I intended, my work, including that on interactions between mountain and plains zebra in Gondwana CP and NamibRand NR, has drawn attention to this problem which, I believe, could be the most important threat facing mountain zebra. I will continue to pursue this issue, hopefully with targeted research that will lead to practical interventions.

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

The main involvement of local communities is by employment in all of the protected areas where I am working. Research on, and publicity about, mountain zebras, a flagship species in these areas, helps promote the protected areas and thus the employment of local people in the thriving Namibian wildlife tourism industry.

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

I plan to continue the project for the indefinite future. There are important problems to solve that build on results obtained to date. These include the vital matter of hybridisation between mountain zebra and plains zebra which appears to be an increasing problem (possibly because natural movement is restricted by fencing) and which is potentially accessible to practical intervention.

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

I am an active correspondent with the Ministry of Environment and Tourism, and with owners, directors and staff in all of the areas where I work. I also contribute articles on a regular basis to newsletters and reports produced by the protected areas (such as Barking Gecko, the magazine produced by NamibRand NR) and write formal reports to the Ministry of Environment and Tourism (these are provided as pdfs on the Namibia Nature Foundation website). I am also in contact with the Ministry of Environment and Tourism about the formation of a mountain zebra research coordination committee and about joint contribution to the IUCN Equid Specialist Group in producing its latest assessment of mountain zebra conservation status. I keep my webpage on the Namibian Nature Foundation up to date and I plan to write a number of popular and scientific papers.

## 7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The funds were used from the time of the award in September 2010 up to the end of my field work in October 2011. Throughout this period and up to the present I have been analysing data and extracting information from large numbers of camera trap images which I bring back after field trips and which are sent to me by collaborators when I am in the UK.

## 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
Air fares UK-Namibia return x 2.	2,410	40.97	2,369.03	Agreed with RSG to vire these funds to vehicle and accommodation costs (see email of 18 <sup>th</sup> August 2011). Air fares (for two field trips in September-October in 2010 and 2011) were paid from lecture fees earned to fund this project. The small cost identified is a seat booking fee.
Accommodation in Windhoek.	602	955.05	-353.05	Costs are low because most accommodation in the field is provided free or subsidised by collaborators.
Vehicle costs.	2510	4,062.81	-1552.81	Increased fuel costs, high insurance costs and unpredictable breakdowns are an ongoing problem. On the plus side I have finally found a good mechanic!
Camera traps.	440	998.73	-558.73	Additional traps obtained from Lynx Optics

				for greater coverage and to replace those destroyed by baboons and oryx.
<b>Total</b>	<b>5,962</b>	<b>6,057.56</b>	<b>-95.56</b>	

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

I believe that the most important threat to Hartmann's mountain zebra populations, and to species conservation, is hybridisation with plains zebra (the Burchell's subspecies in Namibia). If, as seems possible, this is due to the increasing impact of fencing and the consequent prevention of normal ecological separation, this problem could be reduced by practical intervention. This combination of a profound conservation threat to Namibia's only large mammal endemic species, with a potential solution places this issue at the top of conservation priorities for this species.

In addition it is important to continue to monitoring of the study populations, in the south of Namibia that are starting to become better understood. Only long term studies can unravel the complex ecological factors that limit these populations and in particular the relationships between the animals in protected areas and their source populations. These relationships offer opportunities (larger populations are generally more viable) but also greater threats because the factors that limit the populations may be outside the populations under direct protection.

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

I use the RSGF logo on the mountain zebra webpage on the Namibia nature Foundation website and acknowledge RSGF support in all written reports to the Ministry of Environment and Tourism and to the owners, directors and staff of the protected areas in which I work.

**11. Any other comments?**

Many thanks to everybody concerned with RSGF. Your support is most gratefully acknowledged.