

Seabird Group Grant Report – Surveying and tracking sooty shearwaters in the Falkland Islands

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Sooty shearwater are one of the world's most numerous seabirds, with an estimated global population of about 20 million individuals (Brooke 2004). Despite this abundance, the species, like so many others, has suffered marked decreases in recent decades. For example, the breeding population on the Snares Islands, in New Zealand, the species core breeding area, fell by 37% over the last three decades of the twentieth century (Scott et al. 2008). Similar declines have been observed in the California Current, the species' main wintering area (Hyrenbach and Veit 2003). The causes of these declines are unclear but invasive species, harvesting, bycatch and climate change are all suspected. On the basis of incomplete data, BirdLife currently list sooty shearwaters as *near threatened* (BirdLife International 2017) but others have argued that up-listing to *vulnerable* may be more appropriate (Scott et al. 2008).

Contrary to the negative global trend, there is anecdotal evidence that sooty shearwaters are actually increasing in one part of their range - the Falkland Islands. The vast majority of the Falkland's sooty shearwater population breed on Kidney Island (0.32 km²), in the northeast of the archipelago (Fig. 1). Woods (1988) suggested (based, apparently, on observations made between 1958 and 1963 (Woods 1970)) that around 2000 pairs bred on the island but by end of the century others suggested that there were 100,000 burrows (Falklands Conservation 2006b, Otley et al. 2008). The reasons for this apparently remarkable growth are unclear but it may include a response to increased breeding habitat: In the South Atlantic, sooty shearwaters usually excavate breeding burrows in peat, beneath stands of tussock grass *Poa flabellata*. Tussock was once abundant in the coastal fringes of the Falklands but declined approximately 80 % following human settlement of the islands due to the introduction of grazing animals and deliberate burning. It is now largely confined to small, offshore islands (Liddle 2007). Unfortunately, many of these islands are also occupied by invasive rodents, suppressing seabird breeding activity. Kidney Island is rodent free but traditionally its tussock was harvested regularly for animal fodder. This practice ceased in the 1940s, since when tussock cover is thought to have recovered, perhaps to the extent that many more sooty shearwater can be accommodated (Woods 1970, Falklands Conservation 2006a).



Fig. 1. The sight of tens of thousands of sooty shearwaters returning silently to Kidney Island each evening in the summer is one of nature's great spectacles.

The apparent increase in sooty shearwater numbers in the Falklands suggests that bycatch is not a major issue in the region. However, small numbers of birds have been caught in trawl fisheries, suggesting that future changes in fishing practices could cause bycatch. Similarly, pollution caused by hydrocarbon extraction, which looks set to take off in the near future, could impact sooty shearwaters negatively at sea. Fortunately, these activities are closely managed in Falkland Islands waters in order to mitigate negative effects on seabirds, in part through the ongoing establishment of Marine Protected Areas. These measures require accurate data on the distribution and density of seabirds at sea. The course-scale distribution of Falkland sooty shearwaters has been mapped using data collected from ships and geolocator tracks (White et al. 2002, Hedd et al. 2012, Hedd et al. 2014) but little is known about their fine-scale distribution.

Understanding the population dynamics and distribution of sooty shearwaters in the Falkland Islands would inform both local and global conservation efforts. However, prior to our project, no accurate count of Kidney Island's sooty shearwaters breeding population had been made. In January 2017, we visited Kidney Island to deploy geolocators on sooty shearwaters as part of a wider project on the movements of shearwaters and petrels in the Atlantic. Grants from the Seabird Group and the Falkland Islands Environmental Planning Department enabled us to extend our visit, firstly, so that we could survey the island in order to make an accurate estimate of the number of sooty shearwaters breeding there and secondly so that we could GPS-track birds during late incubation and early chick-rearing.

Fieldwork was carried out by a team of four, in two visits: From the 6th to the 12th we surveyed 2.5 m diameter plots throughout the island, recording burrow density and habitat characteristics; established occupancy monitoring plots; and deployed 25 GPS loggers. On the second visit we completed the burrow density survey; continued monitoring occupancy; recovered 21 of the GPS loggers (the remaining birds could not be recaptured); and deployed 32 geolocators.

We are currently analysing the survey data using habitat selection and occupancy models in order to produce the first accurate population estimate for Kidney Island. Preliminary results suggest that the number sooty shearwaters breeding there is now well in excess of 100,000 pairs. Moreover, our analysis of historical aerial photographs and recent satellite images confirm that tussac cover has increased on Kidney Island appreciably over the past 60 years and our models show that burrow density is lowest in areas where tussac has only recently recolonised. This lends some support to the hypothesised link between habitat restoration and sooty shearwater population size, boding well for ongoing efforts to re-establish tussac cover elsewhere in Falkland Islands.

It was immediately obvious from our GPS tracking that in January, 2017 the vast majority of sooty shearwaters foraged south of the Falklands archipelago, on the shelf-break of the Burdwood Bank. This is an area of shallow (< 200 m) water on the south-eastern flank of the Patagonian Shelf, well known for its high biological productivity and diversity (Schejter et al. 2016). Part of the western half of the bank, which is in Argentinean Territorial waters, has been an MPA since 2013. In addition, the Falkland Islands Government is currently considering making some or all of the eastern part of the bank an MPA, which would clearly be a good step towards the protection of the island's sooty shearwater population. We are currently analysing our GPS data alongside the tracks of vessels licensed to fish in Falkland Island waters in order to identify if, when and where sooty shearwaters are at risk of bycatch.

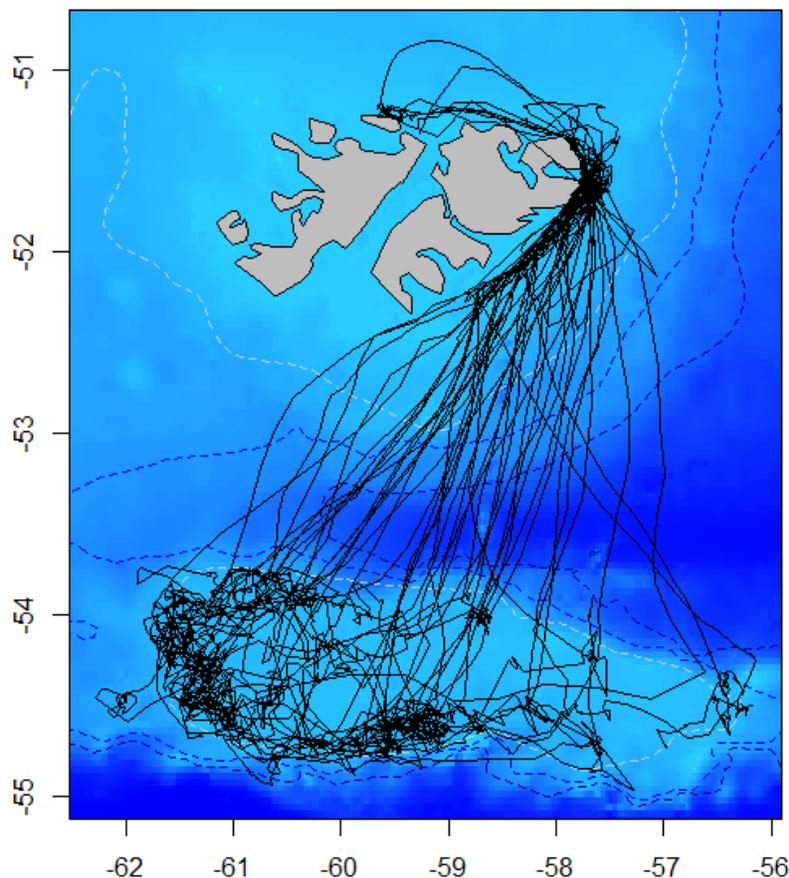


Fig. 2. GPS tracks (black lines) of 21 sooty shearwaters from Kidney Island during late incubation/early chick-rearing.

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