90

Animal-borne acoustic recorders inform mark-resight models for abundance estimates in North Island Brown Kiwi (Apteryx mantelli, Bartlett)

Monitoring animal populations is important to allow for appropriate conservation actions, and monitoring methods need to be as objective, efficient, and accurate as possible.
Passive Acoustic Monitoring, whereby remotely deployed acoustic recorders collect data in unsupervised fashion, is relatively cheap and virtually impervious to observer's bias, whilst also producing potentially perpetual data sets.
Already prominent in marine environments, this monitoring method has become popular in the terrestrial scene, however quantitative estimates are seldom possible as we lack proper scaling factors from cue numbers to animal abundance.
Moreover, thanks to technological developments, miniature animal--borne loggers of many sorts, can nowadays deliver information on individual animal features, including vocal behaviour.
Here we show how concurrently equipping a portion of individual animals with miniature acoustic loggers, and deploying environmental recorders can inform abundance estimates.
Studying North Island Brown Kiwi (Apteryx mantelli, Bartlett 1851), we found how mark-resight models informed with individual vocal behaviour recorded through individual loggers convey more consistent and realistic abundance estimates than others.
Although this is an inherently invasive method, we further detail how iterating its application can lead to fully uninvasive passive acoustic monitoring abundance. This would be possible by informing unmarked populations' estimates with individual behavioural data from marked populations while accounting for environmental covariates.
Overall, combining data from miniature animal--borne acoustic recorders and environmental recorders can deliver more consistent, informed, hence realistic abundance estimates. Furthermore, this provides data for investigating individual identification which, combined with notion on the individual vocal activity would inform ever more accurate passive acoustic abundance estimates.