

## Detection of flying-foxes using automated audio recorders

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### Abstract

Flying-foxes are little understood in Australia largely due to their extreme mobility. This mobility is particularly evident in the two species (spectacled and little red) found across the north of Australia, where huge numbers of animals will suddenly converge on a region and then leave a few weeks later. To improve management of these species we need to understand the movement and ecology of the animals and this is not straightforward as the camps are often remote and inaccessible.

In this project we aimed to test the viability of using automated acoustic recorders for determining the presence of spectacled flying-foxes at camp locations. A Song Meter SM4 recorder was used to record flying-foxes in a number of camps around South East QLD/Northern Rivers (black and grey-headed flying-foxes) and Cairns (spectacled flying-fox). A total of 35 hours of flying-foxes calls were recorded over a period of 8 weeks from August to October 2017.

The recordings were processed using a Binary Winnow classifier and Hidden Markov Model in Kaleidoscope Software (Wildlife Acoustics). Tagged one-minute recordings were used to train the Hidden Markov Model in Kaleidoscope which was subsequently used in classifying the remaining recordings.

Using this approach, we were able to quickly and easily detect the presence of flying-foxes in the acoustic recordings. In this way, ecologists can easily implement projects for long-term monitoring of flying-fox populations using remotely deployed acoustic recorders. It may also assist management agencies for urban planning in northern Australia. For future work, we will be investigating advanced machine learning algorithms coupled with flying-fox behavioural call patterns to attempt to distinguish the species of flying-fox from acoustic recordings.