

Linking habitat use and foraging behaviour of brown skua (*Catharacta antarctica lonnbergi*) from the Chatham Islands

Top predators are crucial for ecosystem function. Alarmingly, population numbers of the brown skua, a large predatory seabird, appear to be declining on South East Island, their major breeding site in New Zealand. Possible causes include habitat loss and human-induced mortality. Collection of spatial information and an understanding of their foraging behaviour is key to brown skua management and conservation. Aim of our 2015 field season was to investigate the spatial distribution, habitat preferences and foraging behaviour of brown skua. To this end, we proposed to capture birds to attach GPS tracking devices and collect blood samples for dietary analysis. We managed to deploy 41 GPS devices on individual brown skuas out of which we recovered 38 functioning loggers in the end of the tracking period (Fig. 1a). Two birds had either lost their device or could not be captured again. A third tracker did not contain any data due to a memory malfunction. We successfully downloaded 38 tracks from 19 males and 19 females from the remainder of devices (Fig. 1b). In addition, we collected blood and feather samples from each captured individual to make inferences about individual diet preferences. Unfortunately, we were not able to capture a large enough sample of non-breeding 'floaters' that would allow to test for differences in foraging behaviour among breeders and non-breeders. However, we observed what appears to be a differing pattern in space use among males and females. While all skuas spent most of their time on their territory, close to their nest site, males and females seemed to have different habitat preferences while foraging. Males displayed a tendency to forage out at sea with a maximum distance from the colony of up to 40 kilometres. Females did not forage at sea, but covered a much larger area on neighbouring Pitt Island, which is mostly farmed and where skuas are known to scavenge on dead sheep. Brown skua have a pronounced reversed sexual size dimorphism with females being substantially larger than males. It is possible that the observed patterns are partly driven by morphological differences between males and females, but may also occur due to sex specific differences in dietary requirements. The Birds New Zealand Research Fund supported this project with funds to perform so-called stable-isotope analysis of skua blood. Carbon and nitrogen signatures derived from such analysis will shed light on whether sexual differences in space use patterns are reflected in sex-specific dietary signatures. Once results from this analysis are available, we will test whether space-use patterns of individual skuas match with those of dietary preferences and whether the distinct spatial patterns observed between the sexes are also evident in skua diet. If females rely more on anthropogenic resources and correspondingly forage in high risk habitat such as farmland, this may have strong implications for skua management and conservation. Since its start in 2014 this project received funding from the University of Auckland, The J.S. Watson Trust, Birds New Zealand, Education New Zealand as well as logistic support by the Department of Conservation, Chatham Island office. I am very grateful for the support by Ngati Mutunga o Wharekauri Iwi and Hokotehi Moriori Trust. I would like to address special thanks to Birds NZ members Ian Southey and Rebecca Hohnhold for their amazing help in the field.

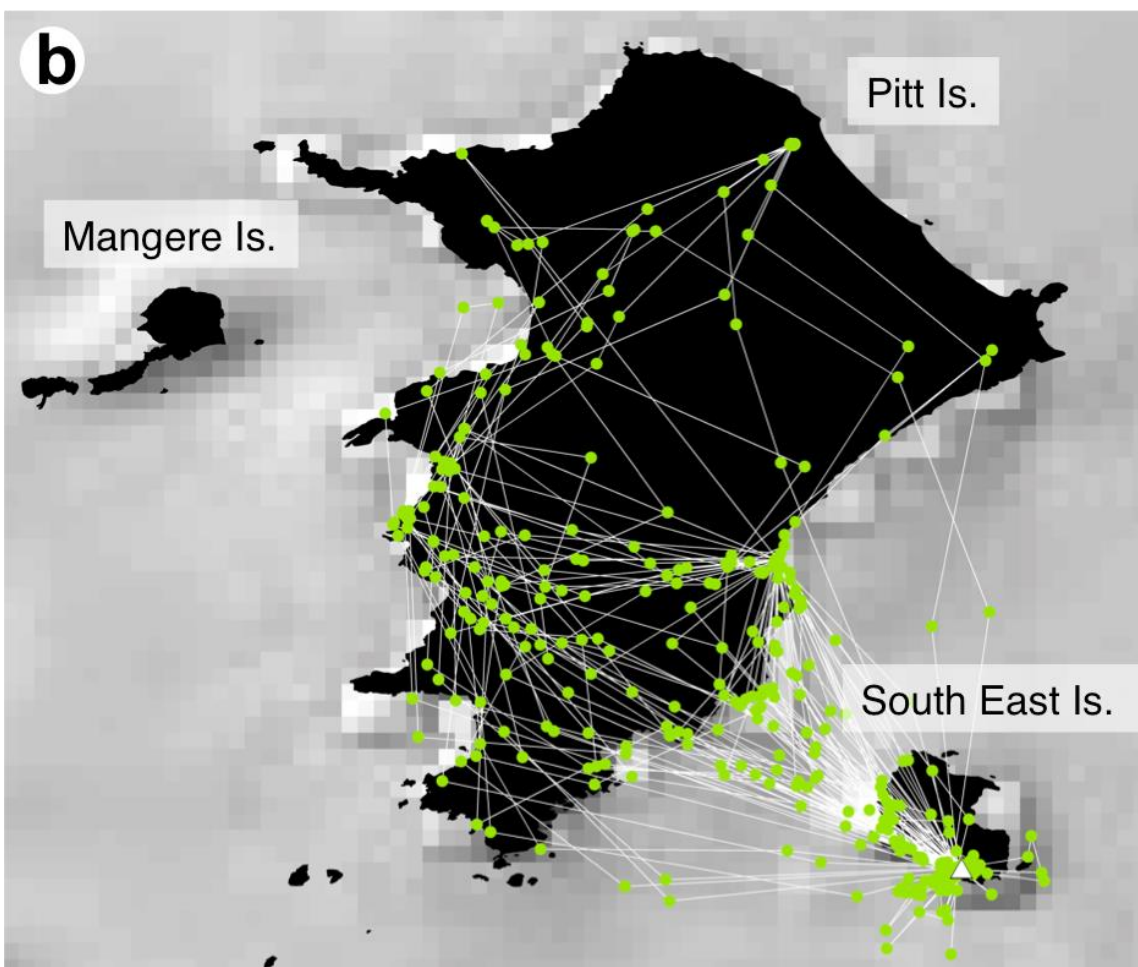


Figure 1. Brown skua with GPS device (a) and a track of a female brown skua breeding on South East Island (b). Photo '1a' by Rebecca Hohnhold. Map polygon by Land Information New Zealand, map bathymetry by NIWA.