

Persistence without intervention: assessing success in wildlife reintroductions

Wildlife reintroductions proceed from a seductively simple assumption: by releasing individuals of a species into a suitable habitat it is possible to restore natural biodiversity. Not surprisingly, therefore, the release of animals to re-establish populations of endangered or threatened species is becoming increasingly common. By 1998 the World Conservation Union (IUCN)/Species Survival Commission's Reintroduction Specialist Group (RSG) had current projects listed for over 200 animal species. The RSG issued a set of reintroduction guidelines in 1998, in which it defines reintroduction as: '... an attempt to establish a species in an area which was once part of its historical range ...'¹. The definition goes on to state that 're-establishment ... is a synonym, but implies that the reintroduction has been successful'¹. This raises a fundamental question common to all reintroduction attempts: by what criteria should we assess success – or should we even try?

There is no general agreement on what constitutes a successful reintroduction, although a variety of definitions of success have been discussed. These definitions include: breeding by the first wild-born generation²; a three-year breeding population with recruitment exceeding adult death rate²; an unsupported wild population of at least 500 individuals³; or the establishment of a self-sustaining population⁴. An immediate problem is that variation in life history traits between target species will limit the general usefulness of any one criterion.

The 7th World Conference on Breeding Endangered Species, held in Cincinnati in May 1999, aimed to link zoos and field conservation through an ambitious series of working groups addressing a range of current issues. One group considered the post-release phase of reintroductions, where a key topic was how best to assess success.

A major problem with defining a reintroduction as a success or a failure is that, by any criteria, this definition is limited in time. If the aim is to establish a self-sustaining population, then a given project can be said to have achieved its aim (i.e. be successful) only at the time at which the assessment was made.

Self-sustainability does not necessarily mean long-term persistence. A review of the changing status of reintroduction attempts over a five-year period found that four out of 74 projects (5%) categorized as successful in 1987, had declining populations by 1993 (Ref. 5). The danger of classifying a reintroduction as successful is that it implies an end-point beyond which further effort, in the form of new releases or monitoring, might be deemed unnecessary. Population viability analyses estimate extinction probabilities over periods of hundreds of years, thus 'failure' of apparently 'successful' projects after only five years is of concern. Demographic stochasticity affecting small populations, and environmental variation acting on larger populations⁶, will mean that a reintroduction can be considered successful only at a given point in time. In addition, new threats might arise. A recent example is given by the re-establishment of Arabian oryx in the Sultanate of Oman, considered to be one of the reintroduction success stories⁶. Almost two decades after the first releases of oryx, an epidemic of poaching over a three-year period rendered the free-ranging oryx population no longer viable⁷.

The consensus of the Cincinnati group was that the end-point categorization of a reintroduction as a success was misleading and potentially deleterious. Although the goal of any reintroduction might be reasonably stated as establishment of a self-sustaining population, this is not a criterion for success. Instead, we could consider any reintroduction as comprising a sequence of three objectives: the survival of the release generation; breeding by the release generation and their offspring; and persistence of the re-established population, perhaps assessed through extinction probability modelling. Long-term post-release monitoring is essential to track these demographic parameters. However, this does not mean that once animals have been released, programme managers become impartial observers; but what level of post-release intervention is acceptable?

Reintroductions have been viewed as a means to restore free-living populations in as natural a state as possible. Consequently, it has been stated that

releases should not take place until certain conditions have been fulfilled, for example, restoration of habitat and removal of the causes of initial population declines¹. It is important, however, to consider the potential benefits that might be gained by releasing animals. Released animals might increase natural biodiversity, fulfil a role as keystone components of an ecosystem, and/or create the public and political support necessary to undertake habitat restoration or to put species protection measures in place. It can be beneficial, or even necessary, to release individuals before all formal pre-release criteria have been met.

This implies that some form of post-release management could be required. It would be ideal to release a group of animals that survive, breed and thereby establish a self-sustaining population with a high probability of persistence in the long-term – all without post-release support. However, it is evident, particularly when releasing captive-bred animals, that it is unreasonable to expect survival and persistence without some degree of post-release care. Fragmentation of suitable habitat will exacerbate matters and, in the case of highly endangered flagship or keystone species, high intensity post-release intervention (e.g. supplementary feeding, veterinary care or predator control) is clearly warranted, even over the long-term. This re-emphasizes the importance of post-release monitoring, not only to evaluate the current status of the re-established population, but also to regularly assess the degree of intervention necessary to achieve population persistence. The ultimate objective of any reintroduction is population persistence without intervention, but this is a state, not a result, and is assessable only through long-term, post-release monitoring.

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