



Darwin Initiative Main/Post/D+ Project Half Year Report (due 31 October 2016)

Project Ref No:

DPLUS044

Project Title:

Assessment and Conservation
Actions for Cayman Islands'
Seabird Populations

Country(ies)/Territory(ies):

Cayman Islands

Lead Organisation:

Department of Environment,
Cayman Islands Government

Partner(s):

University of Liverpool, UK,
University of Exeter, UK
National Trust of the Cayman
Islands

Project Leader:

Gina Ebanks-Petrie

**Report date and number (e.g.,
HYR3)**

HYR1

**Project website/ Twitter/ Blog/
Instagram etc**

Websites:

<http://caymanseabirds.weebly.com>

www.caribbeanseabirds.org.uk

Twitter: @CaymanSeabirds

Funder (DFID/Defra):

Darwin Plus, DEFRA

1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).

Output 1. At-sea habitat use

- Between April and May, 35 adult red-footed boobies (*Sula sula*; RFBs) and 13 adult brown boobies (*Sula leucogaster*; BBs) were fitted with GPS loggers, resulting in 48 and 18 recorded foraging trips, respectively (full trips: RFBs = 38, BBs = 14). Red-footed boobies were tracked with either igotU GT-120 archival loggers ($n = 20$) or Traceme GPS-GSM loggers ($n = 15$), while brown boobies were tracked solely with archival

loggers.

- Morphometric measurements (wing length, bill length, bill height, bill depth, tarsus length, tail length) were obtained for all study birds during tracking periods in April and May, and individuals were weighed and fitted with a numbered colour ring on the left leg to aid recapture and long-term monitoring efforts. To enable identification of sex (and obtain tissue samples for stable isotope analysis), small blood samples were collected from the tarsal vein of all tagged birds. The sex of BBs was determined based on size and colouration, while RFBs were sexed through DNA sequencing at a laboratory in the UK (during September). Photographs of the head of all tagged birds were also taken to potentially assist in identification of sex in RFBs.
- Work has begun to identify important at-sea habitats of the two booby species: preliminary maps have been produced of i) at-sea distributions (and potential marine Important Bird Areas) using Birdlife International methodologies. Models are being developed to identify behaviour and activity-specific distributions.

Output 2. Commuting routes and times

- Over-land flight pathways have been identified in the high-resolution red-footed booby tracking data archival loggers) from Y1, and will be overlaid with map layers of the proposed airport development site on Little Cayman.
- Departure and arrival timings have been identified for red-footed and brown booby foraging trips recorded in Y1.

Output 3. Population biology

- **Productivity:** To gain measures of productivity, and assess the impact of tag deployment on reproductive performance, fledging success data of chicks from tracked nests, and a set of unhandled control nests, for both booby species were collected during the Y1 field campaign. Nests were visited on a number of occasions between April and July and the status of the chick recorded.
- **Phenology:** To collect data on departure and arrival times of red-footed boobies over the summer/autumn, nine reconyx trail camera (set to take photos on hourly intervals) were deployed in the colony at Booby Pond in early July. Collectively, the cameras have been monitoring 23 active nests. Visits have been made to the colony on a monthly basis to maintain the cameras, and record activity in marked nests. Camera monitoring will continue at these nest sites in the coming months (Oct – Feb) to record pre-breeding behaviour.

- **Assess census methods:**

Preliminary survey at Booby Pond: To determine the existing boundaries of the red-footed booby colony and identify areas of high and low nest density, ground counts of active nests, and roost sites, were undertaken in July within 24 strip transects located on the north side of the Booby Pond. Strip transects (20m wide) were walked at 330° angles from Magnetic North (90° from the longitudinal axis of the pond). The narrow strip of mangrove along the south side of the pond was also surveyed for nest presence.

UAV trial at Booby Pond: An aerial survey was undertaken at Booby Pond to trial the use of an Unmanned Aerial Vehicle (UAV) for estimating nest density. A quadcopter drone was flown at 75ft over pre-programmed transect lines covering the western half of the colony. To allow a comparison of density estimates from aerial and ground survey methodologies, nest counts were undertaken over 4x strip transects within the survey area on the same day as the drone trial. Image clarity was lower than ideal for a successful double-sampling scheme and double-observer trials. Nevertheless, the trial highlighted the value of the UAV for routine population surveys. These preliminary data will be used to refine UAV settings in preparation for further trials and a full-scale

population census in early 2017.

- **Baseline assessments of diet:**

Dietary samples: During tracking work on Little Cayman in April and May, eight regurgitate samples were opportunistically collected from RFBs to provide information on diet. The samples were analysed in July and prey identified to the nearest taxonomic level.

Stable isotopes: As a means of improving knowledge on diet and foraging, the isotopic compositions of blood samples taken primarily for sexing from tracked birds will also be analysed. Isotope samples were processed and prepared for Stable Isotope Analysis (SIA) in October, and will be run through the mass spectrometer at a UK-based SIA facility run by Exeter University in November. Exeter University will fund this component of the project, thus adding in-kind value to the study. Efforts were made to catch a range of potential prey samples from waters off Little Cayman in order to describe the isotopic niche space occupied by the prey base in this area. Fishing attempts in Little Cayman were unsuccessful, however, a sample of flying fish was obtained from fishers operating on the banks off Grand Cayman. Depending on the avian blood isotope results, the isotope values in these prey samples may also be analysed.

- **Assess predation rates:**

During colony work between April and July, sightings of potential predators were recorded. Cats and peregrine falcons (known avian predators of RFBs) were both observed in the Booby Pond. However, there was no direct evidence of predation. Imagery from the trail cameras, collected during the summer months, will be studied for signs of predators and potential predation during the second field campaign.

Output 4. Training

- Between April and June, training in tracking and monitoring techniques was provided to DoE field staff (x2) during colony work on Little Cayman and Cayman Brac.
- Work on the seabird monitoring guides began in late September, and the aim is to complete these booklets before the end of the year (slightly later than planned in the originally timetable).
- **Community involvement:** Community meetings were held on Little Cayman (National Trust House, 7th April) and Cayman Brac (District Administration Building, 12th April) engage residents in the project. Volunteers on Cayman Brac (x3) assisted in tag deployment and recovery trips (between 12th -27th April), and informal meetings were held with volunteers (8-9th June) to discuss the continuation and development of BB monitoring efforts on the island. The project officer attended an NTCI committee meeting on Little Cayman (National Trust House, 11th July) to provide an update on recent activities, and project updates were sent to interested parties via email.
- **Publicity:** 3x TV interviews, 1x radio interview, 2x media releases and 1x magazine article were provided between May and August. A project website and twitter feed (see above) have both also been published.

2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

Tracking devices

1. GPS-GSM loggers:

During the project's first tracking season, we attempted to use GPS-GSM loggers on RFBs (in addition to archival GPS loggers deployed on a separate set of animals) to collect data that

spanned a longer period of the breeding season. Unfortunately, we had limited success with the GSMs. While these loggers are extremely useful for tracking many species of seabird, they could not be easily tail-mounted on RFBs, and did not remain on the backs of birds for long enough durations to make them a cost-effective solution for tracking this species. Thus, in Y2, we plan to increase the number of archival GPS devices used in order to collect an adequate sample size of individual tracks. To enrich this dataset, we will also deploy time-depth recorders (TDRs) and activity loggers, which will provide data on dive and on-water activity patterns. These devices have been tested extensively for reliability, and used in this and related species, including by our team. The data obtained will notably improve our ability to identify patterns of behaviour. The funds originally intended for GSM loggers in 2017 will thus be used to purchase TDRs and activity loggers. This change will not affect the budget (the total value of the loggers is equal) or timetable, and will not influence project activities notably as all loggers will be co-deployed on birds over the same tracking period. This tracking campaign will support the original expected outputs of the project, and will provide additional streams of data that should prove extremely valuable to conservation management. This issue has been thoroughly discussed and agreed amongst our project partners and the Independent Project Steering Group, and has been approved in email correspondence with the Darwin team (see Eilidh Young).

2. Device attachment issues / recovery rates / data capture:

All GPS loggers were back-mounted on RFBs and BBs during the 2016 field season, as tail-attachment was not deemed suitable for the study species owing to issues around the size ratio of tags and birds. While it was expected that back-mounted devices would remain attached to birds for shorter durations than tail-mounted devices, the duration of attachment was even shorter in the study species than anticipated (longest attachment duration = 14 days). In addition, the project start date fell towards the end of the breeding season for both species, during a phase of the breeding cycle when adults spend only short periods of time at the nest while provisioning their chicks. These two factors made device retrieval difficult, and resulted in a lower recovery rate than desired. Despite these limitations, we collected an extensive tracking dataset in Y1, and will introduce solutions outlined below to minimise these problems next season. These changes will not influence the timetable to a notable extent.

Solutions:

1. *Device recovery:* During Y2 we will operate over an extended field season, compared to Y1, to account for inter-annual variability in the peak timing of breeding and asynchronous breeding behaviours of the study species. We plan to recapture birds after shorter periods of device attachment.
2. *Timing of main tracking period:* We will track birds earlier in the breeding season during the peak chick-rearing period when rates of nest attendance will be higher.
3. *Length of data capture:* We will track a sample of birds on high-duty logging cycles to obtain high resolution data, and a second sample of birds on lower fix rates to prolong battery life. This will increase the number of recordable repeated trips from individuals, while allowing the original objectives of the project to be met.

Influence on budget: Owing to new information on the flexible and asynchronous breeding periods of RFBs, our Y2 tracking campaign will need to be flexible in terms of timing. Our bio-loggers also take approximately 2 months to manufacture, and will thus need to be purchased before the end of Y1. As the budget allocated for tags for the second breeding season of the project is assigned to Y2, we would like to request that these funds are transferred to Y1 (combined value of tags = £12,300). We have discussed this change with the Darwin team (see Eilidh Young), and will shortly submit the required change request form.

4. Field staff availability:

Owing to unforeseen conservation priorities with other ongoing projects managed by DoE, the Department will not be able to provide the level of in-kind field staff time to the project that was originally hoped. The first field campaign was still able to run effectively as benefitted from volunteer assistance. However this staffing issue is anticipated to continue into the next field

season. As a result, in addition to our full-time project officer, we have secured a dedicated research assistant to work in the field from February – May 2017 (possibly up until July). Our UK partners will also provide additional field staff as required to ensure the smooth running of the project. A budget for international flights for UK project staff was already included in the budget so this staffing change should not affect project expenditure, and will ensure that project objectives are met according to the timetable. The research assistant will receive a food stipend during the season for periods of time spent on Grand Cayman, which should be covered by the existing food budget.

2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS:	Yes (Tag-related change)
Formal change request submitted: (with Eilidh)	No (Tag-related change: agreed via email)
Received confirmation of change acceptance	NA

3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

4. Are there any other issues you wish to raise relating to the project or to Darwin’s management, monitoring, or financial procedures?

At the time of writing this report, the DoE have just within the past 24 hours received Q1 project funds from Defra due to ongoing issues with bank transfers. Project work had to begin as planned on the 1st April owing to the defined annual breeding cycles of the study species and, as a consequence, project partners had to be adaptable with regards to expenditure. Field equipment and international flights were purchased using *temporary* external funds held by partner organisations, and upon receipt of Q1-Q3 payments will need to be replaced using Darwin funding. Therefore, expenses planned early in the project will not be incurred until the later quarters of Y1. There is also a chance that we will need to carry some funds over to the second year of the project owing to the delay in payment, and we ask that Darwin allow for this flexibility to ensure that the project is not unduly affected. If this is the case, we will contact Darwin Plus and follow the formal change request procedures during the final quarter of Y1.

If you were asked to provide a response to this year’s annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with LTS International through a Change Request.**

Please send your **completed report by email** to Eilidh Young at Darwin-Projects@ltsi.co.uk . The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g., Subject: 22-035 Darwin Half Year Report**