

# Identification and Counts of Roosting Shorebirds Using Aerial Imagery and standard ground-based surveys – a Pilot Study

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This study aimed to examine the suitability of fixed-wing aircraft as a platform to gather high resolution vertical imagery to count aggregations of shorebirds. This approach can then be assessed as a viable alternative or supplementary to observer-based counts at high tide roosts – particularly where access is difficult and/or ground-based observers are unavailable. In February 2024 we were finally able to overfly the high tide roosts of shorebirds on Farewell Spit in the presence of ground observers. An initial attempt to do this in February 2023 had been cancelled in the wake of cyclone Gabrielle.

A fixed-wing Cessna 180 aircraft fitted with a Phase One medium format digital camera was flown over the spit on 11<sup>th</sup> February 2024 and timed to coincide with a spring tide in the middle of the day. An initial pass was made at 300 m altitude along the northern side of the spit with observers strategically placed to count flocks prior to the arrival of the aircraft and to note any disturbance. Unfortunately, birds were observed to take flight well before the aircraft was anywhere near overhead making planned comparative counts with ground observers impossible. The northern side of the spit was covered a second time at 210 m as was the gannet (*Morus serrator*) colony at the tip. As the aircraft was available, the opportunity was also taken to cover the southern side of the spit to collect images of black swans (*Cygnus atratus*) adjacent to the high tide line.

Although the level of disturbance to the aggregations of roosting shorebirds on Farewell Spit was largely unanticipated, many images were captured of flocks of shorebirds on the ground and in flight. A total of 2,861 images were collected. A rapid preview was able to identify variable oystercatchers (*Haematopus unicolor*), South Island pied oyster catchers (*Haematopus finschi*), red-billed gulls (*Chroicocephalus novaehollandiae*), southern black-backed gulls (*Larus dominicanus*), white-fronted terns (*Sterna striata*), bar-tailed godwits (*Limosa lapponica*), red knots (*Calidris canutus*), gannets and black swans. The large job of counting individual birds within these images has now commenced.

The impacts of aircraft disturbance appeared to vary depending on the species with the most sensitive being bar-tailed godwits and red knots. South Island pied oystercatcher and white-fronted terns were much less so. Most birds were observed to land back at their roosts within a few minutes of the aircraft passing. No disturbance was noted to the gannet colony at the tip of the Spit nor was any seen for black swans. In retrospect, the observed disturbance wasn't that surprising given the low flying ban that has existed over the nature reserve from more than 40 years. We suspect that similar flights over estuaries near airports without such protection would be significantly less disturbed. Further work on disturbance by aerial platforms, particularly as UAVs (drones) become more ubiquitous, is clearly required.

Mixed flock of bar-tailed godwits and red knots



Portion of gannet colony at tip of Farewell Spit

