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

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Although aerial surveys for shorebirds have been used extensively overseas these have rarely been applied in New Zealand. Aerial imagery may provide a viable alternative or a potential supplementary data stream to observer-based monitoring of many shorebirds at hightide roosts. This is likely to prove particularly valuable to ensure coverage of key habitats/sites at scale - particularly where access is difficult and/or ground-based observers are unavailable. Depending on the ability to resolve different species and count individual birds, an assessment of the precision of standard ground surveys will also be attempted.

This pilot study aims to examine the suitability of fixed-wing aircraft as a platform to gather high resolution vertical imagery as a means of accurately counting shorebirds. A fixed-wing aircraft (rather than a drone or UAV) has been chosen to maximise the efficiency of data collection at scale, minimise bird movement between flock sites during the survey period and provide assurance on the optical and spatial quality of the data collected. Data will be collected using Phase One digital cameras at a height that will minimize disturbance but provide effective ground resolution of 1.1-1.6 cm. Imagery will be collected from the length of Farewell Spit over known roost sites in February 2023 to coincide with planned observer-based counts and spring high tides.

A series of high resolution RGBi images of shorebirds on Farewell Spit will be captured, processed and made available as individual frames and as combined image strips/orthomosaics. An assessment of our ability to resolve different species, using expert opinion, will then be made and counts for each flock computed manually. Ideally these numbers would be compared against, and calibrated with, observer-based counts conducted at the day before the overflight. Longer-term we would anticipate that these images would contribute to a training data set that could form the basis of automated counting methods for shorebirds and other species as well as a potential resource for further public education and engagement.