Pre-breeding Leach's storm-petrels (*Hydrobates leucorhous*) attend and return to multiple breeding colonies

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Background

Young seabirds often investigate potential breeding colonies prior to recruitment.[1] Because long-lived seabirds often retain a single nest site for many years, their initial choice has major implications for individual fitness and population connectivity.[2,3] However, young seabirds that are not tied to specific nest sites are difficult to track, and the movements and behaviours that precede site selection are poorly understood in most species. We sought to characterize movements and colony attendance patterns in pre-breeding (<5 year-old) Leach's storm-petrels at two major (>130,000 pairs) breeding colonies using VHF telemetry (Figs. 1 & 2).

Site & Methods

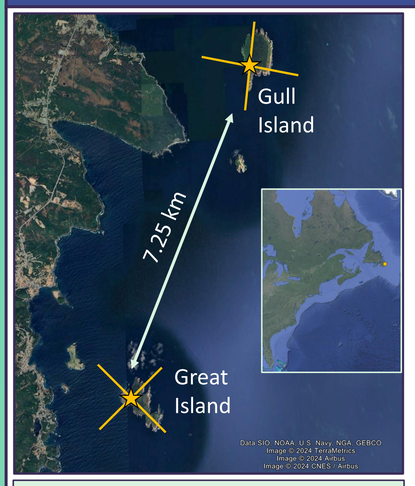

Fig. 1: Study islands and receiver stations (stars) off the east coast of Newfoundland. Yellow lines show the angles of directional antennas.

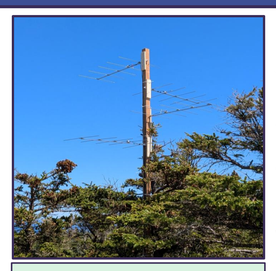

Fig. 2: Antenna array.

Receiver stations consisted of four five-element directional antennas. Each station had an approx. 5 km detection radius.

We mist-netted and tagged 28 storm-petrels during incubation and early chick-rearing (mid June – early August). We identified pre-breeding birds based on brood patch status (Figs. 3 & 4). VHF tags were attached with tape and glue. When tagged birds returned to the area, receiver stations recorded their approximate direction and distance based on receiving antennas and signal strengths.

Fig. 3: Pre-breeding bird without a brood patch.

Fig. 4: Breeding bird with a clear brood patch.

Fig. 5: A freshly attached VHF tag (Lotek NanoTag).

Fig. 6: Releasing a tagged Leach's storm-petrel.

Results

Tracked Inter-colony Movements

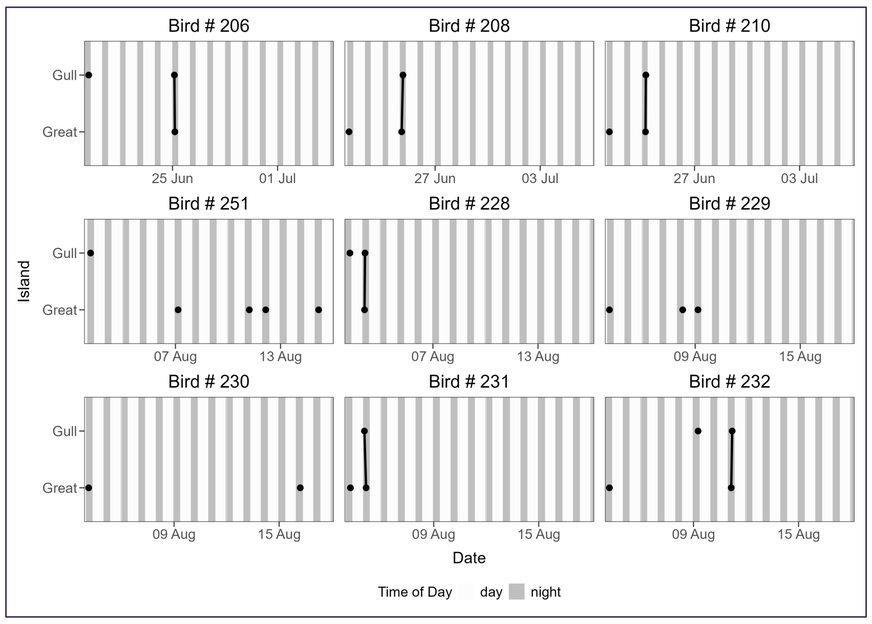

Fig. 7: Nine out of 28 tagged birds returned to the area at least once. 7 out of 9 returners visited both colonies at least once. We recorded 14 visits. In 6 out of 14 cases, birds visited both Great and Gull Islands in the same night. The first point on each figure shows the island of capture. Each figure shows two weeks post-capture. Vertical black lines show inter-colony movements. Repeating gray bars show day and night.

Path of Bird #206 on 23 June

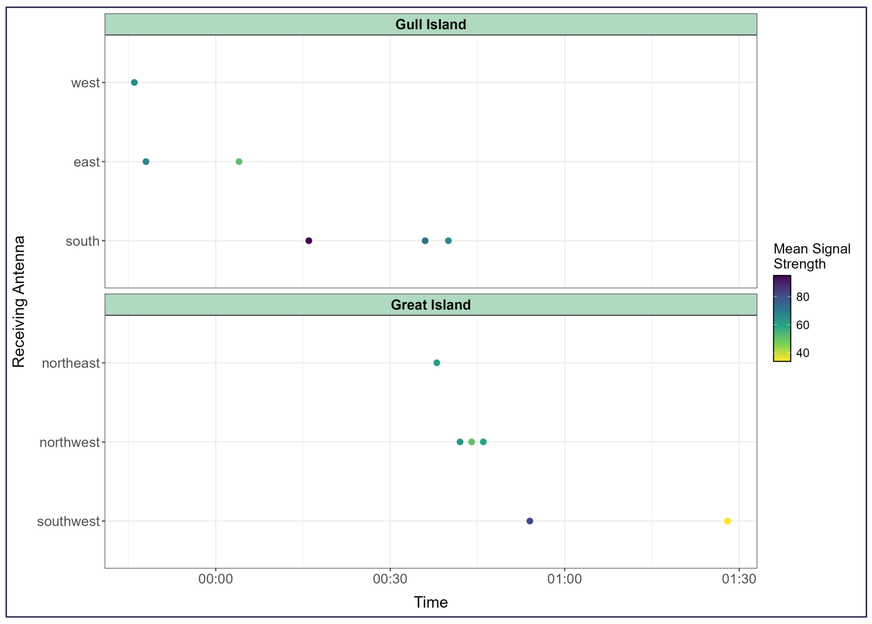

Fig. 8: Directional antennas allowed for inferences about movement paths. Each point on this figure shows the antenna that received the most transmissions in a 3-minute period, colored by the mean strength of those transmissions. Tags transmitted every 13 seconds. On this night, bird #206 arrived at Gull Island, spent approximately one hour there, then moved south to Great Island before departing towards the south.

Typical Durations of Colony Visits

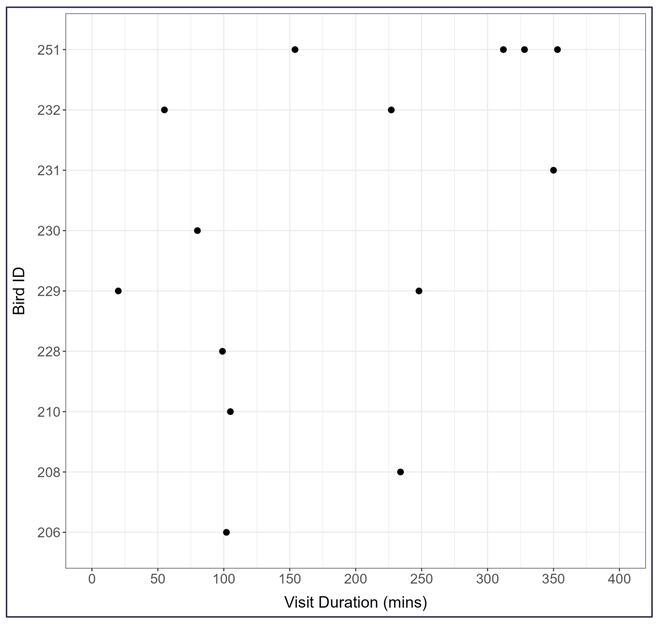

Fig. 9: Visits to the study area ranged in duration from 20 mins to 5.8 hours. Each point shows the duration of a nighttime colony visit. These were calculated as the time when a bird was first detected on either island each night until its last detection that night. Data from the night of capture are not included.

Discussion

We found that pre-breeding Leach's storm-petrels return to visit colonies multiple times, and often visit colonies other than the colony where they were captured. These data suggest that pre-breeders are not particularly faithful to specific sites, though we note that these two islands are only eight kilometers apart. We observed more colony visits in August, during the chick-rearing reason, which may indicate that pre-breeders benefit from information on conspecific breeding success. Although pre-breeders have yet to be tracked at a larger spatial scale, the current study shows that this group of birds makes repeated visits to multiple colonies at a more local scale. In future years, we will expand this project to track movements among more distant colonies. Understanding how young Leach's storm-petrels select breeding sites and how many potential sites they may visit will improve our understanding of colony connectivity and source-sink dynamics. Furthermore, tracking pre-breeder movements and behaviour provides insights into what information young birds may incorporate into their choice of breeding site. The extent to which dispersal is an informed process has important implications for range expansion and the species' ability to respond to a rapidly changing world.[4]

Fig. 10: The Great Island station with Gull Island in the background.

Acknowledgements

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