

**THE BRITISH INDIAN OCEAN TERRITORY
SEABIRD ECOLOGY ON DIEGO GARCIA:
December 2016 research trip report.**



Figure 1: Red-footed Booby *Sula sula*, the pilot study species and focus of the PhD research strand of the Chagos Seabird Research Project.

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Introduction: Red-footed Booby *Sula sula* (RFB) breed all year round in the British Indian Ocean Territory (BIOT) and as a result span two contrasting weather systems. On Diego Garcia (DG), generally, winds are light and from the north-west between October and April when the majority of the 2500mm of rain falls, but the remainder of the year is dominated by the Southeast trade winds and the atoll is drier¹. One of the implications of such a contrasting weather system when researching the foraging strategies of a continuous breeding species is that birds must be sampled at different times of year to reflect this. Therefore, following on from the pilot breeding seabird research undertaken on DG in June/July 2016 during the Southeast trade winds², where field routine and tracking methodologies were successfully trialled, a second fieldwork session was undertaken in December 2016 during the north-west “monsoon” season. The two fieldworkers involved used the same site on DG as a base camp and the same area of Barton Point as the research area. The team employed the methodology and tracking equipment used in June/July 2016, which had been approved by various academic institutes’ ethics committees and the British Trust for Ornithology. The same safety plan was used throughout the December 2016 fieldwork involving daily checking in with the Royal Overseas Police Officers.

Participants: Peter Carr (PC), from the Institute of Zoology, Zoological Society of London, UK / Penryn Campus, Exeter University and Jon Schlayer from the Chagos Conservation Trust.

Dates: 28 November – 22 December 2016 (including travel dates).

Location: Diego Garcia; Barton Point.

Objectives: (i) To identify the feeding and foraging grounds of breeding RFB during the NW monsoon period in BIOT; (ii) To gather more data on the breeding phenology of the RFB sub-colonies on DG atoll; (iii) To collect further morphometric data in order to develop a tool for in-situ sexing of RFB.

Results: The team caught and marked (with individually numbered alloy British Trust for Ornithology issued leg rings) 32 adult and two recently fledged juvenile RFBs. Of these 29 were classed as breeding birds and caught on a nest. All of the breeding birds were fitted with

¹ Sheppard, C.R.C., Seaward, M.R.D., Klaus, R. & Topp, J.M.W. 1999. The Chagos Archipelago: an introduction. In: Sheppard, C.R.C. & Seaward, M.R.D. 1999. Ecology of the Chagos Archipelago. Linnean Society Occasional Publications 2.

² See Nicoll, M, & Carr, P. 2016. BIOT seabird research June 2016 report. Unpublished report to BIOTA.

tail-mounted GPS loggers (IGotU GT-120, Mobile Action Technology Inc. – see Fig. 2) to track their location and movement and leg mounted geolocator (GLS) tracking devices (Intigeo Geolocators, Migrate Technology – see Fig. 3) to track their at-sea foraging behaviour.



Figure 2. A GPS tracking device fitted to the central two tail feathers of a RFB, the remaining tail feathers are tucked behind the green cardboard for ease of fitting the device. To note, for safety whilst being handled the birds are placed in a restraint.

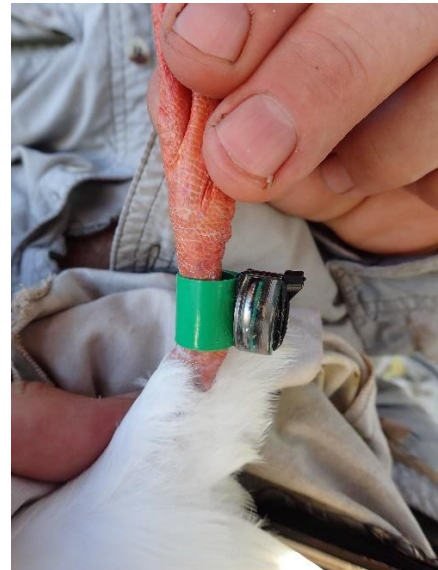


Figure 3. A geolocator attached to an RFB tarsus. These devices have been fitted to birds' legs for up to five years with no adverse effect.

As per the previous fieldwork, tags were deployed for between three and 10 days before being recovered. Nineteen of the 29 tagged RFBs were recaptured and 16 GPS and all 19 GLS devices were recovered. At recovery all but one tag were viable. A total of over 30 tracks were successfully extracted from the GPS tracking devices with associated behavioural data coming from the GLS tags. Despite variable wind conditions rather than the anticipated steady NW wind typical of the monsoon season, GPS tracking data suggested RFBs appeared to utilise an area to the NE of DG as their primary foraging ground (see Figs 4 - 6 at the end of the report). Of interest, this area appears to be broadly similar to that utilised in the SE monsoon period².

Throughout December 2016 the winds were variable and included a two day period of very strong westerly gales in the middle of the research. This two day period of strong westerly winds immediately after the deployment of the tags destroyed 13 RFB nests, most at the Barton Point study site. Unfortunately, this significantly reduced the chances of recapturing tagged birds and recovering tags because the boobies are no longer tied to a fixed, readily

accessible point in the colony (though a small number of birds from destroyed nests were recaptured roosting in the vicinity of their old nest). Chance events like this are part of field-based research and not something that can be mitigated for.

One notable point of interest that was different to the previous period of fieldwork was the presence of an ant infestation at the Barton Point campsite. This proved problematic and distinctly uncomfortable for the field team as the ants invaded sleeping tents, storage bags and containers and rendered sitting with feet on the ground or standing still an uncomfortable experience.

Conclusions: Unquestionably the December 2016 fieldwork was a resounding success with over 30 foraging tracks recorded from 15 RFBs. This demonstrated that the team's skill set and knowledge combined with the methods developed as part of the June 2016 field research trip are entirely appropriate and effective for this study species and location.

However, the field-based research would not have been successful without the continued support of British Indian Ocean Territory Administration (BIOTA) and particularly British Forces BIOT (BF BIOT) on DG. Without the assistance of the Landing Craft Section research at Barton Point and the necessary supporting logistics would have been problematical. Furthermore, the 24-hour listening safety watch provided by BIOT Police HQ is integral to the Safety Plan. It is fully acknowledged that the seabird research on DG could not be undertaken without this support.

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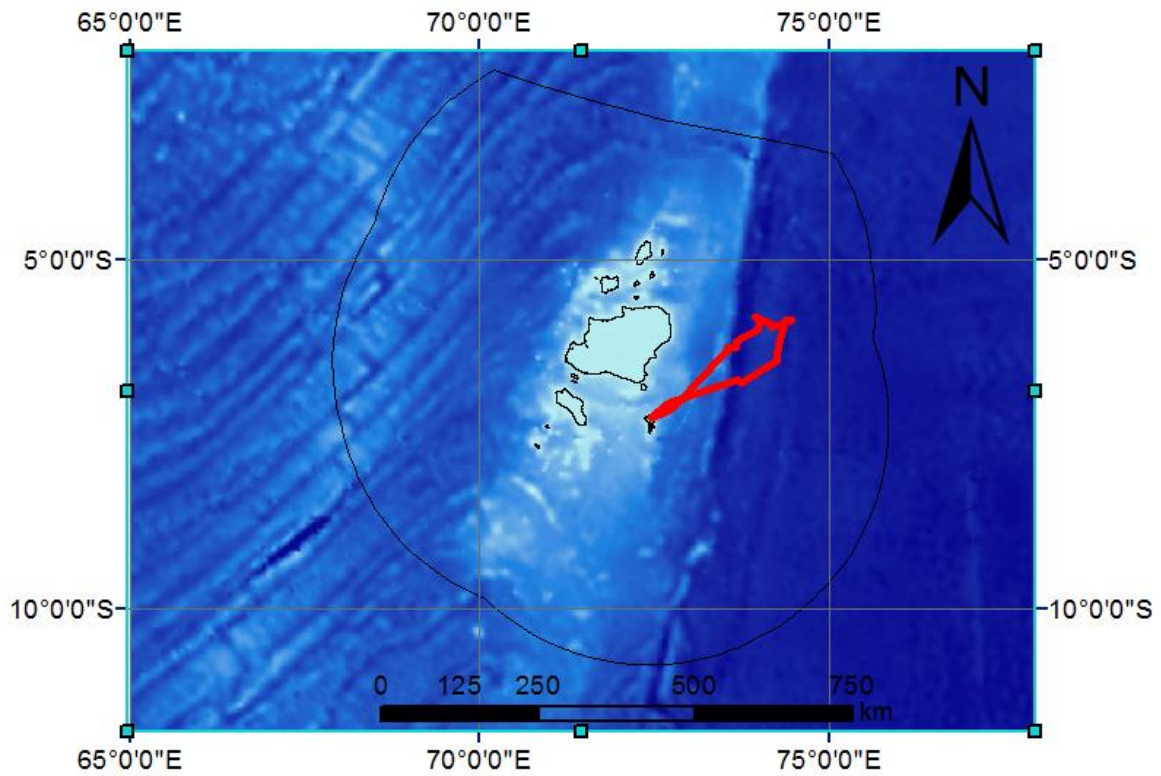


Figure 4. A single foraging track conducted by a breeding RFB (ID:GV37605). It has followed what appears to be the standard route north-east out to feeding grounds past the Chagos Trench and over the Indian Ocean abyssal plain.

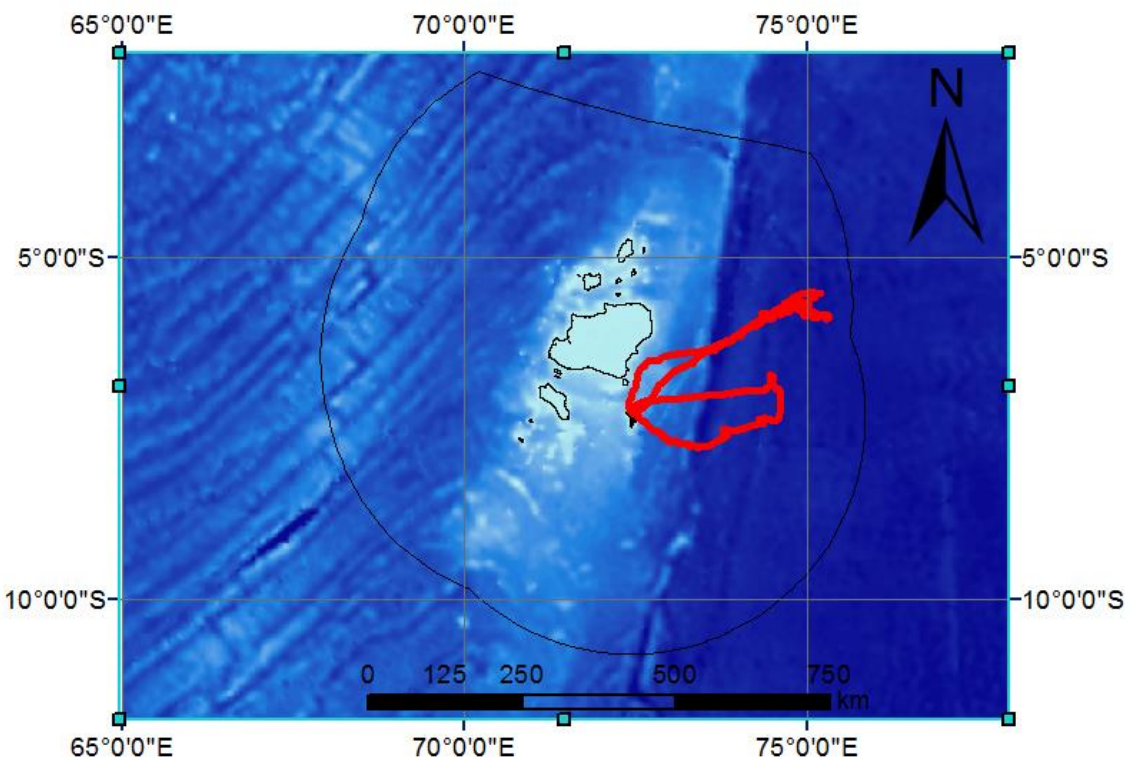


Figure 5. Two foraging tracks, over a six day period, conducted by a breeding RFB (ID: GV37613). The northern track is similar to the route taken by most birds in June/July 2016, the lower route is more easterly and may be a reflection of the strong westerly gales that occurred in December 2016.

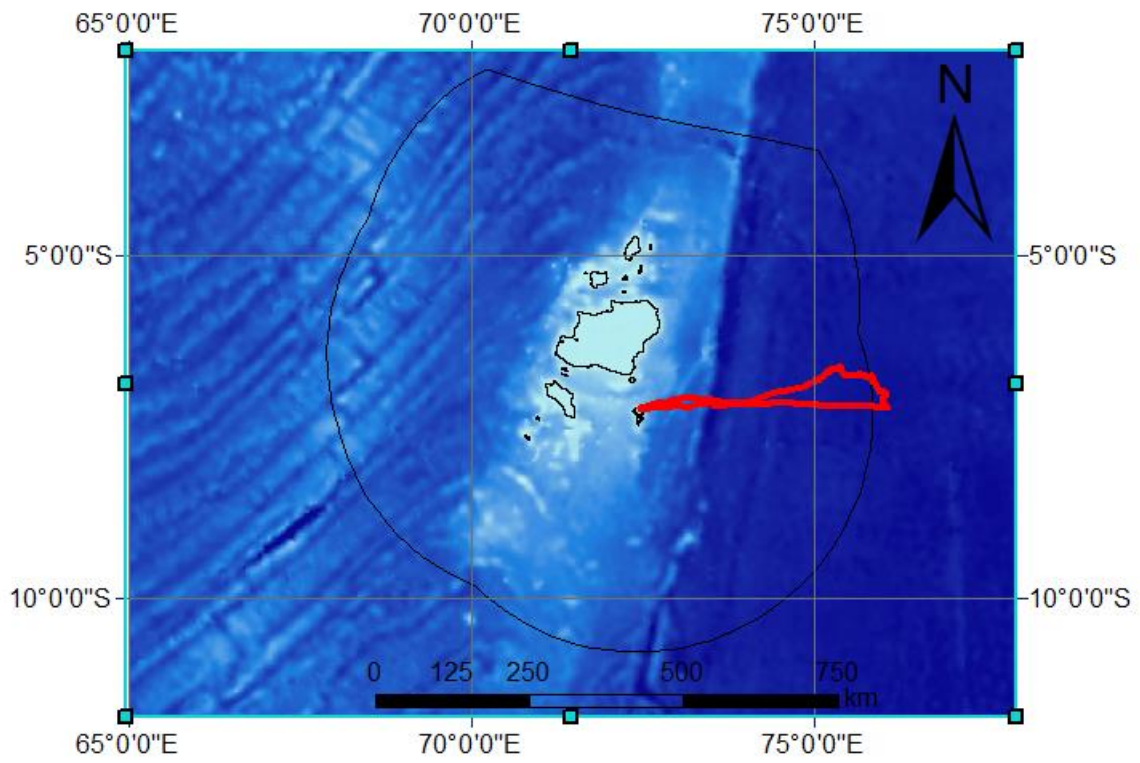


Figure 6. A single foraging track conducted by a breeding RFB (ID: GV37624). This is the first of the tracked birds that has crossed the MPA border (black line).