

**MANAGEMENT GUIDELINES
FOR THE WELFARE OF ZOO
ANIMALS**

Elephant

Table of Contents

1. Introduction	3
2. Elephant Policy Statement	3
3. The Zoo Environment	3
3.1 Social Structure	4
3.2 Enclosure.....	6
3.3 Boundary	9
4. Feeding and Nutrition: Summary and Recommendations	9
5. Breeding in controlled Environments	11
6. Veterinary Management Procedures	12
7. Elephant Handling and Training	14
7.1 Elephant Training: Rationale and Justification	14
7.2 Standard Operating Procedure: Staff Training	16
7.3 Standard Operating Procedure: Use of Chains or Shackles on Elephants	18
7.4 Standard Operating Procedure: Voice Control.....	21
7.5 Standard Operating Procedure: Use of the Ankus or Hook on Elephants	22
7.6 Standard Operating Procedure: Use of the Electric Goad or Hotshot on Elephants	25
7.7 Standard on Educational Activities Involving Elephants	26
8. Research	27
9. Public Relations and Elephants	28
10. Management Audits and Document Revision	30
11. Appendix 1: Risk Assessments	32
12. Appendix 2: Elephant Profiles	32
13. Appendix 3: Staff training	33
14. References/Bibliography	34

1. Introduction

2. Elephant Policy Statement

Elephants are kept in zoos as part of an overriding conservation mission so that they are in actively managed breeding programmes. This may mean that non-breeding elephants are kept at some zoos to ensure maximization of the capacity for elephant breeding zoos.

Their presence enables progressive educational activities and demonstrates links with field conservation projects and benign scientific research, leading to continuous improvements in breeding and welfare standards.

Zoos have a duty of care: that standards of husbandry practices, housing, health and welfare management are humane and appropriate to the intelligence, social behaviour, longevity and size of elephants. All zoos should aim to continuously improve welfare standards.

Zoos have a moral and legal responsibility to ensure the safety of visitors and staff.

Zoos must continually assess their performance against the EAZA Elephant Management Policy with its defined standards and procedures, in order to demonstrate legal compliance and address legitimate public concerns.

The policy documents will be reviewed annually and comments can be submitted at any time by members to one of the EEP Coordinators for consideration.

The goal of this policy statement is the ongoing well-being of elephants in controlled environments in European collections. Furthermore these recommendations offer a tool to all elephant keeping institutions for improving their standards as old keeping regimes are phased out over the years and with the aging of individual elephants.

All sections of this document are intended as exemplary and make no claim to be comprehensive.

3. The Zoo Environment

The welfare of elephants is to a large extent dependant on the size and furnishing of the enclosure, the composition of the group and the establishment of enrichment protocols. Various guidelines are available (Olson *et al* 1994; AZA 2001) and the Federal Office for Nature Conservation in Germany also issue guidelines; this section is designed to provide guidance for a satisfactory enclosure and group composition that allows for modern elephant management

3.1 Social Structure

Elephants are one of the most social mammals and this must be borne in mind when managing them in captivity. Zoos must maintain elephants in as appropriate a social group as possible so that welfare needs, education and conservation potential can all be realised. The best way to achieve this is to replicate the social organisation seen in the wild. The broad similarity between the social organisation of African and Asian elephants means that management recommendations for the social environment are essentially the same for both species. Although Asian and African animals should not be mixed in the same social group, existing mixed herds must be carefully monitored so that before separation is decided upon it should be clear that the animals involved will not suffer due to the loss of an exhibit mate, even one from the other species.

There is a need for the maintenance of appropriate social units not only for welfare and educational grounds but also for conservation. Conservation does not merely entail the preservation of genetic diversity which, arguably, could be carried out far more cheaply in cryo-preserved gene banks, but must provide for the preservation of 'cultural' and learnt elements of an animal's natural behaviour. In elephants, as in the great apes, much of their behavioural repertoire is learnt rather than innate; so that to truly 'conserve' as opposed to 'preserve' elephants in captivity as many naturally learnt behaviours and cultural elements should be maintained as possible.

Different zoos will be able to fulfil these requirements to a greater or lesser extent but all are duty bound to continually strive for the highest possible standards. Otherwise zoos are strongly urged to find alternative accommodation for their elephants. Collections should inform the Elephant TAG what their plans are regarding compliance to requirements, for the following five year period. This plan must be submitted within the next year.

COWS

The basic social unit of the elephant is the family unit. Therefore zoos must aim to establish stable female groups, preferably of related animals, in order to replicate the wild state. Thus the minimum group size that should be maintained is four cows older than two years. The benefits of this are listed below.

Animal Welfare. Bonds demonstrated between females within a group suggest that there are significant benefits to the animals in developing and maintaining these relationships and that separation must inevitably be stressful. Moreover, social interactions are likely to be the most sustainable form of environmental enrichment for zoo elephants.

Learning. Family groups are vital for the appropriate socialisation of young elephants of both sexes. The degree to which animals learn from the matriarch cannot be overstated. Many problems found in elephants in human care relating to reproduction and aggression towards other elephants and keepers

are the result of a poor social environment. An example is the learning of relative strengths of individuals of differing sizes through play.

Decreased social tension. An increased level of relatedness is likely to be highly significant in promoting harmony and co-operation within a group.

Increased reproduction. It has been shown that there will be an increased success rate in calving if cows are given the opportunity to witness births in a zoo environment.

Increased education potential. The benefits of seeing family units with elephants of all ages, in comparison to single individuals, cannot be overstated.

It is therefore recommended that, in zoos that are successfully breeding elephants, the herd is allowed to grow to a point where it is necessary to reduce its size only because of the physical limitations of the zoo or because the herd has reached a social 'critical mass'. Such an upper limit will depend on the nature of the individuals within the group, however a number of five to ten animals is realistic. If a reduction in herd size does become necessary then compatible female pairs (or preferably trios or more) should be moved together to other facilities. Generally bulls should be removed from the herd during adolescence.

BULLS

Due to their comparatively unsociable nature bulls pose a particular problem to zoos. The problem is likely to continue, as even if artificial insemination (A.I.) were to be practised more widely, sperm donors would still be needed. Theoretically semen could be imported from bulls in range states but bulls would still be born in zoos and other facilities and have to be accommodated. The EEP recommendations must be adhered to.

In the wild, bull elephants leave the matriarchal herd during adolescence. Although separation is gradual, female intolerance eventually drives the young male away. A bull during musth is incompatible with a cow herd although not with receptive females in oestrous. The character of individual bulls will largely determine how they can be managed, but zoos will probably have to house difficult bulls. To that end, all bulls must be maintained in such a way that at the very least they can be separated from females and other males during musth. Scope for separation must be built into designs of all bull facilities but it is not acceptable to keep bulls in isolation until required for breeding. All collections keeping bulls should have an elephant restraint chute.

In the long term the zoo community must address the issue of elephant bulls and the likely overall increase in their numbers since this will seriously compromise the conservation breeding performance of zoos by taking up valuable accommodation. The way forward may well be to explore the feasibility of keeping bulls in bachelor herds, in zoos capable of providing enough space. All collections keeping bulls need staff who are trained to work with bulls.

CALVES

It is important that calves are brought up in a matriarchal group. Calves have a long learning period and socialization with other elephants is crucial. Efforts should therefore be made to integrate hand-reared animals back to the group as soon as possible. Females need to learn calf care, and the presence of a young animal in the group benefits all members.

NOCTURNAL BEHAVIOUR

Elephants are active after the public and keeping staff have left. Research has shown that animals were most active between 1800 and 2400 and 0600 and 0700, exhibiting the normal social repertoire, social interactions and feeding behaviour. In general observations show that animals are active for more than 50% of the 'nocturnal' period (Brockett *et al* 1999; Weisz *et al* 2000). These observations, hardly surprising, demonstrate that zoo elephants are active for around the same period in a controlled environment as they are in the wild (i.e. sleeping for a maximum of five hours in 24). Thus animals should be kept in social groupings at night, preferably not chained but, if separated, with possibility to interact with other elephants, and provided with sufficient enrichment and constant access to food. Elephants benefit considerably from having 24 hour access to the outside area (Priest *et al* 1994). Lighting should be on dimmer control (see Section 3.2) and there should be a means of providing food during the night. Observation cameras, which can record nocturnal behaviour, are an advantage and should be fitted if possible.

GENERAL

As far as possible, elephants, especially females, should be maintained in social contact with other elephants. Husbandry regimes entailing separation need to be rigorously justified.

Sufficient time should be set aside for elephants to interact naturally within groups. Although the time spent by keepers with elephants can be mutually beneficial, it is inevitably on the keepers' terms and cannot be regarded as a proper substitute for elephant-to-elephant interactions. Freedom of choice and control are widely accepted by welfare scientists as critical aspects of animal welfare, as are ability to express species-specific behaviours and interactions.

3.2 Enclosure

With the exception of institutions in Mediterranean warm climates, where shelters would be sufficient, all elephants in European collections need indoor and outdoor facilities and, when weather and other conditions allow, they should have reasonable access to both over a 24 hour period. Both enclosures should be designed to ensure that no physical contact is possible between public and elephant.

INDOOR

Animals must be able to move and turn and lie down. The space must allow 200 sq. m. for four animals and 50 sq. m. for each additional adult animal (the minimum herd size is taken as four females over two years of age). The best inside area is composed of free-stall housing, in which elephants can move freely. Separation and isolation facilities i.e. separate pens, are necessary to allow veterinary and behavioural management such as maternity areas for cows and calves. These may be composed of moveable barriers which can be made to be inter-connectible and there are many advantages with this design. The minimum indoor stall size for a bull is 50 sq. m. Dimensions should be planned around the fact that a mature bull animal can reach vertically up to six metres. Ceilings, plumbing and all electrical installations must be out of reach.

The inside temperature must be no less than 15°C and an area capable of maintaining a temperature of at least 21°C is needed for sick or debilitated animals. Indoor areas need good ventilation. Elephants have a wide tolerance of humidity. Areas should be well lit with a gradient. Fluorescent lighting spectrum is acceptable but skylights are highly recommended. Lighting should not suddenly go from bright light to darkness, but fade gradually, and the animals should never be in total darkness.

An elephant restraint chute or crush and a weighbridge should be included in the equipment (Schmidt *et al* 1991). All collections need a restrain chute or crush. Chaining rings, if used, are to be placed carefully and only used when necessary, e.g. for training and veterinary purposes; elephants should not be routinely chained for periods in excess of three out of 24 hours on average .

Standing water can cause foot problems and be contaminated with pathogens. Floors should be impermeable to water, quick drying and well drained, relatively smooth but not slippery and not rough enough to traumatize feet. A range of materials are permissible (asphalt, wood bricks, concrete or other rot-proof material (epoxy or rubberised coatings) which can be readily cleaned and disinfected. The flooring should have properties that include insulation, so that the floor remains warm. An adult elephant can discharge 50 litres of urine in 24 hours. Normal urine is slightly acidic and may contain a large amount of crystals, much of which is calcium carbonate. Daily hygiene routine must also provide for frequent removal of manure, to improve sanitation and aesthetics. In the cold winter months warm water should be available for washing down animals and for drinking.

Feed troughs need to be designed for filling and cleaning from outside the enclosure. There should be high-level feeders for hay and browse. Animals should have access to drinking water from the indoor area and troughs should be cleaned daily. Ideally drinking water in indoor areas should be warm and if possible consumption should be monitored.

Adequate food storage areas are needed, allowing separation of fruit, vegetables, dry foods, hay etc., along with a sink and washable work surfaces.

OUTDOOR

The outdoor area should be protected from extremes of sunlight, wind and rain, i.e. with sufficient sheltered areas. Animals should be monitored at temperatures below 5°C. Choice is important so that animals can effect behavioural thermoregulation. Natural daylight cycles are adequate for elephants even in temperate climates.

The outside area should be as large as possible. The minimum size for up to 8 animals (i.e. adult females) is 2,000 sq.m. and another 200 sq.m. should be added for each additional cow. Ideally no outside area, designed for cows and bulls, should be less than 3,000 sq metres in area.

The outside bull pen should be no smaller than 500 sq.m. If possible the bull should be allowed to roam with the cow herd.

However, there is more to a good outside area than just size. The environment should be challenging to the animals, with devices and structures which enrich the environment and encourage natural behaviour. Outside substrates should be primarily natural e.g. soil, sand or grass with good drainage and discrete hygienic areas for feeding. Access to sand or soil for dust bathing is important as is the provision of rocks, tree-stumps or equivalents for rubbing and scratching. A combination of a hard-standing (concrete) and a softer substrate such as earth or sand is recommended. The harder surface will help reduce foot/toenail growth and a softer area allows for greater interaction and environmental enrichment, e.g. in the form of dust baths or mud wallows, which may also assist skin-care by protecting from sun and biting insects.

Elephants need access to water, especially during hot weather. A pool, waterfall, sprinkler or a wallow provide enrichment and allow cooling and bathing. If man-made, the pool must have gentle entry slopes (not normally greater than 30°) with non-slip surfaces. Pools should not have vertical sides that pose a danger to animals when empty. The pool should be large enough to accommodate the needs of all the elephants in the group and sufficiently deep to allow for bathing behaviour and the full immersion of an adult lying on its side. Some institutions use natural lakes to bath their elephants.

3.3 Boundary

Barriers must be maintained and escape-proof. The choice of actual material is secondary to criteria relating to strength and prevention of direct contact with the public. If a tusked elephant has a tendency to dig at walls then it should be housed in facilities with smooth walls (assuming the areas are walled) to prevent damage to both walls and tusks. However tusks can also be damaged on cables and chains and this also needs to be addressed. One solution is to hotwire the cables/chains to keep the animal back from them.

Door and gate design is vital for the safety and well being of both elephants and staff. Engineering must be suitably robust and any hydraulic system should have manual back-up and/or alternative power. Gates and barriers should not have horizontal bars, which would allow elephants to climb. Diagonal bars have proven most effective. Cows' enclosures should have a minimum height for gates and barriers of 1.8 m, and those for bulls 2.5 m; however a large African bull can climb up to 2.5 metres and therefore may require a 3 m barrier (Terkel, pers. comm.) Safety corridors and stand off areas should be at least 4 m wide. Gates must be designed to be operated remotely by staff, i.e. from outside the elephant area, and to be quickly opened and closed. They should have a stop facility.

Electric fences are a popular and efficient secondary barrier but must be of sufficient power to deter elephants i.e. about 8000v @ 3.5 joules. They should have a fail-safe alarm system. Electric fencing is not recommended as the principle barrier. In cases when it is used to give access to large grassed areas, suitably trained staff members should be present.

Dry moats with a hard surface have become obsolete as they pose a real threat of injury, especially to young elephants. They should be replaced long term and interim plans made for getting out any animals that fall or are pushed in. Particularly bad are moats that are deep (> 1.4 m), narrow (< 3m) and hard bottomed. Moats or ha-ha ditches should be dry, wide enough for an elephant to turn in, and no deeper than 1.75m. The bottom surface must be soft and a ramp, or similar, provided so that an elephant can clamber out of a moat if necessary.

Whatever the form of elephant containment, there must be methods for keepers to get in and out quickly and safely.

4. Feeding and Nutrition: Summary and Recommendations

Summary

From a survey carried out on British and Irish Zoos the diets being fed to elephants seem adequate and the following should be noted:

- Fibre levels are sufficient, however care should be taken to feed hays with an acid detergent fibre (ADF) level of above 30% to prevent colic.
- Browse may play an important role in elephant diets for the provision of essential fatty acids as well as providing environmental enrichment, and collections should ensure that elephants are provided with a regular fresh (or frozen) supply.
- Protein levels seem adequate, but it is very difficult to be certain unless analysis of the hay fed is carried out.
- Calcium and phosphorus levels are acceptable.
- Sufficient sodium is provided.
- Analysed iron and zinc levels seem low, but this is likely due to missing data on forage composition rather than a true deficiency. Elephants should be closely monitored for signs of deficiencies in these minerals, and diets should be supplemented with caution.

RECOMMENDATIONS

Based on (Ullrey *et al* 1997)

- All collections should undertake regular analysis of hays for dry matter, crude protein, acid detergent fibre, neutral detergent fibre, lignin, calcium, and phosphorus in a laboratory with demonstrated expertise.
- Elephant diets should be based on a rough grass hay of known composition. Suitable browse should be added as much as available.
- Using published recommendations, any supplemental sources of energy, protein, minerals, vitamins or fatty acids required should be calculated and extra feeds added to the diet accordingly.
- Consideration should be given to the regular measurement of circulating α -tocopherol levels to ensure that elephants are obtaining adequate dietary vitamin E.
- Elephants should have daily outdoor exercise to ensure adequate synthesis of vitamin D₃, which is essential for promoting the absorption and utilization of calcium and phosphorus.
- Water should be provided *ad libitum*.
- All dietary changes should be made gradually (over 1-2 weeks) to avoid digestive upsets.
- Elephants should be regularly weighed (or measured) and the diets altered accordingly to avoid weight loss or obesity.
- No changes to the diet should be made without consultation with the nutritionist and veterinarian.

5. Breeding in controlled Environments

The Policy Document mirrors the current recommendations from the elephant TAGs; the EEP recommendations for breeding management are (Dorresteyn and Terkel 2000a; Dorresteyn and Terkel 2000b):

- To bring potential breeding bulls into a breeding situation.
- To exchange breeding bulls in a situation where they have sired a relevant number of (viable) offspring in one institution.
- To bring all potential breeding females, especially those under 25 years old, into a breeding situation.
- To encourage the development of matriarchal family units and that these should remain together i.e. with the intention of keeping female offspring within their family unit.
- Further development of AI techniques should be encouraged, but AI should not be promoted as the most important method of reproduction.
- All zoos that rebuild elephant facilities should design new enclosures with the potential of keeping bulls and four or more cows. If a zoo is not able to start keeping a bull within a reasonable period of time, the EEPs will treat that zoo as a non-breeding facility and will determine that the zoo houses only females who are not able to reproduce or a group consisting entirely of young males.
- It is of the utmost importance that a bachelor herd facility for several adult bulls be developed. That facility could and should act as a genetic reservoir but also as a stimulant for the development of relevant social behaviour between bulls. Bulls should be kept in the facility when they are temporarily not in a breeding situation or before reaching that stage. The facility should not primarily function as a surplus-male facility, but as a component of the genetic reservoir of the population.
- Young animals should be kept within their family group for several years and should not be transferred before five years of age. If this should happen they should be accompanied by at least one other member of the herd in which they were born.
- The situation in Europe is not very different from that in other regional breeding programmes, therefore close cooperation with other regions is essential e.g. on the exchange of bulls.
- Although further research is needed, it seems clear that herpes infections are a very important cause of death of young elephants in the EEP. Rotterdam is preparing a protocol of successful treatment.

Each individual animal should be categorised using the following definitions:

- **No breeding future:** these animals should be moved to zoos that have no breeding facilities or kept in a breeding group for social reasons.
- **Potential breeding in the future:** follow-up examinations required annually.
- **Breeding future:** close monitoring is required.

- Isolated bulls in this category should either be moved to a breeding facility or be used for AI or, if applicable, females can be brought to the bull for breeding.
- Cows in this category which are in institutions with a non-reproductive bull should be used for AI, or the institution should acquire a reproductive bull, or the cow should move temporarily to an institution that keeps a reproductive bull.

From these guidelines it is apparent that central to the success of the programme is the methodology for correct identification of the reproductive potential of bulls and cows. The main methods are:

- Behavioural records.
- Ultra-sonographic examinations.
- Hormone profiles (from blood, faeces or urine).
- Semen quality in males.

In order to follow these guidelines certain technology and techniques are required and these are explained below.

6. Veterinary Management Procedures

Because of the many problems associated with keeping and breeding elephants, **members of EAZA are expected to follow certain protocols as detailed below** (Dorresteyn and Terkel 2000b):

- *Cystic malformations:*
 - The intercalving interval should be restricted to a maximum of five years.
 - Cows should start breeding before reaching the age of 10.
- *Herpes virus:*
 - Asian and African elephants should not be kept in mixed groups.
 - Each young (<10 years) elephant showing symptoms of undetermined illness should be suspected of a herpes virus infection. Diagnosis by PCR should be carried out immediately (samples to Berlin or Rotterdam). Early treatment with famciclovir is highly recommended.
- *Anaesthetic death*
 - Proper restraint devices are essential to reduce risk.
 - Further research into anaesthetic procedures is required.
 - Training of animals to undergo veterinary examination and treatment can reduce the number of anaesthesias needed, and such training procedures are highly recommended.
- *Neonatal death*

- Maternal neglect or aggression can be a problem and is helped by improvement in group management. Old facilities, where the animals are chained or kept isolated, should be converted to group accommodation in order to give young females the opportunity to learn maternal behaviour from herd mates.
- *Monitoring of oestrus cycle*
 - During the luteal phase, females should be sampled at least every two weeks. During the follicular phase, weekly sampling is required.
- *Monitoring during pregnancy*
 - During pregnancy monitoring of progesteron should take place at least every two weeks.
 - Ultra-sonographic examinations in early pregnancy are recommended to identify twin pregnancy and to monitor the pregnancy.
 - At the end of pregnancy i.e. from week 89 samples to monitor progesterone should be taken 3x per week.
 - Blood samples to monitor progesteron should be taken immediately before calving, and at the latest from day 620 of pregnancy.
 - Specific veterinary assistance during the calving process. Institutions should not wait too long before intervening in a dystocia.
- *Monitoring the bull*
 - Every potential breeding bull should be examined using ultrasonography at around the age of eight years and annually thereafter in order to determine the development of the reproductive organs. A semen sample should be collected and examined at the same time.

If a collection is not prepared to comply with the EAZA recommendations then it should be planning not to keep elephants in the future as it will not be able to receive animals or take part in the EEPs. European zoos are fortunate in having Thomas Hildebrandt and his team based in Berlin and the Reproductive Biology Department at the German Primate Centre in Göttingen. Protocols have been developed for zoos to send urine, faecal and blood samples there for hormone evaluation (Oerke *et al* 2001).

Areas in most need of further research to aid our understanding of elephant biology and breeding have been identified by EAZA as:

- The influence on reproduction when two bulls are kept in one enclosure, effects of dominance behaviour.
- Preservation of semen.
- Cause of the development of cysts in the female reproductive organs and leiomyomas (tumours).
- Medical treatment of cysts.

- Influence of hormones (prostaglandins, etc.) on the reproductive cycle in females.
- Pregnancy and foetal development.
- Analysis of specific circumstances of post neonatal survival and death, with the goal of setting up a protocol for neonatal management.

7. Elephant Handling and Training

7.1 Elephant Training: Rationale and Justification

The principle aim of a zoo's management is to optimise the welfare, education and conservation utility of their animals within the constraints of the facilities, staff ability and the elephants held. Elephant management should result in a net benefit to the welfare of the elephants. Additionally management practices must ensure staff safety.

It seems to be acknowledged by the zoo community as a whole that in order to manage elephants in controlled environments some degree of training is required. Zero handling as a form of elephant management offers few possibilities of influencing social structures, correcting misbehaviour or carrying out medical treatment and investigation. It is not recommended and therefore not considered within the context of this document. Elephant training should be planned so that it comes close to representing the needs of the elephant in the zoo environment. One of these is walking, and training should therefore be designed to encourage this activity.

Elephant training is carried out for the following reasons:

- To facilitate the safe handling, movement and routine husbandry procedures carried out by keepers such as washing and basic foot care.
- To facilitate essential veterinary procedures such as blood sampling and injection.
- To facilitate the demonstration of educational aspects of elephant biology and of natural behaviours where it is considered appropriate, for the promotion of a greater understanding of elephants and their conservation.
- To facilitate transport of elephants in support of a conservation reproduction programme.

For all these purposes the guiding principles are *safety*, of both elephants and people, and *animal welfare*. There must be a clearly identified net welfare benefit before any sort of training regime is commenced and relevant safeguards must be observed and records maintained. For these reasons the following are required:

- Risk assessments for staff/elephant interactions and public/elephant interactions

- A protocol of the elephant management and training methods used by the institution with a manual for staff
- A Behavioural Profile on each animal over six months, updated annually. This should include individual differences in elephant behaviour with different members of staff.
- Bulls should be put in protected contact from a certain age. This will vary with individuals; it can be as young as three or as old as eight or nine. From the age of four, bulls must be considered by examination of the profile notes and a six monthly review must take place in combination with a risk assessment. Cows should also be reviewed as to whether they should go into protected contact, but once an animal has attacked a keeper it **MUST** be put into protected contact until a full review of the situation surrounding the attack has been carried out. After this review, if the decision is to put the cow back to a free contact situation this must be fully justified in combination with renewed risk assessments.

RISK ASSESSMENTS

The five recommended steps in carrying out a risk assessment are:

- Look for the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done
- Record your findings
- Review your assessment and revise if necessary

An example is given in Appendix 1. This should be completed for each individual keeper for each elephant.

BEHAVIOUR PROFILE

There are various ways of carrying out a behaviour profile of an animal. A list of categories for each animal such as: disposition, relationships with other elephants, handling recommendations, past history, general health, breeding status etc. provides a good background. A daily log should be kept which should be copied into the central recording system such as ARKS. A method of profiling which may prove useful is the technique of Methods of Behavioural Assessment (MBA) where keepers' assessment of an animal is correlated with observations of the behavioural elements of the same individuals (Carlstead and Kleiman 1998; Carlstead 1999; Carlstead *et al* 1999; Carlstead *et al* 1999). An animal's profile may be measured by elements such as: emotional, timid/shy, anxious, fearful, friendly to keeper etc. Animals are ranked on a 1-5 scale for each element. It would be interesting to investigate this methodology further in order to ascertain if it could be a useful method for elephant profiles.

7.2 Standard Operating Procedure: Staff Training

BACKGROUND

Staff training and the use of set procedures is of importance when working with any exotic species, for the welfare of both staff and animals. It is particularly important for elephant staff for two main reasons:

- More keeper deaths and injuries are caused by elephants than by any other species in zoos (Lehnhardt 1991; Roocroft and Zoll 1994; Mellen and Ellis 1996). This is due to a variety of causes but particularly: the keeping of bull elephants, who can show particularly aggressive behaviour; inadequate facilities; individual elephants of unreliable temperament; trauma invoked in an individual elephant as a result of an unexpected event; inexperienced handlers and momentary lapses in judgment amongst usually competent personnel; inadequate staff training.
- Allegations of elephant abuse, such as prolonged punishment after the occurrence of an undesirable behaviour (Mellen and Ellis 1996).

A useful preliminary survey has been carried out of elephant attacks on keepers in European collections (Ray 2002). Out of the 32 collections that responded, 20 (62.5%) reported attacks by elephants and in 13 of these the keepers were alone with the animals at the time of the attack. This survey therefore provides support for the proposed training regime and also the mandatory condition that a minimum of two trained keepers must be present during any contact with elephants. Cow elephants were responsible for the majority of attacks, but this could be due to the fact that females are more often worked in free contact situations.

It is therefore essential that a collection keeping elephants manages these risks effectively. This should be carried out through the process of risk assessments and should include the installation of elephant facilities that are appropriate for the bulls and cows managed by the institution. Risks to staff should be reduced by the implementation of a staff training programme which should ensure a proper succession of handlers and trainers within the collection and also within the region's zoos. Risk assessments must include all management procedures used e.g. free, protected and confined contact. Elephant management, especially free contact management, is very different from other forms of wild animal management. Elephant handlers, therefore, require specialist skills and as institutions managing elephants are dependent on the level of skill of their handlers it is imperative that they are properly and consistently trained and that this is subject to regular review.

OPERATING THE TRAINING PROGRAMME

Risk assessments must be carried out regarding elephant staff safety, and staff/elephant/public safety. These assessments must include all aspects of enclosure design. These assessments should result in the development of

better protocols and improved and safer design of elephant facilities for staff and animals. Risk assessments are necessary for all management situations but must include that all keepers carry a radio or at least a cell phone and in free contact also an ankus.

A collection must have a monitored and written training programme (Keele 1993) encompassing training of new staff and training reviews of existing staff. In order to establish the correct monitored training programme, a complete audit of the existing elephant programme needs to be carried out. This can be done by a recognised elephant expert and trainer. The audit should include:

- Existing staff ability.
- Individual elephant's health and behaviour.
- Facility design.
- The goals, structure and protocols of the in-house elephant programme in relation to the needs of the institution.
- Zoo management and its relationship with the elephant team.

It is envisaged that the training programme would include the following:

- A recognised 'group' of elephant handlers who work as a team, with a team leader responsible for ensuring that agreed protocols, procedures and training are correctly carried out and implemented.
- Theoretical training on biology of elephants, animal behaviour and operant conditioning.
- Good record keeping on all aspects of elephant and staff management and training and good communication between team members and with the team and zoo management.
- Peer review at regular, agreed intervals
- A structured training programme for all new staff, which follows logical learning sequences, including:
 1. An induction programme, lasting one or two weeks, which would include observation and understanding of the in-house elephant programme.
 2. The trainee must work alongside two fully trained members of staff, and will not be in full free contact with the animals for a period in the order of three months (e.g. the animals could be on chains).
 3. At the end of this first three months the keeper will have a review which will determine whether they proceed with the programme, i.e. whether the trainee and trainers agree with progression.
 4. The length of the programme will, to a large degree, depend on the previous experience of the new team member, but a review should take place at three monthly intervals.
 5. Once the trainee has reached an agreed standard he should be issued with a Permit to Work. This would normally classify

him/her as a trained keeper. Some institutions may prefer to issue several levels of permit to work, as the trainee moves through skill levels. This procedure is recommended (see Appendix 3).

6. Until the trainee has completed the full and final level of competence he/she must work with two fully trained keepers at all times.
7. A good approach is to have different levels of keeper, which reflect abilities and training.
 - At no time should a keeper be alone when working with elephants; there must always be a minimum of two trained members of staff present at all times.
 - A review of each staff member should take place at least once per year. This could be in the form of a peer review of training methods with a senior member of management staff present.
 - It is advisable for members of the team to attend a course at one of the acknowledged elephant training schools where more advanced and independent training can be given covering aspects of elephant biology, anatomy, nutrition, handling skills, rope and chain work, environmental enrichments and other aspects of elephant management. It is important that the course operates under the principles of creating an elephant friendly environment.

It has been suggested that a grading system be adopted of various levels ranging from no elephant contact to contact under supervision to contact for training.

Elephant keepers should be encouraged to attend elephant management meetings and have access to relevant publications and literature. Staff should also be encouraged to attend meetings and workshops of the European Elephant Keeper and Manager Association (EEKMA).

Part of the training programme for all staff must include familiarisation with this document, and the Standard Operating Procedures.

7.3 Standard Operating Procedure: Use of Chains or Shackles on Elephants

BACKGROUND

Historically elephants in zoos and range countries have been restrained, chained by the legs to fixed points for extended periods. A typical regime has entailed diagonal chaining of one foreleg and one hindleg overnight. The main stated rationale has been to avoid aggressive interactions between animals in the absence of human supervision. Other reasons given were to reduce the

likelihood of escape and to condition animals to being restrained in order to facilitate safe practice of routine husbandry activities.

There are a number of concerns that relate to unrestricted chaining. The main concern is that an extended period of inactivity leads to boredom and stereotypic behaviours. Such chaining practices are indefensible on welfare grounds.

There are some acceptable justifications for limited periods of chaining. Veterinary procedures clearly may necessitate some physical restraint to ensure human safety and to obviate the possible risks of chemical sedation. Another example, which depends very much on individual animal characteristics and management judgement, would be whether to opt for some restraint during parturition. Chaining is also recommended during transportation. The current EEP guidelines place a limit of no more than an average of three hours chaining out of 24, under normal conditions. In some situations (particularly transportation) webbing is used in preference to chains. In all situations it is important that compatible equipment in terms of strength and resilience is used.

OPERATING PROCEDURE

Ownership: all chains and shackling equipment must be acquired and maintained to a specification agreed by zoo management. Any wear and tear which might cause weaknesses in equipment and therefore a safety risk, or possibly lead to injury to elephants, must be avoided.

Authorisation for use and prohibitions: written, generic approval of routine chaining must be given by senior management in a zoo. In addition the parameters of exceptional chaining must be defined and compliance with the EEP draft guidelines observed and demonstrable

Elephants should not be routinely chained for periods in excess of three out of 24 hours.

Accountable individuals and records: Only named, trained persons may carry out chaining. This may include elephant experts brought in for staff training and/or elephant transportation. Any unplanned variations from routine practice must be documented and management notified.

Training: Keepers will be adequately trained in the procedure and safety aspects followed.

Document revision: The use of chains, shackles and this procedural document will be reviewed at least annually.

SUMMARY

Physical restraint of elephants through the use of chains and shackles should be minimised. There are sound safety and husbandry / welfare management reasons for its continuation at present but the consequences of bad practice are

significant and severe. Looking to the future, alternative methods of physical restraint, such as restraint chutes, may at least partially substitute for chaining. Much will also depend on the degree of human-elephant contact achievable through preferred training regimes and a foreseeable trend of reduced need for washing and foot care with the provision of more suitable environments

7.4 Standard Operating Procedure: Voice Control

BACKGROUND

Whilst means of non-verbal communication by conscious or sub-conscious use of posture, hand and arm gesture and facial expression are undoubtedly used in interaction between keepers and elephants, possibly far more than is generally realised and reinforcement of instructions can be achieved by use of the ankus as a standard item of equipment, the main mode of communication is verbal. The actual list of understood and used words will vary between zoos and the degree of responsiveness between individual elephants and keepers will vary. Some key principles and points of advice are listed below to maximise uniformity of approach between zoos and, hopefully, to guide new elephant keepers as they learn their craft.

OPERATING PROCEDURE

- Voice control as the fundamental medium of human-elephant communication supersedes any other forms including non-verbal and tactile.
- Voice control and body language together project confidence and self-control.
- Voice signals can be used not only for direct commands but also to calm and reassure.
- In a specific zoo, and ideally within a region, all the commands employed should be standardised. A consistent tone and pitch of voice should be used and, if relevant, postures and gestures. In time, as elephants may increasingly have to be moved to different centres to achieve conservation breeding, wider standardisation through a unified training approach would be very beneficial and should be worked towards.
- If an elephant does not respond promptly to a command, repeat the term once and then apply the correct use of the hook. Measured consistency and self-control are absolutely vital and cannot be overstressed.
- Anger, hostility and shouting should be avoided as it ultimately damages a trusting relationship and lessens control. A consistently used sharper, stern voice should be reserved for appropriate situations as should reinforcement of a behavioural command by use of the ankus.

7.5 Standard Operating Procedure: Use of the Ankus or Hook on Elephants

BACKGROUND

The ankus is a tool used to cue the elephant to obey commands. It is, therefore vital that it is used with sensitivity and understanding. Verbal command, body language and use of the ankus are inextricably linked; all relay messages from handler to elephant. Understanding the personalities, characteristics and moods of individual elephants is of paramount importance.

OPERATING PROCEDURE

- The ankus should be always at hand when an animal keeper is working at elephant facilities.
- The ankus should be carried under the arm with the hook facing to the rear, not dangling from a belt loop or stuck in a waistband.
- Cueing should be done decisively in a controlled manner.
- Avoid quick, jerky movements that take the animal by surprise.
- Allow time for the animal to assimilate and comply with the command, but not too long.
- Make the first ankus cue the last one, this goes back to being emphatic in your action e.g. not too hard, not too soft.
- Different (elephant) body regions have different sensitivities and therefore require different pressures. Most sensitive would be any area around the ear, ankles and toe nail beds. (Certain areas e.g. belly, temple, urogenital area and front ankle joints are **out of bounds**).
- Any area where one hooks downwards should be approached with caution, e.g. top of the ear, apex of back. It is easy to increase simple arm/shoulder pressure to entire body weight and cause puncture wounds.
- Additionally, some handlers hook their elephants around the lower edge of the ear (where the pinna meets the side of the face) to lead them. This is an extremely sensitive region and with a correctly honed hook requires minimum pressure.
- Be aware that virtually all 'hooking' sites act directly on nerve centres.
- If natural trauma occurs at a cue site (hook point), this area should not be used until completely healed.
- Occasionally, the handle of the ankus may be used to 'smack' an elephant, never use the hook end.
- Needless or excessive use of the hook will nullify its effectiveness. Elephants may become 'hook shy', flinching and becoming nervous the moment they see a hook.

- Maintain self-control at all times.

SEVERITY LIMITS

These are breached when the handler goes beyond an acceptable level of discipline, punishment or admonishment, as understood within the agreed context of humane elephant management in zoos.

Severity limits have been, or be in danger of being, breached when:

- The discipline becomes disproportionate to the infraction.
- Blood has been drawn.
- Double-handed use of the ankus has replaced normal single-handed use.
- The mode, application and pressure of the ankus becomes uncontrolled and severe.
- There is repeated striking with any part of the ankus.
- The elephant becomes frightened, confused and possibly aggressive. Once an elephant becomes frightened and confused it may assume a conciliatory or submissive stance, but may well have lost sight of the initial command and may also become dangerous.
- A battle of wills replaces rational keeper judgement.

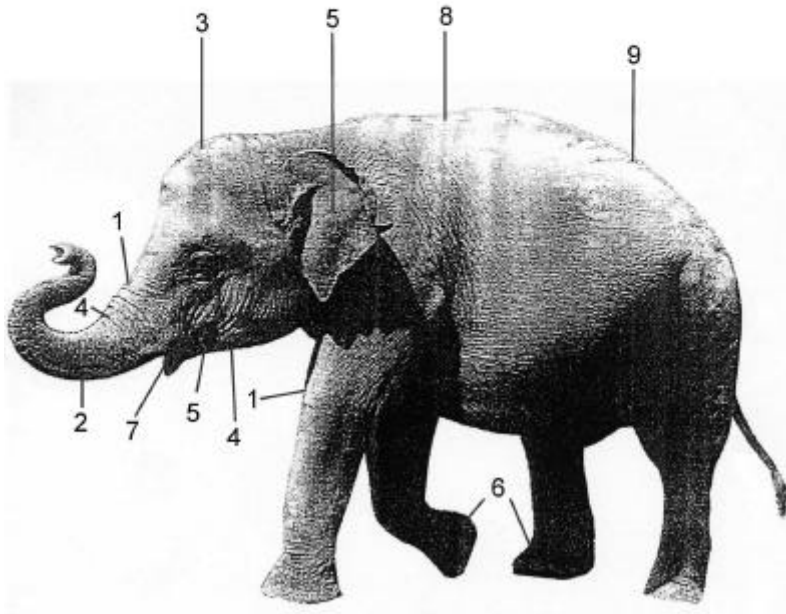
FOOTNOTE

Elephant discipline is difficult at the best of times. This is compounded when on public display and while 'actual severity limits' may not be breached during an on-show keeper/elephant interaction, public perception of events may well be altogether different. Awareness of this always needs factoring in to the handler's thinking prior to any on-display elephant / handler interaction.

The ankus can be made in metal, wood or plastic, the points are made of metal. The shaft is 60-100 cm in length, top point is 2-3 cm, shank point 3-6 cm and the curve 2-4 cm in diameter, depending on the area to be reached (see below). Hook points are demonstrated below.

Elephant Hook Points

1. Steady & Back
2. Trunk
3. Head Down
4. Come Here
5. Move Up
6. Foot
7. Get Over
8. Stretch
9. Lay Down



7.6 Standard Operating Procedure: Use of the Electric Goad or Hotshot on Elephants

BACKGROUND

The use of electric goads has been extensive in the livestock industry, particularly with cattle. It is now subject to more restricted use, covered by guidelines, and under public scrutiny. The use of electric goads on elephants is apparently quite widespread in Europe and North America and general concerns about their use on cattle are amplified by the different perceptions of the public to a zoo species that is known to be intelligent and socially complex with a predominantly benign image in books and films.

There are virtually no scientific data on the physiological and longer-term behavioural effects of the use of the electric goad in elephants. This makes any debate into its justification very subjective. It is felt that a goad can be extremely effective in ensuring keeper safety in difficult situations and it is in this mode of action that justification for its use can currently be found. A review of alternatives to the use of electric goads needs to be conducted with some urgency and identification of safe and practical alternatives will allow their use to be discontinued.

As more information and objective insight is collated it will become possible to review the conditions of use of electric goads on elephants. Until such time the following points must be observed:

OPERATING PROCEDURE

Authorisation for use and prohibitions: The authority to use an electric goad must be given by management in advance of any anticipated use. This authority should relate to specified conditions of use such as movement of an animal to another zoo, a veterinary procedure or other circumstance in which, in the opinion of a veterinary surgeon and the most senior elephant keeper, the animal's temperament may be adversely affected. ***It is not for use in any form of training or as part of a standard husbandry regime. It is not to be carried as a routine.***

Accountable individuals and records: only named, trained persons may use an electric goad.

SUMMARY

The use of electric goads is currently only justifiable in the extreme situation where human or animal safety is seriously at risk and voice control and use of the ankus has failed. For this reason, and given uncertainty about longer term stress and behavioural effects, accepting a stated, humane doctrine of 'giving

animal welfare the benefit of the doubt' it follows that current use of the electric goad must be restricted.

SPECIFICATION AND SITES

The main specification parameters are:

- **Voltage:** 4,000-4,500 volts **maximum**
- **Energy:** 3.5-5 joules **maximum**

It is vital that the above maxima are observed and not exceeded through faulty or non-standard equipment. Models of commercial cattle prods which are also battery powered can operate with varying voltages up to 10,000 volts and 9 joules: these must not be used.

Sites of use for electric goads that have been used are the feet, trunk and area around the base of the tail. It is unclear whether these are sites for general use or in emergencies, but as an instrument of self-defence in a 'last resort' it is more likely that any site would have to be used.

7.7 Standard on Educational Activities Involving Elephants

Educational activities involving elephants can be categorised as follows:

- Static interpretation including signage, interactive devices and informal, unstructured, verbal explanations from keepers.
- More formal and structured /scripted narratives from keepers; often set around routine events such as foot-cleaning and feeding. This category is often described as *Meet the Elephant*.
- Demonstration and explanation of natural behaviours and a limited repertoire of trained behaviours, which illustrate management exercise and veterinary practices at a specific zoo. An example could be *Elephant Walks*.
- Demonstrations or displays of a much wider repertoire of behaviours, which may illustrate aspects of logging and methods of maintenance of physical fitness.

Clearly each of these categories could in practice merge imperceptibly into the next. However, it is important to agree categories that relate to both the breadth of 'unstimulated' and 'stimulated' behaviours expressed by the elephants and the degree of training required to reach each level.

The guiding principles for any educational activity start from the simple statement that the purpose and output of the exercise must be *truly educational* and must stress aspects of elephants' natural biology and behaviour and provide insight into their safe, humane and healthy management in zoos, their conservation status and zoos' roles in securing their future. There are two vital

considerations in the establishment of more comprehensive demonstrations. The first is that any artificial or anthropomorphic behaviour may at best serve to distract people from real educational conservation messages and at worst shade into circus-type shows which do not maintain the 'dignity' of elephants. The second consideration may be less noticeable to members of the public but has a greater negative impact on the welfare of the elephants. It relates to the potential for chronic physiological and behavioural stress from a more intensive training regime and demands for less natural postures such as headstands. Thus elephants should not be trained to perform such routines as headstands and postures standing only on the hind legs. There must be a demonstrable net welfare benefit from more intensive training regimes.

A further, absolute, principle is that human safety, of both visitors and staff, must never be put at risk because of an expectation that educational activities must be presented. For these, and other activities, the provision of updated Risk Assessments is essential. These must take into account variable factors such as new keepers, changes to facilities, changes in group composition etc.

Elephants should not normally be taken outside of the zoo for display purposes.

INTERPRETATION

All collections should have a programme to educate visitors about elephants and issues relating to elephant conservation. Educational graphics and information about elephants should be on display to the public. Messages to convey might include the decline in elephant populations and habitat over the past century (Smith and Hutchins 2000). Zoos can also educate the public about the problems of buying elephant products when travelling, information on why elephants are endangered, what laws are protecting them and what each individual can do to help.

PUBLIC

Some collections allow public contact with elephants, ranging from volunteer keepers, students, film crews to 'meet the elephant' sessions. The public are allowed contact with elephants only when keepers are present. There must be two fully trained elephant keepers present during these encounters, for which full risk assessments must have been carried out.

8. Research

Zoos keeping elephants have an obligation to contribute to our knowledge of elephant biology and management. Much of our knowledge about elephant biology (reproductive biology, analysis of vocalisations) has been gained through research on animals in human care (Smith and Hutchins 2000). Research on chemical communication is presently being carried out on animals in human care which may eventually be of use in manufacturing a repellent against crop-raiding elephants.

Technologies relevant to field conservation can be tested on animals in zoos and other facilities before being used in nature. Contraceptive methods may prove to be of use in controlling populations in the wild. Work on extracting DNA from faecal samples, perfected on zoo elephants, is of great use in determining relatedness between individuals in the wild.

Other research topics that require more work include: vitamin E in diets, hormones and reproduction, measurement of faecal steroids, cognition and special memory (Olson 1994). Autopsies may provide very useful material for research.

There is a great need for survey work to aid our understanding of good husbandry practice with regard to management and training regimes, enclosure design, structure and size and group composition. Collections should encourage research on the use of enclosures, especially when animals are given access to and/or moved to new areas (Rees 2000b). There is a great need for monitoring of behaviour within groups of kept animals (Garai 1992), and methods for establishing useful behaviour profiles. Researchers should be encouraged to undertake this sort of project and collections holding animals should make it a priority to fill in and return research questionnaires. Further work, taking in more collections, on circumstances surrounding an elephant attack such the preliminary work recently carried out by Ray (2002) is required.

Each zoo should contribute in some way to field conservation of elephants and their habitats. This can be done through the elephant TAG. Financial, personnel, logistic and other support can be provided for research and conservation programmes.

9. Public Relations and Elephants

Zoos are often criticised for focusing on charismatic mega-vertebrates. However, although the public can and do appreciate and learn from smaller and invertebrate species, there is a natural human attraction towards large life forms that can be easily related to. On the charismatic mega-mammal scale you cannot reach much higher than the elephant; not surprisingly, they are a top profile animal in zoos. Nothing attracts more positive public and staff attention and an increase in visitor numbers than the successful birth of an elephant. However, injury to a keeper or the death or illness of an elephant also creates much public interest, as does any perception that the animals might not be in a benevolent environment, exhibiting abnormal or stereotypic behaviours or being treated in a cruel fashion by staff. The elephant is a flagship zoo species and, as has been pointed out in the introduction to this document, zoos have a particular responsibility to manage it well. Managed well, in a good environment, elephants provide a wonderful message to the public about conservation, trade in animals and animal parts, habitat protection, animal-human conflict and the importance of maintaining biodiversity for the future of the planet. In fact a well cared for elephant group, exhibited in an enlightened fashion, can get a wealth of important messages across to zoo visitors. This, of course, is why a sound education policy and approach to interpretation is essential.

There has been a revolution within the zoological profession within the last 20 years and this has taken place rapidly (Allen 1995). This revolution is linked to changes in environmental and animal welfare values and understanding. Along with these, our approach to elephant management has changed enormously. Zoos are changing or have changed from menageries to conservation organisations but this rapid change is still surrounded by problems; these problems invoke criticism from those groups who are philosophically against the keeping of animals in captivity and expect the zoo world to have created instant solutions. The elephant, because of its history of coexistence with people and high profile, often finds itself in the centre of this debating stage.

It is therefore essential that collections keeping elephants explain their management philosophies and protocols to the public and have literature available to public, staff and press. EAZA members can explain how they conform to the recognised standards and, through cooperative management, work to continuously improve conditions, husbandry and breeding.

It is important that the public understand why elephant keepers carry an ankus, what it is and how it is used as an elephant training aid. They should also be aware of methods taken by collections to ensure staff and animal safety. A good zoo should be proud of the way it manages its elephants and not try to keep methods secret.

If a collection is well prepared with its elephant information then it will be quickly able to provide essential background copy for both good and bad events. In the nature of things, both will occur, and both will attract attention.

A useful guide to managing the media is provided by the Indianapolis zoo (Gagen 1999), on the occasion of a keeper being seriously injured by an elephant. Gagen stresses that although it is not possible to plan the exact steps that will be taken when an emergency occurs, it is essential that you have planned ahead for such an event. Key issues are:

- Maintain good ongoing relations with the media.
- Do not assume an adversarial relationship: do not treat the media as adversaries, try and work with them in a partnership. The media can smell a cover up from a mile away.
- Find out what happened – fast: get a first hand initial assessment. Zoo staff need to be geared up to expect this.
- Recognise the implications of the media response: the public's reaction to anything that happens in an institution is based to a large degree on how the media interprets information.
- Just tell them what happened: don't start filtering information, put together one version of events for everyone that is accurate, concise and straightforward.
- Make information complete and short: make sure the account is clear and accurate.
- Never, never lie: everything leaks, your lies will find you out.

It is useful for a collection to have an internal communications system in operation for such media purposes.

Some of the more unfortunate events concerning elephants may require the implementation of the zoos crisis management plan. All collections should have such a plan which requires the formation of a crisis team and a crisis communication plan (AZA 2000). The crisis management plan should incorporate the following elements (Rosevear 2001):

- Management representation.
- Chain of command in the absence of the Director (scheme of delegation).
- Representatives from other sectors of the zoo including, as necessary, veterinary, PR, legal, health and safety personnel etc.
- There needs to be a periodic review of the team's composition.
- The team needs to communicate membership of the team and changes to staff.
- Good internal communication plan to quell rumours; keep staff informed and provide them with copies of any press releases.
- A spokesperson should be appointed, (e.g. the head of PR) and that should be the only person who talks to the media.
- A contingency plan needs to be prepared which should be rehearsed and reviewed as necessary.

All members of the EEP must let the TAG chairs know if the EEP policy or parts of it are used in any media campaigns involving their elephants, regardless as to whether the coverage is positive or negative.

10. Management Audits and Document Revision

BACKGROUND

Our knowledge of elephants, their biology in the wild and management in controlled environments, is increasing at a rapid rate and the need to conserve their habitats has never been more critical or more urgent. It is therefore essential that zoos carry out audits on their elephant management programmes and protocols at regular intervals and that this document, its recommendations and procedures, be regularly reviewed and updated. Both processes require teamwork and cooperation. Sally Walker refers to the three C's of Conservation and the three E's of extinction with regard to elephant management. The C's are communication, cooperation and collaboration and the E's egoism, envy and elitism (Walker and Namboodiri 1996). This concept very much sums up the way forward for elephant management in Europe. It is only by practicing the three C's that we can eradicate the historical baggage of the three E's which have plagued moving elephant management forwards and even now still hinder its development.

METHODOLOGY

It would seem that the best method for ensuring an effective audit process is through the European Elephant TAG, which incorporates management and keeping staff of holding collections. An annual meeting of the Elephant TAG should have time set aside to compare objectives or key performance indicators against achievements for the year, this could be combined with a five or ten year plan for elephant management in European collections. The objectives/targets would be reviewed and updated as part of this annual process. The following is suggested as a management audit process:

- Key areas for population management drawn up with yearly targets for each institution, both for collections currently holding elephants and those intending to hold. This, obviously, is part of the EEPs.
- Key areas regarding elephant management be listed with targets for each holding institution; incorporating the areas of elephant training, staff training, management methods, facility improvements and general elephant husbandry and management.
- Key areas for expertise sharing which would include:
 - Risk assessments.
 - Review of accidents involving elephants (both to public and staff).
 - General husbandry.
 - Nutrition.
 - Medical care.
 - Problems and advances in elephant reproduction.
 - Advances in our knowledge of social behaviour.
 - Review of training and management techniques in use.

Using the information gained from the above audit process, the following is suggested for document review:

- General review of document, updating of bibliography with new references, text with new information.
- Review of husbandry protocols

It is considered imperative that this process be set in motion through a meeting of the Elephant TAG and the process incorporated as part of this document

11. Appendix 1: Risk Assessments

Risk assessment should be carried out for each keeper for each elephant. A list of jobs (tasks) should be compiled such as:

- Off chains: handling/leading/walking
- Off chains: washing
- Chaining
- On chains administering an injection
- On chains blood sampling

The hazard value of each job needs to be described and graded e.g. minor, serious, major and the likelihood of occurrence needs to be assessed e.g. low, moderate, high. A risk score for each job for each animal for each keeper can then be assessed and a Safe Working Procedure (SWP) listed. The best way of presenting the information is in a tabular format.

All potential hazards concerning enclosure design need to be taken into account as to any zoonotic risks. Temporary use of areas, such as those electric fenced, also need to be taken into account.

Risk assessments for any public/elephant contact also need to be carried out. Areas to be considered are:

- Separation of public from elephants
- Which elephants can participate
- Disease risks elephant/ public and public/elephant
- List possible contact risk areas
- Staff numbers and seniority level of staff present
- Risk to keepers handling elephants in this situation

12. Appendix 2: Elephant Profiles

The following information should be recorded

- Statistics (age, parentage, movement etc)
- General disposition especially degree of predictability
- Relationship to other elephants and social status
- Training, methods used, important points to note
- Handling recommendations
- Past history especially of misdemeanours
- General health, especially problems than may cause behavioural changes
- Breeding history and status
- Other areas / miscellaneous

Information on the relationship of elephant to individual handlers, especially differences, should also be included in the profile. It is advisable to back up the profiles with some observational behaviour projects carried out by trained individuals.

13. Appendix 3: Staff training

A good method of training is to have a system which categorises handlers into *trainee* and *qualified*. There would be two or more levels within the trainee category and similarly within the qualified category. There should be a Elephant Management Training programme with an evaluation system for each level. The evaluation would have both theoretical and practical elements. Keepers would not have any direct handling or training of animals until they had passed trainee level one, and must be supervised by fully qualified staff at all times. A suggested programme outline is given below.

Trainee Level 1: entry level for new staff. Duties include cleaning and other related elephant care duties, familiarization with enclosure workings, door movements etc. They must become familiar with all elephant protocols. Trainees have contact with elephants only with permission from, and in the presence of two qualified elephant handlers.

Trainee Level 2: Duties may include care contact with elephants, such as feeding, watering and bathing, protected contact training and observing basic foot care etc. They learn the commands and hook points used by handlers, they could begin giving commands.

Qualified Level 1: a level 3 trainee must have two qualified elephant handlers present until they demonstrate that they are proficient with the basic behaviours of individual animals. Duties include manipulation of elephants in free and protected contact within the zoo's protocol.

Qualified Level 2: this level involves the keeper being taken through, and able to perform, all aspects of elephant management in the collection.

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