IUCN/SSC AfESG

Guidelines for the *in situ* Translocation of the African Elephant for Conservation Purposes

Edited by Holly T. Dublin & Leo S. Niskanen

First Edition, 2003

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Prepared by the IUCN/SSC
African Elephant Specialist Group
in collaboration with the
Re-introduction and Veterinary Specialist Groups

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Definitions

***Boma*:** A fenced-in enclosure where African elephants will be kept for the acclimatization period before release into the wild.

Bottlenecked population: A population of African elephants which has been reduced in size, effectively isolated from breeding opportunities with other populations, and whose remaining breeding individuals are unlikely to be representative of the original population as certain alleles and traits may have been lost among the survivors, while others may be under-, or over-represented.

Captive: Elephants kept in a small area (<1–4 km^2), in or out of the historic range of the taxon, with deliberate husbandry, veterinary intervention, constant food supplementation and intensive management.

Conservation (of the African elephant): Ensuring the long-term survival of the species in viable populations, in their natural habitat throughout their historical range, while minimizing the loss of gene diversity. It may require appropriate management action to achieve this.

Cow-calf Group: A cohesive group of females and their calves led by the matriarch or another older female, which associate regularly and closely with one another over time. Individuals in these groups are believed to have a high degree of relatedness but this has not been established through known genetic identification techniques.

Effective population size: the size of a hypothetical stable, randomly-mating population that would have the same rate of gene loss or increase in inbreeding as the real population (size N). N_e of a particular population is determined by several parameters describing deviations from "ideal" conditions such as sex ratio and the variance of family size. The effective population size is lower than the census population size (i.e. the population size measured as number of individuals). Typically, N_e is 1/10 N or less, particularly if fewer males breed than females.

Enhancement: Addition of individual African elephants to an existing wild population of conspecifics. Also referred to as ***supplementation***.

Founder population: An African elephant population, established for re-introduction purposes, that is large enough to form the basis of a genetically viable population in the long-term. Long-term genetic viability should be achievable either by having a large population (thousands) with no ***genetic supplementation*** or a smaller population (hundreds) with genetic supplementation see Section A.10).

Genetic supplementation: Addition of individual elephants to an existing wild African elephant population in an effort to increase genetic heterozygosity and improve its long-term genetic viability.

Inbreeding depression: The loss of individual reproductive fitness, and thus population vigour and long term viability, due to breeding between closely related individuals compared to less related individuals.

In situ: Within the historical range of the African elephant.

Notifiable disease: A disease that must be reported as specified under national or international law.

Pre-capture monitoring: A study of the elephants in the source population prior to the translocation, which has the objective of identifying the most suitable individuals for the proposed translocation and monitoring of these individuals prior to their removal.

Re-introduction**:** An attempt to establish a ***viable population*** of African elephants in an area of historical range where the species has been greatly reduced or extirpated.

Release site: The geographical point at which elephants are released after translocation within appropriate habitat and range selected to support a viable population of the species over the long term.

Resident population: The resident African elephant population at the source or release site.

Semi-wild African elephant population**:** Free-living elephants in smaller areas (>5 but <30 km^2), usually fenced, within the historic range of the taxon, with occasional husbandry, veterinary intervention and food supplementation during times of drought.

Source population: The population from which the elephants targeted for translocation will be sourced.

Supplementation**:** See ***enhancement.***

Translocation**:** The deliberate movement of wild African elephants from one natural habitat to another for the purpose of their conservation and/or management at the source site, release site or both.

Viable African elephant population: A population of African elephants capable of persisting in the long term (i.e. hundreds of years). Generally speaking, long-term genetic viability should be achievable either by having a large elephant population (thousands) with no genetic supplementation or a smaller population (hundreds) with genetic supplementation.

Wild African elephant population: Free-living elephants, in medium to large areas (> 30 km^2).

1. INTRODUCTION

1.1 Context of these guidelines

These days, as sub-Saharan African nations assess the status of their national biodiversity, they are driven to secure, enhance or establish viable populations of the high-profile species. African elephants (*Loxodonta africana*) are frequently viewed as the most important among these due to their ecological, cultural and economic significance. At the same time, African elephants throughout their range are confronted with habitat loss and degradation and increasing levels of human-elephant conflict often caused by local overpopulation of elephants and increases in the human-elephant interface. For these reasons wildlife management authorities across the continent are increasingly turning to **translocation** as a means to manage such challenges. This trend must take into account changing political and welfare considerations for elephants and, consequently, managers and decision-makers need to clearly understand the rationale and justification for translocation as well as the technical challenges presented by such an undertaking before launching into this complex, difficult and possibly hazardous procedure.

The issues surrounding African elephant translocations are extensive and intricate requiring consideration of a number of technical factors. The level of complexity grows significantly when groups of elephants, as opposed to individuals, are moved, and when such movements take place across international borders. Despite this complexity (or perhaps because of it) surprisingly little technical information is currently available to guide the planning of such moves. This lack of guidance has previously resulted in poorly planned translocations with adverse consequences to both elephants and humans. This document is the first attempt to fill the existing technical vacuum by providing a series of guidelines on "best practices" for the translocation of African elephants for re-introduction, supplementation or management purposes.

1. 2 Objectives of these guidelines

These guidelines provide informed advice to decision-makers in African range state governments, managers on the ground, non-governmental organizations, donors and other practitioners wishing to **re-introduce** or **supplement** African elephant populations for the primary purpose of **conserving** the African elephant in the long term.

It is the view of the IUCN/SSC African Elephant Specialist Group (AfESG) that the primary objective of any and all re-introduction and supplementation of African elephants through translocation should be to **promote viable, free-living populations in the wild, i.e. to contribute toward the conservation of the species.** Therefore, the focus of these guidelines is on the deliberate movement of African elephants between extant wild populations and from healthy wild populations to historical range from which elephants have been greatly reduced or, in some cases, extirpated. These guidelines do not focus on issues pertaining to the management or transfer of African elephants living under **captive** or **semi-wild** conditions.

In the case of African elephants in captivity, the AfESG does not believe that the release of these animals to the wild can contribute meaningfully to the conservation of the species overall. Therefore, while these guidelines can provide valuable information and advice on translocations between captive or semi-wild and wild populations, readers considering such moves are strongly advised to consult the *IUCN Technical Guidelines on the Management of* Ex Situ *Populations for*

Conservation (2002) and additional relevant literature.

1.3 Important assumptions in applying these guidelines

It is assumed that before deciding to embark on a project to translocate African elephants, the relevant authorities have thought carefully about the objectives of the proposed exercise in the context of higher level objectives for biodiversity conservation. It is further assumed that the relevant authorities have weighed the advantages and disadvantages of elephant translocation against these higher level objectives and rationalized the use of elephant translocation in light of or in addition to those of other potential management options. Therefore, before applying these guidelines and before deciding on a proposed translocation exercise, **the relevant authorities should determine that, in the local context, the proposed elephant re-introduction or translocation is appropriate with respect to the following:**

- The national biodiversity strategy or strategies (if two countries are involved);
- Existing conservation strategies or management plans for the source and release sites;
- The long-term conservation objectives for any other important elements of biodiversity, for example, unique or highly sensitive plants, animals or habitats which may be adversely affected by the re-introduction or supplementation of elephants;
- An existing national elephant conservation or management strategy;
- The biological, social and ecological requirements of African elephants;
- Political considerations at local, national, regional and international levels;
- Social considerations of the relevant stakeholders both at the proposed source and release sites;
- Existing capacity and availability of resources to carry out such a major initiative.

It is also assumed that, before proceeding with the translocation, all of the potential post release-related management issues have been considered and budgeted for and that all relevant government departments have been informed about the planned translocation operation and have had the opportunity to participate in the decision-making process.

Therefore, these guidelines only cover issues that relate to a specific, proposed translocation exercise that is to be carried out once all the conditions above have been adequately met. It is imperative and assumed that the larger management and conservation issues will be dealt with outside this process by the relevant authorities (see Figure 1 on page 3).

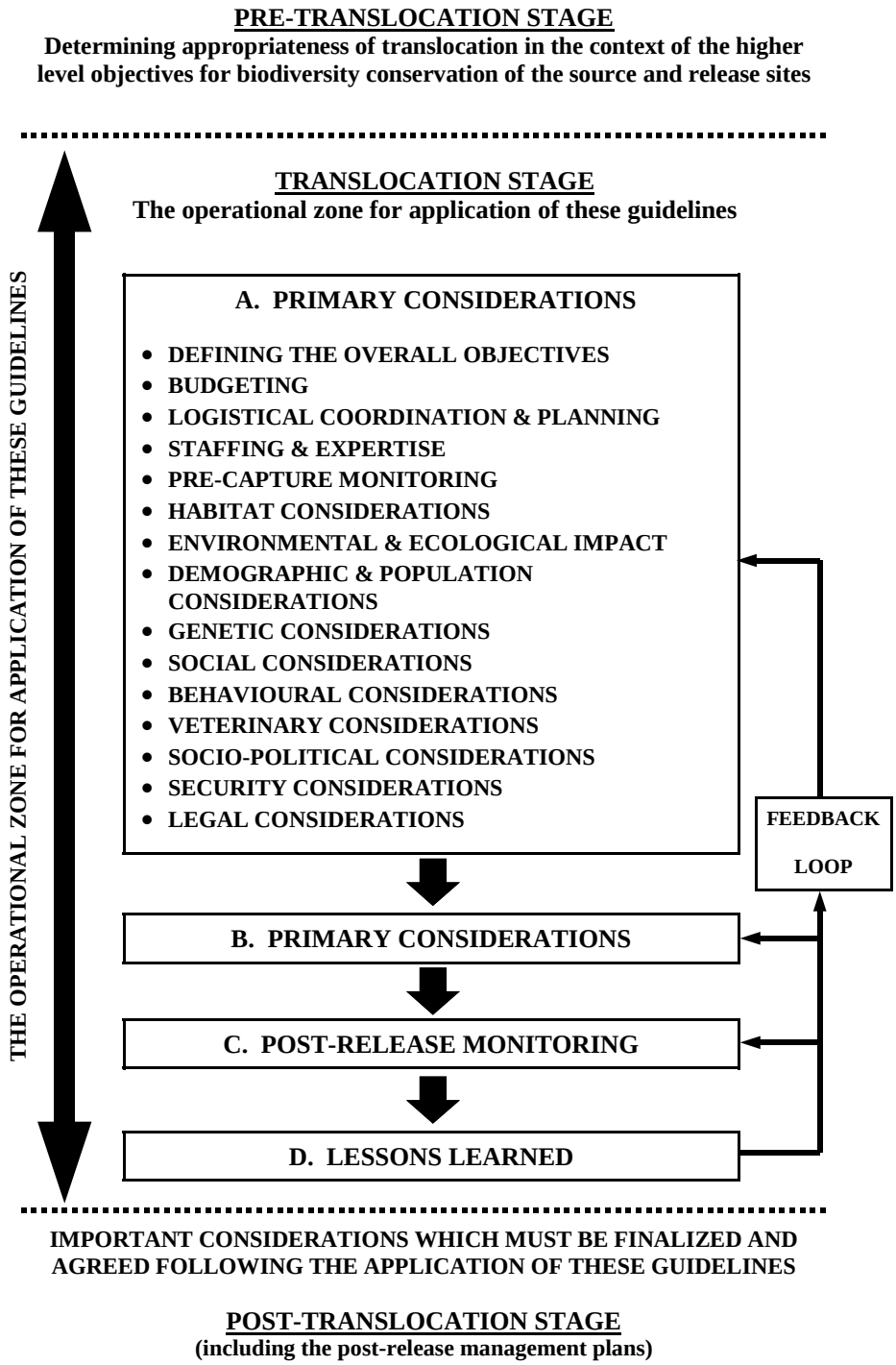
1.4 Determining when African elephant re-introduction and translocation is NOT an option

If any of the following conditions apply, African elephant re-introduction or translocation **should not be undertaken:**

- there is **not** a strong case that the translocation will contribute to the higher-level conservation objectives in the source or release sites;

- the translocation is in conflict with higher-level conservation objectives in the source or release sites;

Figure 1. Scope of these guidelines



- the re-introduction or translocation of elephants could lead to or directly contribute to the extinction of any species of flora or fauna at the release site;
- the proposed translocation is not technically feasible (e.g. the source site is a heavily forested area with steep terrain and inadequate access, rendering translocation an unrealistic option);
- the translocation is in violation of national or international (*Office Internationale des Epizootie*) disease control regulations;
- tuberculosis (*Mycobacterium tuberculosis* or *M. bovis*) is maintained in the wild animal population in the source site, but not in the release site;
- there is war or civil instability in areas adjacent to or impacting on the release site;
- there are unsustainable current levels of illegal killing of elephants at the release site;
- there is poor capacity to protect the translocated elephants at the release site;
- the habitat at the release site is inadequate for translocated elephants (see Section A.7);
- removal of elephants would leave the source population unviable;
- the elephants targeted for translocation are comprised of lone females or calves and juveniles that have been intentionally removed from their natal cow-calf groups;
- the translocation means the movement of known problem elephants into areas where these problems are likely to persist;
- the translocation means the movement of elephants to a release site where there is a likely risk that they will move back to the source site;
- neighbouring communities at the source or release sites oppose the translocation as planned;
- the translocation is in violation of international trade regulations allowed under the listing of the species in Appendix I or II of CITES.

Furthermore, on the basis of current knowledge of African elephant genetics and taxonomy, re-introduction or translocation should not take place:

- between forest, savanna or hybrid populations;
- between West African populations and any other forest, savanna or hybrid populations;
- If the source population is not sufficiently large (see details in Section A.10);
- If all the founder animals are largely from a ***bottlenecked*** source population.

If none of the factors above apply, a proposal for re-introduction or translocation can be considered following the detailed Guidelines for "best practices" outlined in this document.

1.5 When plans for or implementation of African elephant translocation should be discontinued

The authorities involved in the planning or execution of the translocation must be prepared to halt, delay or cancel the translocation operation once embarked upon, for example if:

- war or civil instability breaks out at or near the source or release site;
- a **notifiable disease** is diagnosed at or near the source or release sites;
- previously-established agreements with neighbouring communities begin to break down at the release site.

2. BACKGROUND

2.1 Introduction to the use of IUCN Re-introduction Guidelines

Due to an increasing number of species translocations worldwide, IUCN developed the *IUCN Position Statement on the Translocation of Living Organisms* (IUCN, 1987). This statement acknowledged that translocation is a powerful tool in the management of the natural environment and when properly used offers great benefits to natural biological systems and to man but if misused has the potential to cause enormous damage.

As the number of re-introductions for conservation purposes continued to increase worldwide, it was felt that there was a need for more detailed guidelines to provide comprehensive coverage of the various technical issues surrounding re-introductions. This led to the development of the *IUCN Guidelines for Re-introductions*, a general technical document covering both animals and plants, which was finalized in 1995 and became official after an exhaustive international review process. These guidelines have subsequently been translated into French, Spanish, Russian, Chinese and Arabic (IUCN, 1998).

While the development of the *IUCN Guidelines for Re-introduction* provided valuable general guidance on many of the key issues concerning re-introductions they did not address issues relating to particular species. Yet the increasing numbers of re-introduction projects worldwide, involving a growing number of taxa, highlighted the need for more detailed species- or taxon-specific guidelines. As a first step in this direction, the IUCN/SSC Re-introduction Specialist Group (RSG) finalized its first taxon-specific guidelines with the *Guidelines for Nonhuman Primate Re-introductions*, in 2002. These *Guidelines for the* in situ *Translocation of the African Elephant for Conservation Purposes* are therefore only the second set of technical guidelines to be developed on the taxon-specific complexities of re-introduction and translocation. We hope they will be widely disseminated and put to use for the benefit of African elephants and their conservation and management across the continent.

2.2 A brief history of African elephant translocation

2.2.1 Southern Africa

The practice of moving African elephants for management and re-introduction purposes was first adopted in South Africa in the 1970s. Following the drastic reduction of elephants before the end of the 19th century, the elephant population in South Africa's Kruger National Park (KNP) steadily increased from less than 100 in 1898 (Pienaar, 1963) to reach some 6,500 animals by 1967 (Pienaar, 1967). Faced with increasing pressure on the Kruger ecosystem the management authorities set a maximum population of elephants at 7,000 and initiated a culling programme to limit the population at that level. (Whyte, 2001a).

The initiation of the Kruger culling programme coincided with a rising demand for elephants in other areas as authorities sought to re-introduce elephants in newly- established protected areas. As the techniques and equipment required to move adult African elephants had not yet been developed, the Kruger management authorities decided to spare the juvenile elephants from being culled and to sell and translocate these orphaned animals. The first seven orphaned elephants from Kruger went to Londolozi Game Reserve in November 1976 (Fairall, 1979). A further 37

orphaned elephants were sent to Namibia in 1978 and during the following seven years another 111 young elephants were translocated to Namibia (Kruger National Park Database, 1996) from the KNP.

The translocation of African elephant juveniles continued in the 1980's when large South African protected areas such as Pilanesberg National Park (PNP) and Hluhluwe-Umfolozi Park (HUP) started sourcing elephants from KNP. After an initial translocation of eight elephants from Addo National Park, a total of 99 elephants were translocated to PNP from KNP between 1981 and 1993. The first translocation to HUP took place in 1981 and by 1990, a total of 172 young elephants had been moved there from KNP (Kruger National Park Database, 1996).

In the wake of these developments, many private landowners in South Africa became interested in elephant translocation as a way of enhancing the tourism potential of their properties. Consequently, the sales of elephants to private reserves increased tremendously and by 1994, 1339 juvenile elephants had been translocated out of KNP to other conservation areas (Whyte, 2001a).

In 1993, a technique was pioneered in Zimbabwe to move adult females together with their young. In that same year 470 of the elephants were translocated from Gonarezhou National Park to large conservation areas within Zimbabwe and a further 200 to Madikwe Reserve in South Africa (Coetsee, 1996).

By 1997, the KNP had obtained specialized equipment enabling them to move even the largest of elephant bulls and between 1997 and 2002 a total of 77 adult bulls were translocated within South Africa (Kruger National Park Database, 1996). After the introduction of this new technology, the South African National Parks (SANP) made a policy decision not to carry out any more translocations of juvenile elephant groups, a practice now recognised as inhumane by SANP (Whyte *et al.*, 1999).

In total more than 1300 juvenile elephants and 600 adults have been moved out of KNP since the translocations first began (Kruger National Park Database, 1996). However, the demand for elephants in South Africa has now largely been satiated, and permit requirements for translocation between provinces within South Africa have also become more complex.

Facing a dwindling domestic market the KNP and other South African reserves are now increasingly looking at opportunities to translocate elephants to neighbouring countries as a means of reducing population pressure. In 2001, 16 elephants were translocated from Madikwe Game Reserve in South Africa by air to Quiçama National Park in Angola. This was the first ever translocation of cow-calf groups by air. The following year another 16 African elephants were flown to Quiçama from the Northeast Tuli Block in Botswana.

With the proclamation of the new Limpopo National Park (LNP) in Mozambique, there are plans to move 1100 elephants from KNP to LNP (Whyte, 2001b). In 2001, 25 elephants were translocated into LNP as part of this plan, and in 2002, a further 48. Another 50 will be moved in 2003. The translocation of the remainder will await further developments in LNP.

2.2.2 East Africa

In recent years, several elephant translocations have also been carried out in East Africa, mainly in Kenya. The first ever elephant translocations in Kenya took place between September 1995 and June 1996 when the Kenya Wildlife Service moved 21 elephants in five different operations from the Mwea National Reserve to Tsavo East National Park (Njumbi *et al.*, 1996). A year later 10 bulls were translocated to Kora National Park from the Lewa Downs Conservancy. Since then there have been numerous other translocations in Kenya and one in Uganda. These are summarised below:

In 1999, 30 elephants were moved from Mwaluganje Forest Elephant Sanctuary, bordering the Shimba Hills National Reserve, to Tsavo East National Park (Litoroh *et al.*, 2001).

In 2000, four elephants were translocated from the Shimba Hills National Reserve to Tsavo West National Park (Litoroh *et al.*, 2001) and 10 (seven from Sweetwaters and three from Lewa) to Meru National Park (Omondi *et al.*, 2002).

A total of 64 elephants were translocated in four different operations in Kenya and Uganda in 2001. These included the translocation of a stray elephant from Ongata Rongai to Amboseli National Park, three elephants from the Nakuru area to the Aberdare National Park and 56 from the Sweetwaters Rhino Sanctuary to Meru National Park (Omondi *et al.*, 2002). Four elephants were translocated from the Luwero Valley to the Murchison Falls National Park in Uganda in 2001.

As can be seen from these brief histories there have been relatively few cases of African elephant re-introduction and translocation and even these have not always been well documented. Therefore, the advice provided here represents our current "state-of-knowledge" and is based on our personal, professional experience or transmitted by "word-of-mouth" amongst colleagues. There remains an unfortunate shortage of written "lessons" to draw on.

A. PRE-TRANSLOCATION STAGE: PRIMARY CONSIDERATIONS

1. WHO SHOULD APPLY THESE GUIDELINES AND HOW IS THIS BEST ACHIEVED?

These guidelines should be applied to specific, proposed translocation exercises by qualified experts with the necessary skills to determine whether all the criteria outlined herein have been adequately met. Due to the many complex factors to be considered, this is generally best achieved by assembling a multidisciplinary team to evaluate the various issues. At a minimum, the following skills areas and expertise must be readily available: African elephant management, biology, behaviour, capture and translocation, vegetation and community ecology, legal and policy issues, veterinary considerations and security. In addition, when elephants are being moved from or to areas with overlapping or neighbouring human inhabitants, a specialist with expertise in dealing with these communities should be involved in applying the guidelines. The exact composition of such a team will, however, vary depending on the case-specific circumstances.

2. DEFINING THE OVERALL OBJECTIVES OF THE PROPOSED TRANSLOCATION

When planning African elephant translocations it is vital that the African elephant-specific **conservation objectives** for the exercise are clearly laid out in a formal proposal. In addition to helping realistically plan a translocation operation, this allows comparison of the results of the translocation with the original objectives and gives an indication of the degree of success of the operation in achieving its planned purpose. Proposals are also required by most external donor agencies and are thus a necessary planning and fundraising tool.

The proposal should provide a carefully thought-out and argued justification for the exercise. For instance, is the objective of the translocation for re-introduction or supplementation purposes or primarily to try and solve a local overpopulation or human-elephant conflict problem at the source site? How does the proponent envisage that the planned movement of animals will address these issues and how will the translocation ensure that overall broader conservation objectives are met with respect to both the source and recipient sites?

Authorizations from relevant authorities at both source and release sites should be secured before the proposal is submitted to donors and should be included as annexes to the proposal. It may also be useful to have some statement from the African Elephant Specialist Group confirming that these Guidelines have been properly applied and that the proposed re-introduction or translocation conforms to the accepted standards.

Because of the complexity of elephant translocations, it is crucial that relevant elephant translocation experts are involved in the drafting of the proposal to ensure that all technical issues have been properly considered. These guidelines are designed to help with this process.

3. BUDGETING

Rationale

Without proper budgeting, it is not possible to determine whether the resources available are sufficient to cater for all the costs involved in elephant translocations. Insufficient funds, as a result of inadequate budgeting, or incomplete fundraising efforts, must not be used as an excuse for poorly planned or implemented translocations. Properly drafted budgets are essential for successful fundraising. It is important always to strive for the most accurate cost forecasting possible. An inability to spend committed funds, or worse, overspending, will not be looked upon favourably by donor organizations. Budgeting for a translocation operation should cover all costs of the operation and have a sufficient provision for contingencies or unforeseen expenses.

3.1 General issues to consider for successful budgeting

- In case of a translocation involving the movement of elephants across international borders, both the source and recipient governments must have approved the proposal before it is submitted to donors.
- If the project is donor-funded, it is important to ensure that all donor requirements, including the appropriate budget format, are understood before submitting the budget for approval.
- Both cash and in-kind contributions should be included in the budget.
- It is always important to provide detailed budget notes. This will help prospective donors to determine how the costs were arrived at and will also act as a useful aide-mémoire when preparing future or revised budgets.
- Project evaluation and financial audit costs (if required by the donor) should be taken into account.
- Any administrative or management costs and cost recovery should be included.
- Qualified staff must be available to do the accounting for the project expenditure. If such staff have to be hired their recruitment costs and salaries must be included in the project's budget.
- Costing must be realistic and be based on current market rates.
- Budgeting for operations that could take place more than a year into the future must take into account the effects of inflation and possible currency fluctuations.

3.2 Specific issues to consider when budgeting for elephant translocations

- The objectives of the translocation and the activities required to achieve them should be the primary focus of the budget and all budget lines must be clearly linked to the activities outlined in the proposal.
- The number of elephants to be moved, how many animals are to be moved in a single shipment, and the age structure and composition of targeted individuals or cow-calf groups must be determined as early as possible as this will, in turn, determine the number of days, personnel, and type of equipment required.

- The amount of fuel and maintenance for vehicles, helicopters, aeroplanes and machines, the distance of the capture site from the headquarters as well as distance from capture site to release site, including distances to be travelled within the capture and release sites must be estimated as carefully as possible. Estimated flying time (for both fixed-wing aircraft and helicopters) and aircraft charges per hour should take into account the greatest distance from landing site to capture site. The estimated helicopter hovering and searching time should also be taken into account.
- The cost of radio collars and receivers, immobilization drugs, aerial support, vehicle and personnel costs for pre-capture and post-release monitoring can be a significant component of the overall budget and must be estimated as accurately as possible.
- Any consultancy payments to be made to the members of the multidisciplinary team or other specialized expertise that is required to apply these guidelines must also be budgeted for.
- As unexpected events during translocation operations are common, a reasonable contingency budget to cater for such developments should be included.
- Translocation proposals should, as far as possible, not be packaged as emergency appeals to donors. Ideally, translocations should fall within existing 5-10 year national elephant management plans to ensure adequate time for planning, fundraising and implementation.

While donor requirements may vary it is normally recommended that the budget be laid out in such a way that it covers all the four main categories of operation costs, **Planning, Pre-capture, Implementation** and **Post-release.** Examples of the types of costs to be included under each heading are given in Table 1 on page 12.

4. LOGISTICAL COORDINATION AND PLANNING

Rationale

African elephant translocations are very complex, capital and labour-intensive, and time-consuming undertakings, which require specialized and multidisciplinary input. Two of the key factors in ensuring success of any elephant translocation are proper planning and coordination. Translocation requires extensive and detailed planning well before the actual operation begins. Additionally, certain activities closely linked to translocation, such as pre-capture monitoring and fundraising may require up to one year or more in advance of the operation. Therefore, planning and coordination are long-term activities that must also include the post-release period.

4.1 Coordination Committee

To facilitate proper planning and coordination, a translocation Coordination Committee should be established. This committee should be multidisciplinary, involving representatives of all

Table 1. Translocation Costs

Planning	Pre-capture	Implementation	Post-release
• Preparation of capture and release sites (road repairs, building of bomas) • Purchasing costs (including shipping, clearing and storage costs of all items purchased before the operation) • Fundraising costs • Costs of publicity and awareness-raising campaigns at the release site (See Section A.14) • Personnel costs (hiring and training of staff)	• Equipment, materials and supplies (including radio collars and receivers, cameras, video cameras, film, memory cards and computer hardware) • Capture costs (drugs, staff, helicopters and fixed wing aircraft) • Vehicle and equipment operating costs (including fuel, lubricants and maintenance costs) • Personnel costs (hiring and training of staff)	• Equipment, materials and supplies • Vehicle and equipment operating costs during capture • Cost of transporting elephants to release site • Transport and accommodation costs for administrators, managers and other staff including observers and casual labour • Coordination and communications costs • Capture site clean up costs • Personnel costs (hiring and training of staff)	• Equipment, materials and supplies • Vehicle and equipment operating costs • Coordination and communication costs • Personnel costs for management and monitoring (hiring and training of staff)

relevant parties and including the technical expertise required for all phases of the proposed translocation. Coordination is essentially a "behind the scenes" function, and so the members of the Coordination Committee may not be directly involved in the capture and translocation operation. The Coordination Committee should be headed by a dedicated Project Leader.

The Coordination Committee should be responsible for ensuring that:

- Planning for all the aspects of the operation and broad-based consultation with all the stakeholders (including local communities) before the commencement of the operation has taken place;
- Funding needed for the operation is available before the proposed date of the operation;
- For cross-border translocation, relevant legal documents pertaining to the translocation (e.g. permits for narcotic immobilizing drugs, CITES, firearm and veterinary permits, passports and visas of accompanying team members) including the necessary inter-governmental Memoranda of Understanding, are obtained prior to the operation;
- Pre-capture monitoring is done well in advance of the proposed translocation date;
- All the equipment needed for the operation is available and in good working condition;
- Availability of transport (air/road) for delivery of animals and for personnel is guaranteed throughout the translocation exercise;
- All access roads are serviceable;
- All the personnel requirements will be met throughout the operation;
- Sufficient drugs are in supply and readily available;
- Contingency planning is in place;
- The operation will be altered or terminated in the event of serious unexpected developments (e.g. injury or death of animals or staff. See also Section 1.5);
- The media coverage of the operation at the capture and release sites and, in most cases, at the national level in the concerned countries is properly managed;
- Designing and implementing a post-release strategy to ensure the stated objectives of the operation are achieved.

The Coordination Committee should have representation from the following:

- A dedicated elephant management team or, in their absence, qualified elephant experts;
- A security team;
- A veterinary team;
- A capture team;
- An air support team;
- Area managers for the source and release sites;
- Communications and public relations team(s);
- Financial and administrative management for the funds;
- A legal or permitting officer;
- An appointed logistics officer;
- Higher-level authorities in source and release sites (who may form a sub-Committee for making key decisions).

When translocations take place across international borders two coordination teams (one for the source and one for the release sites) may be appointed but their activities should be closely

coordinated and their responsibilities carefully outlined in a Memorandum of Understanding between the two countries before the start of the operation.

4.2 Planning the timing of elephant translocations

The capture of elephants is usually easier when the ground is dry and the vegetation is less dense than during periods of higher rainfall. The end of the dry season and beginning of the wet season are inappropriate times because of the poor condition of animals. During this time elephants may also suffer from metabolic acidosis from consuming fresh vegetation (see Section A.13.2.1). Therefore, it is recommended that elephant translocations are planned for early in the dry season when the condition of the elephants is expected to be fairly good and the access roads have dried to facilitate capture and transport.

Capture and translocation of elephants should always be timed to coincide with when the temperatures are cool (below 25^{o} Celsius) to avoid the risk of hyperthermia and other heat-related complications (see also Sections B.1.1.2, B.1.2.3 and B.1.2.5 on veterinary considerations during capture and transport).

However, as conditions may vary tremendously from site to site, knowledge of the climate and vegetation at the source and release sites is essential in order to establish the ideal time of year for translocation.

4.3 Planning for procurement and logistics

Procurement of required drugs and equipment may take considerable time and should be carried out well before the target date of the operation. Drugs and equipment for translocations often have to be imported and due to the restrictions surrounding their movement the procurement of immobilization drugs and darting equipment may take up to several months to complete. Radio-collars may also take a significant time to procure. Such delays must be borne in mind during the early stages of planning.

Various licences are required for elephant translocation both at source and destination and these should be acquired well before the date of operation. Veterinary and other conservation-related permits (e.g. CITES permits in both the exporting and importing countries) may also take considerable time to finalize (see Sections A.13.2.2 and A.16 for details).

Many capture teams, pilots and aircraft have busy schedules and their availability must be determined well in advance.

5. STAFFING AND EXPERTISE

Rationale

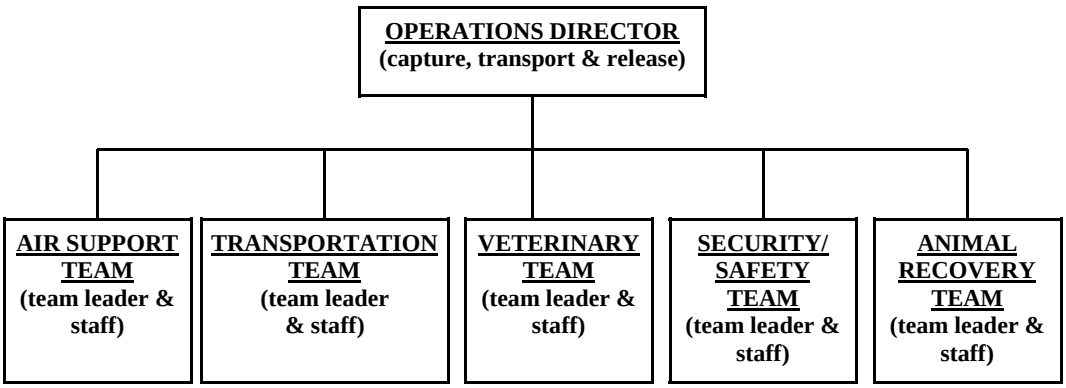
The success of any elephant translocation depends largely on the personnel involved. The decisions relating to elephant translocations will depend on the involvement of the appropriate government (or private) authority, which will be involved at the approval and policy levels. Once a decision is made to carry out the operation, the process should be handed over to a dedicated translocation team with its own management structure for the physical capture and movement of the animals. A successful elephant translocation should always be conducted as swiftly, professionally and humanely as possible and a well-qualified team should be assembled to ensure that all relevant factors are considered when planning and carrying out translocations. Well-qualified and experienced staff are also in the best position to respond to emergencies and other unexpected developments, which often occur.

5.1 Staff requirements

The exact composition and number of personnel needed depends on the number of animals to be translocated but a team should always consist of at least the following:

- Experienced wildlife veterinarians, veterinary technicians and capture personnel;
- Logistics personnel;
- Elephant biologists/researchers (pre- and post-translocation monitoring);
- Experienced game capture pilots (helicopter and fixed wing);
- Security/safety officers;
- Medical staff;
- Media liaison and management personnel;
- Financial and administrative staff;
- Drivers;
- Mechanics and welders;
- Aircraft attendants;
- Labourers (as required).

A translocation operation should be conducted with precision and in an orderly manner. This calls for strict discipline among all the personnel. A management hierarchy with a clear line of command and responsibilities for the team is therefore essential. Such a hierarchy may be structured as follows:



5.2 Building local capacity for elephant translocation

If the elephant translocations are likely to become a regular activity in the country or countries involved then the development of the relevant expertise should become a priority for the wildlife management authority. In such cases, a national or sub-regional translocation team consisting of trained and experienced individuals could be set up to evaluate and implement the country's elephant translocation programme. As is the case for individual translocations, such a team should be multidisciplinary thus ensuring that all the different technical considerations outlined in these guidelines will be taken into account. Alternatively, a country could establish a national team to carry out the physical translocation and external experts could be hired to apply the guidelines and to advise on specific aspects of the operation where national capacity is lacking. If the country is not expecting to carry out regular elephant translocations the costs of training and maintaining an elephant translocation team may be high and in such cases it may be better to rely on external experts for technical advice. If adequately qualified experts are not available, in-country, international expertise may have to be hired to advise on the various technical issues before, during and after the operation. This clearly has important cost implications, which must be taken into account at the preliminary budgeting stages (see Section A.3 on budgeting).

The IUCN/SSC African Elephant Specialist Group (AfESG) can provide advice on any aspects of setting up national or sub-regional elephant translocation teams, including the choice of "experts" (see Annex II for contact details).

6. PRE-CAPTURE MONITORING

Rationale

Pre-capture monitoring is designed to help the capture team select the most suitable animals for translocation and can therefore be a crucial component in the success of a translocation

operation. In addition, this monitoring should ensure that the best possible information is available on the source population size, and age and sex structure.

6.1 Identification of target groups and individuals

- To a greater or lesser extent, elephants will always be stressed and traumatized during capture and translocation. These stresses may be more acutely experienced by cow-calf groups because of the tight social bonds that exist between group members and especially by individual group members if they are inadvertently left behind. Bonds between group members can be strong and not all of the individuals which normally associate, will necessarily be translocated. However, translocations should always aim at minimizing the stress levels of target animals, and ensuring that the source population is not compromised. Pre-capture monitoring enables the identification and selection of suitable individuals or stable cow-calf groups so that the translocation is conducted as humanely as possible.
- If translocation of cow-calf groups is envisaged, this monitoring should focus on selecting animals which show regular patterns of affiliation or association. In other words, intact cow-calf groups (preferably with their matriarch) should be targeted for translocation. This will help to ensure that cow-calf groups are not broken up during translocation and will encourage group cohesion after release in the recipient area.
- If translocation is aimed at removing problem animals it is also necessary to identify and monitor the specific "target" elephants to be moved and these will not always be members of cow-calf groups (see also Section A.12).
- Only stable cow-calf groups with normal sex and age ratios (see also Section A.11) should be selected for translocation unless the objective is to manage problem animals or to select breeding bulls.
- In the case of re-introduction, managers should aim to translocate groups of genetically unrelated elephants to establish a genetically viable founder population (see also Section A.10).
- Elephants from a population that has been highly disturbed by hunting, capture or heavy poaching and that show signs of stress (e.g. running away, aggression, or exaggerated "bunching" behaviour) should not be selected unless it is essential to their survival (see also Section A.12).
- Only healthy elephants able to withstand the stresses of translocation and those not carrying infectious or contagious diseases should be selected for translocation (see Section A.13).
- Once a suitable group or individual elephant has been identified, the use of radio-collars may facilitate the location of the target animal or animals during the pre-capture monitoring and on the day of capture. If translocation of cow-calf groups is envisaged, an adult female in the target group should be fitted with a radio-collar. However, in the case of bull elephants, which are normally solitary and which can undertake long-distance movements in a very short period of time, each target animal should be fitted with a collar.

6.2 Specific parameters

The main aim of pre-capture monitoring is to identify the animals to be translocated.

This has two objectives:

1. to identify the members of the cow-calf group which should not be separated by the

translocation activities at the source site; and
2. to be as certain as possible that the animals identified are suitable for translocation.

Pre-capture monitoring should establish the following parameters:

a) Overall characteristics of the source population
- Estimated total population size
- Population age and sex structure
- Regular seasonal movements
- Overall range and distribution

b) Characteristics of target groups for translocation
- Individual identification of possible target groups including discrete cow-calf units within larger groups
- Approximate size, sex and age of individuals within the target group
- Home ranges of the targeted elephants

The duration of the pre-capture monitoring stage is affected by the following factors:

- Population size of the source population
- Number, age and sex of individuals to be moved
- Size, terrain and habitat types of the source site

Therefore, the time required to identify suitable target groups and to understand the associations between individuals varies and may take up to a year to determine. This is especially true if the site is large and the total population is relatively large and not easily accessible.

While there may be instances where some aspects of pre-capture monitoring are not practical or possible, there should be clearly justified reasons why these aspects have not been included as part of the translocation process.

7. HABITAT CONSIDERATIONS

Rationale

It is important to be sure that the habitats into which (African) elephants are released are suitable and are available in sufficient quantities to enable the long-term survival of the new or supplemented population. These habitat elements include food plants (grass, herbs and woody browse species), trees for food and shade, and water for drinking and bathing. It is important to note and to give due consideration to the fact that African elephants are capable of extensive

habitat modification. This modification can have consequences for future elephant habitat or the future management of the African elephant population. Thus prior to any release the implications of this modification for the African elephant population must be carefully considered and evaluated.

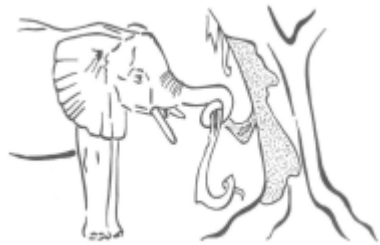
7.1 Source site considerations

- Elephants being moved between two sites are likely to experience less stress adjusting to their new environments when the habitat and seasonality characteristics at the two sites are similar. Thus knowledge of the habitat at the release site should serve as an important guide when selecting a suitable source site.

7.2 Release site considerations

- Prior to any translocation, it is important to determine whether the habitats of the proposed release site are suitable and adequate for the establishment and growth of a new or supplemented African elephant population.
- A population of elephants should only be re-introduced/supplemented where the available habitats will adequately support an overall population that is large enough to ensure the persistence of that population in the long term (see also Section A.10).
- It is inappropriate to stock elephants (through single or repeated translocations) to densities greater than habitats in the release site can support over time. As a general rule of thumb, African elephants should be introduced at densities less than half of that which the release area can support over the long term. This will allow for population growth and persistence as well as time for monitoring and adaptive management. (See also Section D.1.3, Coe *et al.* (1976) and East (1981) for further reference).
- Careful consideration should be given to factors that can influence the movement of elephants in the release site. These may include seasonality and accessibility of water sources, historical travel routes or the presence and distribution of other elephants. If such factors are identified, plans should be made, in collaboration with those most familiar with the release site, to mitigate any potential negative repercussions. For example, water should be available year-round in the release site to minimize the risk of elephants leaving the area in search of it. (Laws, 1973; also see Thouless (1995) for long distance movement).
- The release of elephants into areas that have high connectivity with the surrounding landscape or into large areas of contiguous habitat is preferable to release into highly fragmented areas.

8. ENVIRONMENTAL AND ECOLOGICAL IMPACT



Rationale

The ecological roles of African elephants have been extensively documented and it is widely understood that as a species or in conjunction with other herbivores, the African elephant is capable of extensive habitat modification (Caughley, 1976; Tchamba and Mahamat, 1992; Prins and van der Jeugd, 1993). In general, at relatively low population densities, elephants may play important facilitating roles for other species (for example by influencing habitat density and structure (Stuart-Hill, 1992). This modification commonly takes place along with fire in savanna habitats (e.g. McShane, 1987; Dublin et al.*, 1990). African elephants may also act as dispersal and/or germination agents for the seeds of many plant species (Lieberman* et al.*, 1987). At higher densities, they may become "agents of change", significantly modifying or altering the composition, structure and/or the diversity of plant and other species within their habitats (Laws, 1970; Caughley, 1976; Leuthold, 1977). Although the exact impacts of the removal or addition of elephants to a site cannot be accurately predicted there are a number of aspects that need to be carefully considered for both the source and release areas and which are documented below. No prior value judgment can be placed on these modifications unless this is done in the context of a set of stated objectives for the area (see Section 1.3.)*

8.1 Source site considerations

- Because elephant browsing plays an important role in determining the structure and composition of vegetation, the removal of elephants from a source population may result in habitat changes that are adverse to the stated objectives for the local ecology. The proportion of the source population that is being removed must therefore be carefully considered and evaluated against clear objectives that have been set for the source site prior to any proposed translocation from the site.
- To minimize any negative impacts on the source site habitat and ecology by the removal of elephants, the spatial distribution of the target groups should be spread rather than concentrated, unless the operation is designed primarily to address a problem of local overpopulation or another similar management issue.

8.2 Release site considerations

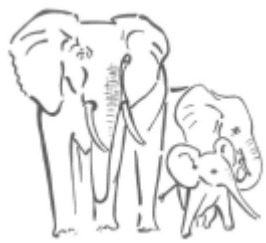
- At high densities, African elephants may reduce the extent of suitable habitats for other species e.g. nesting sites for birds may be lost if the number and density of tall trees is reduced by African elephants.
- At relatively high densities, African elephant may have an impact on the relative abundance of species, for instance, by increasing the mortality rate of certain tree species through selective browsing e.g. baobab (Weyerhaeuser, 1985).
- At high densities, African elephant can reduce the habitat and structural diversity of an area

by reducing many of the taller trees to a lower size class. This can result in either the loss of tall tree habitat or the homogenization of the habitat in a lower size class, or both (Lewis, 1991).

- In areas where there have been no elephants for a considerable period of time, the initial vegetation change is likely to be more than in areas where elephants have disappeared more recently, for example when the newly established elephant population selectively browses on highly preferred tree species causing their local decline or extinction.
- The status of the adjacent land use as well as the trends in human population growth and land-use patterns need to be established to assist with the assessment of the potential for human-elephant conflict (HEC). No translocation should be conducted if it is likely to result in increased levels of HEC which cannot be substantially mitigated.

The translocation authorities must ensure that suitable post-release management plans, including vegetation and animal monitoring, are in place for the release site to cover an eventuality where elephants may interact negatively with other species or biodiversity in general.

9. DEMOGRAPHIC AND POPULATION CONSIDERATIONS



Rationale

The population status in both source and release sites needs to be well understood. The introduction or removal of elephants into or out of a population may have positive or negative consequences overall. The manipulation of numbers and demographics are important determinants of a population's dynamics and must be considered when planning a translocation. In order to best contribute to the stated elephant conservation objectives, all potential positive and negative implications for both source and release populations need to be carefully assessed.

9.1 Source site considerations

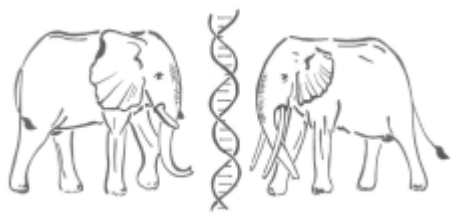
- The removal of individuals from a source population should not compromise the long-term viability of that population. Therefore, technical advice needs to be widely sought to establish the status and size of the source population. Factors including age and sex biases, current elephant management practices, movement patterns as well as any other relevant information collected during pre-capture monitoring need to be considered. Without these data, a population should not be considered as a source for elephant translocations because it will not be possible to determine what impact the removal of elephants may have on this population.
- A source population should be relatively large in the sub-regional and national context and not declining or under threat. Translocations should not reduce the numbers to less than an effective population size of fifty (i.e. an actual population size of several hundred elephants

(Franklin, 1980)) unless the objective is to remove all remaining elephants (e.g. in cases of habitat islands and high human-elephant conflict) or to send the population into an intentional decline (e.g. in areas where intensive human settlement and agricultural development are planned).

9.2 Release site considerations

- Knowledge of the resident population's history should be acquired to guide management actions before making a decision on whether to proceed with an elephant translocation. For instance, it may be found that a population with a record of adequate rates of increase may not require supplementation at all.
- In the case of a supplementation programme, it is important to know the demographics of the resident population at the release site. This is particularly important because if the resident population has a skewed age and/or sex ratio this could be addressed by the proposed translocation.
- It is also important to have a reasonable estimate of the resident population size, as this will inform the decision of how many animals should be added.
- Patterns in the status of the resident population (e.g. population trends, changes in distribution, changes in range) need to be known.
- The causes of any declines must be fully understood to avoid moving animals into an area where their chances of survival might be compromised by pre-existing conditions.
- Knowledge of the seasonal range and movement of the resident population is necessary to guide the supplementation and release.
- Where there are no resident elephants, the introduced elephants should have a normal age and sex distribution and be sufficient in number to at least address genetic considerations (see Section A.10 below).

10. GENETIC CONSIDERATIONS



Rationale

Recent advances in technology have allowed the translocation of breeding groups of African elephants over large distances. This has highlighted the importance of genetic aspects of moving African elephants. There are two aspects to be considered, 1) genetic mixing and 2) long-term genetic viability.

10.1 Genetic mixing

There is growing genetic evidence to suggest that African forest elephants (*Loxodonta africana cyclotis*) and savanna elephants (*L. africana africana*) may be different species, which have only hybridized in areas of range overlap (Roca *et al.*, 2001), although the genetic status of these

hybrid elephants has yet to be established. In addition, there may be genetic differences between forest and savanna elephants and those from West Africa, which may be another distinct species (Eggert *et al.*, 2002). The genetic differences amongst populations of central African forest elephants have not yet been established, but are believed to be significant. In order to avoid the potentially negative conservation consequences of genetic mixing:

- There should be no translocations between central African forest elephant populations and savanna or potentially hybrid populations.
- Individuals selected for translocation from central African forest elephant populations should always be chosen from populations that are geographically as close to the release site as possible.
- There should be no translocations of African elephants between West Africa and any other savanna or forest elephant populations.
- Although the genetic differences among savanna populations are not as distinct as for central African forest elephants, source animals should also always be chosen from populations that are geographically as close to the release site as possible.

10.2 Long-term genetic viability

Current understanding of conservation genetics, particularly for a species as complex and long-lived as the African elephant, makes it difficult to quantify exact numbers for founder populations and minimum viable population sizes. Generally speaking, long-term genetic viability should be achievable either by having a large population (1000s) with no genetic supplementation or a smaller population (100s) with genetic supplementation, to prevent the negative effects of inbreeding depression.

Without genetic supplementation:

- Although this must be balanced against social consideration (see Section A.11), the founder population should ideally be made up of hundreds (effective population size of approximately 50 (Franklin, 1980)) of unrelated cow-calf groups and unrelated males from one or more appropriate source populations to ensure sufficient genetic diversity.
- Founder populations should never be comprised exclusively or mainly from historically ***bottlenecked*** populations (e.g. Addo in South Africa).
- The release site must be able to accommodate a population that will eventually number in the thousands.

With genetic supplementation:

- If the effective founder population size of 50 is not achievable or if the area will not eventually be able to hold a population in the thousands, then there will be a need for genetic supplementation in the future. In establishing or managing such a population, social and genetic considerations must be carefully balanced, as ideally the founder animals (cow-calf groups and males) should be unrelated.
- Again, founder populations should never be comprised exclusively from historically ***bottlenecked*** populations.
- With genetic supplementation, viable populations in the hundreds (as opposed to the thousands) may be achievable in the long term.

11. SOCIAL CONSIDERATIONS

Rationale

African elephants are highly social animals that live in a matriarchal society with two distinct social organizations (males and cow-calf groups) with separate habitat requirements and behavioural traits. These social structures and their attributes must be taken into account before any translocation can be considered. Specifically, the strong bonds between individual females and their close relatives should not be ignored. It is therefore vital that the source population is carefully monitored (see Section A.6 on pre-capture monitoring) in order to obtain reasonable knowledge on the population structure and relationships between individuals as well as between individual cow-calf groups.

11.1 Source site considerations

- The source population should be as large as possible to minimize social impacts of translocation.
- The matriarch plays a vital role in African elephant societies and must be translocated together with the group.
- Lone females or juveniles or groups comprised only of juvenile elephants must not be translocated.
- Groups with very small calves (i.e. less than a few weeks old) should not be translocated.
- A normal population age structure should be maintained within the cow-calf groups and bulls targeted for translocation.
- Except in the case of problem-animal control, elephants should never be translocated on the basis of logistical or economic considerations alone - social and ecological factors must also be considered.
- Elephants that have been moved before and elephants from previously all-juvenile groups should not be translocated.

11.2 Release site considerations

If there are no resident elephants present at the release site, then the composition of the groups of elephants introduced should comply with the genetic, behavioural and habitat requirements outlined elsewhere in these guidelines.

12. BEHAVIOURAL CONSIDERATIONS

Rationale

When selecting elephants for translocation the general behaviour of the target individuals should be observed during pre-capture monitoring. This may provide important clues on how the animals might react to translocation, how they will settle in their new environment and may help to identify and address potential problems in advance.

However, as it is often very difficult to predict the exact nature of behavioural responses it is also crucial to ensure adequate post-release monitoring of the target individuals (see also Section C of these guidelines).

12.1 Source site considerations

- Translocation of elephants that regularly undertake long-range movements in the source site should be avoided.
- "Habitual problem animals" with a history of crop-raiding, damaging of property or aggression towards humans or livestock must never be translocated to areas where there is human activity either in the release site or adjacent to it.
- Adult bulls will be less likely to cause problems if moved in groups (a minimum of 2 individuals). Single bulls are more likely to break out of reserve boundaries in search of social partners (male or female).
- Young adult bulls (20-25 years old) are more suitable for translocation than older bulls, which can cause considerable problems, as they are not easy to contain.
- A bull that is in musth is more likely to show aggression or attempt to break out of the release site and should therefore not be translocated.

12 .2 Release site considerations

- The release site should be inspected prior to the translocation in order to identify any factors that might impede the success of the translocation or compromise the habituation process of the elephants to their new area from a behavioural perspective. These factors may include a high degree of human disturbance such as high tourist vehicle turnover, construction or logging sites or hunting concessions in neighbouring areas.
- Proximity of the release site in relation to the source site is an important factor to be considered. If the two sites are too close to one another, it is possible that the introduced elephants may communicate with others in the source site and this may encourage the introduced elephants to return to the source site. Recent studies suggest that it is possible that elephants may be able to detect seismic cues from other elephants over distances of at least 30 km. (O'Connell-Rodwell *et al.*, 2000).
- There should be sufficient space to allow a translocated group to establish an independent home range. This will depend largely on the availability and spatial distribution of suitable

habitat (see Section A.7), but also on how many elephants already utilize this habitat.

- Human disturbance should be strictly limited at the release site to minimize stress on the introduced animals until the elephants have had a chance to settle into their new environment. This includes the limitation of tourism activities that are known to cause significant stress to elephants. (Burke *et al.*, 2002). Panic caused by human disturbance has led to mortalities among young calves. Where new protected areas are being established and where human activity may still be intensive, translocations should be delayed until all such activities have ceased.
- In the case of translocations of 'problem elephants', the authorities at the release site must be fully informed about the nature of the individuals to be moved and details of their past aberrant behaviour.

13. VETERINARY CONSIDERATIONS

Rationale

From a veterinary perspective a translocation can be seen as a movement of a package of biological elements, including the animal, its bacteria, fungi, viruses, internal and external parasites, all or any of which could be potentially harmful to other populations of elephants and herbivores in the release site. On the other hand, the environment at the release site might have agents to which the arriving animals have never been exposed and which could prove detrimental to their health. It is therefore a pre-condition for a successful re-introduction or supplementation that the translocated animals are healthy and not carrying any infectious or contagious diseases that they can transmit to others. Healthy animals also have more of a chance of coping with the stresses of translocation and are more able to adapt to their new environment. For these reasons, and since a number of the procedures involved in physical intervention with wild African elephants require veterinary expertise, it is important that appropriately trained veterinarians are involved in all stages of the operation. However, despite all such veterinary precautions some mortalities as a result of translocations may still be inevitable. Information collected from over 1000 translocated elephants in East and South Africa shows a mortality rate of 3% on average and a range of 0-10% according to the situation and skill of the staff involved.

13.1 Common issues

13.1.1 Disease database

Prior to translocation, the health status and prevalence of infectious disease in the source and release populations must be established. This requires the involvement of a suitably experienced veterinarian to carry out the following tasks:

- An assessment of veterinary records for the elephant populations and for in-contact herbivores.
- If data are insufficient, a study should be undertaken 2-3 months before the translocation to evaluate the health and disease status of the populations (at both source and release sites) and to allow a full diagnostic workup and sample analysis.
- Observation of the general body condition, diet and nutritional status of animals in the source and release populations according to age, within a few weeks of the intervention.
- Collection of data during immobilization at capture stage. This should include clinical examination, blood haematology, biochemistry and serology where appropriate. Blood or tissue samples from all translocated animals should be banked for later studies and as a baseline on the health, disease and genetics of the re-introduced population. If questions arise later regarding the introduction of pathogens or parasites, these samples will become extremely important tools.

13.1.2 Diseases of concern (Williams and Barker, 2001)

The major biological agents reported to be or potentially to be of concern in African elephants include the following:

- *Mycobacterium tuberculosis;*
- *Mycobacterium bovis;*
- *Bacillus anthracis;*
- *Picorna* virus (*encephalomyocarditis* transmitted by rodents);
- *Endotheliotropic herpes* virus (usually carried asymptomatically by African elephants).

Many other infectious biological agents, such as the Picorna virus causing Foot and Mouth disease, Orthopox virus causing elephant pox, Papilloma virus causing warts, and Cowdria ruminantium causing heartwater are also of importance. However, few data exist on the epidemiology, pathogenicity and sensitivity of tests for these various infectious agents in free-living elephant populations and most evidence of disease or the potential for disease in free-ranging animals has been obtained from captive animals. This fact should not, however, reduce the importance of evaluating the disease status in both the source and release areas. The conditions under which elephant are put during capture, translocation and re-introduction can cause significant stress not dissimilar to that experienced by captive populations.
As a general rule, if a pathogen, which can cause serious ill health or death and can cross species barriers and be asymptomatic (e.g. *Mycobacterium tuberculosis*) is known to be prevalent within a source range, then elephants from such areas should not be use for re-introduction. This is true even if the disease itself has not been recorded in the source elephant population. The only exception might be if the disease is known to be endemic in the release area. If this is the case, the antigenic/genomic character of the pathogen in both source and release populations should also be similar.

Details of available tests and diagnostic criteria are not listed here as they are frequently updated and can be obtained through the network of the IUCN SSC's Veterinary Specialist Group (*www. iucn-vsg.org*) or the Wildlife Disease Association, Africa section (*www.vetmed.ucdavis.edu/whc/ wdaafrica*).

13.2 Source population

13.2.1 Health and welfare

In addition to the general issues outlined above, other specific health issues that should influence decisions on selection of elephants for translocation/re-introduction include:

- Lameness or injury to sensory organs, such as the eye or trunk due to previous trauma or disease would make individuals less suitable for the rigours of translocation and re-introduction.
- Body condition, nutritional and metabolic status. Starvation during drought renders individuals susceptible to the stress of the necessary interventions. A state of metabolic acidosis (e.g. as a result of a recent change in diet from a vegetation flush after rains) or excessive running during capture would increase the risk of immobilization leading to muscle damage or death. Moreover, late pregnancy or musth are periods when elective anaesthetics procedures should be avoided.

13.2.2 Statutory veterinary requirements for animal transportation

An authorized veterinarian must confirm in writing to the appropriate government veterinary authority that the animals to be translocated are in good health and suitable for transportation and free from infectious or contagious disease that might be a threat to domestic livestock according to local legislation and regulations. These requirements need to be looked into well before the translocation is undertaken and necessary permits secured (see also Section A.16).

14. SOCIO-POLITICAL CONSIDERATIONS

Rationale

Re-introductions and translocations of elephants are complex undertakings, which require long-term social and political support. In fact, socio-political considerations are likely to be as important as the biological, behavioural, veterinary, security, logistical and planning aspects. Unlike working with many other species, which have a limited potential for impacts, when dealing with African elephants there are many critical factors to take into account. While elephants may be viewed as an asset when they are associated with benefits through tourism-related revenues at either the source or release sites, these benefits will, in some cases, need to be balanced against possible costs that the translocated elephants may bring, for example through damage to lives and property in their new homes. Whatever these impacts, whether positive or negative, they may not only take place on the local level but also other socio-political levels.

In reality, elephant translocations generally involve socio-political considerations at local, national and even international levels. To ensure its success, the proposed translocation should be a legitimate exercise, fully understood, accepted and supported at all levels. This may require targeted actions at all levels (with their associated cost implications) on the part of the proponents, often at both the source and release sites. It is also important for all concerned parties to consider carefully the rationale for the translocation or re-introduction in both social and political terms. The primary justification should be as part of a conservation plan for the elephants and their habitats but must also be appropriate and acceptable in the existing social and political contexts. There should be a balance between the benefits (political, socio-cultural, biological, economic or emotional) and the costs of the intervention at both the source and recipient sites.

14.1 Issues common to both the source and the release sites

14.1.1 Local level

- Whether working at the source or release sites, there will always be a need for concerted and targeted consultation with local communities and other relevant players in the immediate area (Litoroh *et al.*, 2002). Such consultation must begin well in advance of any planned translocation. The issues and concerns raised in such consultations should be given real consideration in the planning process. While a participatory approach is preferred, at the very least a consultative approach must be adopted.
- Where elephants represent an important asset or liability to local communities their valuation must be understood and respected in the planned translocation to the extent possible. It is critical to understand both the values and the costs that people associate with the existence of elephants in their local area.
- While an experienced translocation team will be able to minimize unexpected events, the capture and release of African elephants is a major undertaking and may potentially be dangerous. As a result, local people must be well briefed on what to expect during and after a translocation exercise, which may have immediate impacts on their lives. This is especially true if capture and release sites are adjacent to or in the midst of human settlement.

14.1.2 National level

- Long before a translocation exercise is scheduled to take place, there should be a proactive attempt to inform decision-makers as well as the general public. Political support at the national level is central to any successful capture or release of elephants.
- Accurate and well-targeted publicity may also serve the purpose of informing the general public and securing their interest and support. This may best be achieved through a planned, dedicated and targeted public relations campaign conducted through newspapers, radio and television media to educate the broadest possible audience. Using clear and simple lay language, such a campaign should aim to educate the concerned public by providing the rationale for the proposed translocation as well as explaining the potential costs and benefits that may be associated with the exercise.
- Where either source or release sites do or could hold elephants whose seasonal movements span other districts, provinces or states, adequate consultation must take place with all those concerned.
- Legislation pertaining to various aspects of elephant re-introduction and translocation should

be in place in both the source and recipient countries and the authorities responsible for these aspects fully briefed and involved.

14.1.3 International level

- Re-introductions and translocations involving the movement of elephants across international borders require the full permission and involvement of all relevant government agencies in both the source and recipient countries (see Section A.16 on legal considerations).
- Where the source site is home to a trans-boundary population, adequate consultation must take place with the neighbouring range states that are likely to have a vested interest in the elephants targeted for translocation.
- Where release sites do or could hold trans-boundary populations or provide opportunity for trans-border movements by the translocated elephants, adequate consultation must take place with all the neighbouring range states that are potentially implicated.
- In cases such as the two above, formal Memoranda of Understanding or Agreements should be signed at the highest possible political levels to document and ensure common understanding and commitment from all the governments involved regarding the proposed translocation.
- As African elephants remain a high-profile species in the eyes of the international conservation community and the world at large, there is additional pressure to ensure that all re-introduction and translocation exercises are properly planned and well-executed.

14.2 Source site considerations

Rationale

There are some socio-political issues that will come into play only at the source site. These issues are likely to be associated with the potential loss of benefits that a community may either currently receive, or perceive to be receiving, from the elephants that are targeted for translocation. Whether through direct or indirect benefits, in many areas of Africa communities now realize the value of elephants at a very local level. In such cases, there may be a strong sense of ownership among local communities.

- Where such feelings are known to exist, consultation will be particularly important well in advance of the removal of any elephants. There could be no greater disincentive to local communities for conserving elephants in the future than to remove such a valuable asset without consultation.
- Negotiated mechanisms should be developed to directly or indirectly compensate affected stakeholders through a mediated process.

14.3 Release site considerations

Rationale

There are also some socio-political issues that will come into play only at the release site. These issues are likely to focus on issues of the potential risks and subsequent costs associated with the release of translocated elephants into a new area.

- Communities in the immediate vicinity of the release site or in areas likely to be visited or utilized by the translocated elephants must be consulted and kept informed of plans. In fact, a thorough assessment of local attitudes is necessary to ensure long-term security of the translocated animals. This is especially important if the original loss of elephants at the release site was due to human activities.
- Potential risks to life and property should be minimized and adequate provision made by the local authorities for compensation/mitigation measures if and where necessary.
- Linkages, roles and responsibilities of the various authorities involved (be they international, national or local) at the local level, should be clearly laid out and, where necessary, covered by the appropriate legislation, to ensure responsibility is taken for the care and security of both people and elephants.

15. SECURITY CONSIDERATIONS

Rationale

Although many local population extinctions, particularly in recent times, are being driven by habitat loss and fragmentation, the primary cause of African elephant population declines during the 20th century, and subsequently the primary motivation for re-introductions and translocations, has been the local loss of elephants to illegal killing (ITRG, 1989). While the absolute numbers of elephants illegally killed may have declined, there is still a demand for ivory (Milliken and Burn, 2002). As ivory is a luxury commodity and of particular value to citizens of wealthy or emerging economies, the threat to elephants remains.

The security of an asset as valuable as African elephants and rhinos is known to be one of the most costly responsibilities that African governments must assume. Recent studies have shown that this cost can be as great as US$1,500/km^2 each year (Currie, 1998; Dublin and Wilson, 1998). The impact of declining operational budgets, the consequent retrenchment and reduction of law enforcement staff and the prevalence of civil instability and freely-available arms among African elephant range states, makes security an ever-present concern (Dublin and Jachmann, 1992; Dublin et al.*, 1995). Its importance cannot be underestimated. Security remains a critical issue at all release sites and must be guaranteed from the outset.*

15.1 Release site considerations

As a general rule, proposed release sites where the immediate and long-term security of the re-introduced or translocated elephants will be challenged should not be considered to be viable options.

Minimum security for the existing and introduced populations should be ensured at the release

site. Security needs for the protection of elephants present a particular challenge in very large conservation areas (> 3,000 km^2) where restricted budgets are rarely able to support the required levels of protection. Therefore, from the security perspective, smaller release sites (< 3,000 km^2 but large enough to support a viable population in the long term), may present better options for elephant re-introductions and translocations in the short to medium term. Regardless of the size of the chosen release site, the following security precautions should be in place:

- Adequate levels of appropriately trained and equipped law enforcement staff. A ratio of 75-88 km^2 per man has been demonstrated to be an effective staffing level for the protection of elephants (Jachmann 1998). In larger areas (>200 km^2) ground surveillance should be supplemented by a mobile specialist anti-poaching unit that can help in an emergency and also act as an internal check on other field ranger patrols (Emslie and Brooks, 1999).
- Adequate annual operational budgets to support the field force in all their operations. The amount will vary according to local conditions but should be sufficient to support the recurrent budget, which includes personal emoluments and other recurrent costs, and modest capital investment for vehicles, equipment and construction.
- A dedicated law enforcement strategy, including the existence or planned establishment of a functioning intelligence network. This may involve the active engagement of local communities to support the network's operations. It may also involve close collaboration with the national police and/or military in the area.
- A standardized system for monitoring law enforcement effort. This should be based on the protocols developed for the CITES system for Monitoring the Illegal Killing of Elephants (MIKE).

In addition to this, the selection of potential release sites should be carefully considered. The following areas should be considered of high risk and, where possible avoided:

- Areas situated on international boundaries. Border areas bring additional security concerns and challenges. Overcoming these challenges requires close cooperation and coordination of law enforcement agencies between neighbouring countries, which may be compromised during times of instability (United Nations Environment Programme, 1994; Thomson, 1997).
- Areas where major development activities, such as road building or other infrastructural construction projects, large-scale agricultural schemes, or major extraction or exploitation industries are taking place. There are clear indications that such areas present high security challenges due to the increase in human activities and the transient nature of the settlements which form around such activities (UN Panel of Experts, 2001).
- Areas where there is existing civil instability or war or an immediate threat of such in the recipient country or neighbouring nations (Mubalama and Mapilanga, 2001). Civil disturbance and the accompanying flow of arms or planting of land mines have always presented a high risk to the security of elephant populations in the vicinity (Douglas-Hamilton, 1983).
- Areas where there is already a high incidence of human-elephant conflict, even if such conflict is created by relatively few remaining elephants. A high incidence of HEC can lead to elephants being killed both legally and illegally in protection of life and property. These are not appropriate release sites for translocated elephants, particularly for those that were "problem animals" in their previous homes.
- Areas where large-scale subsistence bushmeat consumption is taking place or a commercial bushmeat industry exists. Elephants are renowned targets for the bushmeat trade, where a

single bullet can provide significant amounts of meat and income. Where humans are living in high densities, often with accompanying shortages of food and protein, elephants often become an important target species. (Eves and Ruggiero, 2000; Stein and BCTF, 2002).

- Areas where there is a high military presence. Such areas, where members of the military are heavily armed, and often operating with limited supplies and food rations, have been known to present high security risks for elephants (Douglas-Hamilton, 1983).

16. LEGAL CONSIDERATIONS

Rationale

The legal status of the animals to be translocated and the legal status of the land in the source and release sites must be considered during the planning stage. It is important to adhere to all existing local, national and regional laws regarding the status of the African elephant as well as the land and adjoining areas (dispersal areas) at the source and release sites. This is particularly important when a translocation is going to occur across provincial or international borders.

The main types of legislation to be considered can be outlined as follows:

16.1 National level

When translocating African elephants within a country the following sets of laws may be applicable: 1) provincial, 2) intra-provincial and 3) national laws regarding the movements of wild and/or protected animals with special protection status.

There may also be specific laws or veterinary regulations within and between provinces in relation to movements of animals and disease. It is common during outbreaks of livestock diseases that movements of all animal species are curtailed, so this may have to be taken into consideration.

The legal status of the land at the source and release sites must be checked and any impact of this on the elephant translocation must be determined. For example, sites whose land tenure is unclear or in dispute should not be selected for elephant translocation or re-introduction.

16.2 International level

When African elephants have to be moved across international borders, it is important to consider the national legislation of the relevant countries and any relevant international legislation or binding agreements.

In particular, regulations pertaining to the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) must be enforced. CITES is an international trade treaty that was created to control and regulate the international trade in endangered species of fauna and flora. Most of the range states of the African elephant are Parties to the treaty. CITES has a system of three Appendices (I, II and III) which correlate to the degree of threat to the species posed by trade. The majority of African elephant populations are currently in CITES Appendix I with the exception of several in southern Africa (Botswana, Namibia, South Africa and Zimbabwe), which are on Appendix II (Wijnstekers, 1992).

For populations listed in Appendix I, neither elephants nor their derivatives can be commercially traded. However, exceptions can be made for their transport across international boundaries for those movements deemed to be for "primarily non-commercial purposes". This determination must be made by the importing country. However, the importation of African elephants into protected areas within present or former range states to achieve conservation objectives is considered to be for "primarily non-commercial purposes" and, thus, is allowed under CITES. For those populations of African elephants on Appendix II, the country of origin may engage in commercial trade with another country but would have to provide a "non-detriment" finding.

CITES export and import permits must be obtained from the relevant CITES Management Authorities in the source and recipient countries for elephants from source populations on Appendix I or II. For more information see CITES website at: *www.cites.org*

Travel documents including visas and vaccinations will have to be arranged for the capture team as well as clearances for aircraft and special permits for vehicles, equipment, firearms and dart-guns.

16.3 Other considerations

Humane treatment considerations - These are designed to ensure that the animals are moved according to established principles and methods for the safety and comfort of the elephants, the capture team and others. The *IUCN Guidelines for Re-introduction* (1998) clearly state (in the section on Planning, Preparation and Release p.8-10) that, "The welfare of animals is of paramount concern through all these stages". Some countries will have legislation pertaining to humane treatment, which must be complied with.

Veterinary considerations - All laws or regulations relating to the use of controlled drugs or narcotics, the control of animal disease and the transportation of live animals must be understood and adhered to.

B. IMPLEMENTATION OF THE TRANSLOCATION

1. CAPTURE, TRANSPORT AND RELEASE

Rationale

Elephant translocations are logistically complex undertakings and it is vital that they are carried out by a well-trained, well-equipped and experienced capture team. Capture, transport and release procedures should place special emphasis on ways to minimize stress and avoid injury to elephants and people.

1.1 Capture-specific considerations

1.1.1 Logistical and operational considerations during capture

- The capture team should include some people from the release site, especially if the translocation is of an international nature.
- For safety reasons, communication systems should be in place to allow for continuous contact between field personnel.
- In order to minimize delays in capture and loading and to reduce stress, the elephants should be herded into suitable terrain for capture, avoiding thickets and uneven or hilly ground where recovery vehicles may not be able to reach them.
- Mothers and small calves must not be separated during herding and must be captured and crated together.
- Members of cow-calf groups should all be darted together.
- The transport vehicles and equipment used should be appropriate for the terrain at the capture site to enable close positioning at the site of immobilization and for the ease of transfer of the elephants between vehicles.
- With immobilized groups, the older females and lactating mothers and their calves should be loaded first.
- Adult bulls should be loaded and transported singly and shoulder height checked prior to crating to ensure a fit.
- Equipment such as a crane or cotton ropes should be available to assist the animal to stand.
- Each recovery vehicle(s) should have an armed scout to constantly monitor elephants and personnel/spectator movements with safety in mind.

1.1.2 Veterinary considerations during capture

- The darting personnel should be in VHF radio communication with the pilot and capture team at all times to reduce risks to both operators and elephants.
- The recommended procedure is to immobilize the group of elephants (< 6 individuals per

recovery team), during a cool time of day (always below 25^{o} Celsius), within a short period of time by the use of a remote injection system (dart) and the appropriate chemical anaesthetic agent.

- The method of delivery of the agent will vary according to the situation on the ground and will usually involve a helicopter as the darting platform, which is also used to herd the elephants to suitable capture sites and for safety of ground personnel, especially in high density populations, or areas of dense vegetation cover.
- The type of dart and rifle to be used is decided according to the preference of the experienced veterinarian(s) involved and the options will not be listed here.
- The (reversible) chemical immobilizing agent of choice is etorphine hydrochloride at a dose according to the body size and temperament of the animal (5-18 mg) and should be mixed with an appropriate dose of azaperone.
- After capture, this should be followed up with appropriate long acting tranquillizing agents e. g. haloperidol and trilafon, or repeat azaperone doses to reduce the psychological and physical stress experienced by the animals during the process of capture and transportation and release. It is important to administer the tranquillizer early on to ensure it has taken effect at the time of the animal recovering.
- Tranquillizer doses are based on the body size and temperament of the animals and should always be administered by an experienced veterinarian or under supervision as overdosage can put the animals at risk.
- After immobilization, the animal must be placed in lateral recumbency, immediately, if it has not fallen in this posture.
- The top ear pinna must be folded over the eye for protection.
- Patency of the airway (trunk), sufficient respiration and anaesthetic monitoring are the priority concerns. The majority of mortalities recorded have related to suffocation through obstruction of the airway (e.g. lying on the trunk).
- As African elephants tend to form subcutaneous abscesses from dart wounds, covering antibiotic should be administered in the area of penetration.
- During immobilization, a thorough examination and sampling should be carried out to ensure the animal is in good health for transportation. Top up doses of 0.5-1.0 mg etorphine and 10 mg azaperone can be used as required.
- A veterinarian should assess the physiological state of the immobilized elephant and a single person with experience of African elephant anaesthesia (with the necessary veterinary drugs) should remain with the animal throughout and be in radio communication with the veterinarian(s).
- The period of immobilization should be kept to a minimum and the condition of the immobilized elephant should be constantly monitored. The immobilization procedure should be terminated immediately if the vital signs indicate that this is necessary.
- Long periods of recumbency should always be avoided but recumbency with stable anaesthesia in elephants has been undertaken over several hours.

For other useful data on immobilization and key references the reader is advised to consult Kock, 1993; Kock, 1992, 1993a; Osofsky, 1997; Raath, 1993. See also: http//bigfive.jl.co.za

1.2 Transport-specific considerations

1.2.1 Transport crates

Transport crates must be designed for the specific number, sex and age of animals to be translocated taking into account the method of transportation.

Key aspects include the following:

- There are various types of crates that can be used. Customized shipping crates have proven successful and adequate, but need to be reinforced, especially when transporting bulls.
- The crates must have sliding doors, as elephants might push against them. The doors of the crate must also have a safety catch that is strong enough to prevent the elephants from opening it during transport.
- All sharp and/or protruding objects must be removed.
- It is important that each crate is protected from dust and draughts and has ventilation grids at the top and bottom, which can be opened or shut as required.
- A slatted floor (or at least some openings) and a roof that allows for water to be poured onto the elephants and for urine and faeces to drain away. A drainage system is recommended.
- The crates must have non-slip flooring, robust roofing and wall materials, with access to the animals for observation, darting and emergencies.
- The method of loading will vary according to the type of crate/equipment available.

1.2.2 Logistical and operational considerations during road transport

- The translocation vehicle should be appropriate for the load and the roads to be used
- The vehicle should have radio or telephone communication systems on board.
- Transportation of the animals should commence as soon as all individuals have been loaded, assessed and watered (elephant readily take water from a proffered hose).
- The transportation routes should be carefully selected well in advance and should aim to achieve the shortest journey time possible. Rough road surfaces increase physical stress on elephants and should be avoided as much as possible. A cautious driving style should be adopted.
- Vehicle failures are one of the most common problems contributing to unsuccessful elephant translocations. Mechanics qualified to repair and maintain vehicles and specialized equipment such as cranes should accompany the transport vehicle to attend to any unexpected malfunctions.

1.2.3 Veterinary considerations during road transport

- Once the animals are within the secured crate they should be injected with another chemical agent (diprenorphine), which antagonises the etorphine and enables the animal to recover

keeping conditions in the crate as dry as possible and reducing the risk of slipping.

- The animals should be examined frequently during transport for any problems.
- The temperature inside the crate should be monitored. An acceptable range is 15-25° Celsius but this must be monitored in relation to the ventilation. If the temperature is rising ventilation should be increased and if falling, ventilation should be decreased or a source of heat should be provided.
- Any vehicle stoppage should be in areas away from human noise, smell or activity to avoid unnecessary stimulus, which will stress the animals.
- Transportation time should not exceed 14 hours. The longer the animals are recumbent under anaesthesia, and the longer they are confined in trucks, the greater will be the risks of mortalities.
- Water should be made available to elephants during transportation, especially on hot journeys exceeding six hours. Water should also be at hand to control possible hyperthermia of recumbent elephants.
- During transport, equipment and drugs for veterinary intervention and, if necessary, euthanasia, should be carried with the convoy to cater to any emergencies.

1.2.4 Logistical and operational considerations during air transport

- The aircraft must have the ability to load standard sized shipping crates
- The runway must be as close as possible to the capture and release points and never more than five hours' drive away.
- Because sudden and extreme movements could make the aircraft uncontrollable the elephants must not be allowed to move around in the crate during the flight.
- A standard crate must be sub-divided into four compartments with steel bars between each elephant and sliding doors between the two rows of elephants. The horizontal bars should be removable and start at a height that allows a suckling calf to move freely between the two compartments during the flight.
- The transportation crate must have a faecal trap at the bottom with a steel grid that will allow the faecal material to move through. It is also important to prevent the urine from contaminating the floor of the aircraft. Elephant urine is highly corrosive and may cause damage to parts of the aircraft.
- The transport crates must have ventilation holes to allow for cooling of the compartments, but these must not be so big as to enable the elephant to get its trunk through them and pull out electric cables running in the roof of the aircraft.

1.2.5 Veterinary considerations during air transport

- Water must be made available to the elephants throughout the flight. The water must be provided in a secure manner and according to international flight regulations for animals. Leakage of water into aircraft systems must be prevented.
- Elephants must be tranquillized during the flight. Haloperidol should be administered about an hour before the aircraft takes off.
- Loading of the elephants should happen in the early hours of the morning when it is cool. The air turbulence that may cause discomfort to the elephants is also lowest early in the morning. The aircraft should plan its arrival to allow offloading of the crates and transport to the release site to take place during daylight hours.

1.3 Release-specific considerations

1.3.1 General issues

- There should be minimal disturbance to the animals during the acclimatization period and all unnecessary spectators should be barred from the site until animals have been fully acclimatized.
- Special security procedures must be in place to prevent injury or death of people or animals during the release process.

1.3.2 Boma-release

- Elephants should be released into a large and secure enclosure or boma (minimum 1-2 hectares). This allows the veterinarian to monitor the animals for any transport injuries or any other health-related issues and gives the elephants a chance to recover from the drugs and to get acclimatized to their surroundings.
- For animals moved from a free-ranging situation to a fenced-in release site, the boma also provides the first experience of a confined environment and teaches the elephants to respect fences. If the release site has an electrified perimeter fence, the boma fence should also be electrified. (See EMOA, 2001 for fencing specifications).
- The boma should be built in a shady area, have an offloading ramp (the construction of this will depend on the type of transport vehicle) and should be strongly built to prevent elephants from breaking out.
- The boma must have sufficient water and browse for the entire period of the confinement of the animals.
- The boma should have a wide sliding gate operated by remote control.
- The boma should have easy access for the transport trucks (e.g. no large trees obstructing the trucks, smooth, hard-surfaced roads, and sufficient space for the vehicles to turn and back up). The access routes to the boma must be checked before the translocation takes place.
- The release of the elephants from the transport vehicles into the boma should be done with the least possible stress on the elephants. There should be no shouting or prodding of the animals. The number of people present should be kept to a minimum and all non-essential staff should be briefed on the procedure and asked to keep quiet and out of sight during the release.
- Cow-calf groups that are translocated together should also be released into the boma together but this will depend on the number of animals to be moved. If a large number of animals are translocated (50 or more), then individual cow-calf groups must be released one after the other with a new group arriving as the old group is released from the boma. This requires coordination to ensure that the boma is vacated by the time the new group is brought in.
- Bulls may exhibit aggression against other elephants after release, so only bulls that know each other should be released into the boma at the same time
- The elephants should be kept in a boma no more than one to two days to allow for full acclimatization. However, the elephants may be kept confined longer if this is deemed necessary by the translocation veterinary team.

1.3.3 Release without a holding boma

- If release into a boma is not possible, the release site should be carefully chosen. In particular,

it should not be near the boundary of a protected area or close to human settlement. The animals should have access to water near the release site.

- Under these circumstances, it is also crucial that some individuals within the group be radio-collared and monitored regularly for some time afterwards (see Section C below).
- When elephants are not released into a holding boma, it is possible that some of the more timid members of the group will not exit the transport vehicle with the others. This can lead to splitting of the group. The risk of this occurring can be minimized by limiting disturbance at the release site to an absolute minimum, which will reduce the incentive of the more timid elephants to remain hidden in the vehicle.

1.3.4 Veterinary considerations

The period immediately after transportation is critical because undetected health problems caused by stress may become evident at that time. This is a crucial period to undertake regular monitoring and veterinary diagnosis by qualified personnel.

C. POST-RELEASE MONITORING

Rationale

The success of any translocation will be measured against the achievement of the original objectives of the exercise and the subsequent health and proper acclimatization of the translocated animals.

It is not possible to conduct a translocation of any species of animal without causing a significant amount of stress to the individual(s) concerned. This may be particularly true of elephants due to their intelligence, their social bonds with other elephants that are left behind in the process, their traditional feeding and movement patterns and the fact that they have a high degree of fidelity to the home ranges from which they are uprooted. In a translocation, elephants are removed from these "safe environs" and thrust into an unfamiliar world where the location of food and water resources are unknown and where many of the disturbances, which may be of an entirely different and unknown nature, will be perceived as threats. Initially this must be a terrifying and traumatic experience. It does not matter from which source population the translocated elephants are acquired - they will suffer stresses when translocated and their behaviour will be affected accordingly. This does not necessarily mean that translocations should not be carried out - the stresses of the new environment decline as the animals settle in, and normal behaviour should then resume. However, in order to ensure that normal behaviour is restored it is critical that the condition of the translocated animals is closely monitored after the translocation.

1. GENERAL CONSIDERATIONS FOR THE POST-RELEASE PERIOD

- Post-release monitoring personnel need to be identified before the translocation operation is undertaken. A trained elephant biologist should oversee the monitoring programme.
- The necessary post-release monitoring equipment must be made available. These may include vehicles, radio collars, radio receivers, global positioning systems (GPS), VHF radios, computer and Internet facilities, and access to aircraft. All equipment should be tested to make sure that it is in good working condition before release of the elephants.
- Radio-collaring of translocated elephants is considered extremely important for both the post-release monitoring phase and for relocation in case of breakouts. If they can be accommodated in the operational budget, the new generation GPS/satellite collars are excellent for monitoring post release movements. Standard VHF radio collars should also be deployed on at least one adult animal in each group, for ease of monitoring and to confirm group cohesion. These collars must be fitted during the capture operation to avoid the need for a second immobilization.
- Social integration into existing populations, and inter- and intra-specific behaviour patterns and interactions need to be monitored.
- Post-release habitat utilization (water points, feeding areas, and habitat types) needs to be monitored.

- Elephants should be actively monitored for at least one year to determine the extent of their movements in all seasons.
- Bulls, in particular, should be monitored for problematic behaviour (e.g. crop raiding, break out of release area, undue aggression to other animals or humans) and should preferably be radio-collared.
- Because security of the elephants must be guaranteed at the release site (see Section A.15, Security Considerations), monitoring of the security situation must also form a part of the overall post-release monitoring programme.
- The cause of death of any translocated elephants during post-release monitoring should be established.

2. VETERINARY CONSIDERATIONS FOR THE POST-RELEASE PERIOD

After release, a programme to monitor the health of the introduced animals and in-contact herbivores should be put in place to ensure problems are identified and dealt with early on. The capture team veterinarian(s) should monitor the animals for any ill health as a result of the capture and transport in the short term. In the immediate post-release period a remote assessment of the animals for injuries, wounds or clinical symptoms of ill health or disease such as nervous, locomotive or digestive disturbance should be conducted on the first and the fourth day after translocation and interventions made where necessary. For instance, if lactating females show signs of lack of milk flow as a result of stress, let down agents (e.g. oxytocin) administered by injection can be used.

There should also be long-term monitoring of the health of the released population as a part of the overall post-release monitoring programme to look for chronic problems such as failure to reproduce or persistent weight loss. This monitoring should take place on the fourth and the twelfth week and again twelve months after the translocation.

D. LESSONS LEARNED

Rationale

Although a number of elephant translocations have taken place in recent times, the re-introduction and translocation of these large animals is still a relatively new field. The importance of learning from past translocations, both from ones' own experiences and those of others, is vital for preventing mistakes in the future and for the continued developing and refining of "best practices" for the translocation of African elephants. Moreover, just as these guidelines are based on the current state of collective knowledge and experience from previous attempts to re-introduce or translocate African elephants, it is likely that as our understanding of the complexities of elephant biology and behaviour improves, we may have to adjust our advice and update these guidelines. Keeping such issues in mind is always advisable and adopting a precautionary approach to moving African elephants is recommended. Giving serious consideration to other conservation and management methods that could be employed to reach the desired objectives is also essential.

1. LESSONS LEARNED FROM PAST TRANSLOCATIONS

1.1 Behavioural patterns of translocated elephants

- Post-release movements are likely to be erratic and may cover long distances, especially if there are human disturbances in the area. This has lead to exhaustion or even death of young calves as a result of hypoglycaemia when trying to keep up with the herd. Although such exaggerated movement patterns will subside once the animals settle into their new environments, human disturbances should nevertheless be minimized during this period.
- Elephants tend to wander from the release site and frequently attempt to return to their old home range. In areas that are not fenced, they may cause considerable problems through crop-raiding and other human-elephant conflict in their attempts to get back to their former home range.
- There is potential for problems to develop as a result of social interaction between the resident animals and the newly introduced elephants. For example, general aggression towards newcomers and conflicts between adult bulls due to re-establishment of the hierarchy can arise. Competing herds may also change their home ranges or even force some of the resident elephants out of the release site. In addition, adverse behaviour such as crop-raiding or chasing vehicles could be taught to the resident elephants by the introduced animals or vice versa.
- Utilization of the environment by elephants is never spatially uniform and their bunching behaviour often becomes exaggerated when they are moved to new sites. Elephants like to congregate in certain areas (e.g. along watercourses, in favoured habitats or in secure refuges). This may not be the distribution expected or favoured by the management

authorities when planning to re-introduce elephants. For example, their chosen distribution may not be conducive to tourist viewing or may have significant impact on the habitat where they congregate.

- Elephants stressed by translocation will be more aggressive in human-elephant encounters, but generally this level of aggression will decrease once the animals settle down.
- Large (older) adult bulls tend to be more problematic after release than young adults. Stopping a large bull determined to escape is a daunting task but this problem may be reduced or alleviated if there is a substantial and well-established resident population of cow-calf groups already at the release site.
- There have been cases of juvenile bulls developing behavioural aberrancies (including abnormally aggressive behaviour toward other herbivores, such as rhinos) when translocated as juveniles to areas without adult bulls. However, all such reported cases involved the translocation of juvenile cull orphans that grew up under abnormal social circumstances without an established cow-calf group structure or male hierarchy.
- Cow-calf groups originating from the same source area or possibly related individuals will usually join up to form a single herd at the release site. On the other hand, groups sourced from different areas or comprised of unrelated individuals will tend to avoid each other, which results in a wider dispersal of elephants.
- Breakouts by adult bulls from fenced-in release sites have occurred in areas with inadequate boma and perimeter fencing. Once an elephant has learned to break out of a boma it is likely to replicate this behaviour and also break out of the perimeter fence (Garaï & Carr, 2001).

1.2 Costs of elephant translocation

Although the exact costs vary tremendously from country to country and region to region, elephant translocations are costly undertakings sometimes running into hundreds of thousands of US dollars. Those planning elephant translocations and re-introductions are therefore recommended to carefully consider the monetary costs of elephant translocations vis-à-vis the expected benefits before deciding whether such operations are the most appropriate way of using scarce conservation resources. Consultations with other elephant translocation or re-introduction practitioners and a review of the costs of other previous translocation operations are advisable.

1.3 Initial stocking densities

As mentioned in Section A.7.2, it is inappropriate to stock African elephants at densities greater than the habitats in the release site can support over time. African elephant populations can increase at close to 7% per year (Whyte, 2001), meaning a doubling in numbers every 10 years. This means that elephants can very quickly achieve population densities which may negatively impact on other species. This has happened on two occasions in South Africa - in Madikwe Game Reserve (MGR) and Welgevonden Private Game Reserve (WPGR) and more recently in Swaziland:

A founder population of 219 elephants was established in MGR, a reserve of 620 km2 (North-West Province Parks and Tourism Board, In Press) in the early 1990s. However, because mortality in the re-introduced population has remained low and as the estimated maximum number of elephants which could be maintained sustainably in MGR was probably only 100-150 animals from the outset, clear signs of overstocking, such as the negative impacts on various tree species, particularly the marula (*Sclerocarya birrea*), were evident within two years (M.

Hofmeyr, pers. comm.). To date, 30 elephants have been translocated out of MGR (See Section 2.2.1) and further removals are sought to alleviate these high densities.

In the case of the WPGR, a founder population of 50 elephants was introduced in to the 330 km2 reserve, which exceeded the estimated carrying capacity, by about 30 animals (Anonymous, undated). The impacts were dramatic enough to cause concern to managers within four years. Attempts have been made to alleviate the problem by translocating elephants out of the area but so far all efforts to find buyers for the elephants have been unsuccessful (E. Leibnitz, pers. comm.).

In an effort to re-introduce African elephants into Swaziland, the country imported 18 young elephants from South Africa in 1987 and an additional 19 in 1994 (Moss et al., 2003). In 2002 there were 39 elephants in Swaziland (M. Reilly, pers.comm.). However, this is now considered too high by the management authorities as it threatens other wildlife species such as vultures (through the impact of the elephants on suitable nesting trees) and Black Rhinos (through competition for food plants) (Reilly, pers.comm). Subsequently efforts are underway to remove some of the elephants and transfer them to zoos in the United States.

In conclusion, African elephants should only be introduced at densities which allow for healthy population growth and, preferably, which are well below levels that could place habitats in the release site under pressure. The density of re-introduced elephants should be such that there will always be sufficient time for monitoring their use of the area and the implementation of required management actions well before negative impacts on the habitats occur.

2. SHARING LESSONS LEARNED

Lessons learned from elephant re-introductions and translocations should always be documented in writing and widely shared so they can be referred to by others. This is important because it can help to avoid the repetition of mistakes in future translocation and re-introduction operations. Sharing such information is also useful for updating these guidelines and thus further refining the science and practice of African elephant re-introduction, supplementation and translocation.

A post-operation assessment of whether or to what degree the translocation managed to achieve its original objectives should be made and clearly documented. As a part of this "post-mortem", the overall financial costs of such operations should also be carefully accounted for and assessed. This will allow the proponents to determine the overall success of these interventions compared to other conservation and management strategies that might have been possible. All such lessons should be widely shared with professional staff, especially those expected to play a role in the planning or execution of future elephant re-introductions or translocations.

When planning elephant translocations, it is advisable that wildlife management authorities of countries that have carried out numerous elephant translocations, such as South Africa and Kenya, are consulted for their expertise. A review of existing literature should also be undertaken.

For up-to-date information on African elephant re-introductions, supplementations and translocations contact the IUCN/SSC African Elephant and Re-introduction Specialist Groups. See Annex II of this document for contact details.

E. CHECKLIST FOR AFRICAN ELEPHANT TRANSLOCATION √

1.	Have the primary African elephant conservation objectives for the proposed translocation been clearly defined and laid out in a formal proposal? **(See Section A.2)**	**Yes** ☐	**No** ☐
2.	Has a structured budget been developed and are sufficient funds available? **(See Section A.3)**	**Yes** ☐	**No** ☐
3.	Has a translocation Coordination Committee been set up? **(See Section A.4)**	**Yes** ☐	**No** ☐
4.	Are all necessary skills available to carry out the operation including the multidisciplinary team to apply these guidelines? **(See Section A.5)**	**Yes** ☐	**No** ☐
5.	Has pre-capture monitoring been carried out? **(See Section A.6)**	**Yes** ☐	**No** ☐
6.	Have all relevant habitat considerations both at the source and the release sites been taken into account? **(See Section A.7)**	**Yes** ☐	**No** ☐
7.	Have all possible environmental and ecological impacts of the translocation been considered? **(See Section A.8)**	**Yes** ☐	**No** ☐
8.	Have the demographic and population considerations been taken into account? **(See Section A.9)**	**Yes** ☐	**No** ☐
9.	Have genetic issues been considered? **(See Section A.10)**	**Yes** ☐	**No** ☐
10.	Have the social impacts of translocation both at the source and release sites been taken into account? **(See Section A.11)**	**Yes** ☐	**No** ☐
11.	Have the behavioural aspects been considered? **(See Section A.12)**	**Yes** ☐	**No** ☐
12.	Have all veterinary requirements been fulfilled? **(See Section A.13)**	**Yes** ☐	**No** ☐
13.	Have all relevant socio-political considerations been taken into account at both source and release sites? **(See Section A.14)**	**Yes** ☐	**No** ☐
14.	Have sufficient security measures been taken to ensure safety of the release population? **(See Section A.15)**	**Yes** ☐	**No** ☐
15.	Does the planned translocation meet with all relevant national and international legal requirements? **(See Section A.16)**	**Yes** ☐	**No** ☐
16.	Have all issues relating to capture, transport and release been taken into account? **(See Section B)**	**Yes** ☐	**No** ☐
17.	Have arrangements been made for adequate post-release monitoring? **(See Section C)**	**Yes** ☐	**No** ☐

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NOTES

IUCN - The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 1,000 members in all, spread across some 138 countries.

As a Union, IUCN seeks to in uence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

The World Conservation Union builds on the strength of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

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