

**UK Overseas Territories and Crown Dependencies
Project Training and Research Programme**

Research Project Report

**Red-footed Booby Monitoring, Little
Cayman, Cayman Islands**

January 2011

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PROJECT REPORTING FORM

CONTACT

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If you have suggestions for improvement of this form, your feedback would be appreciated:

COUNTRY:

Cayman Islands

PROJECT TITLE:

Red-footed Booby Monitoring – Little Cayman, Cayman Islands

REPORTER: Name, Organization, Contact Details.

(v tick if same as APPLICANT)

Mat DaCosta-Cottam

ACKNOWLEDGEMENTS:

FIRST SURVEY TEAM

Mat DaCosta-Cottam (DoE)
Kristan Godbeer (DoE)
Peter Borg (Turtle Farm)
Paul Watler (National Trust)
Sian Rowland (Volunteer)
Fred Burton (Blue Iguana Recovery Programme)

SECOND SURVEY TEAM

Kristan Godbeer (DoE)
Jeremy Olynik (DoE)
Samantha Hicks (Volunteer)
Fred Burton (Blue Iguana Recovery Programme)
Doug Bell (Blue Iguana Recovery Programme)
Kathrin Sawannia (Blue Iguana Recovery Programme)

DATA COMPILATION and GIS

Mat DaCosta-Cottam
Jeremy Olynik (DoE)

AERIAL SURVEY

Scott Slaybaugh (DoE)
Richard Clough (MRCU)

AERIAL ANALYSIS

Mat DaCosta-Cottam (DoE)
Jeremy Olynik (DoE)

STATISTICALLY ANALYSIS

Frank Rivera-Milan (US Fish Wildlife Services)

FUNDING

JNCC funding £3,000

RSPB funding \$2000

The Cayman Islands Mosquito Research and Control Unit MRCU is supporting this project with plane and pilots.

PROJECT DESCRIPTION: How did the project go? What were the HIGHLIGHTS and OVER-ACHIEVEMENTS of objectives? What CHALLENGES did you encounter? How were these RESOLVED?

PROBLEMS and RESOLUTION

This project proved problematic.

1. The first ground survey (undertaken 8th-12th Feb, 2010) proved too early to capture the peak of nesting, with many birds in the early stages of nest construction, and having not yet commenced laying.
2. Heavy winds associated with a storm on the last night of the survey disturbed the survey area before the aerial photography could be undertaken. The disruption of nests between the ground survey and the aerial count would have invalidated the survey method.

For these reasons, it was decided to undertake the survey a second time, later in the year (commencing 2nd May 2010).

3. The second survey was completed in good time and better represented the overall breeding status of the colony with nests at all stages of development observed and recorded, from "empty" to containing a "large chick".
4. Data analysis was delayed by the loss of staff.
5. Despite previous field testing, and several flyovers of the colony, the image quality of the aerial photography was of a much lower standard than expected. While most areas of the colony were represented by two or three images, in most cases all were of substandard quality. All images displayed an as-yet unexplained blurring in variable sectors of the picture, many part-focused / part-unfocused. Possible explanations include computer processing limits being stretched, and vibration of the camera / camera housing, however further testing will be required to elucidate the cause.
6. The poor image quality complicated the aerial analysis. The images were compiled in Arc View and a 20x20m grid overlaid, to assist nest recording. The nest counts using the aerial imagery were undertaken, following lengthy practice sessions, by two observers, working independently at all times.

HIGHLIGHTS and OVER-DELIVERY

1. During the ground survey, nest presence was recorded in 20m² quadrats (individual area = 0.04ha). These were ranged in seven transects, running approximately north / south through the colony. This constituted a total of 46 quadrats (total area = 1.84ha) containing 145 nests.
2. Despite the variable quality of the aerial imagery, the independent observers recorded a similar number of nests. Thanks in large part to the donated statistical services of Dr. Frank Rivera-Milan of USFWS working on this odd data set, a strong correlation was derived between the aerial survey and the ground count. The data was treated as a

3. Using the correlation factor, an estimate of 2493 active nests (intact empty / containing eggs / containing chicks) was determined for the entire colony. As an alternative method, more comparable to the previous study of Burton *et al.*, (based on density within transects extrapolated over colony area), the nest density in the transects was extrapolated over a polygon of colony area (averaged from independently estimated colony areas), to yield an estimate of 1678 active nests.
4. A likely explanation for the majority of the discrepancy between these two results is that the transects currently appear to fall within sub-averagely populated portions of the patchily-distributed colony (this is apparent to the eye when viewing the colony overall). Hence this method currently yields a lower estimate of total numbers when extrapolated. As the colony has been reported to shift over recent years, this latter figure is also not directly comparable to Burton's previous estimate of total numbers, despite the similarity of method. Thus, of the two estimates, we would regard the higher, correlation-based estimate, to likely be the most accurate.
5. It is intended to undertake further work to address some of the potential gaps in comparability between the current data and that of Burton *et al.* While it is too early at this stage to draw any concrete conclusions on colony dynamics, given that the previous study of Burton *et al.* yielded a total colony estimate of 4,839 pairs, it would appear that the colony may currently be subject to a significant decrease in nesting pairs.
6. Now that the correlation has been established, we intend to publish in a peer-reviewed journal. The contribution of JNCC and RSPB will be fully acknowledged in the publication. Sincere thanks to all involved.

Burton, F. J., P. E. Bradley, E. A. Schreiber, G. A. Schenk, and R. W. Burton. (1999). *Status of Red-footed Boobies Sula sula on Little Cayman, British West Indies*. Bird Conservation International 9:227–233

Pollock, K. H., and Kendall, W. L. (1987). Visibility Bias in Aerial Surveys: A review of estimation procedures. *Journal of Wildlife Management* 51 (2):502-510.

OUTPUTS: With reference to the FUNDS APPLICATION form, did your MAIN OUTPUTS achieve their EXPECTED OUTCOMES?

ACTIVITY	ACTUAL OUTCOME	COMMENTS
1	Use grant funds to purchase and fit camera mounting to MRCU plane.	Completed
2	Ground survey of booby colony.	Completed (twice)
3	Use of grant-funded equipment to undertake aerial survey.	Completed
4	Combine data from ground count and aerial survey to estimate Booby colony size	Completed
5	Progress towards research priorities submitted during consultation for GBSC paper in 2007. ITEM 2: Terrestrial, endangered, monitoring - Developing monitoring protocols for endangered species was identified as a priority area	Completed
6	Progress towards the <i>National Biodiversity Action Plan for the Cayman Islands 2009</i> , SAP for Red-footed Booby, Research and Monitoring Action Item: RM1. Develop and implement regular, minimum disturbance aerial monitoring programme for the booby colony, to determine population size, incorporating occasional ground survey, to calibrate accuracy of aerial observations and determine breeding success.	Completed

INFORMATION: This final section is, in some ways, the most important part of this form. Provision of this information will enable us to pursue further funding and support for conservation projects in the Overseas Territories.

I ATTACH the following, by way of INFORMATION:

(Please ✓ tick appropriate boxes, and attached necessary information as necessary)

- Brief QUOTATIONS from the Project Manager / individuals involved with this project, which may be used freely by the Hub to promote and publicized the conservation achievements of this project through suitable media:**
The Cayman Islands Department of Environment wishes to extend its sincere thanks to the JNCC and RSPB for their financial support of this important project, and also to USFWS and the numerous local organisations who donated resources and staff to ensure the completion of the project. The establishment of the new aerial survey methodology for estimating the numbers of breeding birds in Little Cayman's Red-footed Booby colony represents a significant advance in the monitoring of colony dynamics at this internationally significant site. We hope to publish these results in order that our experiences may be of use to others faced with similar challenges.
- PHOTOGRAPHS or VIDEO CLIPS and full details of associated photo-credits, which may be used freely by JNCC and other OTs, to promote and publicized the conservation achievements of this project through suitable media.**
Attached.
- A scanned copy and / or web-address of any NEWS ITEMS, PUBLISHED ARTICLES arising from this project.**
- A copy of any EDUCATIONAL MATERIALS, books, brochures, pamphlets or posters, arising from this project.**
- Details of any WEBSITE or WEBLINKS arising from this project.**
- Details of any COLLABORATION or PARTNERSHIP, local or international, which contributed to the success of this project.**
Blue Iguana Recovery Programme
National Trust for the Cayman Islands
Cayman Islands Mosquito Research and Control Unit
JNCC and RSPB, UK
Cayman Islands Department of Environment
US Fish and Wildlife Service
Cayman Islands Turtle Farm
Volunteer field workers
- Details of any other unexpected benefits arising from this project, such as CONSERVATION AWARDS, PUBLIC SUPPORT, VOLUNTEER PARTICIPATION or SPONSORSHIP.**
All fieldworkers involved received a subsistence stipend only during the course of the survey. Cayman Islands Mosquito Research and Control Unit donated use of the MRCU plane for test flights and aerial surveys of the colony. The Department of Environment donated accommodation for both survey periods.

