

Abstract - IOC 2022

A VHF-equipped drone – evaluating methods for tracking birds in a forested landscape

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36. Drone Research: From scientific advances to applied conservation

Evaluating methods for tracking birds in a forested landscape, including a VHF-equipped drone

Locating and tracking birds in forested landscapes offers a unique set of difficulties, particularly for cryptic species or when animals are obscured by canopy. Handheld VHF tracking is useful but detection range and tracking ability are limited by topography and vegetation, and field crews still need to traverse the landscape on foot.

Aerial tracking offers many advantages over traditional ground-based survey and research techniques. As well as making fieldwork faster, safer, and more efficient, searches can follow a set flight plan for repeatability. However, manned aircraft can be expensive, potentially risky, and impractical where there are no landing areas nearby.

Unmanned Aerial Vehicles (UAVs, or drones) offer a useful alternative, as they are cheaper and more portable than aircraft. However, there are a number of technical considerations to get best results from this emerging tool.

Endangered yellow-eyed penguins (*Megadyptes antipodes*) breed on Enderby Island in the New Zealand subantarctic, nesting individually underneath thick coastal scrub up to 1 km from the sea. Nests are difficult and time-consuming to find by ground searching, and field conditions can be hazardous. Nest locations were urgently needed to facilitate other research, including monitoring nest attendance and breeding success.

We developed a multi-frequency VHF receiver for this study which offers many advantages over standard single-frequency receivers, particularly for aerial tracking, including simultaneously monitoring up to 500 frequencies (instead of scanning sequentially). Unlike traditional receivers, this system also stores position data for easy spatial analysis, and comparisons over time.

Here we discuss the successes and failures of various methods of using drones for applied conservation, including use of thermal imagery and multi-frequency VHF radio-tracking. In this case-study we tracked endangered forest-nesting penguins to their nests, and we present results comparing the efficiency of different nest-finding methods.