DRAFT - SEABIRD ECOLOGY ON NELSON'S ISLAND

July 2018 research expedition report

Figure 1. Passing Nelson's Island to the East. Photo M. Nicoll

Figure 2. An incubating Brown Booby on Nelson's Island. Photo P. Carr.

Figure 3. Wedge-tailed Shearwaters at a newly discovered significant colony on Nelson's Island. Photo M. Nicoll.

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Introduction:

As part of the Bertarelli Programme in Marine Science The Zoological Society of London (ZSL) and Exeter University, mounted an seabird research expedition to Nelson's Island (NI), British Indian Ocean territory (BIOT), during 03 – 24 July 2018. The expedition to NI was combined with research on Diego Garcia (DG); but due to the unique nature of the NI phase, a specific report has been produced. The research team were left without close boat support for 12 days on the island; a move that is unprecedented in modern day BIOT science.

The overall mission of the NI expedition was part of the wider seabird ecology programme to explore the importance of the surrounding Marine Protected Area (MPA) for breeding seabirds. The research continued to use Red-footed Booby (RFB) as an indicator species, as has been used on DG for two years. For the first time ever in BIOT Brown Booby (BB) were also used as a study species. Building on the two years of ornithological research on DG, the specific objectives of the NI expedition were:

Objective 1*:* To commence the documentation of the year round biology and foraging ecology of breeding RFB and BB at NI.

Objective 2*:* To establish the status and distribution of breeding seabirds on NI.

Methodology

Objective 1: The techniques used to explore the foraging strategies of both RFB and BB are the same as used throughout the DG research, with the exception that BB, being bigger than RFB, is fitted with a larger unique identifying British Trust for Ornithology (BTO) metal ring. As used on RFBs on DG, tail-mounted GPS loggers (15g, IGotU GT-120, Mobile Action Technology Inc) and leg-mounted geolocators (3.0g, Intigeo C330, Migrate Technology) were attached to 40 breeding RFBs and six BBs to document at-sea foraging locations and behaviour whilst rearing small chicks. Tags were deployed for between three and eight days and no apparent adverse effects were observed on either breeding success or welfare.

Objective 2: The standard method to census breeding seabirds is to count the number of Apparently Occupied Nests (AONs) of a given species. NI are exceptional in BIOT terms in that seabirds nest in the interior of the island as well as the littoral. Where seabirds nest along the shoreline, counting AONs is simply a matter of walking the coast counting the nests. Where birds nest in the often inaccessible interiors of islands, techniques for estimating breeding numbers have to be employed. On NI this involves counting the breeding seabirds in a number of accessible known size plots, e.g. 10m x 10m, taking the mean of these plots and multiplying it by the number of plots within the breeding area. For most species on NI this was the whole island. For Lesser Noddy the breeding colony is wholly within the confines of a Coconut stand. The perimeter of this colony was mapped and the area calculated using the Calculate Area function on a Garmin GTS handheld GPS.

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Dates: 03-24 July 2018.

Results: The NI ornithological expedition was an outstanding success, surpassing the expectations of all participants.

Objective 1

Table 1. Tagging activities.

RFB ringed	BB ringed	RFB fitted with short-term GPS/GLS	BB fitted with short-term GPS/GLS	RFB short-term GPS/GLS recovered	BB short-term GPS/GLS recovered
73	**14**	**40**	**6**	**38**	**6**

40 pairs of GPS and GLS tracking devices deployed on breeding RFBs and 38 of these were recovered. Six pairs of devices were deployed on BBs and six pairs recovered. The outstanding success of the fieldwork can be attributed to meticulous preparation coupled with the experience of the field team and, the full support of BIOTA/BF BIOT.

Preliminary mapping of the GPS tracks show that both RFB (Figure 4) and BB (Figure 5), from NI, forage wholly within the MPA when breeding. The tracks also demonstrate that at the time of this breeding episode, RFB from NI forage in a completely different area than those from the colony 180km South on Diego Garcia (see maps in separate report on the DG part of the expedition).

Figure 4. The tracks of a foraging Red-footed Booby on Nelson's Island (Copyright of Google Earth is acknowledged). White boundaries represent Important Bird Areas.

Preliminary mapping of foraging tracks from the six BBs suggest that this species does not range as far as the pelagic specialist RFB (see Figure 5).

Figure 5. The tracks of a foraging Brown Booby on Nelson's Island (Copyright of Google Earth is acknowledged). White boundaries represent Important Bird Areas.

Objective 2

Prior to the fieldwork it was known that Nelson's Island was important for breeding seabirds, having already being classified as an IUCN Important Bird and Biodiversity Area (IBA). The July 2018 fieldwork revealed that NI is even more important than originally believed. In addition to what was known, this fieldwork discovered a new, significant colony of Wedge-tailed Shearwater and that the island is an important roosting area as well as a breeding site for a number of species. It was estimated that a minimum of 20,000 birds were roosting nightly on the island. A summary of the abundance and diversity of seabirds censused on NI is provided in Table 2.

Table 2. Breeding seabirds on Nelson's Island.

Species	Breeding pairs	Comments
Wedge-tailed Shearwater	0	This species breeds from September-March in BIOT. Prior to the expedition it was believed 1-10 pairs bred on NI, but a minimum of 1000 birds were observed returning to the island at night and were preparing to breed. This is an exceptional discovery and is a significant new (potential) breeding colony for BIOT.
Tropical Shearwater	0	This species breeds from September-March in BIOT, primarily on islands of the Great Chagos bank. Prior to the expedition it was not thought to breed on NI, but up to 4 birds were heard calling during the night. It is possible a small breeding colony exists on NI.
Red-footed Booby	279	In addition to breeding birds, significant numbers of RFB roost on NI. Two counts of returning birds to a specific area of NI both registered *c.*3000 birds.
Brown Booby	12	There were an estimated 160 birds present on the island. NI is now known to be the third largest breeding colony of this species in BIOT.
Great Frigatebird	110	A minimum of 400 non-breeding birds were also recorded.
Lesser Frigatebird	10	A minimum of 350 non-breeding birds were also recorded.
Bridled Tern	9	NI is now recognised as an important colony for this species.
Common Noddy	310	NI is now the breeding stronghold for this species in BIOT.
Lesser Noddy	6300	In addition to the breeding birds, a minimum of 4000 extra birds were roosting on the island. NI is one of three islands in BIOT where this species breeds in the thousands.
White Tern	10	NI provides suboptimal breeding habitat for this arboreal nester.
Great Crested Tern	0	A total of 94 birds were present on NI. A breeding episode had recently been completed for this nomadic breeding species.

Conclusion: The July 2018 seabird research visit to NI was an outstanding success, producing results completely beyond what was expected. These results are adding to our understanding of the MPA's value for seabird conservation and highlights the need for further research of this nature in the northern islands of BIOT.

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