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The roles of trials and experiments in fauna reintroduction programs

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Summary

The aim of any trial or experimental reintroduction is to consider key questions relevant to improving the likelihood of population establishment and persistence. These questions relate to the ecology of the focal species and the suitability of the release environment. Although trial reintroductions provide insight, and generate hypotheses relating to an organism's persistence and establishment, experiments (controlled manipulations with replicates) allow clearer conclusions. However, given that reintroductions often involve threatened species, experiments may be impossible due to small sample sizes and few opportunities for replication. As such, trial reintroductions are often the only option available to get an indication of which factors influence establishment success, habitat use and requirements, tolerance of threats, competition for resources, and social and spatial requirements. Thus trials remain a valuable tool for conservation managers, provided they are interpreted cautiously, with clear understanding of the parameters documented for each trial. Trials can also be combined strategically within an adaptive management framework. Here we outline the roles of trials and experiments, provide some case studies, and offer some advice for handling the limitations inherent in both reintroduction experiments and trials.

Introduction

The management of threatened or endangered species by translocating animals to re-establish populations is an important strategy for conservation (Griffith *et al.* 1989; Moro 2003; IUCN 2013). Translocation has become increasingly common since the 1990s as opportunities have increased through breeding programs, development of translocation skills, and the benefits of establishing geographically separate populations become evident in a rapidly changing world (Danks 1995; Seddon 1999a; Comer *et al*. 2010). However, early reintroductions had limited success worldwide, and attempts in Australia and New Zealand showed a particularly high rate of failure (Griffith *et al*. 1989; Fischer and Lindenmayer 2000). Factors influencing the success of reintroductions occurred at population, metapopulation and ecosystem levels (Armstrong and Seddon 2008; Polak and Saltz 2011). Key limiting factors may include: the size of release groups and composition; genetic effects, such as effective population size, founder