

## APPENDIX

### SUMMARY RECOMMENDATIONS FOR CAPTIVE POPULATION FROM P.H.V.A. WORKSHOPS

#### Sangai (*Cervus eldi eldi*) — Mysore, 1992 — Captive Population Recommendations

1. An enhanced captive population should serve as security against catastrophe and possibly for reintroduction programmes. For this, the captive population should be increased as rapidly as possible by improved management assisted by recent advances in reproductive physiology
2. The captive management of the species must include marking of individual animals, scrupulous maintenance of birth, transfer and death records, including infant mortalities. Demographic and genetic information should be utilised in strategic management and collection planning for the species.
3. The present captive population should be managed for maximum genetic variance through a system of exchange of individuals among zoos. Judicious import from the wild was also recommended although not supported by all in the workshop.

#### Lion-tailed macaque (LTM) (*Macaca silenus*) — Madras, 1993 — Captive Population Recommendations

1. According to the Report of the Modelling Group, the maintenance of a healthy stock of LTM in captivity is crucial for intensive metapopulation management, e.g. providing genetic material for wild population by reintroduction of live animals or of germ plasm.
2. All breeding of LTM is to be conducted under the recommendations of the Regional Species Co-ordinator who will be responsible for liaising with the International Studbook Keeper and coordinating the eight zoos identified as Conservation Breeding Centres for the country. These Centres shall manage their LTMs according to the national coordinated Breeding Programme, observing genetic and demographic principles and cooperating with International efforts such as the Global Animal Survival Plan for LTM.
3. In order to achieve conservation management goals, each animal is to be individually marked, by a tattoo or transponder and each animal is to have an individual record card and veterinary history. A copy of this should accompany the animal being moved from one institution to another.
4. Husbandry measures for LTM should be in highest quality of modern management including regular veterinary screening of both LTM's and their keepers; enclosures designed with consideration of the behavioural and biological characteristics of the

animals; inclusion of environmental enrichment devices; training in modern methodology for staff and keepers with regular updates; exchange of information between the facilities holding the species. Diet should ensure that all animals receive optimal nutritional requirements, especially animal protein as vertebrates and invertebrates make up 37.3% of the diet in the wild.

**Asiatic lion (*Panthera leo persica*) — Baroda, 1993 — Captive Population Recommendations**

1. A genetically pure, healthy captive population of between 400 to 600 animals should be developed taking care to provide for the genetic diversity and demographic stability for the long term.
2. Hybridization has seriously affected the integrity of the captive population of the Asiatic lion in the past. Therefore the zoo community should identify the genetically pure lions and permanently identify those individuals. The use of transponders at the dorsal base of the tail and tattooing on the inner right thigh shall be done by each zoological institution housing these animals. Studbook numbers should be used for identification whenever possible.
3. Genetically pure individuals should be housed only at institutions that can prevent hybridization. It may be preferable that these animals be kept in facilities which have no hybrid lions. However, if all the hybrids cannot be removed, individual hybrid lion should be sterilized before accepting the facility as a member of the captive breeding programme.
4. For ex situ (zoo) breeding programmes, assisted reproduction (techniques like artificial insemination) should be developed for overcoming problems associated with sexual incompatibility, cases of organic infertility and aged or under-represented founders unable to contribute to species preservation. This will also be useful for implementing the controlled breeding strategy with fewer complications such as transport of large animals.
5. Veterinary research on captive populations of the Asiatic lion should be initiated. A full time researcher with veterinary background should be employed on this long term project. A complete disease diagnostic laboratory at Sakkarbaug Zoo should be established. Research topics identified by the working group: a. Establishing the normal physiological values of the Asiatic lion; b. Research on the probable causes for juvenile mortality; c. Investigation of epidemiology and therapy of myiasis (maggot infestation)

**Indian rhinoceros (*Rhinoceros unicornis*) — Jaldapara, 1993 — Captive Population Recommendations**

1. The zoos that have had breeding successes should be given priority when pairing or supplying animals.

2. Mates should be provided to proven breeders in different zoos so that maximum breeding potential is realised.
3. The use of Guwahati Zoo as orphanage for young rhinos stranded during flood has affected the management of the other rhinos in the zoo and should be curtailed. The orphanage should be attached with the Kaziranga National Park or other rhino rearing areas where facilities could be established to rear young animals. If surplus females are available from the orphanage, they may be kept for the ex-situ breeding programme while surplus males could be used for re-introduction research.
4. A feasibility study should be undertaken to determine if indeed reintroduction of captive born rhinos into the wild is a viable possibility and what captive management activities should be undertaken to ensure a successful project. This could be done in consultation with the Reintroduction Specialist Group, SSC, IUCN.
5. All data related with each individual, namely date of birth, date of any acquisition, transfer, date of death and cause of death should be sent to the National Studbook Keeper (Kanpur Zoo), the Species Coordinator (Addl. I.G., Wildlife), and Central Zoo Authority. The National Studbook Keeper should take all the responsibility to send all information to the International Studbook Keeper.
6. All the zoos that maintain the species should have educational materials available to the visitors and they can be in the form of signage, brochures, or pamphlets in the light of conserving the species.

#### **Indian gharial (*Gavialis gangeticus*), Gwalior, 1995 — Captive Population Recommendations**

1. Individual identification marking of gharial should be done using a standardised code to facilitate planned captive breeding. Preparation of a studbook should be carried out and maintained with available gharials in zoos/gharial rearing centres.
2. It is recommended to have detailed investigation with the help of disease diagnostic laboratories to come to definite conclusion about the disease responsible for mortality and to find out the proper prescription for cure.
3. Detailed investigation with the help of disease diagnostic laboratories should be carried out to arrive at definite conclusions about diseases and causes of mortality. Better management practices which include prophylactic measures may be undertaken as well as proper prescriptions for treatment, developed with collaboration between veterinary institutions and captive rearing centres.
4. The number of hatchlings to be reared should be decided strictly according to the requirement of the stock intimated by the concerned authorities responsible for reintroduction programmes.
5. Rearing procedures for hatchlings should be standardised and these standards strictly maintained to ensure maximum production of gharials from eggs produced in captivity.

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