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The efficacy of collar-mounted devices in reducing the rate of predation of wildlife by domestic cats

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Abstract

Volunteer cat owners from across the UK were recruited to take part in two trials designed to test the efficacy of collar-mounted warning devices in reducing cat predation rates of native wildlife. Cats equipped with a bell returned 34% fewer mammals and 41% fewer birds than those with a plain collar. Those equipped with an electronic sonic device returned 38% fewer mammals and 51% fewer birds compared with cats wearing a plain collar. There was no significant difference in prey return rates by cats wearing collars equipped with one bell, two bells or the sonic device. Warning devices mounted on quick-release collars are recommended as an effective way of reducing wildlife kill rates by domestic cats. Future research and development aimed at further improving the efficacy of sonic devices is recommended.

Keywords: Citizen science; Conservation; Gardens; Population decline; Songbirds

1. Introduction

Feral cats *Felis catus* have had a severe impact on the conservation of island bird species, especially flightless endemics and breeding seabirds. In such instances, eradication of the introduced species is a common management technique (Nogales et al., 2004).

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There is increasing concern about the possible impact of predation by domestic house cats on native mainland wildlife. Studies in Australia (Barratt, 1997, 1998), New Zealand (Gillies and Clout, 2003), North America (Lepczyk et al., 2004), and the UK (Churcher and Lawton, 1987; Woods et al., 2003) have all indicated that some cats can and do kill large numbers of small mammals and birds. Some authors have attempted to extrapolate from published data from relatively small studies to estimate national levels of mortality. Woods et al. (2003), for example, recorded information on the number of prey returned by 696 individual cats over a five month period. They then extrapolated the result, using an estimate of 9 million domestic cats in the UK to suggest that, nationally, cats may have killed up to 92 million animals, including 55 million mammals and 27 million birds in this period. May (1988) extrapolated from Churcher and Lawton's (1987) data from 70 cats to suggest that 100 million animals may be killed each year. Whilst there are dangers of extrapolation (Barratt, 1998), it is clear that domestic cats do kill substantial numbers of wild animals in the UK. This does not necessarily equate to a conservation problem (Barratt, 1995). Most of the species killed by cats are small, short lived and have high reproductive rates. Whether cat predation imposes an additional mortality level or is simply compensatory (for instance, taking young or weak individuals, e.g. Møller and Erritzøe, 2000) is unclear for most of the species concerned. Baker et al. (2003) report a negative relationship between woodmouse *Apodemus sylvaticus* abundance and both cat abundance in residential gardens and distance to the nearest patch of semi-natural vegetation and suggest this is evidence that urban small mammal populations may be limited by cat predation. In Australia (Barratt, 1995) and New Zealand (Gillies and Clout, 2003) much of the prey taken is of introduced species, and the authors argue that the juxtaposition of domestic cats and native wildlife is crucial in determining the extent of any conservation issues.

Gardens and built up areas cover some 1.8 million hectares in Great Britain, or some 8% of the total land area (Haines-Young et al., 2000). In the wider countryside, agricultural intensification has resulted in severe declines in the quality of farmland habitats over the last 30 years (e.g. Aebischer et al., 2000; Anderson et al., 2001; Boatman et al., 2002; Vickery et al., 2004) and several common and widespread bird species have undergone spectacular declines as a result (Fuller et al., 1995). In view of this, gardens may well become increasingly important refugia for birds (Mead, 2000). Three species which appear on the UK red list of bird species of conservation concern (Gregory et al., 2002), house sparrow *Passer domesticus*, starling *Sturnus vulgaris* and song thrush *Turdus philomelos*, have a high proportion of their population in gardens (Bland et al., 2004) and are frequently taken by cats (Mead, 1982; Churcher and Lawton, 1987; Woods et al., 2003). If the impoverishment of habitats in the wider countryside has the effect of concentrating greater proportions of birds into gardens, it will also bring a greater proportion of individuals into closer proximity to cats. House sparrows have recently undergone spectacular declines in several UK cities as well as in the wider countryside (Summers-Smith, 1999; Crick et al., 2002). Although the impact of cat depredation on the populations of these three species is unknown, it would be prudent to adopt a precautionary approach and seek management techniques to reduce mortality levels. Apart from conservation issues, there are animal welfare issues associated with cats' habit of playing with prey rather than killing it quickly. Further, owners often