

Can camera trap surveys provide reliable population estimates for nondescript species?

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Abstract

Camera trap surveys are a useful tool for conducting population estimates of elusive, habitat-specialist species, but the reliability of individual identification of nondescript species requires verification. We tested the use of remote cameras to estimate minimum population sizes of the uniformly coloured quokka (*Setonix brachyurus*, a medium-sized macropod) at three riparian sites in south-west Western Australia, and tested the hypothesis that the presence of marked animals and baited camera traps improved reliability of population estimates made with camera traps. Camera traps were placed out for up to 11 months at each site and populations were also monitored by live trapping over three sessions, resulting in an increase over time in the proportion of individuals at each site that were tagged and uniquely marked. Over 46 000 photos were reviewed, quokkas were sexed, identified as tagged or non-tagged, attributed an individual ID number, and numbers of individuals identified from photos estimated for each month. We found no significant influence of the number of marked individuals on estimates

of the number of individuals identified from photos ($P = 0.39$), but the presence of bait at camera traps increased the number of individuals identified ($P < 0.01$). We conclude that camera trapping is a valid method for estimation of quokka population sizes and that the presence of bait greatly enhances detectability of this species, and therefore reliability of population estimates, due to the increased number of photos of animals aiding individual identification.

Introduction

The quokka (*Setonix brachyurus*) is a small macropod endemic to south-west Western Australia. Quokkas occur on two offshore islands and within small pockets of forest on the mainland where they are associated with dense, often impenetrable, riparian habitats (de Tores *et al.* 2007). This habitat preference, coupled with a shy nature and naturally small population sizes, can make quokkas a challenge to adequately sample. Despite intensive live trapping, individuals can vary markedly in their catchability; this has driven a range of