# 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.

Thank you for your help.

**Josh Cole, Grants Director**

| **Grant Recipient Details** | |
|---|---|
| **Your name** | Simon Tollington |
| **Project title** | The analysis of stable isotopes to determine the value of using supplementary feeding as a conservation management tool |
| **RSG reference** | 10518-2 |
| **Reporting period** | November 2011 – November2012 |
| **Amount of grant** | £5750 |
| **Your email address** | Simon.tollington@gmail.com |
| **Date of this report** | 27/11/12 |

**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 |
|---|---|---|---|---|
| Collect naturally shed feathers from a sample of supplementary fed individuals | | | ✓ | Many feathers were collected but the majority cannot be associated with specific individuals and therefore a degree of assumption about the origin of these feathers is made. In total over 200 feathers were collected from around 75 independent collection events. |
| Collection of feathers from a sample of non-supplementary fed individuals | | | ✓ | Collecting feathers from non-supplementary fed individuals is a challenge and is restricted to taking feathers from nest cavities where the occupants are known to be exclusively natural feeders. This means that the total number of feathers collected from this group was fewer than those collected from the supplementary fed group. |
| Collection of feathers from captive individuals | | ✓ | | Whilst these samples have been collected, they have not yet been analysed and await appropriate permits for transportation and subsequent analysis. |
| Opportunistic collection of nail clippings | | | ✓ | Samples collected but not yet analysed. |
| Collection of blood plasma | | | ✓ | Samples collected but not yet analysed. |
| Stable isotope analysis of samples of supplementary food | | | ✓ | This analysis revealed that a range of values were present within a sample of supplementary food depending on the colour and shape of the specific sample. The investigation into the variation within this food resource is ongoing. |
| Stable isotope analysis of collected samples | | ✓ | | Collected feathers have been analysed but other samples await analysis |
| Statistical analysis to determine variation between supplementary fed | | | ✓ | Significant variation was found between isotopic signatures derived from feathers belonging to supplementary and non-supplementary |

| | | | | |
|---|---|---|---|---|
| and non-supplementary fed individuals | | | | fed individuals. |

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

The commercially available parrot pellets displayed a range of carbon and nitrogen stable isotopes which was unexpected. This variation is being investigated with the manufacturing company. Whilst results were encouraging the isotopic signatures from these commercially available pellets cannot currently be used to predict the level of consumption among parakeets. This requires more research and further sample analysis.

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

**1**. The ratios of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) stable isotopes varied significantly between supplementary fed and non-supplementary fed individuals. Samples from supplementary fed individuals revealed significantly higher ratios of both $\delta^{13}C$ (mean supplementary fed= -20.24, mean non-supplementary fed =-23.38) and $\delta^{15}N$ (mean = than non-supplementary fed individuals (Figure 1).

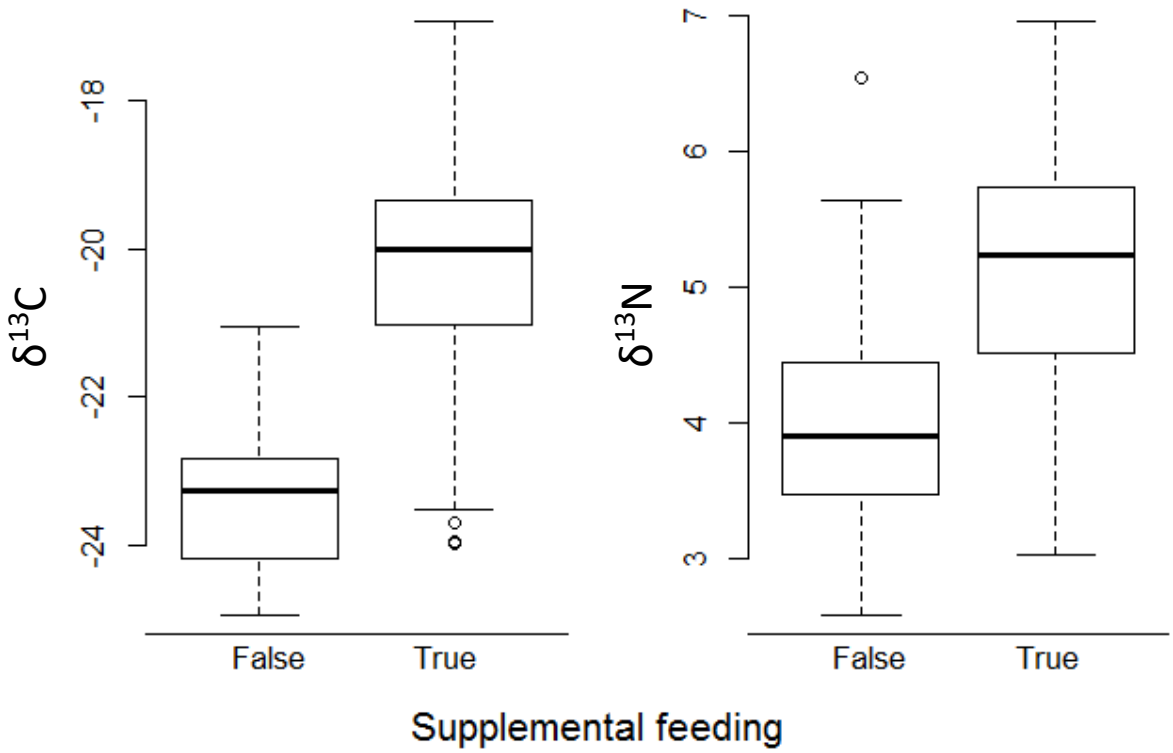


Figure 1. Samples from supplementary fed individuals revealed significantly higher ratios of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) stable isotopes ($\delta^{13}C$: $t = 8.92$, d.f. = 31.53, $p < 0.001$; $\delta^{15}N$: $t = 3.48$, d.f. = 17.80, $p < 0.01$).

**2.** Linear regression analysis revealed that, at the individual level, the relationship between $\delta^{13}C$ and $\delta^{15}N$ for those individuals which take supplementary food was significantly positive (Figure 2). This potentially reflects individual consumption but requires further investigation.

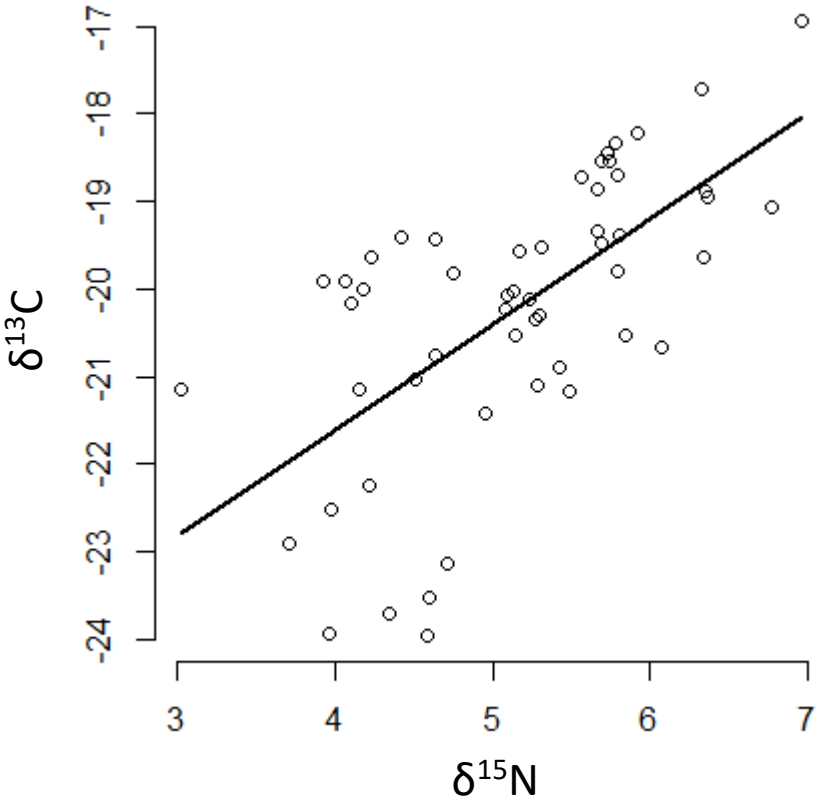


Figure 2. Relationship between stable isotopes of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) for samples derived from individuals which are known to take supplemental food (n = 52. Linear regression line represents the positive significant relationship ($r^2 = 0.40$, $p<0.001$).

**3.** Kaytee© parrot pellets are manufactured in a range of colours and shapes. This variation was assumed to bear no association to the nutritional content or isotopic signature of different looking pellets. However, a range of values for stable isotopes among pellets were found indicating variation based upon colour and shape. This variation is being investigated with the manufacturing company and potentially opens up new lines of investigation into which (if any) colours and shapes are preferred by individual parakeets.

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

All fieldwork/ sample collection was carried out by Mauritian field biologists funded by this research grant. Both this and a previous RSG have been used to increase local capacity in understanding the implications of managing threatened species. Accordingly, a young and enthusiastic Mauritian field biologist, Aurelie Chowrimootoo, was employed and learned valuable practical skills which are directly related to the long-term sustainable management of this species. Aurelie has recently been awarded a full scholarship to attend the Durrell Endangered Species Management (DESMAN) course

at Durrell Wildlife Conservation Trust; the skills she has learnt whilst funded by Rufford have been instrumental in the success of her application.

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

Yes. This preliminary investigation has revealed that the analysis of stable isotopes can be used to investigate dietary variation between supplementary and non-supplementary fed individuals of a threatened and managed population of endemic parakeets. It is anticipated that this research will act as the catalyst for a much greater funding investment designed to quantify individual consumption and to relate this to individual life-history data. Furthermore, it is hoped that this future research will reveal the effects of supplementary feeding on long-term productivity, recruitment and survival.

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

It is intended that these results will be distributed among the wider scientific audience by way of a peer-reviewed publication. A short communication will be composed and submitted to an appropriate publication in due course.

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

The duration of this project was, as intended 12 months.

**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 = £1GBP – Rs48.95 MUR**

| Item | Budgeted Amount | Actual Amount | Difference | Comments |
|---|---|---|---|---|
| Lab costs associated with preparation and stable isotope analysis of samples | 3750 | 3750 | | |
| Salary for Mauritian field biologist for 6 months | 1200 | 1200 | | |
| Accommodation and transport costs for fieldwork/sample collection | 800 | 800 | | |
| **Total** | 5750 | **5750** | | |

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

The next step is to carry out analyses on more samples, specifically from captive individuals and to use this to measure individual consumption. This will provide a control group where 100% of the diet is known and recorded. Additionally, more analyses will be carried out on different samples such as nails and blood plasma in order to infer dietary composition from varying time scales, thereby facilitating research into seasonal food availability. Significantly more funding is required to initiate this research and applications are underway. The evidence gathered as a result of this preliminary

research will provide a much needed catalyst to secure the types of funding required to finance a much larger research project concerning the costs and benefits of providing supplemental food to this population and to other bird species in general.

**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?**

No, but RSG will be given a full acknowledgement as the funders in resulting publications.