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Criteria for reintroductions

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14.1 INTRODUCTION

The recent surge of interest in the use of reintroduction, especially of captive-bred animals, as a conservation tool, has resulted in two recent reviews of the subject (Jones, 1990; Gipps, 1991) and the formation of a Re-introduction Specialist Group (RSG) of the Species Survival Commission (SSC) of the World Conservation Union (IUCN) and a Reintroduction Advisory Group (RAG) for the American Association of Zoological Parks and Aquariums (AAZPA).

While it is advisable to consult the RSG and RAG prior to initiating a reintroduction, there is currently no formal global mechanism for application to a national/international body before a reintroduction is planned and execution implemented. The purpose of this paper is to review the necessary criteria that should be met prior to a reintroduction, and to give additional guidelines and recommendations. Also we will provide

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both a framework for the initial decision-making as well as a set of issues to be addressed as the process proceeds. Not all guidelines and recommendations will be relevant for all species or all conditions, but planners need to address the criteria none the less.

Reintroduction has the following goals or objectives (from Draft Guidelines for Re-introductions, IUCN/SSC Re-introduction Specialist Group):

(a) to enhance the long-term survival of the species;
(b) to re-establish a keystone species (in the ecological or cultural sense);
(c) to increase or maintain biodiversity;
(d) to provide long-term economic benefits to local people;
(e) or to achieve a combination of all of the above.

Reintroduction is an attempt to re-establish a species in an area which was once part of its historical geographical range, but in which it has become extinct. Sources of stock may be from another region within the species' range or from a captive population. Reintroduction using captive animals is an expensive approach to conserving a species, and is not the most cost-effective conservation strategy for the majority of rare and endangered species (Kleiman, 1989; Chivers, 1991; Stanley Price, 1991).

The success of a reintroduction can only be measured in terms of its goals and objectives. However, in most cases, success requires that there is eventually a self-sustaining viable population of the species at the reintroduction site (see Beck *et al.*, Chapter 13); this means that there must also be an intact functioning ecosystem.

Terms used by authors to define the release of animals or plants into their natural areas vary (Konstant and Mittermeier, 1982; Cade, 1986; Kleiman, 1989; Stanley Price, 1989). In the current definition used by IUCN (1987) 'translocation' is the movement of living organisms from one area with free release in another. The three main classes of translocation are defined as follows.

(a) 'Introduction' of an organism is the intentional or accidental dispersal by human agency of a living organism outside its historically known native range.
(b) 'Re-introduction' of an organism is the intentional movement of an organism into a part of its native range from which it has become extirpated in historic times as a result of human activities or natural catastrophe.
(c) 'Re-stocking' is the movement of numbers of plants or animals of a species with the intention of building up the number of individuals of that species in an original habitat.

IUCN (1987) does not distinguish between different origins of organisms, e.g. in the wild, in captivity, wild-bred or captive-bred, although these differences may have a major impact on the potential for success of a translocation. Also, many individuals use the term 'reintroduction' when they are releasing animals into already occupied habitat; the terms 'reinforcement' or 'restocking' may be more appropriate in such circumstances. However, with populations of some species very fragmented and the potential dispersal distance for the individuals of a species not being known, it may be impossible to distinguish between restocking and reintroduction.

The reintroductions considered most effective and successful have all been comprehensive efforts involving a large team and many resources. An evaluation and consideration of the criteria presented in this paper should also contribute to the success of individual reintroduction programmes.

There appear to be 13 criteria which should be considered prior to implementing a reintroduction. Subsumed under these criteria are additional guidelines and recommendations which will enhance the likely success of the effort. While these criteria can be considered for both animals and plants, they are most relevant for animals. Specific guidelines for the reintroduction of plants are currently being drafted by the IUCN/RSG; the issues of concern are presented in Falk (1990) and Maunder (1992).

In this paper, we will first review the criteria for reintroduction and then present several examples of how the criteria can be used in decision-making, especially regarding proposals to use captive-bred animals for a reintroduction. The zoo community is particularly enhanced with the idea of using reintroduction as a conservation tool to save endangered species that are bred successfully in captivity. The criteria can be lumped into four discrete categories: condition of the species; environmental conditions; biopolitical conditions; and biological and other resources. Kleiman (1990) presented 10 criteria in evaluating the appropriateness of reintroducing three species of lion tamarins (*Leontopithecus*); the additional three criteria presented here involve an expansion of the number of biopolitical criteria.

14.2 CONDITION OF THE SPECIES

14.2.1 Need to augment the wild population

There should be a need to augment the size or genetic diversity of the wild population. It may be self-evident, but a reintroduction is not warranted unless there is a need to increase the number of individuals of a species, the number of separate populations of the species, or unless some genetic manipulations are needed to increase the genetic diversity.

Additionally, an evaluation of the environmental conditions, the local biopolitical considerations, the available resources and information, and the species biology will indicate whether reintroduction is the most cost-effective species recovery effort (Kleiman, 1989; Stanley Price, 1989; MacKinnon and MacKinnon, 1991). The attractiveness of reintroduction as a public relations tool should not result in cheaper and more efficient methods of species conservation and recovery being ignored.

14.2.2 Available stock

There should be available appropriate stock for use in a reintroduction. A reintroduction can use existing wild animals that are transplanted from another area to the reintroduction site. (For some biologists, the use of wild animals by definition means that they are involved with a translocation although translocation is the umbrella term used by the IUCN (1987) for any movement of organisms with free release in a second area, and thus encompasses introductions, reintroductions, and restocking.) Or, captive animals (either wild-born or captive-born) may be used. In either case, the individuals selected for release should be as close genetically to the original population as is feasible (Campbell, 1980; Caldecott and Kavanagh, 1983; Cade, 1986; IUCN, 1987; Wemmer and Derrickson, 1987; Kleiman, 1989; Stanley Price, 1989) to minimize chances of interbreeding between the original population and the newly released animals resulting in outbreeding depression (Shields, 1982; Templeton, 1986). Additionally, since the original stock was adapted to the particular environmental conditions present at the release site, genetically closely-related individuals will have a better chance of surviving (Brambell, 1977; Stromberg and Boyce, 1986).

If captive animals are to be used, the individuals must be surplus to the genetic and demographic needs of the captive population. However, reintroduction is not a mechanism for removing surplus animals from a captive population or a method of population management. There must be a viable self-sustaining well-managed captive population with a surplus from which to draw animals for release (Konstant and Mittermeier, 1982; Kleiman, 1989). A reintroduction should never jeopardize the captive population unless there is strong evidence that the release will save the species' habitat from further destruction or if prospects in the wild are better than in captivity, e.g. if there are severe husbandry problems. The explosive growth in the scientific management of breeding programmes in zoos since 1980 has meant that using captive-born animals has become more feasible.

14.2.3 No jeopardy to the wild population

The reintroduction should not prejudice the existing wild population. The release of captive or translocated animals into or near an already existing wild population, no matter how small the latter, can be extremely dangerous and even have the reverse effect of that desired. While we cannot achieve absolute certainty that our activities will not be prejudicial, no reintroduction should jeopardize the original wild population through disease, genetic swamping, or social disruption (Brambell, 1977; Campbell, 1980; Konstant and Mittermeier, 1982; Harcourt, 1987; Chivers, 1991). Ultimately, the protection of the original wild stock in its original habitat should have the highest priority (Caldecott and Kavanagh, 1983; IUCN, 1987; Kleiman, 1989). Especially when using captive animals, stringent pre-release veterinary screening is necessary to ensure, as much as possible, that the candidates for release are free of contagious disease, genetic defects, and other medical problems which could be transmitted to native animals (Brambell, 1977; Caldecott and Kavanagh, 1983; Wemmer and Derrickson, 1987; Woodford and Kock, 1991; Bush, Beck and Montali, 1993; Woodford and Rossiter, Chapter 9). In some cases, vaccinations against common diseases may be recommended.

14.3 ENVIRONMENTAL CONDITIONS

14.3.1 Causes of decline removed

Biotic and abiotic causes for the species' decline should have been eliminated or controlled. A reintroduction is not warranted unless the reasons for a species' reduction are known and have been removed (Brambell, 1977; Konstant and Mittermeier, 1982; Caldecott and Kavanagh, 1983; Cade, 1986; Griffith *et al.*, 1989; Stanley Price, 1989; Chivers, 1991). These may include, but are not restricted to, habitat destruction, hunting (or taking), predation by non-native forms (see Carey, 1988), introduced disease and environmental pollutants.

14.3.2 Sufficient protected habitat

Sufficient appropriate habitat in species' original range should be protected and secure. Without adequate habitat being available, a reintroduction is not warranted. Additionally, this habitat must be protected from further degradation so that the released individuals and their descendants will be secure (Aveling and Mitchell, 1982; Borner, 1985; MacKinnon and MacKinnon, 1991). The site must be large enough

eventually to house a viable population, i.e. there must be sufficie carrying capacity (Brambell, 1977).

There has been considerable discussion about the release of ind viduals into habitat not previously occupied by the species. While ma authors would restrict a reintroduction to ecologically suitable habi within the original range (Brambell, 1977; Griffith *et al.*, 1989; Kleima 1989; Stanley Price, 1989), a few authors (e.g. Cade, 1986) have contra ing views.

Since the ultimate goal of any reintroduction is actually the mainte nance of biodiversity and the potential for further evolution, a reintr duction can be a major incentive for a habitat restoration effort, inclu ing both basic research and actual implementation. Restoration e natural habitats is a relatively new discipline which is becoming mor important as human population explosion and greed lead to globa habitat destruction. Since many species' extinctions derive from sever habitat degradation, having a habitat restoration component in a reintro duction programme is likely to become increasingly common. Habita management and restoration may involve very aggressive activitie (Kleiman, 1989; Stanley Price, 1989).

14.3.3 Unsaturated habitat

There should be low densities (or none) of the species existing in the available habitat. It is usually preferable to release specimens into habitat which has no members of the species (reintroduction) or a very sparse population (restocking) unless the purpose of the release is to increase genetic diversity within a limited region. The release of individuals into saturated habitat can result in severe intraspecific conflict between the newly-released individuals and the stable residents. Competition for resources and social disruption (Brewer, 1978; Carter, 1981; Borner, 1985; Hannah and McGrew, 1991) are two possible outcomes while the transmission of an unknown pathogen to which the wild population is susceptible is a third (Brambell, 1977; Aveling and Mitchell, 1982; Caldecott and Kavanagh, 1983; Woodford and Kock, 1991; Bush, Beck and Montali, 1993). As already indicated, protection of the native wild population should always be given a higher priority than of individuals targeted for release.

14.4 BIOPOLITICAL CONSIDERATIONS

14.4.1 No negative impact for locals

The costs and benefits to the local human population shall have been assessed, and there should be no major negative impact. No reintroduc-

...on can succeed if any segment of the local community will be seriously ...rt by the effort. It is self-evident that a release should cause minimal ...k to human life and property; releasing a 'man-eating' tiger is clearly ... non-productive strategy (Stanley Price, 1989).

It is also non-productive if a large segment of the local population will ...e severely hurt economically by the reintroduction, without the possibility of reasonable recompense or alternative employment. In many ...ases, there will be a minimal negative impact on the local community which can be absorbed, but which appears more serious due to local publicity by special-interest groups. Appropriate education may result in a reduction of the negative perceptions about the reintroduction.

In other cases, the reintroduction programme itself might add to the economic base of a community through eco-tourism or simply additional employment and the people will change their negative attitudes after assessing the costs and benefits.

14.4.2 Community support exists

Local community support for the reintroduction (and conservation more generally) should be achieved through economic benefits, conservation education, or other means. This is the positive side of the cost-benefit analysis. Local support is essential for a successful reintroduction and can be achieved in a variety of ways. First, if a reintroduction can provide economic benefits to the local community, there is likely to be a more positive rapport (Stanley Price, 1989; Kleiman, 1989). Secondly, a community conservation education programme that explains the aims and objectives of the reintroduction, in a manner that is relevant to the local people, is important for gaining support for the effort (Carley, 1981; Cade, 1986; Dietz and Nagagata, 1986; Kleiman, 1989; Phillips, 1990; Chivers, 1991). This is especially important in international programmes where there may be significant cultural differences between the local community and those involved with the reintroduction.

Community conservation education programmes can involve giving lectures while attending meetings of adult groups and visiting schools, but also developing public relations efforts that target the entire community or particular members of the local population. Using the media (television, radio, newspapers, magazines) to keep the broader public informed of the reintroduction's activities is extremely helpful; this form of public relations can reach the local community but also be distributed nationally and internationally (Phillips, 1990). Although media attention is generally viewed in a positive light, there are some situations when secrecy is warranted, especially about specific details of the reintroduction. For example, it may be preferable not to publicize the site of the actual release. Additionally, a reintroduction can produce materials that

are distributed locally such as notebooks, T-shirts, posters and puzzles as well as staging specific events such as parades and plays, which have an educational as well as recreational function (Dietz and Nagagata, 1986).

A reintroduction programme can gain considerably more local support if it includes a component of professional education, that is, if the budget has resources for supporting higher education for some individuals. This commitment also provides convincing evidence that 'outsiders' intend to assist seriously in local development and even turn over management of the reintroduction effort to the community.

14.4.3 GOs and NGOs are supportive/involved

All relevant governmental/non-governmental organizations (GOs and NGOs) should support the effort; where appropriate, they should be part of the decision-making process. Most reintroductions are likely to involve multiple organizations and agencies, both in the approval and the implementation process. All such agencies need to support the effort strongly since officials with negative attitudes can prove very obstructive. It is therefore best that the 'recovery' team include representatives from most relevant government and non-governmental agencies (Stanley Price, 1989; Kleiman *et al.*, 1991). While extremely complex for a multinational programme, the institutional collaboration and cooperation is essential to a smooth operation. Additionally, it provides the appropriate framework and basis for eventually turning over the programme to the local community.

All reintroduction programmes require that there be a clearly defined structure for making decisions, and that the authority and responsibilities of different members of the 'recovery' team are delineated (Clark and Westrum, 1989). Policies for interventions, talking with the press, hiring and firing staff and other sensitive issues need clarification long before a release is attempted. For example, it is inappropriate to develop a policy on interventions as individuals disappear from view after release. Members of the team can have vastly different opinions about how and when to provide support to released specimens; in times of crisis there is too much emotion for objective decision-making (Kleiman, 1989). Conflicts among the 'recovery' team members can only be avoided when the structure of the team and procedures for decision-making are laid out well in advance. As an additional guideline, it is a good idea to have a contingency plan to discontinue or suspend the reintroduction, if there are unanticipated problems or serious mortality.

14.4.4 Conformity with all laws/regulations

The relevant provincial, national and international legislation, regulations, treaties and guidelines should be incorporated into the action plan and not form a barrier to the reintroduction effort. It seems self-evident that a reintroduction programme should comply with all the appropriate legislation and regulations, but these factors are not always addressed. The lack of a single completed and signed form can stop a release from proceeding regardless of how much time, energy and resources have been put into the preparation and organization.

14.5 BIOLOGICAL AND OTHER RESOURCES

14.5.1 Reintroduction technology known/in development

There should be knowledge of techniques for reintroduction for this (or a closely related) species – or the protocol should incorporate methods for evaluating and improving the techniques. The 'science' of reintroduction is new and the techniques used will vary across species, habitats and other local conditions. There is currently no standardized approach, even within closely related taxa. Thus, a reintroduction programme must always contain a 'research and development' component. There needs to be incorporated into the protocol a mechanism both for evaluating the 'success' of the effort and for changing (improving) the methodology. This might include using a formal experimental design and statistical analysis of the resulting relative rates of survivorship (or whatever measure is used to indicate 'success') (see Beck *et al.*, 1991 for an example of this process). In any case, a reintroduction programme must specify a clearly defined method of evaluating the results.

Reintroduction protocols depend on the application of basic biological information. The degree of pre-release acclimatization or adaptation to local (biological and non-biological) conditions, and pre-release preparation or training will depend on the circumstances (Temple [1978] reviews this area extensively for birds). Obviously, it is better to prepare candidates for release as much as possible by exposing them to the appropriate environmental conditions and providing training (for examples of extensive training see Brewer, 1978; Carter, 1981, 1988; Cade, 1986; Beck *et al.*, 1991). This might include holding them in cages at the reintroduction site before release for recuperation from transport and local acclimatization. The release of totally naïve animals into a situation that is known to be difficult would be inhumane to say the least, especially in a species that requires considerable learning and experience (however, see Griffith *et al.* [1989] and AAZPA-RAG [1992] for some of the negative aspects of pre-release training). For captive-born animals,

imprinting or dependence on humans should be avoided. Whether a species should be reared to avoid all humans will depend on the degree to which humans threaten it.

The degree of post-release life support and supplementation provided for each individual depends on a variety of factors peculiar to the species and local conditions. In general 'hard' releases do not involve much supplementation and support – and often minimal monitoring. Once released, the animals are expected to survive without much further human involvement. Alternatively, in 'soft' releases the individuals are first prepared/trained and then supported by humans for considerable time – through the provision of food, medical care and shelter and a period of pre-release acclimatization to the local environment (Scott-Brown, Herrero and Mamo, 1986; Kleiman, 1989; Stanley Price, 1989). Each reintroduction will have a different policy concerning the degree of life support proposed for individuals after release.

Numbers of individuals to be released simultaneously and numbers of successive cohorts to be released depend on the project's goals. In general, the more individuals that are released, the more likely that a viable population will be established, assuming that the conditions are appropriate.

Reintroduction techniques may be developed using non-native animals (Wallace, 1990; Miller *et al.*, 1991) but must include mechanisms for the protection of the native ecosystem and the recapture of the animals to prevent establishment of an unwanted population (IUCN, 1987; Stanley Price, 1989).

14.5.2 Knowledge of species' biology

Sufficient information should exist about the species' (or closely related taxa's) biology (e.g. demography, genetics, behaviour, reproduction, and ecology) in the wild (and/or captivity) to evaluate the success of the reintroduction.

This criterion is critical. Developing the preparation, release, and post-release management of a species requires the ability to answer questions about basic biology and critical resource needs in advance. Thus, well before the target date for the reintroduction the 'recovery' team needs to have access to information such as preferred types of habitat; typical size and structure of social groupings; required territory size and home range per individual/group; and amount and distribution of critical requirements such as water, den or shelter sites, or particular plants or animals. The existence and potential impact of competitors and/or predators needs evaluation (Konstant and Mittermeier, 1982; Cade, 1986; Wemmer and Derrickson, 1987; Griffith *et al.*, 1989, Kleiman, 1989; Stanley Price, 1989; Chivers, 1991; AAZPA-RAG, 1992).

Biological knowledge will help make multiple decisions about the reintroduction, e.g. choosing the best date, season, or time of day for a release or determining how many specimens to release over what period of time. This information is also important during the preparation phase, e.g. developing appropriate social groups before release (Jeffries et al., 1985; Oliver *et al.*, 1986; Stanley Price, 1989; Hannah and McGrew, 1991; Beck *et al.*, 1991).

The problems and challenges posed by a natural environment for a newly released captive animal strongly suggest that for humane reasons no individual should be released with injuries, genetic defects, or other characteristics that might reduce their chances of survival (Harcourt, 1987; Stanley Price, 1989; Bush, Beck and Montali, in press).

14.5.3 Sufficient resources exist for the programme

Sufficient resources and mechanisms should exist to conduct the reintroduction, monitor the results of the effort, and do a cost–benefit analysis of the techniques. There have been several reintroductions where little was learned because there was insufficient post-release monitoring, and evaluation protocols were not developed, e.g. the early releases of orang-utans, *Pongo pygmaeus* (Aveling and Mitchell, 1982; Borner, 1985). Release of specimens into the wild, regardless of origin, is a wasted effort without a simultaneous commitment to understand which animals survived and why. This requires an intensive post-release monitoring programme during which the behaviour of permanently identified individuals is regularly observed, and causes of disability and death determined (Beck *et al.*, 1991). Monitoring should include behavioural observations of individuals' feeding, ranging, social interactions, activity cycles, and any other parameters which are relevant to the measurement of successful adaptation. Adequate monitoring cannot be accomplished without a secure source of funding (Brambell, 1977; Campbell, 1980; Cade, 1986; Scott and Carpenter, 1987; Griffith *et al.*, 1989; Kleiman, 1989; Stanley Price, 1989; Chivers, 1991). Beck *et al.* (Chapter 13) have found that long-term funding is significantly correlated with success of a reintroduction.

14.6 EXAMPLES OF THE USE OF CRITERIA

In 1990, a Population Viability Analysis (PVA) Workshop for the genus *Leontopithecus* was held in Brazil. For this, Kleiman applied the criteria for reintroduction to the three major forms of lion tamarins. Table 14.1 (adapted from Kleiman, 1990) presents the criteria and indicates where each species is with respect to the recommendation to initiate or carry out a reintroduction programme. In some cases, we have insufficient

Table 14.1 Translocation/reintroduction of lion tamarins: do appropriate conditions exist? (scale 5 = best) (adapted from Kleiman, 1990)

	Golden	*Golden-headed*	*Black*
Condition of species			
1. Need to augment wild popn.	Yes	No	Yes (?)
2. Available stock	Yes	Yes	No
3. No jeopardy to wild popn.	?	?	?
Environmental conditions			
4. Causes of decline removed	?	No	No
5. Sufficient protected habitat	Yes?	No	Yes
6. Unsaturated habitat	Yes	Yes(?)	?
Biopolitical conditions			
7. No negative impact for locals	No	?	?
8. Community support exists	5	2	4
9. GOs/NGOs supportive/involved	Yes	Yes	Yes
10. Conformity with all laws/regulations	Yes	?	?
Biological and other resources			
11. Reintroduction technology known/in development	4	3	3
12. Knowledge of species' biology	5	1.5	3
13. Sufficient resources exist for programme	Yes	No	No
Recommended reintroduction/translocation?	Yes	No	No

information to determine whether a criterion is met; e.g. for all three species, we do not know whether a reintroduction directly into already occupied habitat will jeopardize the wild population.

Overall, a consideration of the 13 criteria suggests that a reintroduction or translocation would be appropriate for the golden lion tamarin (*L. rosalia*), but not for the golden-headed (*L. chrysomelas*) and black (*L. chrysopygus*) lion tamarins. In the case of the black lion tamarin, the chief problem is the lack of a large, genetically diverse, captive, self-sustaining population. For the golden-headed lion tamarin, probably the major factor against a reintroduction/translocation is the lack of a need to augment the numbers of the wild population within the available habitat. It appears that there are still sufficient numbers of golden-headed lion tamarins in the wild although severe habitat destruction continues, there is not yet sufficient protected habitat, and the causes of the decline have certainly not been controlled.

Table 14.2 presents a comparable analysis for the giant panda (*Ailuropoda melanoleuca*), based on discussions with experts in the manage-

Table 14.2 Translocation/reintroduction of giant pandas (*Ailuropoda melanoleuca*): do appropriate conditions exist? (scale 5 = best)[a]

Condition of species	
1. Need to augment wild popn.	Yes
2. Available stock	No
3. No jeopardy to wild popn.	?
Environmental conditions	
4. Causes of decline removed	No
5. Sufficient protected habitat	No
6. Unsaturated habitat	No
Biopolitical conditions	
7. No negative impact for locals	No?
8. Community support exists	2
9. GOs/NGOs supportive/involved	Yes?
10. Conformity with all laws/regulations	?
Biological and other resources	
11. Reintroduction technology known/in development	1
12. Knowledge of species' biology	2.5
13. Sufficient resources exist for programme	No
Recommended reintroduction/translocation?	No

[a]Developed during Workshop 'Pandas: A Conservation Initiative', 2–8 June, 1991, Front Royal, VA, with input from numerous experts in giant panda biology.

ment and behaviour of giant pandas during a Workshop on Pandas held in June, 1991 at Front Royal, Virginia (Kleiman amd Roberts, 1991). A major block to a consideration of a reintroduction/translocation programme is the lack of a viable self-sustaining captive population of giant pandas from which candidates for reintroduction can be chosen. Additionally, it is not clear whether there is a need to augment the size or genetic diversity of the wild population, and the causes of the giant panda's decline have not been controlled. Finally, we have too little information on the species' biology and on reintroduction/translocation techniques. Although pandas have been taken into captivity and released, there has been insufficient monitoring of released animals (or even free-ranging wild animals) to develop a reintroduction technology. Thus, at this stage, it would seem unproductive to recommend a reintroduction programme for giant pandas. Indeed, given the status of the species, individuals which are brought into captivity for medical or other treatment should be released as soon as is feasible into the location from which they were taken. Giant pandas should not be brought into and then kept in captivity without a very strong justification.

14.7 CONCLUSIONS

Beck *et al.* (Chapter 13) present the results of a survey of reintroduction projects using captive animals. Additionally, they attempt to evaluate those characteristics of reintroductions that lead to success (their definition of success requires that the wild population reaches 500 individuals free from provisioning or other human support or a PVA suggests that the population is self-sustaining). Successful projects tend to extend over many years, and involve the local community through conservation education programmes and local employment. It is still unclear whether pre- and post-release acclimatization, training, or extensive post-release provisioning have positive effects. Based on Beck *et al.* (Chapter 13), it would appear that Criteria 7, 8, 9 and 13 (Tables 14.1 and 14.2) need special attention before a reintroduction is planned. Their preliminary findings suggest therefore that biopolitical conditions and long-term funding are as or more important to the success of a reintroduction as knowledge of species' biology or reintroduction technology, a tentative result which needs to be examined in much more detail. Hopefully, with greater documentation of future reintroductions and a more expanded database we can test the effectiveness of different approaches more fully, as recommended by Beck *et al.* (Chapter 13).

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