Short-term welfare implications of capture-mark-recapture trapping of medium-sized mammals: the brushtail possum (Trichosurus vulpecula) as a case study

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Abstract

Capture-mark-recapture (CMR) repeated at intervals is a commonly used method of population estimation of mammals. Most guidelines for the use of wild mammals recommend adequate measures to ensure a captured animal has food and water available, as needed, until it is released. Small mammals are often highlighted as needing special care, but recommendations are either less clear or absent for medium- and large-sized mammals. We therefore examined the short-term welfare implications of CMR trapping of medium-sized mammals, using the marsupial, brushtail possum (Trichosurus vulpecula) as a case study. Possums were caught in cage traps baited with circa 30 g of food and set for three consecutive days at monthly intervals. Timing devices on the traps measured when traps were sprung. Possums were confined in traps for, on average, 89% of each night they were trapped, plus a further 2–6 h between sunrise and the actual time of release from the traps. They lost 3–8% of their bodyweight on average, depending on the number of captures in a trapping session. A recently developed framework for humaneness assessment, based on five welfare domains, gave an overall welfare impact of mild-moderate for cage trapping of possums. The short-term solutions to these welfare impacts would be, at a minimum, to provide trapped possums with adequate additional food and water, and minimise their time spent in the traps. Guidelines for the use of wild animals in research and management could also be more prescriptive regarding the provision of food and water in studies of medium-sized mammals that involve repeated capture.

Keywords: activity patterns, animal welfare, mark recapture, possum, Trichosurus vulpecula, weight loss

Introduction

Capture-mark-recapture (CMR) is a commonly used method of population estimation of mammals, primarily for research but also for population management (Otis et al 1978). Animals are usually trapped in sessions lasting several days, and sessions may be repeated at regular intervals. Where intervals are relatively frequent, for example, monthly, mammals, particularly nocturnal ones, may spend repeated, prolonged periods in traps as those are normally checked during daylight hours. CMR and associated handling and marking procedures may affect survival and reproductive rates (Parminter et al 1998; Clinchy et al 2001; Cattet et al 2008), but this has not been much studied compared with impacts associated with attachment of radio-transmitters and/or identification tags (eg Godfrey & Bryant 2003; Tuyttens et al 2003; Moorhouse & MacDonald 2005; McMahon et al 2011). Most guidelines for the use of wild animals in research (eg CCAC 2003; Sikes et al 2011; Anon 2012) recommend adequate measures be taken to ensure that a captured animal has food and water available, as needed, until it is released. While small mammals are often highlighted as a group needing special care, recommendations are either less clear or absent (other than in very general terms) for medium- and large-sized mammals.

Such is the case for common brush-tail possums (Trichosurus vulpecula), nocturnal 2–4 kg marsupials introduced to New Zealand in the 1850s from Australia. Their ecological and economic impacts are sufficiently significant that approximately NZ$100 million is spent annually controlling them, mostly by poisoning and trapping (Cowan 2005). Consequently, their population ecology has been much studied in both New Zealand and their native Australia (Montague 2000), often by CMR using cage traps or leg-hold (foot-hold) traps (eg Efford & Cowan 2004; Glen et al 2012).

For the present study of the impacts on welfare from CMR-trapping of possums over three-day sessions at monthly intervals, we attached timing devices to cage traps to measure when traps were sprung, and used those data to explore the implications for animal welfare. Possums typically emerge from their dens about 30 min after sunset, unless delayed by heavy rain or strong winds (Herbert & Lewis 1999) and feed in several bouts spread over 7–9 h, starting approximately 1–2 h after sunset (Winter 1976; Ward 1978; MacLennan 1984). Trapping interrupts the foraging efforts of possums