July – August – September 2004
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EAZA News

Photo: Rob Doolaard/IZP

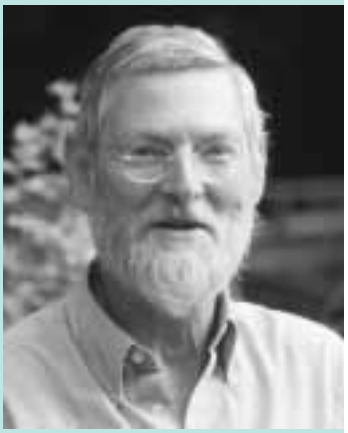
Contents

ELEPHANT SPECIAL

Towards a healthy and self-sustaining population of elephants in Europe

From the Chairman's Desk

Dear colleagues,



Two papers in this issue of EAZA News are of special interest for further reflection: those on the recent developments of the African and Asian elephant EEP populations. Both programmes started virtually from scratch in the 1980's, with populations in which successful reproduction rarely occurred, and with little or no sense of cooperation between holding institutions. After twenty years of hard work, struggle, regular disappointments, endless debates and often discouragingly slow progress, in 2004 the conclusion is that there is reasonable hope for both elephant populations to become self-sustainable in the near future. This is a victory for those who have steadfastly believed that joint population management is ultimately the only way the zoo community can go.

Nevertheless, both elephant programmes also conclude that – in order to reach the ultimate goals of population size and sustainability – additional imports from the wild are still needed. And in spite of the success story of joint management, it is exactly this limited demand for animals from the wild which, especially with elephants, but also with other charismatic species, often stirs considerable commotion and protest from animal welfare groups, and sometimes even from fellow conservation organisations. Why is this so? Should imports from the wild be strictly condemned? Should the absolute and ultimate goal of zoo breeding programmes always be to become totally independent of supply of wild animals? The answer is definitely 'no'. The ultimate goal of zoo breeding programmes has always been, and will always be, to support survival of populations in the wild, together with their natural habitats. Whether this support is in the form of education, awareness, fundraising, research or interactive *in situ* and *ex situ* population management, occasional imports from the wild may very well be part of the strategy.

Import of wild animals is perfectly legitimate in many cases, and directly or indirectly in the interest of conservation. CITES allows export quotas in order to promote sustainable harvest from wild populations. Countries with active confiscation policies to restrict illegal trade are facing the problem of what to do with thousands of captured wild animals. National parks with strict protection measures often have to deal with considerable surpluses of certain species because of confined park boundaries. Critically endangered populations may benefit from bringing founder individuals into captivity…

Why then do zoos attempting to bring wild animals into their populations regularly encounter media alerts and criticism? The reason for this seems to be that zoos are often still highly individualistic where imports from the wild are concerned, despite having definitely learned that cooperation is of utmost importance in managing captive animal populations. This individualism tempts zoos to respond to offers from dealers. Unfortunately some of these dealers do not seem interested in working according to acceptable conservation and ethics standards, and have no scruples in finding ways around national and international laws and rules. Each time this happens (and there are many examples, including elephant ones) the zoo cause and credibility is seriously harmed, leading to considerable damage to the zoo community's mission of conservation, education and awareness.

Why do we let this happen? If we have come so far in managing our populations cooperatively, if we so honestly believe in the importance of these populations for conservation, and if we are so convinced of legality of additional imports for this cause, why don't we then finish the job? Finish the job by working together to organise the required imports in close harmony with governmental authorities and conservation agencies? This would seem much better than leaving this part of the work to others, and risking severe criticism or even accusation of unethical, commercially driven behaviour which is counterproductive to our ultimate goals.

Leobert de Boer
Chairman

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Overview of the African elephant EEP population

by Amelia Terkel, coordinator African elephant EEP, Zoological Center Tel Aviv - Ramat Gan, Israel

*The European population of African elephants (*Loxodonta africana*) comprises approximately 40% of elephants residing in zoos world wide and is therefore of significant importance. This presentation focuses on the population since 1980, and how the programme appears to be developing over the next five to ten years.*

Review

In the early 1980's the population of African elephants in Europe was sustained by importation; but by that time it was clear that a major paradigm shift was required in how elephant populations were reproductively managed in zoos. It was no longer acceptable to rely only on importations. There were insufficient males within the population. There was no satisfactory way to conceptually view the scattered groups of elephants as a single population. The EEP for African elephants started in 1993. The EEP initially served as a clearing house for information about the population, but more was required. A watershed in the two European elephant breeding programmes occurred in 1999 when a meeting was held at the EAZA Executive Office, Amsterdam and a statement of purpose and 14 basic action points, relevant to both African

Photo: Frédérich Tardy/Sigean

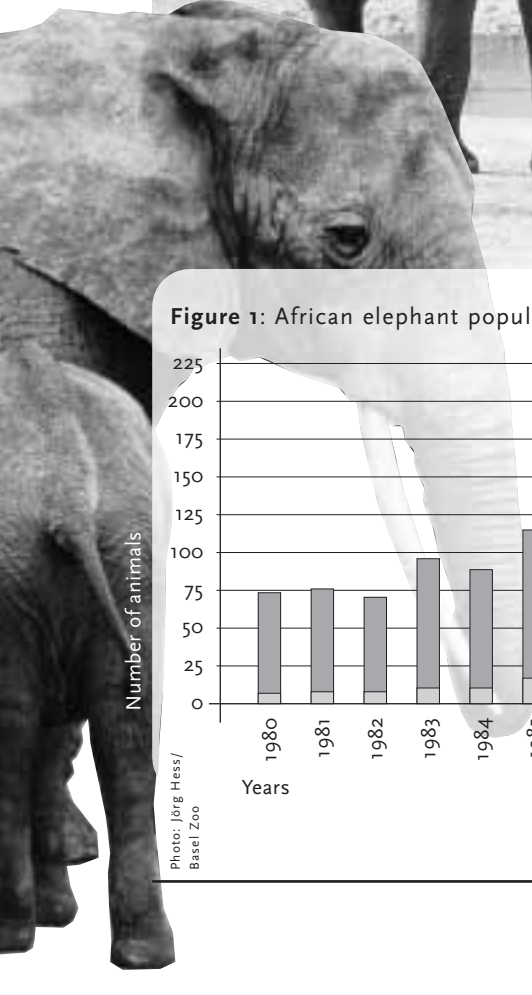
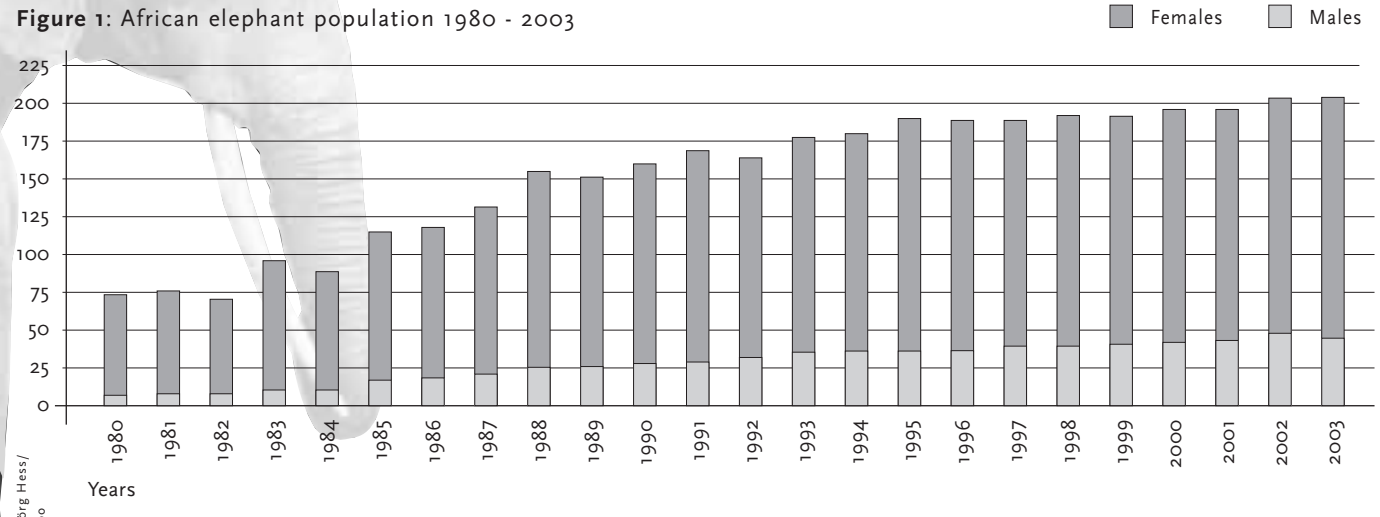


Photo: Jörg Hess/ Basel Zoo

Figure 1: African elephant population 1980 - 2003



and Asian elephants were defined. These action points serve as a living document and have been modified, but still serve as our guide today (see page 44).

The African elephant EEP population at the end of 2003 in zoos was 45.160 (205) in fifty institutions (including four non-EAZA institutions). The population is relatively young. The animals in their late teens and early twenties reflect the importations of the 1980's. The population is heavily skewed toward females in the older groups, due to a selective importation of females; but in the younger age groups the number of males and females is approximately equal, as a consequence of approximately equal number of births of males and females in zoos.

Population developments

The population has more than doubled over the last 23 years (see Figure 1: African elephant population 1980 - 2003). Population growth in the 1980's was mainly due to importations (see Figure 2: Imports African elephants 1980 - 2003) while in the 1990's it was primarily through births (see Figure 3: African elephant births 1980 - 2003). Of the 21.30 (51) births since 1980, 38 have occurred during the last decade. Of those calves born, two died on the day of birth and two during the first week; the remainder survived the first year and 39 are alive today. Two of the calves born were conceived by artificial insemination (AI).

Births and deaths are matched over this 23 year period (see Figure 4: African elephant births and deaths 1980 - 2003). At this point in time the crude rate of growth of the population is 1.04, so it appears to be self sustaining. Our current annual number of births based on the last four years is six.

The percentage of captive born animals in the population is 17% and rising. Currently breeding is taking place in ten institutions (see Table 1: Living proven breeders African elephants 2004). The number of living proven breeders is now 10.30. Recruitment of new breeding groups to the population will most likely be through herds of young bulls and cows now at zoos including Beauval, Duisburg, Wuppertal, Basel, and Safari Beekse Bergen (Hilvarenbeek).

We also have several breeding age cows without bulls in a number of institutions; the owners of many of these animals are sufficiently committed to find out whether the cows are cycling. Non-invasive techniques of hormone analysis in urine or faeces pioneered at the German Primate Center Goettingen (see page 26) are used, and AI is being attempted with

Figure 2: Imports African elephants 1980 - 2003, total 132

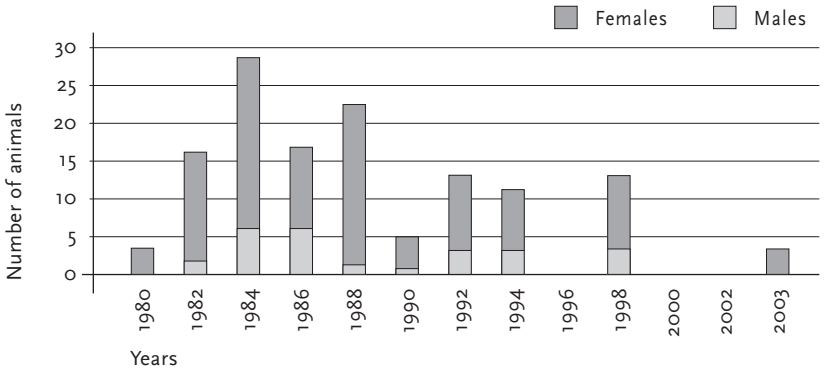


Figure 3: African elephants births 1980 - 2003, total 51 (22.29: 4DNS)

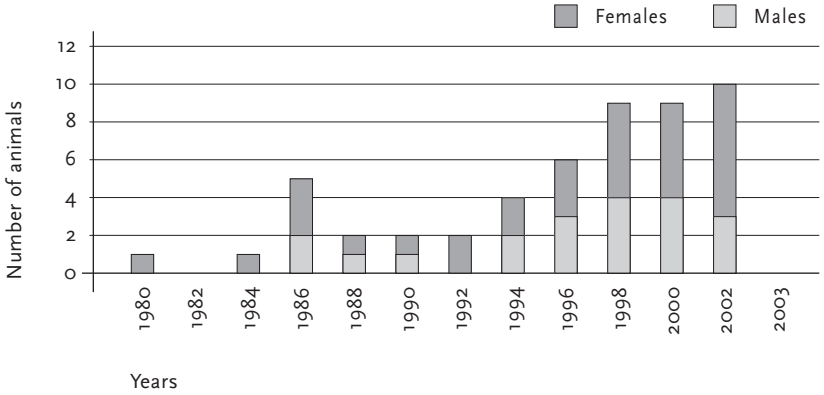


Figure 4: African elephant births and deaths 1980 - 2003

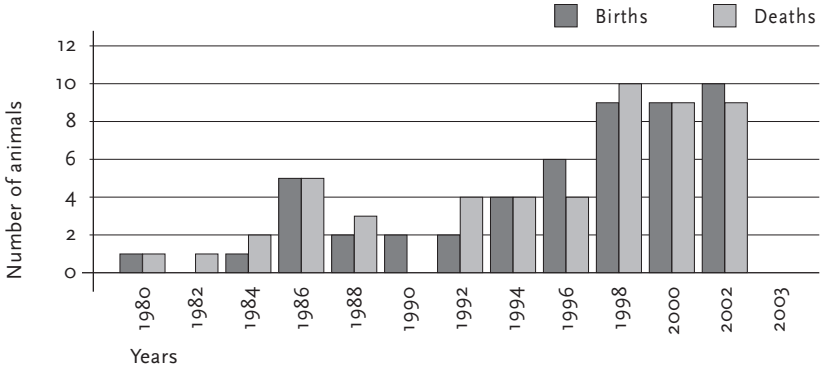


Table 1: Living proven breeders African elephants 2004*

INSTITUTION (shortname)	FEMALE	LAST BIRTH	BULL
Bekesbourne Total Births 3.5	LARA/7702 (CB)	7.1994	JUMS/8708
	SARA/7801 (CB)	5.1994	
	TAM1/8704 (CB)	4.1997	
	SWANA/8502	8.1997	
	STAVIT/8706 (CB)	10.1998	
	MASA/6910	8.1997	
Berlin Tierpark Total Births 1.2	PORI/8102	5.2001	TEMBO/8503
	BIBI/8505	1.1999	
	SABAH/8504	4.1999	
Boras Total Births 0.2	SHONA/9003	3.2003	KIBO/7704 (CB)
	DUDU/9004	8.2001	
Cabarceno Total Births 4.5	PENNY/8002	2.1995	CHISCO/8603
	ZAMBI/8101	3.1999	
	LAURA/8308	3.2004	
	GUSTL/9008	4.2003	
	KIRA/9501 (CB)	8.2003	
Colchester Total Births 1.1.1	TANYA/8104	12.2002	By AI TEMBO/831.10
	ZOLA/8206	2003 **	
	ROSA/8311	3.3004	
Prescot Total Births 0.3	SHABA/8402	1.2003	KRUGER/8403
	BUTA/8302	4.2004	
	TAWA/8701	4.2003	
Lisboa Zoo Total Births 1.1	JANE/8904	1.2004	JOHN/8903
	NINA/9005	4.2003	
Ramat Gan Total Births 9.7	BAHATI/6401	5.2001	YOSSI/7402 (CB)
	NORRIS/6906	1.2002	
	yoki/9002 (CB)	2.2001	
Sigean Total Births 1.3	SIMBA/8306	12.2003	NDUME/8407
Wien Zoo Total Births 1.1	SABIE/8501	4.2001	By AI TEMBO/8310
	TONGA/8604	5.2003	PAMBO/920
SUM BREEDERS	**30**		**10**

* includes only living females which have bred in the last ten years
** full term foetus retained in utero
CB captive born
Total births: from 1980

one of these females. If our goal is to achieve population growth, it really is necessary to make the (considerable!) effort to bring these females to males. Projections made using simple modelling from PM 2000 indicate that the population will remain stable at six births per year. Population growth to 250 animals over the next ten years requires ten births per year (but see further on where the trend seems to be for 350!).

What other life data do we have?
There are 37 founders, 41 living descendants, and gene diversity is currently 0.949.
The youngest African elephant dam was just under eight years of age, the oldest dam was forty. Mean age at first reproduction has been 14.5 years, mean age of reproducing females seven years. The shortest inter-birth interval has been 782 days. The largest number of calves produced by one dam is six.

The youngest African elephant sire was eight years and ten months, the oldest 29 (because there are no older bulls in the population yet).
Longevity data show that the oldest living animal is over 53 (estimated, since wild born). A complete population analysis is currently underway by a MSc student at the University of London (supervised by the Zoological Society of London).

It should be mentioned that among the differences between African and Asian elephants in the EAZA population, the clearest seems to be survivorship of young on day of birth, with Africans showing almost no perinatal death while Asians show relatively high stillbirths and day one deaths. This difference does not pertain to the SSP population, where both species have a high neonatal death rate. In North America the African elephant SSP population is 34.202 (as of 2001). From 1980 through spring 2003 there were 35 births; of which 11 were stillborn, seven did not survive and 17 are still alive. There are currently additional pregnancies. A discussion of factors of neonatal mortality is presented in this issue on page 20.

Where do we go from here?
An EAZA-wide space survey for African elephants carried out in 1999 indicated that the expected population size in 2004 would be 37.149 and in 2009 35.152. We have already passed these numbers. A second space survey was sent out to all elephant holding EAZA members this last winter. Of the 32 respondents for African elephants, 12

From the African Elephant EEP

Photo: Knowsley Safari Park

are planning to build or rebuild over the next ten years (see Table 2: New elephant enclosures); of these, six institutions plan totally new facilities and do not have elephants while six are remodelling and do have elephants. For those that do not have elephants now there is a projected need of approximately 7.24 animals. If we take the survey trend at face value the population trend is from 204 animals today to 350 in ten years! This is a remarkable planned increase, perhaps testifying as much as anything else to the drawing power of elephants for the general public, and to the relative success of managing this population at the moment.

Where will these animals come from?

It will certainly be possible to provide males from within the EEP. Provision of females from within the EEP could come from splitting off a matriline or a group of female half sibs. This may be possible if the institutions breeding African elephants run out of space! Recruitment of new animals can come from two other sources: importation from the wild and circus animals.

Although importations from some range states are certainly legal, there is a cachet of bad feeling around them, partly because vociferous and well organised animal rights groups that are against importations on the grounds of elephant welfare. They generated a great deal of international animosity at the time of the 'Tuli' importation of 1999 in which three European zoos were involved and in the United States in 2003 when two zoos imported African elephants. If importations occur in the future, it is recommended

Photo: Knowsley Safari Park

Table 2: New elephant enclosures. (new locations)

INSTITUTION (shortname)	Ready in	Elephants
Augsburg	2013	1.3
Cambron-Casteau	2004/2005	0.3
Erfurt	2006/2007	1.6
Kiriat Motzkin	PLANS	
La Fleche	2005	0.2/3
Magdeburg	2007/2008	1.3/5
Montpellier	2005	1.1
Osnabruck	2006	1.5
Poznan	2009	2.6
Rostock	2013	1.5
Nyiregyhaza	2005/2006	1.3/4
Valencia	2007	2.6
12 Institutions		11.43/47

to make direct contact with the responsible officials in the range states and not through dealers.

A large population of circus elephants exists in Europe, especially in Germany, Spain and Italy. Many of these animals are African elephants under twenty years of age, imported after it became impossible to import Asian elephants. Since 1980, at least 5.7 of these animals have been given up by their owners or confiscated, and have found places in the zoo population. Some animals are waiting today for spaces in zoos and it is likely that this trend will continue. From the animal welfare point of view it is important to accommodate these animals in zoos. Although some of these animals surely suffer from health and behavioural issues, others may continue to live a healthy, productive, even reproductive life in zoos.
Contrary to some popular ideas that circus bulls are unable to breed, at least one became a breeder (the bull in Obregón, Spain), and others are likely to be breeders shortly.

Non-reproductive groups

We can see that tremendous progress has been made in population growth, but progress creates its own problems. On the one hand we seem to appear to be approaching a viable self maintaining population. On the other hand we have the production of a large number of male calves. What should be done with this apparent surplus? One of the points of our forward planning was to establish bachelor groups for elephants. So far two institutions that have agreed to take on variants of such groups.
A large facility in Sevilla (Castillo de la Guarda, Spain) has three male African elephants from three different sources. Two bulls and one male calf (the calf since died) are in an enclosure with two cows and female calf. The amount of physical space available to these animals is immense and the animals are outdoors all day long. Warsaw Zoo, in a cold climate zone, has received two captive born bull calves from Ramat Gan with the plan that one will move on as the calves reach puberty.
It will be important to have behavioural observations to follow up on these animals to see how they develop socially. Significantly for the overall programme, the 2003 space survey shows that no further zoos are interested in starting a bachelor group. This dilemma must be further discussed and resolved.
A further important issue is that of older females. Only four zoos indicated willingness to house a group of older non-reproductive females. We should not forget that these animals do play a positive role in education.

Conclusion

In summary, the African elephant population in European zoos seems to have a good future ahead of it, but it will still require all our work and cooperation to achieve not only a healthy population, but also good conditions for the animals to live in.

Acknowledgements
Many dedicated people have contributed to the success of the African elephant programmes from all levels of expertise – from keeper, reproduction, veterinary, behaviour, nutrition, management issues, many on their own personal time. The success of this programme is a tribute to all of you, your institutions and management.

Photo: Harald Schwammer/Schönbrunner Tiergarten

From the Asian Elephant EEP

Thanks to good cooperation and combined efforts

by Ton Dorresteyn, Coordinator Asian elephant EEP, Rotterdam Zoo, the Netherlands

Photo: Rob Doolaard/IZP

*The general view regarding the European Asian elephant (*Elephas maximus*) population was not very optimistic in the mid 1990's. Although the reproductive rate had slightly increased, the possibility of creating and maintaining a healthy self-sustaining population in Europe was still very far away. The demographic situation was not good, the reproduction rate was still too low, serious health problems were common and endless discussions about elephant management techniques were occurring. In short, it was not a very good example of how a flagship species should or could be kept in zoos. Of course there were exceptions to this general conclusion, and fortunately the number of exceptions was growing yearly, but still the general picture was bad enough to evoke understandable attacks from animal welfare organisations, interested public and governmental institutions in some countries.*

Planning and management

The Asian elephant EEP and African elephant EEP together formulated the management strategy 'Forward planning and EEP management for elephants in EAZA institutions' in 1998. The strategy was accepted by the elephant keeping EAZA zoos in 1999. Although perhaps nothing completely new was mentioned in this 'forward planning', it has resulted in a major development. While the simple statement that 'all potential breeding females and breeding bulls should be brought into a breeding situation' took a while to sink in (if somebody had said then that in the year 2004 movements of elephants between zoos in Europe would be numerous enough to keep at least one specialised elephant transporting company in business, we all would have laughed), this is occurring. Almost all transfers recommended by the EAZA elephant EEP Species Committees to move potential breeding females into breeding situations have been accepted and carried out. The same is true for potential breeding males, and even proven breeding bulls (usually the pride of the 'owner zoo') have been transported to other institutions and/or exchanged.

The focus on development and maintenance of matriarchal family units in the forward planning strategy has resulted in far fewer separations of female offspring from their mother/sister group. This means that zoos currently unable to house family groups and/or with no plans for creating facilities to do so, will generally only receive older, often 'problematic', non-cycling females. This situation may be at least in part responsible for the fact that dozens of zoos are planning new or renovated elephant facilities and, as can be read elsewhere in this issue, quite a few excellent (simple and palace-like') facilities have already been built.

While accepted as being in the best interest of the elephants, sending a (sub)group of a family group that has grown too large, rather than sending only young animals away as was done in the past, is not an easy decision. Separating two of your best breeding females, each with her (female) offspring, takes quite a bit of resolve. I have seen several colleagues and many PR-department people having such difficulty in explaining to the outside world (and sometimes the 'inside world' of the zoo as well) the reason for such a move that the transfers were hardly accepted. Problems such as this were addressed during the EAZA Elephant TAG meeting in March 2004 in Kronberg, and agreement was reached about how to tackle this recognised problem.

Increasing reproductive rate

Another positive effect of the realisation of the proposals mentioned in the forward planning has been the further increase in the reproductive rate. The number of Asian elephant calves

born has grown to approximately ten per year; the number of reproducing females has more than doubled; and the number of second, third and further births has also increased. While this is not yet enough to reach a self-sustaining population level, I believe that if the current trend continues we will have reached that stage within five to ten years, as long as some other issues are also resolved, i.e. too many calves are stillborn or die at a young age and some zoos still can not accept the idea that the best way to reproduce elephants is to have 'your own' bull (or a good contract with a bull keeping zoo in the region) and rather than building a bull facility would prefer to believe that AI is the solution.
The negative side of producing a large number of offspring, assuming a more or less equal sex ratio, is that accommodations must be found for an increasing number of younger and ex-breeding males. Fortunately, several zoos are prepared to house two or more young males, rather than a family group. That is excellent, and solves housing problems for the next few years, but eventually proper facilities to house quite a few adult males (who are usually so nice when in musth!) will also need to be found.

Research

As said before: although reproduction has improved dramatically within the Asian elephant population, the number of calf deaths is much too high. Deaths are attributed to various causes (e.g. inexperienced cows at first birth; sometimes within inexperienced groups; inexperienced personnel; non-expert veterinary help; pregnant elephant females being too fat), but each of these causes has an underlying cause that requires further investigation. Fortunately, we do see that the number of dead second, third and further births drops to almost nil.

Herpes, tuberculosis and elephant pox are spreading their lethal effects within the European elephant populations. Research to develop effective measures to counter these diseases is ongoing in several facilities, but in the meantime elephants are dying every year.

Photo: Rob Doolaard/IZP

Protected contact method

It was generally accepted at the EAZA Elephant TAG meeting in 2004 that the best management method for the elephants and the keepers is the protected contact method. Protected contact does not guarantee that no unpleasant incidents between elephants and keepers will occur, but it at least diminishes the number of fatal or near fatal elephant-keeper accidents. While further investigation is needed, the survey on accidents made by John Ray of Twycross Zoo in 2003 (see page 27) clearly showed that the number of elephant-related accidents is still unbelievably and unacceptably large. Protected contact requires training elephants, but also training elephant keepers, and this is one of the goals in the upcoming years.

Husbandry Guidelines

In 2002 the RSPCA in the UK published a rather negative report on the way elephants were kept in European zoos. Although the quality of the report was bad enough in quite a few places that the best use of its pages would be for packing your fish and chips, it also contained a number of relevant critical remarks. Fortunately, most of the items raised had already been discussed by the EAZA Elephant TAG at that time, but as said before, we are not yet where we want and have to be. Some elephant holders still find it acceptable from an animal welfare point of view to chain elephants 16 hours per day, and some still doubt the advantages of an unchained female giving birth within her family group. Fortunately, we now have very well-written, extensive husbandry guidelines. These excellent guidelines were originally produced by the UK Zoo Federation but are now accepted (with very few alterations) as the EAZA Elephant Husbandry Guidelines. Another major goal reached in a very limited time!

Status of the Asian elephant EEP

by Rob Belterman, Rotterdam Zoo,
the Netherlands

*The EEP for Asian elephants (*Elephas maximus*) was established in 1991, and the first European studbook was published in 1993 by Kuno Bleijenberg and Rob Belterman, Rotterdam Zoo. This article provides you with an overview of population developments from 1980 to 2003.*

Photo: Rod Doolaard/IZP

Population numbers

The number of Asian elephants in the European population was 33.173 (206) in 72 institutions in 1980. This number grew to 57.239 (296) animals in ninety institutions (including 17 non-EAZA institutions) as of 31 December 2003 (see Figure 1: Census Asian elephants 1980 - 2003). Of these 296 elephants, 176 (59.5%) animals are wild born, 113 (38.2%) are captive born and 7 (2.3%) are of unknown birth type.

A total of 180 elephants died between 1980 - 2003 (see Figure 2: Births, deaths and imports 1980 - 2003). However, due to improved breeding results (121 births), a better survival rate, and importation of elephants from the wild and/or timber camps, the population could grow to a current population of almost 300 animals.

Survival rate

Of the 121 elephants born between 1980 - 2003, 45 died within thirty days (see Figure 3: Births and deaths within thirty days 1980 - 2003); see page 20 for a detailed report on neonatal deaths). The survival rate of neonates during 1960 - 2003 was only 50% in primiparous cows, but was higher for calves born to cows giving birth to second (75%) and third calves (90%; see Figure 4: Survival multiparous births since 1960). Survival rate of primiparous births can be improved by calving within the family herd and by following the guidelines 'Veterinary guidelines for reproduction-related management in captive elephants' completed in 2004 by the EAZA Veterinary TAG advisors Willem Schaftenaar and Thomas B. Hildebrandt (see page 21). Twenty-eight EEP institutions have bred elephants since 1980 (see Table 1: Institutions breeding Asian elephants since 1980). There are 20.57 proven breeders in the population, although not all of these animals are still capable of breeding due to their advanced age and/or breeding conditions. Non-represented bulls and cows need to be brought in breeding situations and over-represented animals should be bred at a lower level. Cows of reproductive age will need to be tested and monitored for cycling. At this moment we have 18 (recently) breeding institutions with a potential of 26 in the near future.

Figure 1: Census Asian Elephants 1980 - 2003

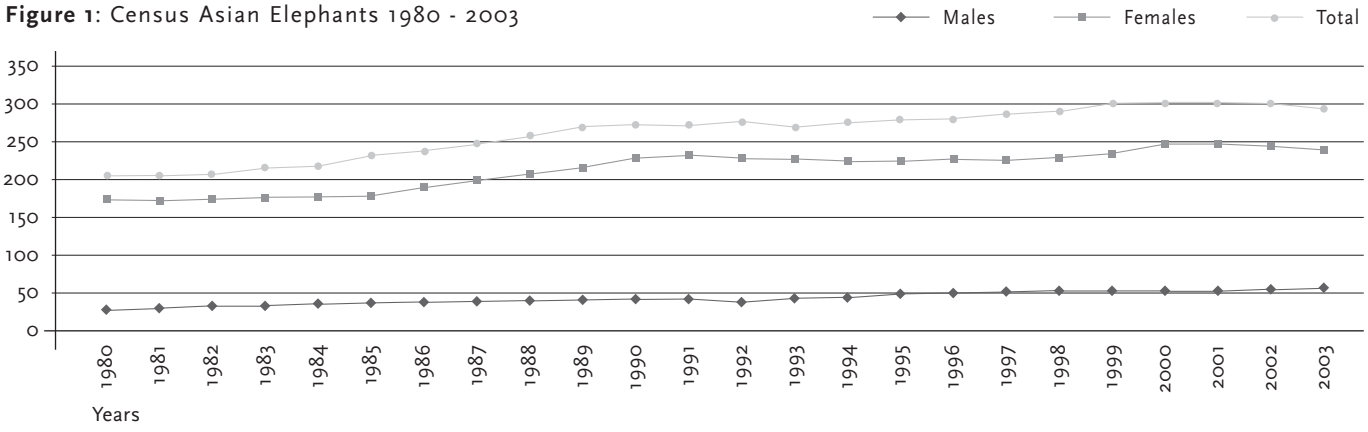


Photo: Jantijn van den Heuvel

Studbook analysis

Analysis of the population using SPARKS and PM 2000 gave the following results: there are 41 founders with 49 living descendants in the EEP population, and the genetic diversity is currently 0.969. The youngest dam at first birth was 5.5 years old, and oldest dam at first birth was 36 years of age. The oldest dam to give birth was 44.5 years. Mean age of females at first reproduction is 16 and the mean age for reproduction is 19.5 years. The shortest birth interval is 703 days. The dam with the most offspring is 'Warda' at Ramat Gan with 11 births. The oldest living female is 'Java' with an estimated age of 59 in Lyon.

Figure 2: Births, deaths and imports 1980 - 2003

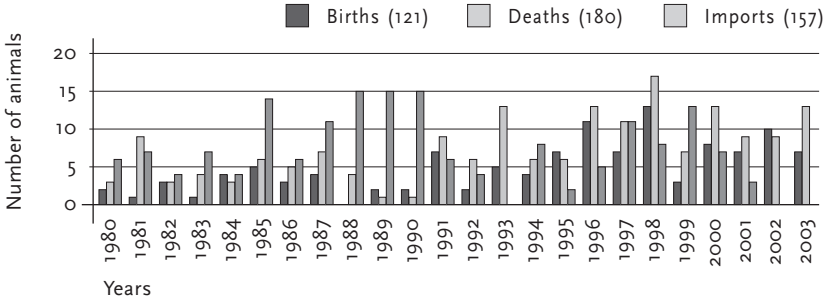
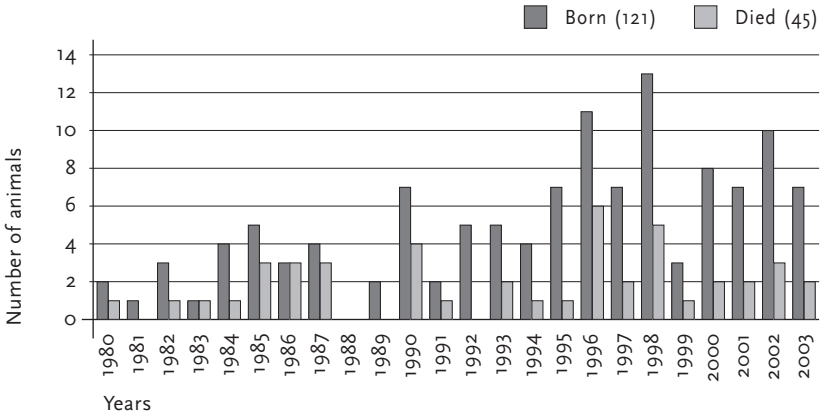


Figure 3: Births and deaths within 30 days 1980 - 2003



The youngest sire at first reproduction was nine years old, and the oldest sire at first reproduction was 25.5 years of age. The oldest reproductive sire was almost 52 years. Mean age of males at first reproduction is 14 and the mean age at reproduction is 21.5 years. The most productive bulls are 'Motek' (Ramat Gan) with 15 offspring and 'Naing Thein' (formerly the breeding bull at Emmen, now in Praha) with 14 sired births. The oldest living male (54) is 'Bahadir' in Izmir. An MSc student at the University of London (supervised by ZSL) will do a complete population analysis later this year.

Forward planning

Twelve surviving births a year are needed to keep the population stable at 300 elephants in 2014. However to fill available spaces calculated from the latest space survey, 31 surviving births per year would be needed to reach a population of 500 elephants in 2014! Part of this growth can be realised by confiscated and/or donated circus elephants or by limited imports of surplus timber camp elephants, but most importantly we need to improve birth and survival rates.

There were 37 responses to the Asian Elephant Space Survey sent out by Martin van Wees through the EAZA Executive Office in 2003. Fifteen

Figure 4: Survival multiparous births since 1960

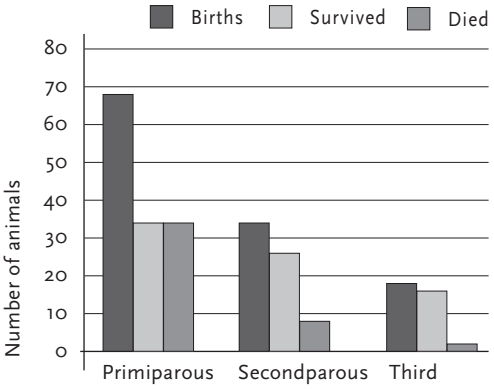


Table 1: Institutions breeding Asian elephants since 1980

INSTITUTION (shortname)	BIRTHS	DIES < 1year	LAST BIRTH	HERD SIZE
Amersfoort	0.1		1999	1.4
Belfast	0.1		1997	0.4
Berlin Tierpark	1.2	1.1	2001	1.7
Berlin Zoo	1.0	1.0	2000	1.5
Chester	4.4	2.0	2004	4.6
Kobenhavn Zoo	5.3	1.1	2001	2.4
Emmen	11.3	2.0	2002	5.10
Hamburg	6.4	4.1	2003	1.10
Hannover	0.3	0.1	2003	1.9
Kaliningrad	2.3	2.2	1995	0.1
Krefeld	0.1	0.1	1985	0.3
Kyiv	1.0		1985	1.1
Les Mathes	3.2	1.0	2001	2.4
Leipzig	1.0		2002	2.4
Lisboa Zoo	1.0	1.0	2003	NONE
Warminster	0.1	0.1	1995	NONE
Lympne	6.2	5.2	2002	3.6
Moskva	1.1	0.1	1995	1.2
Munster	1.0	1.0	1999	1.6
Odessa	1.1		1998	1.1
Paris Zoo	4.3	0.1	1998	0.2
Ramat Gan	5.9	0.5	2002	2.4
Riga	0.1		1990	NONE
Rotterdam	4.8	2.1	2004	2.7
Twycross	0.2		1998	0.5
Whipsnade	1.1	1.0	2004	1.6
Woburn	1.0	1.0	1990	1.2
Zurich	3.4	1.1	2002	1.5

institutions keeping Asian elephants are planning to build or renovate an enclosure over the next ten years and at least four new institutions are planning to start keeping elephants (see Table 2). All respondents but one intend to keep at least one bull. Unfortunately none of the respondents is willing to keep a bachelor group; thus new institutions to hold bachelor groups need to be found in addition to the three institutions already doing so (see African elephants overview, pages 4 to 8, for similar problems). The population growth rate was 0.99 over the last two years, but if expected births in 2004 (12) and 2005 (16) are taken into consideration, the population could be growing slowly.

Acknowledgements
We would like to thank all keepers, curators, veterinarians, researchers and managers for their contribution to the Asian elephant EEP; their dedication in the future will help us to reach our goal: a healthy and self-sustaining population of Asian elephants in European institutions.

Photo: Rod Doolaard/IZP

Table 2: New elephant enclosures. (new locations)

INSTITUTION (shortname)	Ready in	Elephants
Amsterdam	2008	1.5
Antwerpen	2008	1.3
Benidorm	2004	2.13
Budapest	2006	1.3
Dublin	2006	1.4/6
Fuengirola Park	2008/2013	1.2
Kiriat Motzkin	PLANS	
Heidelberg	2013	1.6
Karlsruhe	2013	1.4
Koln	2004	3.12
Dompierre	2005/2006	1.4
Lodz	2012	1.4
Neunkirchen	2010	1.4
Ostrava	2004	1.2/4
Plock	2006	1.3
Praha	2007	1.5
Rhenen	PLANS	ADULTS
Riga	2007	1.3
Wroclaw	2012	0.3
19 Institutions		19.80/84

Taking stock of management and welfare of elephants in EAZA

by Amelia Terkel, coordinator African elephant EEP, Zoological Center Tel Aviv - Ramat Gan, Israel

African bull 'Yossi' with three cows and two very young calves, Zoological Center Tel Aviv - Ramat Gan

Photo: Zoological Center Tel Aviv - Ramat Gan

Detailed and very thorough 'Management Guidelines for the Welfare of Zoo Animals - Elephants' were published by the UK Zoo Federation in 2002. This document was adopted by the EAZA Elephant TAG as their guidelines in 2003. It is a living document, intended to be modified over time.

Criticism

In 2002, one month after the publication of the UK management guidelines, a report commissioned by the RSPCA entitled 'A review of the welfare of zoo elephants in Europe' was published. This publication heavily criticised welfare of elephants in zoos, and the viability of the population in captivity. In regards to physical facilities, management and welfare, it identified areas which required improvement. These included enclosure size; flooring; social groupings; stimulation in enclosures; and training procedures. There were also questions regarding the 'value added of keeping elephants' – education; research; and conservation.

Survey

During the winter of 2003 - 2004 the EAZA Elephant TAG carried out a survey among all EAZA member institutions holding elephants. The purpose of the present survey is to take stock of our elephant management as it is today, vis-à-vis the written EAZA standards and the areas of criticism from the RSPCA study. With this snapshot in time we can determine where we have achieved standards, where we must improve and where we lack information. This tool should aid us in defining areas of concern in future welfare and management, in modification and design of new physical facilities as well as the way the animals are handled.

Responses

The survey was originally prepared by the UK Zoo Federation and issued to 14 UK zoos (of which two non-EAZA members) in the United Kingdom in March 2003 and received 100% response. It was modified for EAZA and distributed to all continental EAZA elephant holders. There were 72 responses including ten holding both species (counted as separate responses). Together with the UK zoos, this makes a total of 86 responses out of a possible 112 (77%). The length of the questionnaire (!) may have contributed to the relatively low response rate. The area covered by the survey included: guidelines and procedures; physical facilities; husbandry and management; enrichment; keepers; research; conservation; and education. An additional section reviewing each animal's personality and handling profile has not yet been summarised.

CONCLUSIONS

Guidelines and procedures

Forty-two percent of the continental zoos had a copy of the UK guidelines (now EAZA guidelines); written training procedures for keepers were found in 50% of the zoos. Written risk assessment specifically for elephants were found in 46% of zoos. These documents are reviewed irregularly, or periodically based on changes in keepers.

> The UK guidelines can be obtained from the UK Federation office (Fedzoo@zsl.org) on disk, and include examples of risk assessment and training procedures.

Physical facilities

The size of indoor physical space for bulls and cows does not meet the standard in several institutions; in view of the lengthy period animals remain indoors in winter months in northern climate zones, this should be improved. The planned renovations over the next five years should positively change the situation for those specific facilities. The significance of standing on concrete floors as opposed to more yielding surfaces still needs investigation, especially in view of the foot and leg problems in animals (see Table 1: Physical facilities).

Table 1: Physical facilities

CATEGORY	GUIDELINES	COMMENTS
Enclosure size bull indoors	min. 50 m^2	12 less than standard
Enclosure size cows indoors	UK 50 m^2; old EAZA 34 m^2	10 less than 34 m^2; 10 between 30 - 50 m^2
Enclosure size outdoors bull	500 m^2	4 below standard. Range: 100 - 5000 m^2
Enclosure size cows outdoors	2000 m^2 for 8 animals	Range: 200 - 6000 m^2 One facility has 25 hectares.
Pool outdoors or indoors	recommended	4 lacked both indoor and outdoor pool.
Minimum temperature	min. 15°C	5 in northern climate zone below minimum temperature.
		25 have under floor heating in parts of enclosure.
Substrate indoors	Rapid drying, insulated, well drained	Mostly concrete, 6 asphalt, 1 rubber flooring.
Restraint chute for bull	Recommended	Only 8 have a chute.

Photo: Zoological Center Tel Aviv - Ramat Gan

Husbandry and management

Twenty-five percent of respondents (19 zoos) still house less than the old recommended minimum of three animals, including single animals, two females of different species or two females of same species; although some are older elephants which on welfare grounds may be better off where they are and will eventually be phased out, others are young and should be moved into a breeding situation or at least an improved social situation. There has been an improvement in night-time housing, enabling social groupings, and even night-time access to outdoor enclosures. Chaining over night still occurs, and should be discontinued. The relationship between the need for foot care, substrate, level of activity and age of animal still needs to be addressed (see Table 2: Husbandry and management).

Table 2: Husbandry and management

CATEGORY	GUIDELINES	COMMENTS
Minimum group size cows	UK minimum is 4 cows; old EAZA minimum was 3 cows (raised to 4 in 2004)	5 collections have only one elephant 5 collections have one Asian and one African 9 collections have two females alone (same species) 6 collections have two females with one male 6 collections have three females alone 6 collections have three cows and male
Social grouping at night	Strive to keep animals in unrestricted social groupings	6 zoos box totally alone; others in compatible combinations; many comment the elephants can see or touch each other although separated.
Chaining	Limit 3 hours / day	Only 3 report chaining all night
Bathing	No recommendation	Europe excl. UK 27 zoos bathe daily 23 - frequency changes seasonally 11 - do not bathe
Foot care	No recommendation	16 respondents do no foot care 46 respondents do foot care – of these 20 have daily or weekly routine. Others periodically or when necessary.
Enrichment	Recommended	All respondents use some kind of enrichment: see list of ideas.
Browse	Recommended	60% respondents give browse daily; others weekly, or seasonally. 3 zoos did not give browse at all.
Time outdoors	When the weather conditions allow, access should be given to both over a 24 hour period	Summer: 7 respondents allow animals to be outdoors 20-22 hours; remainder 6.5-13 hours. Winter: less than 5 hours outdoors in 22 facilities.

Photo: Safari Beekse Bergen

Enrichment

In addition to browse, scatter feeding was found in 80% of collections, elevated feeding rack in 10%, tires in 44%, scratch posts in 92% and waterfalls or showers in 50%. Other enrichments included food dispensers, ropes, mud areas, boomer ball, music, other species (baboons or ungulates) sharing the same enclosure, walks through zoo grounds, and training. The effectiveness of enrichment was evaluated in 22% of the zoos by keepers, daily report or by students.

Handling cows

There is much discussion about handling of elephants. Each system has its merits. In some institutions both free and protected contact systems may be used on different animals. Table 3 gives a general view of percentage of institutions using different systems. It should be remembered that the fall-back recommendation of the EAZA Elephant TAG is protected contact. There is a striking difference in handling styles for the two species.

Table 3: Difference in handling styles for African and Asian elephants

CATEGORY	ASIAN	AFRICAN
Free contact	81%	61%
Protected contact	11%	16%
No contact	8%	22%

The ankus is used by 54% of all respondents; an additional 6% only carried but did not use. The hot shot was present in 25% of zoos but used only for emergency; of those having hot shots, half had never used it.
It is recommended that two keepers together work with elephants for safety reasons: however, three institutions reported one person working alone with elephants that are handled.

Keepers

The respondent institutions in Europe have a total of 215 elephant keepers. Of these 15% have less than one year experience with elephants, 11% have one to two years experience, 20% have three to five years experience. The most senior group with 21 years or more of experience constitutes 11% of them all. These numbers are significant in indicating the importance of organising training for newly recruited elephant staff.

VALUE ADDED AREAS

Education

Of the fifty respondents, 90% indicate their signs teach about general biology, 40% include explanations about elephant training, 60% include conservation information. In looking at education, it is not clear whether the value added for education is simply the attractiveness of these remarkable animals. It is clear that the message on conservation is somewhat confusing as there are surplus populations in major areas of Africa and many instances of human-animal conflict for both species.

Research

At least 23 zoos participate in research projects. We can safely say that there has been considerable effort expended on elephant research in captivity and that this is a genuine contribution which could not be done in the wild.

Some of these findings have had direct application to management, for example observing nocturnal activity and then changing feeding patterns so that animals can feed at night. The understanding of onset of female puberty in both species was a cooperative project among many holders with the German Primate Centrum Goettingen. Better understanding of the reproductive system of males and females has been achieved through those zoos participating in the IZW Berlin AI work. An ongoing cooperative project on musth in males is about to be completed at the German Primate Centrum Goettingen.

Conservation

Of the 64 respondents, 12 (19%) support *in situ* projects, three in Africa and nine in Asia, including projects on well-being of domestic elephants. The range of projects and institutions involved is listed in the article on conservation (see page 30).

Summary

This snapshot in time should be reviewed again in a reasonable period of time to see how elephant management is evolving and hopefully improving. Certainly the new facilities being developed will contribute to improved physical environment. Nevertheless it is the keeper management and improving skills which give full expression to the physical environment. How the institutions holding elephants develop their 'value added' requires institution-wide vision.

Acknowledgements
Special appreciation to Miranda Stevenson and the UK Elephant TAG for the enormous impetus in pushing forward a survey and discussion of elephant management standards. Special thanks to Lars Versteege of the EAZA Executive Office for reformatting the questionnaire and collating the results.

Educational work involving elephants at Schönbrunner Tiergarten

by Gaby Schwammer, Schönbrunner Tiergarten, Vienna, Austria

*The very first African elephant (*Loxodonta Africana*) set foot on Viennese soil exactly 452 years ago, causing quite a stir among the citizenry, for whom this was a wondrous beast from a far-away world. Elephants have always held a great fascination for humankind and have played a special, symbolic role throughout our cultural history. Beyond setting the cornerstone for successful breeding programmes, the design of the modern elephant park in Schönbrunn (1996) opened the door for a broad range of educational initiatives involving these wonderful, charismatic animals.*

The three-year-old male 'Abu' and the two-year-old female 'Mongu' – both born in Vienna – became undisputed public favourites. It was somehow amusing to watch the clusters of visitors moving back and forth like waves along the outer enclosure walls, closely in sync with the movements of the young elephants. This interest called for the zoo education department to unfold its many talents: the entire team, including all the free-lancers and trained volunteers, were swamped with requests for first-hand information.

(Inter-)Active events

The many different avenues of verbal communication (for example information booths, feeding sessions with commentary, workshops etc.) proved to be very demanding but highly effective approaches. An important aspect of our work is to live up to the motto 'bringing research and science to the general public' by providing a free flow of information about new research projects (both *ex situ* and *in situ*). A very broad pallet of events is organised for visitors of all ages; emphasis is placed on interactive approaches to convey information, including special guided tours, action weeks, regular children's afternoons under professional supervision, exhibitions, seminars, birthday parties, rallies, play stations and numerous 'zoo-active' events.

Backstage experience

Our exclusive party packages have turned out to be one of our most successful offerings. This programme gives participants 'backstage' access to Schönbrunn's elephants, in a private atmosphere outside normal opening hours (although no direct contact is allowed). This special programme is frequently booked by people who want to give themselves or a friend an unforgettable experience. After the staff-accompanied elephant encounter (1.5 hours), a luxurious breakfast 'fit for an emperor' is served at the 'Kaiserpavillon'. In addition, the guest of honour receives a surprise package to make his or her day a long-remembered experience.

Backstage access

Photo: Schönbrunn Tiergarten

Choosing an education event

Beyond a full schedule of events for young and old, a wide range of programmes is available for schools, academies and universities. Teaching modules in line with the tradition of classic zoo education are offered, and many schools have taken advantage of this opportunity. Selected topics promote an interdisciplinary learning experience. Last year, 70,000 school-children enjoyed an individualised educational experience and were able to choose from the following zoo education events:

- guided tours on selected topics or educational tours;
- special guided tours;
- ethology courses;
- advanced training seminars for teachers;
- tours for handicapped persons;
- night tours;
- animal keeping workshops;
- clay modelling and handicrafts courses.

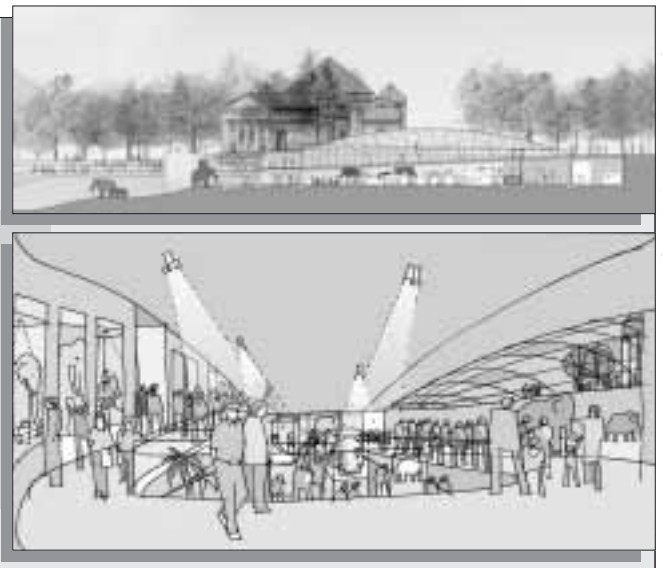
Guiding principle

Our education programme is backed up by zoo guides, maps, brochures, posters, special books and other literature, along with press releases, radio interviews and television appearances. The guiding principle behind the entire zoo education programme at Schönbrunner Tiergarten is to use every available means to promote nature conservation ideals and to boost awareness for environmental issues.

A journey into the world of elephants

by Lars Lunding Andersen, Copenhagen Zoo, Denmark

*The zoo's new elephant facility will provide optimal conditions for the zoo's breeding group of Asian elephants (*Elephas maximus*) in- and outside. Interpretation areas offer zoo visitors unique and varied experiences with the elephants – experiences that lay the groundwork for education and reflection. The new Elephant House will be a giant leap forward compared to our current elephant facilities.*



Drawings: Michael Petersen/Copenhagen Zoo

Copenhagen Zoo's interpretation principle is simple. The starting point is the visitors' experience; their fascination with the animals in the enclosures. This fascination motivates the visitors – adults as well as children – to ask questions. The educational objective is not merely to answer questions posed, but also to use the questions as an incentive to seek further knowledge. By means of interactive, educational activities in the form of playground equipment, displays, graphics, models, electronic media etc. the zoo visitor should proceed on an exciting journey into the world of animals. The educational activities should be prepared so that not only reading ability, but also skills in other subjects such as mathematics, physics and chemistry are put to use. It has been a long time wish at Copenhagen Zoo to further develop these interpretation principles. So far the model has been tested on a smaller scale at the giraffe, tiger and common seal enclosures with great success.

Holistic concept

The new elephant house will lead the way in designing zoological enclosures focussing on visitor experience. The animals, interpretation elements and information about the zoo's involvement in breeding and nature conservation projects are all being integrated into the exhibit design – creating coherence and a consistent whole for the zoo visitor. This holistic exhibit concept has been incorporated into the building programme prepared by the zoo staff since the conception of this project. Elephants housed in the northern hemisphere spend more time indoors than in the outdoor enclosures, and it is thus of the greatest importance that encounters with these giant animals inside the house are as positive as outside encounters. The architects were given the task to create a light and pleasant environment for visitors to view the elephants in spacious indoor facilities that allow the elephants to thrive in a natural social structure 24 hours a day. This applies to bulls, which live alone in zoos just as in the wild, as well as to the herd (cows and calves). Emphasis is also on creating a visual continuation of the outside park into the indoor area.

Adventure trail

Interpretation activities for the new elephant facility will be placed along an 800 m long, levelled pathway winding along the elephants' outdoor enclosure and through the elephant house. Out of consideration for disabled visitors there are no stairs and no gradient steeper than one in twenty (1:20). Visitors on the trail will encounter a variety of interpretation components focussing on five main elephant themes: biology; their exciting cultural history; the most recent research results; breeding programmes in zoos; and finally, nature conservation projects in which Copenhagen Zoo participates.

Interpretation activities are organised at three different levels in order to make it possible for all zoo visitors to participate. No doubt family groups with small children will favour the activities offered to non-readers and the intermediate group. From many years of experience we know that by motivating children in a family group we also motivate the adults. Unlike visits to many other cultural institutions, a visit to the zoo is a social event, and interpretation should stimulate social interactions as well.

This interpretation at different levels, combining use of many skills and a strong social element, is a totally new concept in interpretation in zoos. We have great expectations as to the outcome, especially with the current focus on the time (or lack there of) that children and adults spend together.

A few concrete examples from the 'Script for the Adventure Trail' are given below to illustrate the kind of experiences that will be in store for the visitors, once the new elephant facility is finished. We currently anticipate its completion in the summer of 2006.

Example 1: The elephant herd

Seven to ten elephants carved from wood will be placed in a circular area facing the female elephants' outdoor enclosure. The largest carved elephant is an old bull about 70 cm high with tusks. The others are cows of different ages and calves, as well as a young bull with small tusks. The elephant figures are wheeled in a secured track. Each elephant has its own symbol and a brief description. For instance: old bull, matriarch, young female, aunt, young bull, calf etc. Symbols indicate where the elephants should be placed. When the elephant figures are correctly placed, the visitor can study social organisation of elephants. Nearest the centre is the matriarch with her newborn calf, then the young females (the matriarch's daughters) with their calves and then the aunts (females with no calves at present). The old bull is quite naturally isolated – far out in the periphery.

Example 2: The elephants' secret language

Elephants communicate by means of sounds (infra-sounds) so low in frequency that we can not hear them. By placing a hand on the forehead of a rubber model of an elephant head, the visitor will be able to feel the vibrations made when sounds are generated. The sound picture (the extended wavelength), will be visible on a screen. Pictures of the sound waves that humans send when we speak may be seen in a small sound studio, and compared with those of elephants and other animals. A tone generator connected to a display will illustrate how far sound waves with different

Photo: Nigel Young & Richard Davies

frequencies will reach. The low sounds (long wavelength) will reach farthest and are therefore excellent to penetrate dense forest, thus elephants far away from each other (more than 5 km) can still communicate. By means of a directional microphone the visitor will be able to pick up sound waves from the elephant herd and perhaps trace which of the elephants is 'speaking' at that moment.

Example 3:

How many elephants went by and how big were they?

A part of the adventure trail will be designed as a dried-up river bed with footprints of a small herd of elephants that has crossed the trail. Often biologists must draw conclusions from the tracks they find in the wild. The tracks contain essential information about the individual elephant, for example an elephant's shoulder height can be calculated by measuring the circumference of its footprint and multiplying by two. Family groups and young school pupils will be able to measure the circumference by means of a piece of rope and a mounted ruler. The older school pupils will be able to measure the diameter and calculate the circumference by means of the mathematic formula 2pr. The exercise will reveal that three elephants have crossed the trail: an old female, approximately 25 years old, accompanied by a newborn calf and a younger elephant around ten years old – probably her daughter.

Infant mortality in Asian elephants

by Miranda Stevenson, Zoological Society of London, United Kingdom

*Early infant mortality in Asian elephants (*Elephas maximus*) is unacceptably high in European zoos; determining the cause(s) of this mortality is essential if we are to have a self-supporting population of the species in Europe. Data from the European studbook show that deaths on day 0 (i.e. day of birth) are 3% for African elephants and 25% for Asian. However, in North America, African animals also suffer high mortality on day 0. Day 0 deaths are mainly due to injury to the calf by the dam and stillbirths.*

This report is based on an analysis of studbook data (European studbooks up to the end of 2002) and literature to try and assemble information to help us understand the reasons behind the problem and examine possible solutions. It presents a summary of data and conclusions. Given the relatively small sample sizes, care must be taken in drawing conclusions from these data.

STUDBOOK DATA

Parous females

Of the 104 females that have reportedly bred in non-Asian countries (all births in the studbook excluding births that took place in Asian countries, i.e. logging camps), 82 have studbook numbers. Out of these 82, 24 (29%) have had at least one stillborn infant, likewise out of the 104, 30 (29%) had at least one stillborn infant.

Captive born Asian elephant

Fifty of the 198 captive born calves (outside Asian countries) died on day 0 (24%), of which 33 were stillborn (17%). According to Kurt and Khyne (1996) these figures are roughly five times higher than for wild or working Asian elephants. Dams of 166 of the 198 calves are listed in the studbook. Of the 166 calves with known dams, 42 died on day 0 (25%) and of these 26 (16%) were stillborn. Six of the stillborn young were sets of twins, with a several week interval between the passing of the two foetuses.

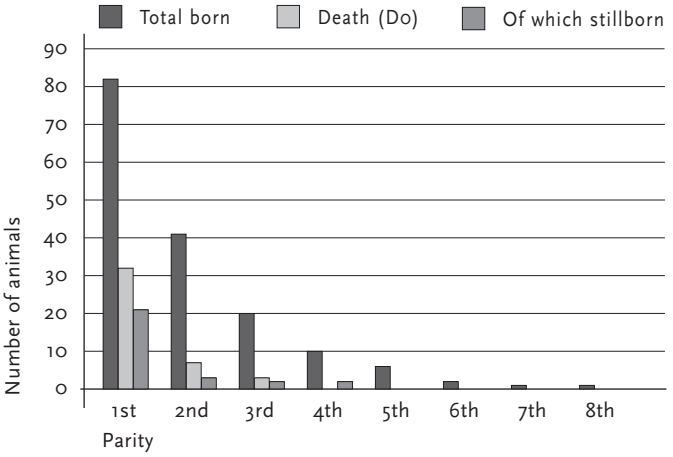
Order of birth

One important factor to investigate is order of birth. Table 1 and Figure 1 show data from 166 births to 82 females.
As can be seen the percentage of young dying on the day of birth is higher in primiparous females.
All three females who had twin stillborn young were primiparous and did not breed again. Only six of the remaining 19 primiparous females with stillborn young bred again and produced live young in the following births.

Table 1: Parity and death on day 0

ORDER OF BIRTH	1st	2nd	3rd	4th	5th	6th	7th
% stillborn	26	7	10	0	0	0	0
% day 0	39	17	15	0	0	0	0

Figure 1: Animal born and died on day 0 (D0)



Contributory factors

Factors which may be significant contributors to stillbirths are:
- age of dam;
- disease (elephant pox and herpes both cause infant deaths);
- weight of the mother;
- weight of the calf;
- gestation period;
- chaining;
- isolation of the dam from the group;
- human interference during the birth process;
- time in matriarchy and early socialisation.

A survey carried out on 18 pregnancies in European animals suggested a correlation between age of dam and success of first pregnancy (Flügger *et al.*, 2001). Therefore it is worth examining the age of dam at first birth in relation to stillbirths (see Table 2: Age of dam at first birth).

The row showing age of primiparous dams with a stillborn calve indicates that the age range of dams with still births was 6 - 30 years, with 40% of the dams over 19 years old, while in the row with no stillbirths 21% of dams were over 19 years of age. These factors suggest that primiparous females over twenty years may be more likely to have stillborn

Table 2: Age of dam at first birth

	N female	MEAN Age of dam	MEDIAN Age of dam	RANGE Age of dam	% DAMS > 19 years old
Primiparous and stillborn	20	19	18	6-30	40% (n=8)
Primiparous and lived > two days	47	18	15	5-36	21% (n=10)

young. Of the ten oldest primiparous females in the studbook, five had stillborn infants, one premature and four live, a 60% rate of stillbirths, compared to a 20% rate of stillbirths in the ten youngest primiparous females in the studbook.

Work by Fred Kurt suggested a correlation between weight of the dam, weight of the foetus and gestation length. Large females had larger (overweight) infants with longer gestations. Kurt's data showed that the mean weight of stillborn infants was 125 kg, which is significantly higher than the 92 kg mean weight for live born young. Studbook data show the range of weights for stillborn young being 103 - 180 kg. Work by both Kurt and Flügger suggests that there are less likely to be problems if the dams were in social contact with familiar females and not chained.

It appears that elephant cows control parturition in a similar manner to mares and that active labour may be interrupted if the cow becomes alarmed. It may also be interrupted if the cow finds the labour painful, which may be the case in older primiparous females, and they also may be more inclined to delay this strange event.

Conclusions

- Older the mother at first birth > greater chance of stillbirths;
- Primiparous dam > greater chance of stillbirths;
- Mother overweight > larger infant > greater chance of stillbirths;
- Infant over 100 kg weight > greater chance of stillbirths;
- Isolation of mother > greater chance of stillbirths;
- Chaining > may cause dam to be less able to perform comforting movements > greater chance of stillbirths.

Photo: Rob Doolaard/IZP

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Flügger, M., F. Göritz, R. Hermes, E. Isenbugel, A. Klarenbeek, W. Schaftenaar, K. Schaller and G. Strauss (2001). Evaluation of physiological data and veterinary medical experience in 31 Asian elephant (*Elephas maximus*) births in six European zoos. In: Proceedings of the Institute for Zoo and Wildlife Research 40: 123-133.

Kurt, F. and U. Khyne (1996). Neonate mortality in captive Asian elephants. In: Zeitschrift für Säugetierkunde 61: 155-164.

Much more work needs to be carried out on this topic, and we need more information on cow weights and measurements and also calf weights. We need more accurate recording of causes of calf death and of birth protocol. We also need accurate information on diets fed to pregnant cows and to relate this to weight. The pregnancy must be monitored so that we have information on exact gestation lengths and hormone changes during pregnancy. We need accurate recording of the birth process and the behaviour of the dam; ideally births should be documented using video imagery. It is important that the birth process is as natural as possible, with the cow among other cows, with as little human interference and as few as possible changes in 'normal' conditions. A study of the relationship of stillbirths to different management regimes and enclosure sizes is also needed.

Veterinary guidelines for reproduction-related management

The 'Veterinary guidelines for reproduction-related management in captive elephants' have been sent to the important breeding institutions and can be downloaded from the EAZA website member area (EAZA Elephant TAG section). Additionally these guidelines are available on a special Rotterdam Zoo website, where also the latest studbook can be found (website address can be provided upon request: r.belterman@rotterdamzoo.nl).

The reproductive potential of EEP elephant populations

by Ann-Kathrin Oerke, Elephant Service Department of Reproductive Biology, German Primate Center Goettingen, Germany

In order to establish a self-sustaining elephant population in captivity it is important to define the proportion of potential breeding females. The category 'potential breeding females' includes proven breeders, cows of potential breeding age and young animals approaching sexual maturity. Due to different age structures, sex distributions and keeping conditions, management problems of the Asian elephant EEP and the African elephant EEP are different. Analysing the female population of both elephant species by age, presence of a male in the facility, and reproductive status (via hormonal monitoring) enables determination of specific areas for action to improve future breeding management in captivity.

RESULTS ANALYSIS

Asian elephant (*Elephas maximus*):

Eighty-one Asian elephant females of potential breeding age (4 to 25 years) form only 40% of the female population. Eleven elephants of four to six years are still too young for breeding, but are already able to conceive (see page 26). Fifty percent of the cows between 7 and 25 years are proven breeders and 50% non-breeders. Forty-six females (66%) have access to a bull of proven fertility, 12 (17%) are housed with a male that has not yet produced offspring, eight (11%) are housed without a male and four are kept together with their fathers, three (6%) of which have bred with the fathers. Breeding management for the Asian elephant is very progressive in that reproductive status for 80% of all proven breeding cows and 94% of the non-breeders is monitored.

The possibility to check ovarian activity in female elephants has been beneficial to the breeding mangement of both species in captivity. With non-invasive methods, i.e. hormone analysis in urine and faeces it is possible to monitor reproductive status in virtually EVERY elephant. These methods, established and validated in captive animals, are now also used to monitor reproductive status in free-ranging elephants, a perfect example of zoo research going wild!

Photo: J.K. Hodges

African elephant (*Loxodonta africana*):

A promising large number of 98 animals, comprising 63% of all female African elephants, is of potential breeding age (7 to 25 years). Of these, eleven are considered too young to breed (seven to nine years of age) but are already showing ovarian cycles (see page 26). However, only 30% of the cows between 10 and 25 years of age are of proven fertility; thus 70% have not conceived so far. Only 35 females (40%) have access to a breeding bull and another 29 females (33%) are kept with a male which has not yet sired offspring. One daughter keeps on breeding with her father but even worse, there are 22 elephant females that are housed without a male, forming an unacceptable proportion of 26% of all cows in potential breeding age! Facilities housing these animals are not contributing to the conservation efforts of the species in captivity and the females will be lost for future breeding if zoos do not invest into keeping a bull of appropriate age. Only 59% of the females without a male and 55% of the females housed with a male of unproven fertility are monitored for ovarian cycles, whereas 96% of the proven breeders and even 100% of non-breeders housed with a breeding bull are monitored.

Conclusion

The female Asian elephant population is of old age compared to the female African elephant population, yet there are still more proven breeders and more females being monitored for reproductive status than in the African elephant population. While there is a higher proportion of African elephant females of potential breeding age, only a small number is of proven fertility. The reproductive status of proven females and non-breeding cows kept with a bull of proven fertility is well monitored. Monitoring of other potential breeding cows is less frequent, and many are not housed with a suitable bull, while these are the animals that need to be included into the pool of breeding females.

Since there is a striking positive relation between the proportion of breeding females and the intensity of monitoring for reproductive status in both species, the use of hormone measurements must be viewed as beneficial for breeding management and it is strongly recommended that available methods (blood, urine, faeces) are further applied in order to improve future birth rates. However, all efforts will be in vain as long as young cyclic elephant females are housed without access to a male. It is therefore of utmost importance that more zoos keeping African elephants invest into bull facilities.

EADISC

Update on recent ZIMS, EADISC and IADISC activities

by EADISC co-chairs Frands Carlsen, Copenhagen Zoo, Denmark
and Duncan Bolton, Bristol Zoo Gardens, United Kingdom

We are extremely happy and proud to announce that the ZIMS project has reached a major milestone: the selection of the Canadian based company CGI as software developer for the project. CGI, founded in 1976, is a Global Information Technology and Business Process Services firm with over 25,000 professionals and 3,500+ clients worldwide. CGI has offices in sixty countries including the United Kingdom, France, Italy, Luxembourg and Belgium. It would not have been possible to achieve this very important stage without the help and support from a wide range of the global stakeholders. We would like to thank everyone in EAZA that have been involved so far for their considerable time and effort.

EADISC mid-year meeting

The EADISC mid-year meeting was hosted by the EAZA Executive Office, Amsterdam on 7 March 2004. Apart from discussing actions for the next half year the meeting had a special focus on data quality issues related to the regional preparation for ZIMS. All in all the European region has shown a good improvement in data quality but there is still a long way to go before we can truly say that our ISIS data are ready for migration into ZIMS. The data migration is essential for a successful deployment of the new system. According to the timeline set for the project this is only twenty months away – so please keep up the good work!

Other meetings

A ZIMS Data Standards workshop was hosted by Lisbon Oceanarium, Portugal, on 29 to 31 March 2004. The purpose and objectives of this workshop were to work on functional requirements, workflows and data standards pertaining to environmental monitoring, group management and enclosures. Joao Correia from Lisbon Oceanarium and David Gibson from The Deep participated in the workshop and gave valuable input from a European perspective.

Sandra Silinski from Salzburg Zoo, veterinary member of EADISC, participated in the first ZIMS veterinary data standards workshop hosted by the Zoological Society of San Diego, California, on 16 to 18 April 2004. The purpose of this workshop was to provide a ZIMS overview and project status update along with introducing the standards development and overall application processes.

Information about ZIMS will be distributed through the regional zoo and wildlife veterinarian organisations. Also, a new ZIMS Veterinary Listserve will be a powerfull tool for sharing information as well as the data standards development process. This listserve is moderated by Ilse Stalis and Tracy Clippinger both from San Diego Zoo and account issues are dealt with by Nell Bekiares from ISIS (nell@isis.org; please contact this e-mail address for more information).

The EADISC chairs participated in the IADISC mid-year meeting hosted by Disney Animal Kingdom in Orlando, Florida, on 11 to 14 May 2004. IADISC worked hard to identify additional Subject Matter Experts (SMEs) for future workshops and to fill out vacant positions. The latter part of the meeting was attended by two members of the CGI ZIMS project team. The focus of this meeting was mainly on creating an understanding of expectations from both parties, to settle unclarified issues and agree on dates and venues for future workshops on Joint Application Design (JAD) and Data Standards development. All meetings need input from SMEs and we will soon begin the process of head-hunting EAZA SMEs for all meetings.

SMEs (that means all of you reading this newsletter) are needed for the EADISC Working Group. This is the forum for you all to make sure that the new records system provides what you need. ZIMS is coming, help us to ensure that it will meet our needs for the future. Contact Frands Carlsen (fc@zoo.dk) or Duncan Bolton (dbolton@bristolzoo.org.uk) for more information.

More on people

In order to promote the European Data Quality process Ross Snipp from the ISIS Office is now also working specifically on European data quality. If you have questions regarding your data please feel free to contact Ross directly on ross@isis.org. You can also seek assistance and more information through the European Animal Records Keepers Group (EARKG) listserve. For inclusion on this listserve please contact Rob Belterman, Rotterdam Zoo, the Netherlands on r.belterman@rotterdamzoo.nl.

To improve regional communication on the ZIMS project Ulrike Rademacher from Wilhelma Zoo, Germany now acts actively as Regional ZIMS Communication Facilitator. Ulrike will work directly with the ZIMS Communication Manager to keep key stakeholders in the European region informed about ZIMS developments.

Last but not least we are happy to announce that Britta Scholz, Givskud Zoo, Denmark has been invited to join the ZIMS Technology Working Group (ZTWG). ZTWG will work closely with CGI on technical questions and design.

This article has been abridged; the full version is available in the EADISC area on EAZA website (member area).

From the EAZA Office

EAZA Council meets in Italy

The 2004 EAZA Spring Council Meeting was hosted by the Parco Zoo 'Punta Verde' and attended by 28 council members and seven observers on Sunday 18 April. Additional meetings were held by the EAZA Executive Committee, the EAZA Membership and Ethics Committee and the Committee on Technical Assistance and Animal Welfare on 16 and 17 April. Important topics on the agenda included the discussion of the third draft of the EAZA Code of Practice, discussion of the progress on the EAZA Action Plan 2002 - 2004, discussion of a first draft of an update of the EAZA Constitution and discussion and approval of an EAZA Award Scheme. The membership will be informed in more detail of the progress of the above mentioned issues during the EAZA AGM in Kolmarden on 25 September, and will have an opportunity to respond.

New EAZA members

The EAZA Membership and Ethics Committee met during the EAZA Spring Council Meeting in Parco Zoo 'Punta Verde' on 16 April 2004. The main topic on the agenda of the meeting was the discussion of the applications for EAZA membership. The membership status of six new applicants, five temporary members, two Candidates for Membership and one complaint procedure were discussed. The final decisions by Council on membership of these applicants, can be found in the section 'Welcome to EAZA' (see page VI) and on the EAZA website. As a result of the Spring Council Meeting, EAZA has now 290 (institutional) members, 2 Honorary members and 9 Candidates for Membership.

EAZA members accused of selling animals to dealer

The UK newspaper 'The Observer' published an article under the heading *"Revealed: UK zoos caught in rare wildlife trade with dealer"* on 28 March 2004. In the article the Observer states that a number of European zoos, all EAZA members, are selling and/or purchasing animals from *"Chris Bienvenue of Herne Breeding Centre, a notorious Belgian dealer in rare and exotic creatures"*. The Observer further quotes this dealer as saying: *"I don't care what happens to the animals. I will sell them to you. What you do with them after that, even if you eat them, I don't care"*. Furthermore the Observer mentions that *"there is no suggestion that zoos or Bienvenue are breaking any law in these deals. Bienvenue accuses zoos of hypocrisy, claiming that they produce too many animals and are only too happy for him to take them off their hands for money"*.

EAZA has also received a letter of complaint from the UK based Born Free Foundation (BFF) in which it states that some eight EAZA members have been working with the Herne Breeding Centre over the past three years. Additionally in a recent TV documentary broadcasted by the TROS in the Netherlands on 5 June 2004, numbers of up to 12 EAZA members selling animals to this dealer are mentioned.

The EAZA Membership and Ethics Committee has launched an investigation into the complaint put forward by the BFF, based on the article in the Observer. In the mean time it is important that all EAZA members take notice of the article on 'transfer and disposition of animals' in the EAZA Code of Ethics. This article states that **"EAZA members should ensure that institutions receiving animals have appropriate facilities to hold the animals and skilled staff who are capable of maintaining the same high standard of husbandry and welfare as required of EAZA members"**.

EEP Committee

EAZA's EEP Committee met in Amsterdam on 4 and 5 March 2004. One of the tasks of the Committee is to deal with complaints received regarding non-approved transfers of EEP animals and the inadequate functioning of a number of EEP coordinators. An evaluation procedure is being developed to improve the functioning of EEP programmes. Additionally, the EEP Committee is in the process of evaluating the guidelines for EEP coordinators. The EEP Committee would in the mean time like to emphasise that EAZA members must seek approval from the relevant EEP coordinator for all transfers of EEP animals before making practical arrangements for potential movements.

Last call for registration Kolmarden

EAZA members are urgently requested to register for the EAZA Annual Conference in Kolmarden, Sweden, as the deadline for early registration payment of 30 June 2004 has already passed. Invitation and registration forms have been sent to all members and invited guests. For more information – also on the programme – please refer to the EAZA website.

From the EAZA Office

Shellshock, EAZA Tortoise & Turtle Campaign 2004/2005

During the EAZA Spring Council meeting in Parco Zoo 'Punta Verde', it was decided to postpone the EAZA European Carnivore Campaign scheduled to run in 2004/2005. Instead the proposal for a turtle and tortoise campaign, originally proposed for 2005/2006, was accepted and moved up by a year.

The campaign planning group, headed by Kevin Buley of Chester Zoo, is working very hard to have the Campaign, including the Campaign Info Packs, ready for the Kolmarden Conference. The campaign will have three main aims:

1. Raising public and zoo awareness of what is arguably the biggest terrestrial vertebrate taxon extinction event since the disappearance of the dinosaurs;
2. Promoting and supporting further member participation in *ex situ* 'Assurance Colonies' which, in the short term, represent the only hope of survival for many species of tortoises and freshwater turtles;
3. Fundraising initiatives for specific *in situ* turtle and tortoise conservation projects where there is still hope of saving species from extinction in the wild.

We invite all members to participate in this exciting new EAZA Conservation Campaign. If you can not wait until Kolmarden, please check the EAZA website for more information on the campaign.

Photo: Richard Gibson

Do you want to join the Education Committee?

The EAZA Education and Exhibit Design Committee is searching for new talents. During the past years the Committee has promoted the important role of education within the EAZA membership. The Committee publishes important educational developments through EAZA News, investigates the educational level of the EAZA membership and recently assisted Leipzig Zoo in organising the European Zoo Educators Conference. At this moment the committee is working on a special 'zoo education course' which will be accessible for all educators from EAZA institutions. Furthermore the important role of educators will continue to be promoted.

Are you interested in joining the EAZA Education & Exhibit Design Committee? You need to have reasonable command of the English language, both oral and written. Furthermore you should have been in zoo education for no less than two years and be employed by an EAZA member institution. Please also confirm that your institution is supportive of your application and will cover all costs for travel and accommodation necessary to attend the committee meetings which will take place approximately twice a year. Applicants for the committee are invited to apply in writing to the chair of the committee, Lars Lunding Andersen (Copenhagen Zoo, lla@zoo.dk) by 1 September 2004. The chair will welcome applicants from every corner of Europe, so that regional representation of Northern, Southern, Western and Eastern Europe is achieved, to ensure that the Committee can reflect the various cultural and financial regional differences that exist in its work.

During the upcoming EAZA Annual Conference in Kolmarden, the new members of this committee, as well as a new chair, will be appointed.

EAZA Tiger Campaign

Amur tiger © David Higgs

EAZA Tiger Campaign

Most members participating in the EAZA Tiger Campaign have now relaunched their activities for the Summer. Obviously we would like to encourage all members to enthusiastically continue their activities, so that we reach our ambitiously set fundraising goal of €500,000. Please find below updated information on Tiger Project Number 3 and let yourself be inspired by some amazing fundraising goals of the Dublin and Colchester zoos and activities at Valencia Zoo, Colchester Zoo and the Dutch zoos.

News from Project 3:

Recently received report from Project 3: Ranging patterns of tigers in altered landscapes, Jambi, Sumatra

Last April the Zoological Society of London (ZSL) used funding from 21st Century Tiger and Save the Tiger Fund to purchase a new 4x4 pickup. The vehicle has performed fantastically so far and many hours that would have been spent stuck in mud holes or broken down are now spent searching for signs of tigers. Furthermore, the new conservation head-quarters are nearing completion. This eight-room building is funded by Commonwealth Development Corporation (CDC) and will be shared by ZSL and CDC. It will be used for staff accommodation, and will serve as a centre for education as well as conservation activities for both parties.

Camera traps continue to provide evidence of an array of threatened species in the study area. Tigers have recently proved more elusive on film but are still roaming the boundaries of the oil palm plantation.

Furthermore, ZSL secured a grant to re-equip and train the anti-poaching and wildlife monitoring unit (APWM), taking temporary control and implementing a new schedule ensuring more effective patrolling and data collection seven days a week. This team consists of scouts who receive their salaries and are supervised by the plantation.

Source: Naomi McClure, 21st Century Tiger (whole report on EAZA website)

Celebration birth Sumatran tiger cubs at Dublin Zoo

Three female Sumatran tiger cubs were born on 27 March 2004 at Dublin Zoo. 'Satu', 'Dua' and 'Tiga', which means 'One' Two' and 'Three' in Bahasa Indonesia, each weighed approximately 900 g when born. The cubs are showing good social skills and are playing, 'wrestling' and otherwise interacting with each other continuously. During the first ten weeks, visitors could watch the cubs' playful behaviour on a tv screen via a special video link from their inside enclosure. They made their first public appearance on 2 June, when they weighed between 6 to 8 kg.
'Indah', the tiger cubs' father, was born in April 1990 in Krefeld Zoo. He was transferred to Dublin Zoo in November 2000. 'Sigra', the cubs' mother, was born in June 2000 in Tiergarten Heidelberg, and has been on a breeding loan to Dublin Zoo since August 2003. This is Sigra's second litter. Last year she gave birth to Ratna, who was hand-reared by keepers at Dublin Zoo when Sigra rejected her cub. But Sigra learned valuable lessons in parenting from that

Photo: Nora Lawton/Wilson Hartnell PR

experience and is now displaying excellent maternal instincts. Dublin Zoo launched its tiger campaign in March 2003. It has already raised over €24,000, making it one of the most successful participants amongst the many European zoos involved in this campaign.

Source: press release Dublin Zoo

EAZA Tiger Campaign

Dutch children make a tiger wish

Members of the Dutch Zoo Federation (NVD) are participating in the EAZA Tiger Campaign again this second campaign year. The Dutch campaign was officially relaunched on 31 May 2004 with activities which were partly prepared and coordinated by a campaign working group. All member zoos received new additional education boards as well as visitor information leaflets on the campaign, including tiger games. Other children's activities included a lottery in which a prize could be won by answering a tiger question correctly, games on the NVD website (www.nvdzoos.nl) and writing a wish for tigers on a prayer flag. The flags were hung high up in the sky so that the children's wishes for tigers would 'blow' to Eastern Asia. All zoos added activities in their own style and interest to make a successful tiger awareness and fundraising day.

Have you earned a certificate?

We would like to encourage you to transfer your collected funds to the 21st Century Tiger bank account. Not only do the projects welcome the money, you will also receive your fundraising certificate, which could make a nice addition to your tiger exhibition.

Photo: Burgers' Zoo

Tiger theatre at Valencia Zoo

We at Valencia Zoo have been working enthusiastically on the EAZA Tiger Campaign. Although we also participated in previous EAZA campaigns, the tiger campaign is especially attractive for us because tigers can arouse the appreciation and admiration of our visitors. Conveying to the public the harsh reality of threats facing animals today is the primary objective of Valencia Zoo, and perhaps is the only justification for the existence of a zoo nowadays. Using photographs on the EAZA Tiger Campaign CD-ROM we prepared three posters and an information leaflet. This material has been distributed among various Spanish zoos interested in participating in the campaign. In addition we designed a new line of keyrings which we sell along with t-shirts obtained from 21st Century Tiger in the stand where the posters are exhibited. We had sold 1,500 t-shirts and 2,100 keyrings by May 2004. However the most innovative contribution to the campaign, of which we feel most proud, has been the production of a theatrical play targeting children called 'La tigresa Violeta'. The play, performed last autumn in the zoo, told the story of Violeta, a tigress whose mother was killed by a hunter. Judging from the reactions of the 1500+ spectators and the engrossed faces of the children we believe that the play was a success. Every part of the play – costumes, scenery, design of the masks, script – was created especially for this production. The zoo intends to perform the play at Valencia Zoo again in spring, and perhaps even to tour other zoos and theatres within Spain. We hope that the stories of Violeta, the white tigress of Valencia Zoo and also the star of the production, may succeed in awakening the conscience of future generations to create a society that respects nature and its creatures.

Source: Ignasi Docavo Ferran, Valencia Zoo

Photo: Valencia Zoo

Tiger Day at Colchester

Colchester Zoo will organise a Tiger Day on Saturday 31 July. The whole day and evening will be geared to raising funds for the two projects supported by Colchester Zoo. Visitors will be informed on the endangered tiger in special talks given throughout the day. The tiger band will play and a children's disco and mini fête are organised. A raffle will be held to take part in assisting a special evening tiger feed. An €1.50 (UK£1) donation will be requested from each adult visiting on the day. Colchester has set an amazing goal of raising €60,000 (UK£40,000) by September 2004.

Source: press release Colchester Zoo

Welcome to EAZA

We welcome new members and look forward to a fruitful cooperation. We are convinced that our new members will benefit from the membership services which EAZA offers as a strong pan-European zoo and aquarium organisation. At the same time, we would like to introduce the new members to the readers of EAZA News by providing some general information.

Faunia
Mr. Antonio Luis Garcia del Campo
Avenida de las Communidades 28
28032 Madrid
Spain
FULL MEMBER

Tel: +34 913016231
Fax: +34 913016229
E-mail: algarcia@faunia.es
Website: www.faunia.es

Faunia, formerly named Parque Biologico de Madrid, opened to the public on 10 July 2001. Themed domes (e.g. jungle, nocturnal house, primate islands, polar ecosystem) are located in between lakes and gardens of this park. The zoo emphasises in educational activities in which visitors use all their senses to become aware of the importance of biodiversity.

Founded: 15 July 1998
Size: 14 ha
Staff: 50 (total full-time); 5 managers, 3 curators, 2 veterinarians, 30 keepers, 2 educators, 2 PR and marketing employees, 5 administrators, 1 horticulturist
Number of species: 197
Paid attendance: 431.196 (2003)
Organisational type: Biopark organised for profit

Lycksele Djurpark
Mrs. Irene Sjogren
92181 Lycksele
Sweden
TEMPORARY MEMBER

Tel: +46 95016710
Fax: +46 95014500
E-mail: irene.sjogren@epost.lycksele.se
Website: www.lyckseledjurpark.com

Lycksele Djurpark was originally founded in 1959 at Gammplatsen, but moved to its present site at Brännberget in 1966. It is the most northerly zoo in Sweden, and mainly keeps Nordic animals, which are housed in large naturalistic enclosures. The zoo is well-known for its musk-ox farm, which is the only one in Sweden and the largest one in Europe. A streamwater aquarium, a children's zoo with domestic animals, a marine animal display and a playground called Lyckoland are present within the zoo.

Founded: 1959
Size: 38 ha
Staff: 5 (total full-time); 1 manager, 3 keepers, 1 technician
Number of species: 36
Paid attendance: 83,000 (2002)
Organisational type: Zoological park organised for profit

Quinta de Santo Inacio
Mr. Roberto Guedes
Rua 5 de Outubro, 4503
4430-918 Avintes
Portugal
TEMPORARY MEMBER

Tel: +351 227878500
Fax: +351 227878517
E-mail: roberto.guedes@aveleda.pt
Website: www.quintasi.pt

Quinta de Santo Inacio is part of a larger attraction which also includes an 18th century manor, and a garden centre. The Van Zeller family, decided in 1997 to create a project that focussed both on preservation of history, and on making people aware of the respect they should have for nature. This resulted in the current institution, which was finalised in 2001. Future plans for the institution include reserving an area for breeding endangered species and carrying out research activities.

Founded: 1997
Size: 50 ha
Staff: 33 (total full-time); 1 manager, 1 curator, 1 veterinarian, 4 keepers, 1 educator, 1 PR and marketing employee, 1 administrator, 6 horticulturists, 6 others
Number of species: 350
Paid attendance: 125,000 (2003)
Organisational type: Zoological park organised for profit

Candidates for membership

Candidate for membership can be awarded to zoos under construction (not yet open to the public) and to those institutions that are working towards compliance of the EAZA standards for members. Institutions in this category are offered a range of technical assistance and consultancy, mainly provided and supervised by the EAZA Committee on Technical Assistance and Animal Welfare. The following zoos have received the Candidate for Membership category:

GaiaPark Kerkrade
Dr. Leobert E.M. de Boer
Brughofweg 27
6468 PB Kerkrade
The Netherlands
CANDIDATE FOR MEMBERSHIP (UNDER CONSTRUCTION)

Tel: +31 455676070
Fax: +31 455676071
E-mail: hb.gaiapark@solcon.nl
Website: www.gaiapark.org

GaiaPark Kerkrade is a zoological park, which is currently under construction; the first phase is due to open in spring 2005. The institution aims to increase public awareness on the endless inter-relatedness of all living and non-living components of earth, and in doing so to also convey the message that even the most innocent of man's interventions in nature may have a profound effect on future life. The name GaiaPark is based on the Greek mother goddess called 'Gaia', which means 'Mother Earth'.
Visitors of GaiaPark Kerkrade will be able to 'travel through time' and view Limburg, the province in which it is located, in respectively the Carbon Age, the Chalk Age and the Ice Age. This time travel through Limburg leads to a time travel through the world: South-America, Africa, Southeast-Asia, Patagonia, Siberia and Europe will all be represented.

Dierenrijk Europa
Mr. Matthieu de Sevaux
Heiderschoor 24
5731 RG Mierlo
The Netherlands
CANDIDATE FOR MEMBERSHIP
(FORMERLY UNDER CONSTRUCTION)

Tel: +31 492668240
Fax: +31 492668241
E-mail: info@dierenrijkeuropa.nl
Website: www.dierenrijkeuropa.nl

Dierenrijk Europa was under construction at the time of applying for membership, but opened to the public on 3 May 2004. The institution, which currently covers about 11 ha, is located on the remnants of an old waste depository. Being the most nearby zoo in the region, Safari Beekse Bergen is taking care of the development of this institution, and contains the central facilities for finance, administration, human resource and technical support. The animal collection of Dierenrijk Europa consists of all-European species, including species currently considered to have permanently settled in Europe.

The Zoological Garden of Sofia
Dr. Ivan Ivanov
1, Srebarna Str., kv. 'Hladilnika'
1407 Sofia, P.O.B. 67
Republic of Bulgaria
CANDIDATE FOR MEMBERSHIP
(WORKING TOWARDS COMPLIANCE OF THE EAZA STANDARDS)

Tel: +3592 8682043
Fax: +3592 683202
E-mail: sofiazoo@internet-bg.net
Website: www.sofiazoo.com

The Zoological Garden of Sofia was originally located in the park of the royal palace of King Ferdinand. After the Second World War, the zoo was enlarged and many new animals were purchased. In 1984 the zoo moved to a new area. Since 1995, Ivan Ivanov is the director of the Zoological Garden of Sofia. Under his management several improvements have been made to the zoo, for example, the first clinic in Bulgaria specialised in exotic animals was established.

Founded: 1888
Size: 35 ha
Staff: 85 (total full-time); 3 managers, 4 curators, 4 veterinarians, 36 keepers, 3 educators, 1 PR and marketing employee, 9 technicians, 8 administrators, 6 horticulturists, 11 others
Number of species: 350
Paid attendance: 125,000 (2003)
Organisational type: Zoological park under supervision of the Sofia Municipality

Publications

Publications of interest, received by the EAZA Executive Office
Publications should be ordered through the editors. Further questions can be addressed to danny.de.man@nvdzoos.nl

David Brunger and Roger Wilkinson, 2004. **European studbook for palm cockatoo (*Probosciger aterrimus*); no. 12.** North of England Zoological Society, Chester.
Data current through 31 December 2003

Marc Damen, 2004. **European studbook for the greater kudu (*Tragelaphus strepsiceros*); third update to the second edition.** Burgers' Zoo, Arnhem.
Data current through 31 December 2003

Lydia Frazier Bosley, 2004. **International studbook for bongo antelope (*Tragelaphus eurycerus isaaci*); year 2003 historical edition, vol. 18.** Forth Worth Zoo.
Data current through 31 December 2003

Volker Gatz and Sheila Sykes-Gatz, 2004. **International studbook for the giant otter (*Pteronura brasiliensis*); first edition.** Zoologischer Garten Dortmund.
Data current through 31 December 2003

Gabriele Hlavacek, 2004. **Pygmy hippopotamus (*Hexaprotodon liberiensis*) international studbook.** Basel Zoo.
Data current through 31 December 2003

Gabriele Hlavacek, 2004. **Greater one-horned rhinoceros (*Rhinoceros unicornis*) international studbook.** Basel Zoo.
Data current through 31 December 2003

Ellen Krebs, 2004. **European studbook for the lion-tailed macaque (*Macaca silenus*).** Zoologischer Garten Köln.
Data current through 31 December 2003

Joost Lammers, 2004. **European studbook and husbandry guidelines for the southern cassowary (*Casuarius casuarius*); first edition.** Vogelpark Avifauna, Alphen a/d Rijn.
Data current through 31 December 2003

Will Masefield, 2004. **European studbook for Livingstone's fruit bat (*Pteropus livingstonii*); second edition.** Durrell Wildlife Conservation Trust, Jersey.
Data current through 31 December 2003

Peter Müller, 2004. **International tiger (*Panthera tigris*) studbook 2003.** Zoologischer Garten Leipzig.
Data current through 31 December 2002

John Partridge, 2004. **European studbook for black howler monkeys (*Alouatta caraya*); no. 10.** Bristol Zoo Gardens.
Data current through 31 December 2003

Gary Robbins, 2004. **Malaysian peacock pheasant (*Polyplectron malacense*) European studbook.** World Pheasant Association, Mendlesham.
Data current through 1 June 2003

Gary Robbins, 2004. **Mountain peacock pheasant (*Polyplectron inopinatum*) European studbook.** World Pheasant Association, Mendlesham.
Data current through 11 November 2003

Steve Romo, 2004. **Eastern giant eland international studbook (*Taurotragus derbianus gigas*); tenth edition.** Los Angeles Zoo.
Data current through 10 March 2004

Mark A. Rosenthal, 2004. **International studbook for the Andean bear (*Tremarctos ornatus*) 2000-2002.** Lincoln Park Zoo, Chicago.
Data current through 31 December 2002

Michael Schropel, 2004. **European studbook for the red-bellied tamarin (*Saguinus labiatus*); first edition.** Magdeburg Zoo.
Data current through 31 December 2003

Stefan Stadler, 2004. **European studbook for the sunbittern (*Eurypyga helias*); Second edition.** Frankfurt Zoo.
Data current through 31 December 2003

Xie Zhong and Jonathan Gipps, 2004. **The 2003 international studbook for giant panda (*Ailuropoda melanoleuca*).** Chinese Association of Zoological Gardens (CAZG), Beijing and Bristol Zoo Gardens.
Data current through 12 December 2003

EEP Committee

The following new EEPs, ESBs, TAG (co-)chairs, EEP (co-)coordinators and European studbook keepers were approved:

NEW PROGRAMMES

GREEN TREE MONITOR ESB
(*Varanus prasinus*)
Mr. Markus Juschka, Dusseldorf, Germany

RED-HANDED TAMARIN ESB
(*Saguinus midas*)
Ms. Aude Desmoulins, Lille, France

RED-FACED BLACK SPIDER MONKEY EEP
(*Alteles paniscus*)
Dr. Brice Lefaux, Doue-Fontaine, France

ONCILLA ESB
(*Leopardus tigrinus*)
Mr. Pavel Brandl, Praha, Czech Republic

NEW COORDINATORS

TURKMENIAN KULAN EEP
(*Equus hemionus kulan*)
Ms. Anna Mekarska, Krakow, Poland

NEW STUDBOOK KEEPERS

BROWN BEAR ESB
(*Ursus arctos*)
Drs. José Kok, Rhenen, The Netherlands

— Directory Updates —

PERSONALIA

Dr. Jacques Rigoulet is the new director of **Menagerie du Jardin des Plantes**, France, as of 1 February 2004. He replaces Prof. Dr. Marie-Claude Bomsel.

Mrs. Suzanne Boardman is the new director of **Twycross Zoo**, United Kingdom, as of April 2004. She replaces Miss Molly Badham.

MVDr. David Nejedlo is the new director of **Zoologicka zahrada Liberec**, Czech Republic, as of 1 May 2004. He replaces RNDr. Josef Janecek, who will continue to work as a consultant for the zoo.

Mrs. Zdenka Barbara Ban Fischinger is the new director of **Zivalski vrt Ljubljana**, Slovenia, as of 25 May 2004.

Dr. Bernhard Blaszkiewitz is the new president of **Verband Deutscher Zoodirektoren (VDZ)**, Germany, as of early June. He replaces Dr. Ulrich Schürer.

Mr. Mark Challis is the new contact person of **City of Belfast Zoo**, United Kingdom.

ADDRESSES AND TELEPHONE/FAX NUMBERS

The new contact details for **Verband Deutscher Zoodirektoren (VDZ)**, Germany are:
c/o Tierpark Berlin-Friedrichsfelde
Am Tierpark 125
10307 Berlin
Tel: + 49 30515310
Fax: + 49 305124061

The new telephone and fax number of **Natur- und Tierpark Goldau**, Switzerland are:
Tel: + 41 418590606
Fax: + 41 418590607

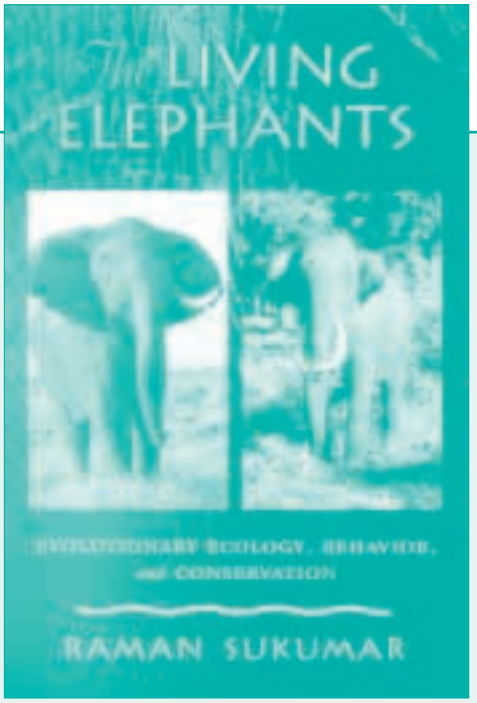
The correct telephone and fax number of **Longleat Safari Park**, United Kingdom are:
Tel: + 44 1985844328
Fax: + 44 1985844763

TERMINATED MEMBERSHIP

Parc Animalier de Courzieu, France

MEMBERSHIP CHANGES

Sosto Zoo, Hungary, Full Member
The Scientific Centre, Kuwait, Full Member
Kharkiv Zoo, Ukraine (now Candidate for Membership)



The living elephants; evolutionary ecology, behaviour, and conservation

- R. Sukumar (2003)

From the ancient origins of the proboscideans to the present-day crisis of the living elephants, this volume synthesises the behaviour, ecology and conservation of elephants, while covering also the history of human interactions with elephants. All topics are discussed within the theoretical framework of evolutionary biology. The book begins with a survey of the sixty-million year evolutionary history of proboscideans, emphasising the role of climate and vegetation change in giving rise to a bewildering array of species. The possible role of humans in the late Pleistocene extinction of mastodons and mammoths is discussed. The latest information on molecular genetics of African and Asian elephants and its taxonomic implications are presented. The rise of the elephant culture in Asia and its early demise in Africa are traced, along with an original interpretation of this unique animal-human relationship. The book moves on to the social life of elephants. The foraging strategies of elephants, and their impact on vegetation and landscapes are also discussed. The dynamics of elephant populations in relation to hunting for ivory and their population viability are described with the aid of mathematical models. A detailed account of elephant-human interactions includes a treatment of crop depredation by elephants in relation to their natural ecology, manslaughter by elephants, habitat manipulation by humans, and a history of the ivory trade and poaching in the two continents. The ecological information is brought together in the final chapter to formulate a set of pragmatic recommendations for the long-term conservation of elephants.

Pages: 494. ISBN: 0-19-510778-0 (hb). Price: UK£45.00.
To be ordered from: Oxford University Press Bookshop, 116 High Street, Oxford OX1 4BZ, United Kingdom

Births (no Hatchings)

CHESTER - UNITED KINGDOM

On 8 March 2004, following two weeks of secretly filming our herd of **Asian elephants** (*Elephas maximus*) at night using an infra-red camera, the female 'Sithami' gave birth to the first second-generation calf born at Chester Zoo.
The calf, born following a normal pregnancy and uneventful labour, has been named 'Sundara' – the pretty one.
Her mother was born at Chester Zoo in 1997 to female 'Thi-hi-way'. The birth occurred within the herd without any intervention from zoo staff. We feel that this natural birthing situation is very important. Sundara is Sithami's first calf and Sithami is being greatly assisted in rearing Sundara by Thi-hi-way, who sadly had a stillborn calf four days earlier.
The first Asian elephant birth at Chester Zoo occurred in 1975 and was the first Asian elephant to be born in the United Kingdom. Five successful births and an additional two calves born at Twycross have been conceived at Chester, all from the bull 'Chang'.

Source: Mark Pilgrim

Photo: Chester Zoo

OBREGÓN - SPAIN

The female **African elephant** (*Loxodonta africana*) 'Laura' gave birth to her second living offspring on 29 March 2004. The male calf was born after a pregnancy period of 20 months and 18 days. The delivery was entirely normal and the calf suckled immediately. The mother and calf are in good shape, having joined the rest of the herd of 13 elephants after two days.
The calf was sired by the dominant male, 31-year-old 'Chisco' who arrived from Mallorca (Auto Safari Reserva Africana - no longer existing) in 1990. Chisco also fathered seven other calves born in our park (see EAZA News 32/2000, p. 20). One other calf was fathered by 'Cita', the second male in age and dominance, who died two years ago, and there is one calf whose father could be either male because they both mated the female.

Laura, aged 21, came from Malaga (the old Zoologico Municipal de Fuengirola) ten years ago. She had her first living calf in 2000, also a male, and two years later she took over the task of mothering another calf (female) whose mother died. She took care of both calves and they both suckled from her. This male is the tenth calf born at El Parque de la Naturaleza de Cabárceno since it opened in 1990. Of the ten (4.6) calves born in our park, one female drowned in the pool when she was born, and one male named 'Pepe', died from a colic at the age of three, after having been hand-reared from birth, without having received colostrum milk from his mother. This death was very saddening for all of us, because his survival to that point had involved a great collaborative effort from the whole park, and it was the first elephant to survive without receiving colostrum milk from the mother.

Source: Beatriz Gallego

COLCHESTER - UNITED KINGDOM

Colchester Zoo has kept elephants since the park opened in 1964. No more than two cows had ever been housed at the zoo at any given time before a modern elephant facility was built on newly acquired land in 1999. The new elephant facility, totaling an area of approximately 1.2 ha, includes a large indoor area with five stalls in the cow area as well as an extensive communal area with an indoor pool and high-level feeding stations. The bull is housed separately in an approximately 2,000 m^2 indoor area. Two paddocks, both with waterfalls and pools, are outside.

Three elephants (one bull and two cows) arrived from the Chipperfields in 1999 amongst much publicity due to an impending court case against this compagny for animal cruelty. In fact 'Tembo', the bull, is featured in a video used as evidence. The film showed him being beaten with an iron bar. Tembo was the semen donor in the first successful AI of an African elephant in Europe at Vienna Zoo. He is also the father of the two bull calves, 'Kito' and 'Jambo', at Colchester. Kito, conceived through AI, was born to 'Tanya', a 25-year-old female, in December 2002. Jambo was born in March 2004 to 22-year-old 'Rosa' through natural breeding.
The latter birth was allowed to take place without keeper assistance. Rosa was in her own stall during the birth but had visual and tactile contact with the other herd members.

The cow 'Zola' was unsure of the new arrival after the birth of Kito, but now both calves have integrated beautifully within the herd, all the cows and the two calves are often together.

Two more pregnancies through natural mating were confirmed, but sadly Zola's pregnancy has resulted in a retained foetus.

Source: Anthony Tropeano

LISBOA - PORTUGAL

There was no more promising way to start a new year than the birth of a baby **African elephant** (*Loxodonta africana*) at Lisbon Zoo on 1 January 2004, the first successful birth of an elephant in Portugal's history.

Lisbon Zoo has kept elephants since at least 1917, but there are no records of births before 2002, when another baby was born but did not survive. Our adult elephants (one male and three females) were wild captured in Kruger Park in South Africa in the early 1990's. These elephants were supposed to be culled in the frame of the South African elephant-culling programme, but when we showed our interest in receiving a group of young elephants the South African National Parks Board decided to donate them to Lisbon Zoo.

As we were expecting this most recent birth, and because of the death of baby elephant born to another female in 2002, the mother was separated, but in visual contact, with the other elephants, including the male, at the time of the birth of her male offspring.

The primiparous mother did not rear her baby during the first two days. Contact with institutions with more experience such as Obregón, Jerusalem and Colchester led to the decision to give a tranquilliser (Rompun) to the mother. One hour later the baby was suckling.

Photo: Lisboa Zoo

The mother (the alpha female of the herd) and the baby were introduced to the other two females five days after the birth. There was some aggression from the two other females towards the baby, much more due to curiosity than real aggression, but because this could risk the baby's life we decided to separate the mother and young from the others again and change strategy. We then introduced the mother and baby first to the lower ranking female, and one week later to the middle ranking female. These introductions proceeded without problems.

The group is now socialising well and a national tv contest has been organised to name the baby.

Source: Eric Bairrao Ruivo

ROTTERDAM - NETHERLANDS

While 12 **Asian elephant** (*Elephas maximus*) births have occurred at Rotterdam Zoo in the last twenty years, there is a big difference between the first and the latest birth, both of which were by 'Irma', the herd's matriarch. Irma gave birth for the first time in a box in 1984, separated from the other herd-members and we were very lucky that she raised her young so well. After the elephants moved in 1994 to their present facilities it was possible for females to deliver their young in a free-ranging elephant herd. Nine elephant births have taken place in this situation, and we are extremely satisfied with the results.

Directly after giving birth the new mother is encouraged by the other cows to move aside to take time to collect herself. Meanwhile the other females protect the newborn from the curious youngsters in the group and any possible danger until the new mother has regained her composure and some of her strength. Irma oversees events, but allows the other females to organise things unless there is a problem, in which case Irma clearly takes command. If Irma herself is giving birth, her oldest daughter 'Bernhardine' takes charge of the situation.

All females of reproductive age in the herd are breeding, including Irma (1970, born in Copenhagen), Bernhardine (1984, Rotterdam, first offspring of Irma), 'Douanita' (1987, wild born, confiscated 1988) and 'Yasmin' (1990, born in Rotterdam, second offspring of Irma).

Bernhardine has produced two calves, both of which unfortunately died. The first died shortly after birth at Munster Zoo because of a herpes infection, and a male born in Rotterdam died in 2002 unexpectedly when 11 months old because of intestinal problems coupled with a herpes infection. Bernhardine was an excellent mother, and the death of her offspring was clearly difficult for her. Both calves were sired

Births (no Hatchings)

Trong Nhi

Photo: Rod Doolaard/IZP

by bull 'Alexander' (born in Ramat Gan, 1978), who was with Bernhardine while she was in Munster and then became the breeding bull in Rotterdam shortly after Bernhardine returned home.

Douanita has a special rapport with calves, and is always Irma's first choice for a baby sitter. Unfortunately Douanita's first calf, a male, died at birth in 2000 because of a herpes infection. This was the last calf sired by 'Ramon' (1970, born in Hannover) before his death in 1998. Douanita is a very self-confident, relaxed mother to her second offspring 'Trong Nhi', born in May 2003 and sired by Alexander. Yasmine, not having had all the baby-sitting experience of Douanita, might be considered slightly over-protective to her first offspring 'Anak', just two months younger than Trong Nhi. The arrival of 'Sibu', Irma's fifth offspring and her first son, in February 2004, has meant that the two calves born in 2003 have a third playmate of similar age, in addition to slightly older 'Bangka' the fourth daughter of Irma born in 2000. Rotterdam Zoo also serves more widely as a breeding centre. A visiting cow from Krefeld Zoo and one from Amersfoort Zoo gave birth some time ago to offspring sired at Rotterdam Zoo by 'Ramon'. Alexander has also successfully inseminated 'Thong Tai', who is expecting her calf at Amsterdam Zoo in 2005. The cow 'Dumbo' from Antwerp Zoo is currently visiting Rotterdam Zoo and will hopefully also return home pregnant.

Much has been learned and experienced in the last twenty years of keeping elephants at Rotterdam Zoo, and problems, such as herpes infections, still need to be solved. But watching the harmonious interactions within the current group, especially the amusing contributions of its younger members, does give the feeling that all the effort has not been in vain.

Source: Martin van Wees

WHIPSNADE - UNITED KINGDOM

On 16 March 2004, after a gestation of approximately 638 days, 'Kaylee', a 22-year-old **Asian elephant** (*Elephas maximus*) gave birth to a female calf. The birth weight of the calf was 149 kg and she is probably the largest female Asian elephant calf to be born in zoos.

Some months prior to the birth, Kaylee had been habituated to being chained for periods at different times during the night, being separated from the other cows and similar procedures. This was done to reduce the risk of Kaylee reacting adversely to unusual procedures. As this was the first birth, the prospect of veterinary intervention to assist the birth was planned for. The pregnancy was monitored throughout, using ultrasound by Thomas Hildebrandt of the Institute for Zoo and Wildlife Research (IZW), Berlin, who was also present for the birth. The progesterone level dropped below the threshold concentration 0.3 nmol/l on 9 March. Seventy-two hours later there was still no further progress with the labour. The condition of the calf continued to be monitored through ultrasound and although still alive foetal movements were becoming less frequent. On this basis some intervention was required. Oestrodiol was administered and then following two bouts of rectal manipulation the labour progressed and parturition was successful.

After an initial and short veterinary check (in full view of the mother) the calf was introduced to the mother who remained restrained. The introduction proceeded gradually but without any difficulties. The calf attempted to suck but failed to latch on fully to the nipple. Milk obtained from the mother provided supplementary feeds for the calf. The calf continues to receive supplementary feeding. Within 72 hours of birth, two other cows were introduced to the calf under close supervision again without any major difficulties.

Source: David Field

Photo: Whipsnade Wild Animal Park

Monitoring of sexual maturity in female elephants in EEP populations

by Ann-Kathrin Oerke, Elephant Service Department of Reproductive Biology, German Primate Center Goettingen, Germany

*Young female elephants kept in European zoos form the breeding potential of the future and it is important to know at which age they are able to reproduce. Birth records from the elephant EEPs indicate that this can occur amazingly early; five years in Asian elephants (*Elephas maximus*) and eight years in African elephants (*Loxodonta africana*). Given a gestation period of nearly two years, this means that the females conceived when three and six years of age, respectively. Females are obviously still premature then, and zoos are urged to postpone first breeding until the females are older. At the same time it is not advised to let females get too old before producing their first calf since older cows are more prone to birth problems.*

Hormone analysis

In order to be able to time breeding in young elephants accordingly, and also to prevent inbreeding with the father, it is important to know if a cow is cycling. Longitudinal monitoring of reproductive status is possible by measuring hormones in urine, faeces and blood. This allows determination of cycle length and prediction of estrus periods. No information other than age of the female at first birth was available to establish onset of ovarian function in elephants, thus a study was conducted from 2000 to 2003 on 28 African elephant females between four and ten years of age. At the same time an increasing number of zoos began routine monitoring of young Asian elephant females and information from 14 females between four and ten years of age is now available. Hormone analysis in all but one African elephant, which was monitored via faecal samples, was carried out in urine samples collected once weekly.

RESULTS

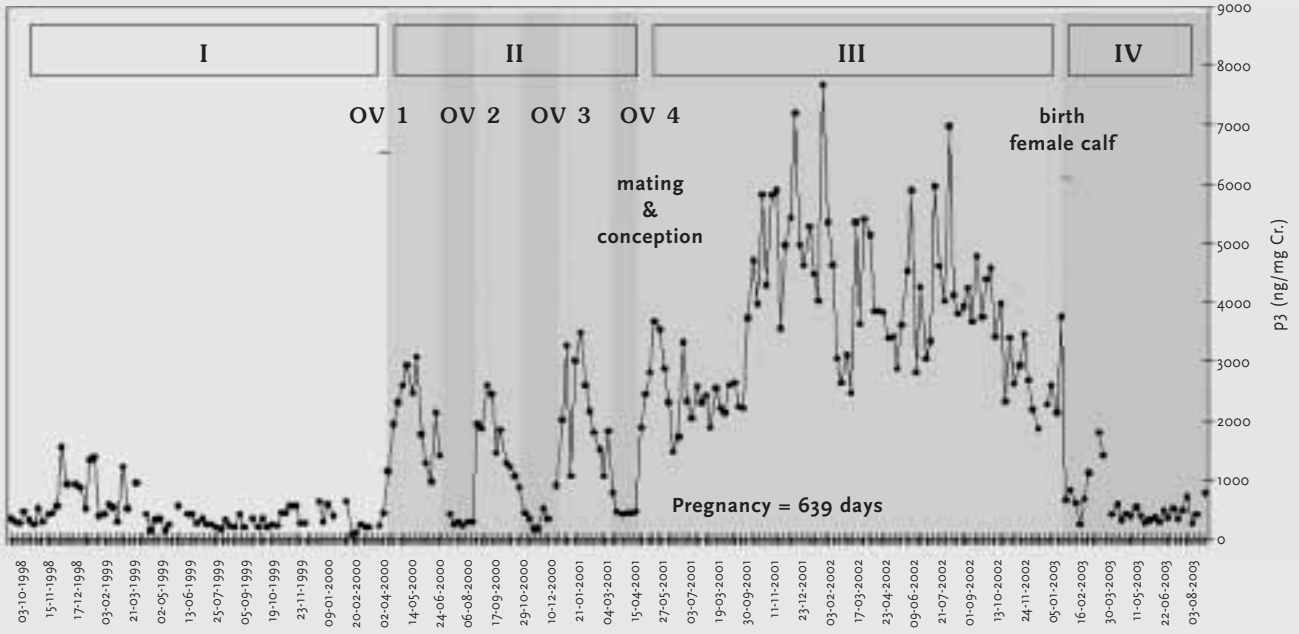
African elephant:

Of the 28 females monitored in the study only three (11%) were captive born whereas 25 (89%) were wild born. Thirteen females (46%) ranging from four to ten years of age were not cyclic throughout the study. Nine elephants (32%) were already cyclic when the study started. None of these animals was younger than seven years. Six females (22%) started to show ovarian cycles during the study; five of these six females were seven years old and the other elephant was nine years old. These data clearly demonstrate that African elephants in captivity may attain sexual maturity when seven years of age. Furthermore 54% of the animals in the study can already be defined as potential breeders.

'Manari' with her female calf 'Califa' born on 2 February 2003 in Hannover Zoo

Photo: Hannover Zoo

Urinary hormone profile from Asian elephant 'Manari' 1998 - 2003, Hannover Zoo



Urinary hormone profile of a young Asian elephant female showing four reproductive stages: I. prebubeatel = no cycles (consistently low hormone levels); II. sexually mature = ovarian cycles (regular changes in high and low hormone levels); III. pregnant = no cycles (constantly high hormone levels); IV. lactating = no cycles (constantly low hormone levels).

Asian elephant:
Zoos sent samples from 14 young females, of which six (43%) were captive born and eight (57%) were imported. With the exception of one five-year-old imported animal all the females aged four to ten years were cyclic (93%). The age of onset of ovarian cycling is exactly known for six elephants, as monitoring had begun before they began cycling, whereas the rest of females must have started showing ovarian function at an even earlier age. Cycles were detected in one female four years of age, in four females five years of age and in three females six years of age. Interestingly all but two of these elephants were captive born in Europe. One of the five imported elephants began cycling when seven years of age, three females when eight years of age and one female when ten years of age. It is therefore concluded that Asian elephants in captivity are able to conceive when four years of age and monitoring to avoid premature pregnancy must be initiated even earlier.

Conclusion
Apart from the difference between the two elephant species, females within each species also seem to reach sexual maturity at different ages. This might be due to developmental status and body condition or to the social structure of the group. It is therefore expected that captive-born animals which are raised by their mother in a stable social environment will begin ovarian cycling at an earlier age than females that are imported at a very young age and consequently need to establish their position in a new social group.

Elephant - keeper related incidents

by John Ray, Twycross Zoo, United Kingdom

During 2003 concern was growing in the Asian and the African elephant EEP Species Committees and in the British and Irish Elephant TAG regarding the number of recent incidents involving keepers and elephants in European zoos and safari parks. It was therefore decided to send a 15-part questionnaire to establish whether any common denominators existed. The survey covered the last 15 years, during which time six keepers had been killed and fifty injured.

Results questionnaire
A total of 78 questionnaires were sent out with 55 (70.5%) collections responding. Sixteen (29%) of the collections had no incidents but 39 (71%) collections had incidents. If it is assumed that collections which did not respond had no incidents, 50% of collections would still have had incidents, which is not acceptable.
On looking at the sex and species of elephants involved in an incident, it emerged that female Asian elephants (*Elephas maximus*) were the more likely candidate. This may be because more Asian elephants are kept in zoos and safari parks compared with African elephants (*Loxodonta africana*) and Asian elephant cows are more often kept in 'free contact' situations (see page 16). On the other hand bulls of both species were generally kept in 'protected contact' or 'no contact' situations. Incidents usually happened in elephant barns and in close contact with other elephants but on only one occasion (that has been recorded) did another elephant join in with the attack.
The incidents more often occurred soon after the animals were taken off chains or at the end of a foot trimming session, possibly when the keepers were not as vigilant as they should be. Incidents also occurred when the elephant was being given a command by a new keeper and the animal did not want to respond.
The age of the elephant or how long it had been kept in the zoo was not a significant factor, nor was the age of the keeper.

Significant factors
The most significant reasons for an incident occurring were:
- In nearly 50% of incidents, the keeper was working alone;
- In nearly 50% of incidents, the keepers had a maximum of only three years experience with elephants (in many cases this was much less);
- In many cases the keeper had a maximum of three years experience with the particular elephant involved in the incident (again in a lot of cases this was much less).

Some other factors possibly contributing to incidents were if an elephant was in musth or in pain due to an infected tusk or foot, if the elephant was nervous (either because there was work going on in the barn or it was a new animal) or if there were unusual associated circumstances (for example an elephant was just recovering from anaesthetic).

Management
Two management issues which must be addressed if we are to continue keeping elephants in our collections are:
- Keepers should never work alone around the animals;
- Continued training of all keepers, whatever their experience, is necessary.

Name: Amelia Segre Terkel

Position: Curator at the Zoological Center Tel Aviv - Ramat-Gan (Safari)

Last book read: 'No logo' by Naomi Klein: a reminder that marketing the multinationals drives the world, but that it is possible to stand up to the WTO

Last trip made abroad: California, to visit our first grandson

Pet animals at home: A dog, a cat (both found on the street); unfortunately the macaw was stolen

Hobbies: Swimming, gardening, reading, bird watching

Photo: Zoological Center Tel Aviv- Ramat Gan

Please describe your career path.

After my PhD in animal behaviour, I did post doc work in brain research, then when my children were small I worked in biology curriculum development for elementary school. I have always wanted to work in a zoo since undergraduate days. When the Safari was about to open in 1981, I invited the director to a lecture I gave on using animal collections for education. He hired me the next week! My responsibilities at the zoo include collection, design team, plant team, education team, registrar and research projects liaison.

What is the most memorable or fascinating event in your career so far?

Most of memorable events have to do with application of 'eco-tourism' to the zoo. For instance spending ten days in Berenty Madagascar, gave me an appreciation of lemurs and their plant community. We were then able to work on the planting for our own lemur area. The most emotional events surely have to do with the physical touch and smell of animals, from Bosso, the gorilla whose incredible presence really moved me, to the wiry hair of hand-reared baby orangutans to watching the development of baby macaws.

Which important changes do you see happening in the zoo world in the next ten years?

It seems to me that a homogenisation of zoos is occurring, reducing the biodiversity in collections. This is the flip side of maintaining large social groups and less species. The rarer animals which may be more difficult to breed or to acquire or have less 'marketing' interest for the public will be phased out. On the public service side, there is already an increasing reliance on zoo expertise for many issues, whether the zoo is used as an information resource or as instigator or as a participant in local environmental projects.

Which important changes do you see happening in the zoo world related to keeping elephants?

Management is improving: larger spaces for the elephants, larger herds, better understanding of social needs, and a slow evolution toward less intense handling (protected contact). We are learning and sharing information better than before.

What are the main challenges for the African elephant EEP Coordinator?

Improving the welfare of elephants – it is difficult and expensive to change things that are entrenched in existing physical sites. Trying to see the big picture of a very complicated animal – management – keeper relationship. It is extremely rewarding to discuss the many issues with a very talented and dedicated EAZA Elephant TAG committee.

Why does the elephant stand out for you?

I was never really interested in elephants until 1987, the year in which six African elephants (and one Asian) were born in our zoo. Two were born on one day! We realised that a world-class constellation of events had occurred, because we could find almost no births reported in the International Zoo Yearbook in the previous decade. We had the privilege of seeing grandmothers take over the care of the newborn calves for many hours while their frightened screaming primiparous daughters collected themselves and calmed down. In talking to colleagues we realised that our social group was really remarkably stable and well structured. Sharing our experience and our way of (not) handling elephants provided a different paradigm of managing elephants than most other zoos.

Name: Ton Dorresteyn

Position: Director at Rotterdam Zoo

Last book read: 'Absolute friends' by John le Carré

Last movie seen: 'Lord of the Rings; the Return of the King'

Last trip made abroad: China, February 2004

Pet animals at home: None

Hobbies: Reading, looking at wild birds, collecting stamps and trying to have some kind of a family-life

Photo: Rob Doolaard/IZP

Photo: Jantijn van den Heuvel

Please describe your career path

After I finished my university (biology) degree I started as scientific editor at Elsevier Scientific Publishers Company in Amsterdam. Two years later I left for a position as staff biologist for the State Forest Service. I worked there for 13 years as staff biologist, nature conservation officer and regional director (in the province of Gelderland), before I moved to Rotterdam Zoo to become the director in September 1988.

What made you decide to accept your current job?

I was always interested in the management of (small) populations of endangered species and also interested in making as many people as possible aware of the importance of nature conservation, so the step from being responsible for the management of the nature reserves in the eastern part of the Netherlands (all fenced in!) to a zoo was a small one. In my spare time I am (still) chairman of one of the larger nature conservation societies in the Netherlands.

What do you enjoy most about your job?

I like working with people (and being able to walk through the zoo when there is nobody there except the animals and plants). However, sometimes I envy those people who don't have to work with (many) people.

What is the most memorable or fascinating event in your career so far?

Giving a speech to a large audience in which I compared nature conservation (action) work with a swarm of bees, when suddenly a large swarm of bees came up from behind and settled in a chimney twenty metres from me (coincidences don't occur!).

Which important changes do you see happening in the zoo world in the next ten years?

That it is acceptable again to be a zoo for visitors, where as a visitor you can enjoy the fact that you are able to see strange and exotic animals just for your own fun, without having to read nature conservation messages on every corner in the zoo. That doesn't mean that the latter is not important but sometimes I feel that we are trying to defend our existence by saying over and over again that we are a nature conservation institution.

Which important changes do you see happening in the zoo world related to keeping elephants?

A lot is changing at the moment, and has changed in recent years. Almost any elephant keeping zoo in Europe is really trying to contribute to the goals that the elephant EEPs and TAG members defined a few years ago. Family-herds are being created, breeding bulls are being moved to other facilities, big efforts are being made to increase the rate of reproduction in captivity; quite a few new elephant houses are being planned and/or built etc.

What are the main challenges for the Asian elephant EEP Coordinator?

To keep the present, very positive developments going.

You are involved in many zoo-related topics and make very long days. What keeps you going?

The sheer joy of being able to enjoy the birth of a young giraffe, okapi, or elephant.

Promoting synergies with *in situ* conservation of elephants

by Holly T. Dublin, Chair African Elephant Specialist Group and
Gerry Guldenschuh, previously Zoologischer Garten Basel, Switzerland

The African Elephant Specialist Group (AfESG) is one of the most active and productive of the over 120 taxonomic and thematic groups of experts comprising the IUCN Species Survival Commission. The AfESG provides impartial technical advice to conservation agencies, governments, non-governmental organisations (NGOs) and other relevant parties inside and outside Africa on matters associated with the conservation and management of the African elephant. In line with the statutes of IUCN, the membership is re-appointed approximately every four years; all members are required to have been actively involved in some aspect of elephant conservation or management for the previous 12 months prior to appointment. As a result, the AfESG is in a unique position to engage in cutting-edge elephant conservation action across the continent.

Collaboration

Perhaps not surprisingly, the *ex situ* lives of African elephants are often far from our day-to-day consciousness. For many people actively working in the field of African elephant conservation and management, it requires a far stretch of the imagination to fully understand the relationship and, perhaps, the hidden benefits that zoos bring to the conservation of the species. To this end, the AfESG has, over the years, made a conscious effort to ascertain and promote possible synergies between active conservation of the species in the wild and efforts of captive facilities in Europe and North America.

Although the AfESG is concerned of the poor breeding success and low life expectancy of captive African elephants relative to those living in free-ranging conditions and does not see any contribution to the effective conservation of the species through captive breeding per se, it does recognise the role that zoos and zoological societies may play in mobilising public support for funding of relevant activities such as public education, scientific research, development of technologies, professional training and direct support to the conservation of the species in the field. While such direct support for the conservation of African elephants has been relatively limited to date, and has focused on a few localised efforts, we are confident that much greater collaboration can be achieved in the future, though this may take time.

In fact, the AfESG encourages captive facilities to maintain and expand their support to field programmes directed to African elephant populations in African Range States, and to improve the content of their public awareness and education programmes as it relates to African elephants. The group feels it is important to emphasise that holding of African elephants by a captive facility is not a necessary precursor for active involvement in *in situ* African elephant conservation; collaboration with all interested EAZA members is welcome.

Challenges

Africa's elephants face many challenges, including

Photo: Andrea Turkalo

Enquiries about subscriptions to 'Pachyderm' the journal of the African Elephant, African Rhino and Asian Rhino Specialist Groups, can be addressed to: The Editor, Pachyderm, PO Box 68200, 00200 Nairobi, Kenya (email: afesg@ssc.iucn.org)

the loss and fragmentation of their habitats; increasing conflict with people over land; and illegal hunting for meat and ivory. Large areas within the range of the elephants are of unknown population status. To this end, the AfESG would be happy to help in conceptualising and operationalising any substantive, new funding initiatives that EAZA may wish to undertake regarding conservation of Africa's elephants. There remains so much to be done in their complex and increasingly threatened realm that from now into the foreseeable future, Africa's elephants will need all the help they can get.

What are EAZA zoos doing now?

Information from the elephant survey revealed that several zoos are currently involved in *in situ* projects in Africa and Asia as well as projects targeting well being of domestic elephants in Asia:

Amersfoort Zoo:
Marjo Hoedemaker Elephant Foundation;
Uda Walawe National Park, Sri Lanka;

Blackpool Zoo:
Database of, and medical support for captive elephants in Thailand;
Permanent identification and registration of 4,500 captive elephants in India (a joint project with the IUCN AsEISG and Project Elephant India);

Chester Zoo:
Human-elephant Conflict Programme, Assam, India (supporting the work of Fauna & Flora International (FFI));
Major sponsor of the IUCN Asian Elephant Specialist Group Meeting 2002;

Frankfurt Zoological Society:
Garamba Project, Democratic Republic of Congo.

Hamburg Zoo:
Financial support to Cat Tien National Park, Vietnam;

Paignton Zoo:
Nigerian Forest Elephant Group & Nigerian Conservation Foundation;

Stuttgart Zoo:
Distribution and movements of elephants and other wildlife in the Selous-miassa wildlife corridor, Tanzania;

Twycross Zoo:
Sponsorship of a reintroduction project of a single animal;

Zooparc de Beauval:
Regional programme ECOPAS Ouagadougou, Burkina Faso;

Vienna Zoo:
Amboseli Elephant Research Project, Kenya;

Woburn Safari Park:
Asian Elephant Conservation and Welfare Programme (supporting FFI's work).

TAG Conservation Proposal

The below actions were proposed for inclusion in the EAZA Elephant TAG Conservation Strategy during the closed EAZA Elephant TAG meeting in Opel Zoo Kronberg in March 2004:

1. The strength of zoos with elephants in increasing awareness, education and fundraising should be used;
2. The two EEPs in the EAZA Elephant TAG should focus on a single small project for each species;
3. Both EEPs should support field projects;
4. Support for improving well being of captive Asian elephants in range states should be continued;
5. Inclusion of an additional European representative in International Elephant Foundation will be proposed;
6. The Conservation Task Force, including Ton Dorresteyn, Harry Schwammer, John Ray, and Mark Pilgrim was appointed.

A specific proposal for involvement of the EAZA Elephant TAG in African elephant conservation was presented by Gerry Guldenschuh. The TAG could join AfESG in sponsoring research on elephant bushmeat in central Africa (e.g. Cameroon). The project objective would be to track the line of transport movement of elephant meat from field to market in order to break the supply chain. The project would be carried out in conjunction with MIKE and TRAFFIC, and the government of Cameroon. This proposal meshes with the general EAZA Bushmeat Campaign (length of project four to five years). Supporting such a project would signal cooperation between the EAZA Elephant TAG and IUCN for the first time. This proposal requires further discussion and approval of the EAZA Conservation Committee.

International Elephant Foundation (IEF)

The IEF is sponsored primarily by USA zoos, IEF is a non-profit organisation established in 1998 for the purpose of contributing expertise and providing funds to support elephant conservation programmes worldwide, including protection of elephants in the wild and of their habitats; scientific research; education efforts; and improvement in intensively managed captive animal care. Fifteen projects are currently sponsored (total US$1.5 million). Projects in Asian range states focus on human-elephant conflict; DNA analysis of ivory; Sumatran elephants; workshops to improve well being; and conservation field work, including radio collaring. One African project; undertaken in Garamba (Congo) in conjunction with the International Rhino Foundation, is ongoing.

For more information: please refer to the websites of AfESG (www.iucn.org/themes/ssc/sgs/afesg/) and the International Elephant Foundation (www.elephantconservation.org)

The International Elephant Management Academy at the Vienna Zoo

by Harald M. Schwammer, Schönbrunner Tiergarten, Vienna, Austria

To date, 11 workshops on Elephant Care and Management have been carried out by the Vienna elephant team. Four workshops have been held in Vienna, three workshops in Sri Lanka, three in Thailand and one in India. The regular team consists of Harald Schwammer (coordinator), the veterinarians Wolfang Zenker and Thomas Voracek, and head keeper Gerd Kohl. The veterinary specialists Thomas Hildebrand and Frank Göritz, Angelika Hinke, Brian Batstone, Heidi Riddle and others are invited as lecturers during specialised workshops. We try to reach a broad audience, ranging from mahouts, veterinarians and elephant camp managers in Asia to zoologists, veterinarians and keepers in Europe, with our workshops.

Topics covered

The workshops are organised as theoretical and practical modules. The theoretical modules providing the basic and theoretical background are presented using 'Power Point' software. Topics covered in the basic module include information helpful in up-to-date keeping of elephants, e.g. standards; guidelines and manuals from all over the world; information on safety aspects; hands-on, protected and restricted contact and hands-off management methods, and the advantages and disadvantages of these methods; restraint chutes; behavioural enrichment; and construction of master plans (from individual enclosure to the breeding programme). The different approaches of zoos, elephant camps and sanctuaries are also presented.

Another module gives the theoretical background for training and veterinary procedures which will be expatiated in the practical modules, during which veterinarians and keepers give demonstrations with elephants. These demonstrations regularly include foot and skin care; trunk-washing; drawing blood samples; making radiographs; dental treatment; ultrasonic examination with references to reproductive health status; as well as semen collection and artificial insemination.

Elephant foot care demonstration by Harald Schwammer, veterinary course in Bangkok

Photo: Schönbrunner Tiergarten

'Trunk wash' training for tb-testing

Photo: Schönbrunner Tiergarten

Further veterinary aspects and advanced subjects covered include use of chemical drugs for sedation; herpes-virus infection; tuberculosis; pox disease; nutrition-related diseases; blood sample programmes; and use of microchips. Other focal points include building up a breeding group; monitoring of the reproductive cycle; pregnancy and growth; and the importance of good record keeping for births. We introduce research projects and stress the importance of behavioural monitoring.

Perspective for the future

One workshop will be organised in Europe and two in Asia in the near future. We have been invited to arrange workshops in Sri Lanka, and in Pakistan. An extensive three week training programme for elephant keepers will be launched in 2005. The programme will include one week at Vienna Zoo, where the basic and theoretical background will be presented, followed by a two week practical training programme in Sri Lanka at the Colombo Zoo and the Pinnawala Orphanage. Dependant on demand, a special 'protected contact training programme' will be offered soon.

Our aims in founding the International Elephant Management Academy were to stimulate a dialogue between elephant experts in Asia and Europe, to improve knowledge about elephant husbandry, thereby improving the life of elephants under human care. Approximately 560 persons throughout the world have been trained by the Vienna team to date.

Elephant exchange

by Wijbren Landman, Emmen Zoo, the Netherlands

*There is one adult male in the herd of 15 Asian elephants (*Elephas maximus*) at Emmen Zoo. 'Naing Thein' (Burmese for 'great conqueror') was that male for some time, but when his eldest daughter 'Mingalar Oo' reached sexual maturity at 12 years of age, a new bull was needed to take his place. This replacement was 'Radza', an enormous elephant from Riga, Latvia.*

The impressive 'Radza' in his new herd at Emmen

Photo: Emmen Zoo

Cooperation of many zoos

Thanks to the efforts of Koen Brouwer, Executive Director of EAZA, Riga Zoo was willing to give up its star attraction. Six zoos cooperated in the elephant exchange: Prague Zoo is now home to Naing Thein; Rotterdam Zoo participated in its function as coordinator for the Asian elephant EEP; and Artis Zoo - Amsterdam supplied the enormous transport container. Riga Zoo was willing to send us Radza only if a new home could also be found for its other elephant, 'Rupa', giving the zoo the opportunity to build a completely new elephant enclosure. A place was found, at Burgers' Zoo, Arnhem.

Successful transfers

Before the move, Naing Thein's handlers trained him to feel comfortable with a chain around his front and back leg. The chains were used to secure him in the transport container, as this is the only way to safely transport such a large and heavy elephant. The handlers tempted the 5,700 kg elephant into the container with tasty morsels. He was then loaded onto a lorry and transported to Prague without any problems.
After the long journey from Riga to Emmen, Razda's container was lowered into the elephant enclosure. Out came 35-year-old Radza, weighing about 7,200 kg and with tusks of almost two metres, he is an impressive sight. He stood there for a couple of hours before turning around and heading over to the stables. Even the inviting trumpeting of an entire herd of elephants did not make him move any faster; Radza was in no hurry. It took about eight hours to talk him into his new stable.
Radza does not cause any problems in the herd. The young elephants are particularly curious about his tusks and can not stop touching them with their little trunks. That is fine by Radza, he is more interested in the ladies. So far, he has mounted four elephants, including Mingalar Oo, and that was exactly the reason why he made the long trip to Emmen.

Planned restart of keeping elephants in Riga Zoo

Elephants have been kept in Riga Zoo since its opening to the public in 1912. This year is the first year with no elephants in Riga Zoo's animal collection as both Asian elephants were transferred to the Netherlands in the framework of the EEP on 4 October 2003.

In the beginning of the 21st Century, Riga Zoo faced the fact of the old historic Elephant House does not meet modern elephant-keeping standards. In June 2003, Riga Zoo was approached by the EAZA Asian elephant EEP Coordinator, with a recommendation to send the proven breeding bull 'Radza' on loan to Emmen Zoo. The elephant cow 'Rupa' was found to be unsuitable for natural breeding. It was decided to transfer her to Burgers' Zoo in Arnhem where she could join their female group.
The closing of Riga Zoo's old Elephant House opened up the prospect of building a new facility suitable for keeping an elephant family group, in line with the modern standards. The planning of the new building has already started.

Source: Riga Zoo Annual Report 2003

Amiens Zoo's elephant story

by Cédric Libert, Amiens Zoo, France

*Amiens Zoo, a fifty-year-old zoo but a young member of EAZA, is situated in Northern France. The story of Asian elephants (*Elephas maximus*) in our zoo is not exceptional but, we think, a good example of how a small zoo with very limited financial possibilities can keep elephants.*

Our elephant enclosure was very outdated by 2001, as nothing had changed since 1972 when it was built. 'Sandrine', a female born in Thailand in 1969, was circling the enclosure alone, placing her feet in exactly the same spot at every turn… a spectacle that would depress any zoo defender. This animal was out of control after an accident with the elephant keepers ten years before, so her feet were also in bad condition. We decided in October 2001 to immobolize Sandrine to take care of the feet and then to transfer her to Amsterdam Zoo. The municipality was not happy with this decision and wanted to continue exhibiting elephants; however we did not have the space, personnel or the money to make a breeding group enclosure. We decided to keep non-cycling females and receive animals surplus to the EEP's collection plan. We extended the enclosure from 800 to 1500 m^2, built an outside pool, and created two boxes inside with a wide front corridor for the keepers. We made a third box for training the elephants in a protected contact situation. We opened the building in July 2003 with two females from Antwerp Zoo, 'Jana' and 'Bombay'. Sandrine was eventually transferred to La Barben Zoo, in Southern France in December 2002 to join 'Dora', another non-cycling female. With the help of the elephant keepers from Antwerp Zoo during June 2003 and from Rotterdam Zoo during February and May 2004, our keepers learned to manage elephants and to take

Photo: Amiens Zoo

care of the feet. Today we participate in the Asiatic elephant EEP, we are able to control and to work in protected contact with our animals, and above all the animals, the keepers and the visitors seem to enjoy this new arrangement! The end result is that there are now two apparently compatible pairs of non-breeding females in suitable enclosures in two zoos. We would like to thank Amsterdam Zoo, Antwerp Zoo and Rotterdam Zoo for their help in coming this far.

EEKMA meeting at Duisburg Zoo

by Achim Winkler, Zoologischer Garten Duisburg, Germany

The 2004 annual meeting of the European Elephant Keeper and Manager Association (EEKMA) took place at Zoo Duisburg on 20 - 22 February 2004. As in previous years, the official language of the workshop was German, thus most attendants were from German speaking regions. Nonetheless a total of 86 participants from seven different countries attended the meeting, making it the biggest EEKMA meeting to date. Elephant keepers and a number of zoo directors, curators and veterinarians participated in the workshop, as did several scientists working on elephant matters.

Topics

A broad range of topics, largely focussing on general elephant husbandry issues, was presented. Safety measures were discussed, and free contact and protected contact compared. Some veterinary issues were covered, such as the common herpes problems; hormonal analyses; artificial insemination; and elephant reproduction. Interesting videos on the recent births at the zoos of Hamburg, Hannover and Rotterdam were shown. Further talks addressed management of the European elephant population; the latest developments within EAZA's African and Asian elephant EEPs were presented; and the well-attended workshops on elephant management held at Vienna and Hamburg zoos described. These workshops will be continued in forthcoming years.
Finally, the latest developments in elephant housing were detailed, with presentations of the new facilities at the zoos in Amersfoort, Hannover, Heidelberg, and Leipzig, and with a guided tour through the new elephant facility at Duisburg Zoo.

Proceedings

All participants agreed that it was a very productive meeting with many fruitful discussions on a number of critical topics. A summary of the workshop will be presented in the proceedings, which are to be published later in the year.

African bull arrived at Safari Beekse Bergen

by Rolf Veenhuizen, Safari Beekse Bergen, Hilvarenbeek, the Netherlands

*Safari Beekse Bergen received 0.5 African elephants (*Loxodonta africana*) from Zimbabwe in 1986. The females, approximately two years old then, have now reached reproductive age.*

The construction of a new enclosure for an African elephant bull began in autumn 2003 and was completed in spring 2004. The bull 'Calimero', also originally from Zimbabwe, arrived from Basel Zoo on 28 April. The 26-year-old bull, weighing 6,300 kg and more than 3.4 m in height, was a large load to transport from Basel to Hilvarenbeek. The veterinarian in Basel Zoo gave him a light sedative the day before his journey and even during the transport the bull remained calm. With a chain on one of his hind legs and a winch, he was pulled in a container. Early the next morning the truck, with Calimero inside, arrived at its destination. He was in no hurry to leave the container and unloading him was uneventful.

New home

The bull's new environment consists of two indoor enclosures and an outdoor exhibit with a smaller pen. One indoor enclosure (64 m^2) has a natural sand floor and the other (32 m^2) has a concrete floor. Both indoor facilities have very strong fences, making protected contact training possible. Much light comes in through five windows and three dome-shaped sky lights in the roof.

There is a corridor between the pen and the 3,000 m^2 outdoor exhibit. If necessary the elephant can be kept in this corridor temporarily, which enables the keepers and the veterinarian to perform small handlings on the animal. Five horizontal cables, including three with electric wires, surround the outside enclosure. The highest cable is three metres high. The exhibit includes several boulders, trees (protected by electric fencings), a bath and sandy soil.

The arrival of 'Calimero' at Safari Beekse Bergen

Photo: Safari Beekse Bergen

First bath

Calimero immediately began to dig in the sand of his indoor enclosure, and seemed to enjoy his first sand-bath in his new surroundings. Thus, after talking to the keepers from Basel, it was decided to let him explore the small outdoor pen on the second day. He returned to his indoor quarters at the end of the afternoon with no problem. On the third day the corridor was opened at one side and without any hesitation he went in, moving on to the large outdoor exhibit. Not more then thirty minutes later he took his first bath in the full attention of the five females, who could see the bull from a distance.

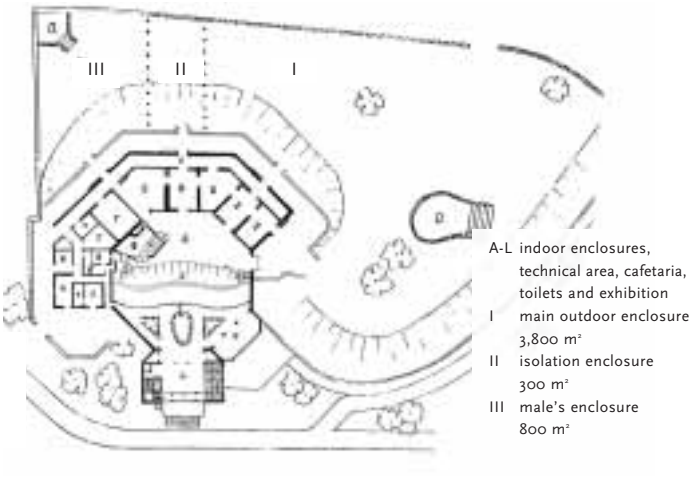
Before Calimero's arrival it was determined that two of the females have reached fertility, and the bull's sperm is of good quality. In theory things look favourable, let us see what happens in practice.

Photo: Safari Beekse Bergen

New elephant house in Warsaw Zoo

by Anna Zlamal, Warsaw Zoo, Poland

*After the death of our last Asian elephant (*Elephas maximus*) we decided to build a new, modern elephant house for a new group of African elephants (*Loxodonta africana*). This major project began in Spring 2001 and was finished in June 2003. The new elephant house cost three million euros. The new building consists of one indoor and three outdoor enclosures.*



Enrichment features in the 3,800 m² outdoor exhibit include some trees, two scratching posts, a pool, a mud wallow and an area with loose sand for sand-bathing. There is a stone wall barrier in the back of the enclosure and a dry moat with a 45° slope in the front of the enclosure. A second outdoor enclosure of 910 m², also with a pool, is prepared for an adult bull. A third enclosure, covering only 300 m², separates the first two enclosures and can be used in emergency situations.

The elephant building consists of a main hall, night quarters, back-up facilities and a visitors' area. There are four night quarters. The night quarters for the bull are 80 m², and the three areas for cows are each 50 m². There is also a training box with a squeeze cage. The floor is covered


Photo: Warsaw Zoo

with plastidur, i.e. plastics and resin. There is mechanical ventilation and warm-air heating. The bar door is operated mechanically. The 215 m² back-up facilities include a keeper passage, a keeper area with a monitor to observe the night quarters and outdoor enclosure, the food storage area, and a technical area.

An indoor enclosure and a visitor area, located in the 730 m² main hall, are separated from each other by fencing, vegetation in the public hall, an electric fence and a dry moat in the animals' enclosure. The roof of the main hall is artificial glass (lexan) and is 14 m high at its highest point. The indoor enclosure is furnished with rocks, artificial baobab, savannah paintings on the walls and a waterfall.
The viewers area is divided in three parts: a room with educational boards, the toilets, and, on the upper level, a restaurant with a balcony, providing excellent viewing opportunities. Disabled visitors can reach the upper level by elevator. We plan to exhibit rock hyraxes (*Procavia capensis capensis*) in a separate enclosure in the visitors' area.

The first two new inhabitants of this elephant house, 'Yoni' (two years old) and his friend 'Ninio' (four years old), arrived from Ramat Gan in July 2003. These two young bulls seem to enjoy their new house, and we hope they will soon be joined by three cows to form a new, happy group.

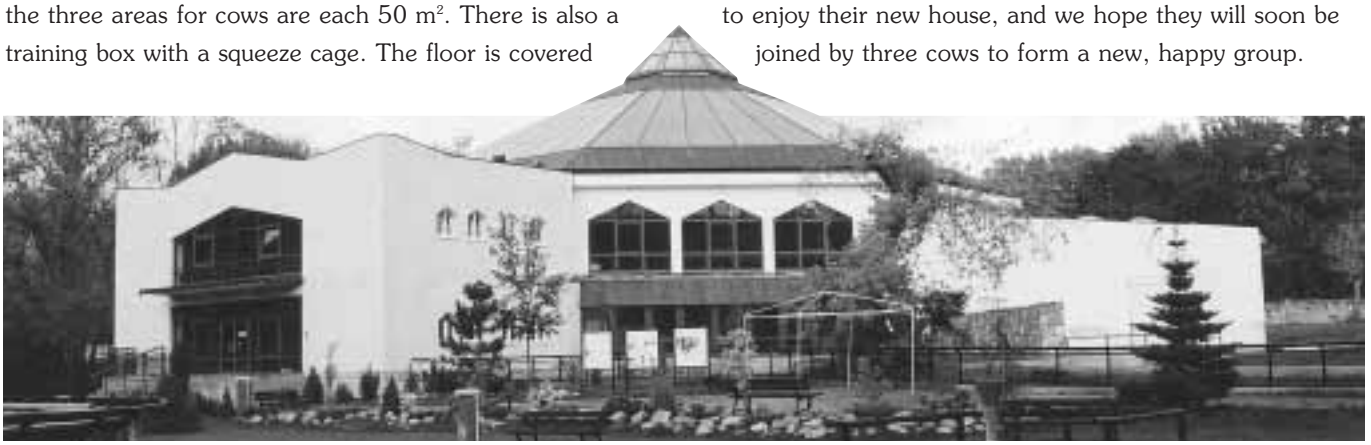


Photo: Warsaw Zoo

New elephant house in Zooparc de Beauval

by Françoise Delord, Zooparc de Beauval, Saint-Aignan-sur-Cher, France

*Beauval's elephant house opened in March 2003 with the arrival of our five wild-born African elephants (*Loxodonta africana*) from Longleat Safari Park, United Kingdom: 'Limbo' the male born in 1991, 'M'Kali', 'N'Dala' and 'M'Bli' three females born in 1989, and 'Marge' the fourth female born in 1986. The exhibit was designed by Rodolphe Delord of Zooparc de Beauval after visiting many zoos across Europe and the USA, which proved to be very helpful.*

Photo: Zooparc de Beauval

Outside areas

The 5 ha exhibit includes an outside pen and two outside enclosures. One of the outside enclosures is a 1 ha half-sand paddock with undulating ground, rocks and logs. The other outside enclosure (2.5 hectares) is covered with grass. An automatic watering system helps maintain the grass. This enclosure includes a 800 m² pool that is four metres deep and surrounded by a beach with gentle slope for easy elephant access. Our five elephants enjoy swimming regularly!
Many trees surround both of the outside enclosures. Trees are also planted within the outside enclosures, and are protected with rocks and electric fences. A thousand small trees (e.g. acacias), have been planted elsewhere to provide browse for the animals. A dry moat, six metres wide and two metres deep, separates the visitors from the elephants. The slope of the moat is steep on the visitor's side and gentler on the elephant's side. The elephants are kept away from the moat with rocks and electric fences. Access gates built at both ends of the moat provide easy exit should an unfortunate elephant fall into the moat.
The outside pen lies against the elephant house. The floor is concrete and the pen is surrounded with steel posts.
All posts used in the exhibit are galvanised rust-free posts, buried 50 cm deep into the ground and filled with concrete.

Inside enclosures

The elephant house covers 1,500 m². The roof is made of transparent synthetic material and can be opened to provide effective ventilation. Four 70 m² individual boxes for the females are adjacent to a large central pen (450 m²), which allow for all the females to be kept together inside when the weather is too cold for them to go outside. The male quarters include two adjacent boxes (100 m² each). They are separated from the female boxes by the large central pen previously described. To get to the outside pen the females and the male have to walk through a narrow corridor with a gate at each end. An hydraulic crush cage is built inside the male corridor. All 25 gates are manually operated and facilitate an easy shift of the elephants between the different areas of the building. The temperature inside the building is kept above 13°C all year around.

Keepers' area

The service area is a five metres wide corridor surrounding all quarters. The service area is wide enough to allow for a lorry to drive back inside the building, which has proven helpful when unloading an elephant. The service area also includes a kitchen, rest rooms, shower and a cold storage room for browse, fruits and vegetables. Although the elephants used to be trained for free-contact management in their previous location, we decided to switch to protected-contact management to improve safety for our keepers, and have built our facilities in view of this decision.

Visitors' area

A thirty metres long balcony terrace at one end of the building is open to the visitors. Educational boards along the terrace inform visitors about the elephants' biology, physiology and conservation.

One year on, it seems that the elephants have adjusted very well to their new environment. Students conducting behavioural studies on the elephants have observed mating behaviours many times. Hopefully regular blood sampling procedures will indicate whether some females are pregnant and the estimated time of calving.

Keeper's security cage

Photo: Zooparc de Beauval

A multi-level facility for Asian elephants at Moscow Zoo

by Vladimir Spitsin, Moscow Zoo, Russian Federation

*The first elephants arrived in Moscow in the middle of the 19th century, even before the Moscow Zoo opened to the public. The first Elephant House was built in 1861. One of the first elephants in the house was an Asian elephant (*Elephas maximus*) donated in 1870 to the zoo by the Emperor Alexander II, who had received him from the Emir of Bukhara. A new facility for the elephants, designed to resemble the Elephant House at the Berlin Zoo, was built in 1893 - 1894. After more than a hundred years, including a complete rebuilding in 1937 and expansion in 1960, the building has now been replaced by a new elephant facility. The new Elephant House was built within a record time of 14 months. It was inaugurated on 4 September 2003 and now houses 1.2 Asian elephants.*

Design and construction

The design and construction of the new Elephant House was financed by the Government of Moscow and the Moscow City Council, and the Mayor personally controlled the whole process. Special attention was paid to the size and design of enclosures and doors, to the parameters of various types of barriers and to potential opportunities for using environmental enrichment. The 4,478 m² house is designed to house five to six Asian elephants. It is a concrete building with the upper part made of decorative brick, and has two levels above ground as well as two levels below ground. The outside elephant enclosures cover 1,930 m² (300 m² for the bull and 1,630 m² for the herd) surrounded by a moat and including a pool of 250 m².

Photo: Moscow Zoo

Photo: Moscow Zoo

Two-level basement

The first level of the basement contains all engineering and technical services: the heating system, the electric cabinets, water supply and heating systems for the pool and showers, laundry facilities for personnel, workshops and maintenance rooms. The second, deeper level holds engineering communications and water purifying systems. The visitors enter the Elephant House through the front hall at the upper basement level, containing an exhibit consisting of ten displays introducing visitors to the biology and ecology of Asian and African elephants.

First and second floor

The elephant exhibit and viewing platform are located on the first floor (disabled visitors can use the elevators). The elephant enclosures are separated from the visitors by a 2.3 m wide dry moat and by five loosely hanging electrically wired ropes attached to 2.5 m posts. There is a glass barrier installed on a concrete base, with a total height of 2.1 m, on the visitors' side. The total distance between the electric fence and the glass barrier is about four metres.

The central exhibit area of 310 m² is separated from the holding areas by framed stainless steel pipes. The distance between the pipes is 150 mm for the male and 300 mm for the females. The holding areas (76 m² each) are separated from the night areas (33 m² each) by 3.5 to 4 m high concrete dividers. All cages and enclosures are connected by iron sliding doors that are equipped with covered electro-mechanical driving gears located at the top of each door. The whole system is protected by electric wires.

The total height of the exhibit area is 9.5 to 11 m. The exhibit is lit by three glass lamps shaped like truncated cones, with a diameter of nine metres each. A balcony with natural and

artificial plants stretches along the length of the whole exhibit. Rooms for forage, a kitchen and rooms for the personnel are also located on the first floor. Offices for the staff and personnel rooms with showers and a sauna are located at the second floor level at a height of 5.4 m.

Comfort for all

The floors are covered with epoxy resin and are electrically heated. The enclosure has an indoor shallow pool measuring 50 m², including a shower. The inside and outside enclosures are connected through airlock chambers that prevent cold air from coming into the building. A 2.5 m wide service corridor extends along the perimeter of the exhibit and holding areas, and contains the sewer chute and a metal box with a hanging bucket that transports dung into a special room, from where all the waste is removed in containers by truck.

Not only the elephants, but also the visitors and keepers benefit from the new building – they can enjoy the comfort of a two-level exhibit hall.

Making the best of a limited surface

by Marjo Hoedemaker and Erik van Vliet, Amersfoort Zoo, the Netherlands

*Amersfoort Zoo has a long tradition of keeping Asian elephants (*Elephas maximus*). An elephant enclosure was constructed in 1962 when a 1,760 m² woodland site was surrounded by a two metres high fence of railway ties. This elephant woods was of giant dimensions by the standards of the time – but the woody character soon disappeared of course.*

Photo: Amersfoort Zoo

Amersfoort currently keeps four females, including five-year-old 'Indra' born in Amersfoort, and 13-year-old male 'Sammy', sired by the huge and magnificent Parisian male 'Siam'. Sammy will probably eventually equal or surpass his famous father in size.

Expansion of the elephant accommodations has been undertaken in June 2004. Challenging factors in the design process included dense construction in the area surrounding the current elephant enclosure, the position of the stable, lack of surface, and presence of many giant beech and oak trees that we want to preserve.

Making a virtue of necessity we designed an enclosure with many inlets, outlets and a very irregular shape. Thus there is reason enough for the elephants to walk the entire area, as there might always be something interesting 'around the corner'. Hills, many tree trunks and water enhances the landscape. The approximately 4,000 m² area is divided into a herd area and a bull area. The herd area includes a natural pool measuring about 200 m². The two areas are about the same size, since the bull needs at least as much space as the cows. The objective was to create a flexible situation in which the whole area will sometimes be accessible to the bull and sometimes to the cows. The complete space is therefore surrounded by a 2.80 m high bull-proof cable-fencing. Two outside viewing areas (one of the herd area and one of the bull area) provide visitors with excellent viewing opportunities. An educational track challenges our visitors to compare their strength and intelligence with those of the elephants.

The new bull stable measures 140 m² and is located at a distance from the herd stable. The bull stable is divided into two boxes, one with a concrete floor and one with a sand surface. The female stables (built in 1988) contain separate boxes, but will be reconstructed into one indoor area in the future.

Photo: Amersfoort Zoo

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The European Zoo Food Group

www.eurozoofood.com

The supply of high quality food has become a major topic since the recent food crises in Europe.
Local and European rules and regulations on zoo foods are currently being reviewed.
The new legislation does not only affect us as suppliers, but are also extremely important to our customers: European Zoos, Bird Parks, Aquariums and Falconers.
For this reason we decided to unite our interests into one organisation, The European Zoo Food Group (EZFG).

Together we aim to set up programmes on the following topics:
- promotion and improvement of R&D on food products,
- quality assurance for the production and supply of zoo food, combination of logistic resources to reduce transportation costs, risk reduction,
- improving our position towards European Commissions,
- how to operate in Europe with open veterinarian borders.

The companies who started the organisation in 2001 are:

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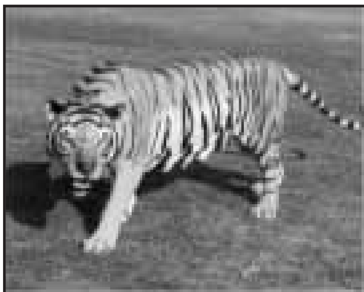

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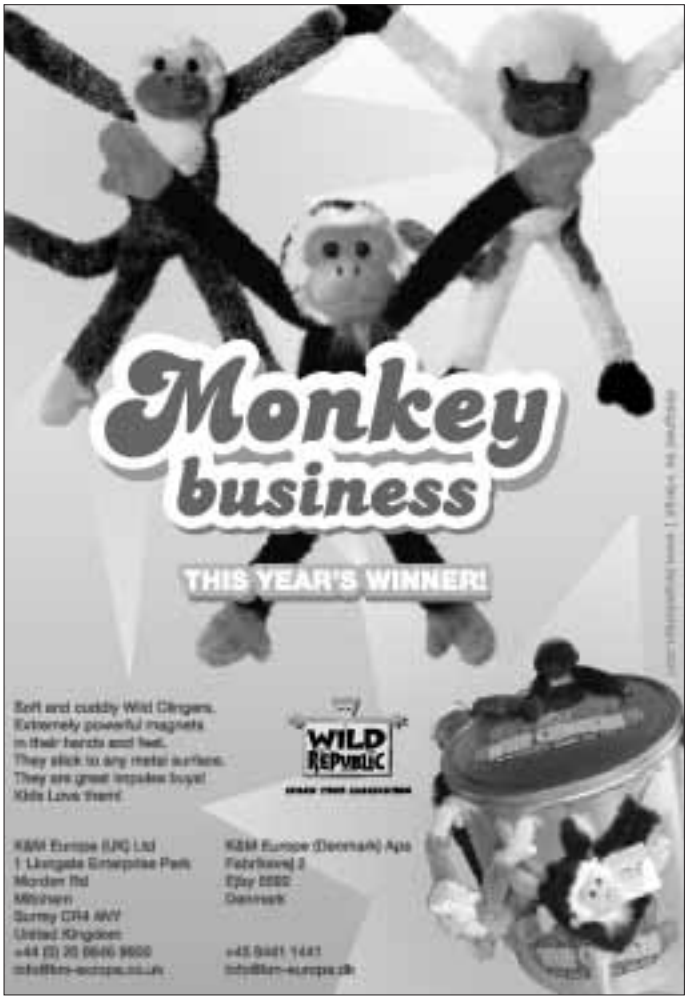

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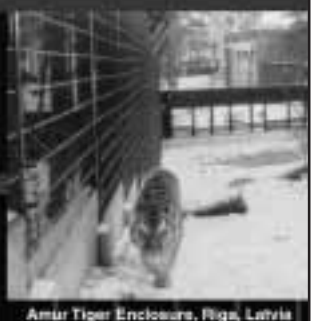
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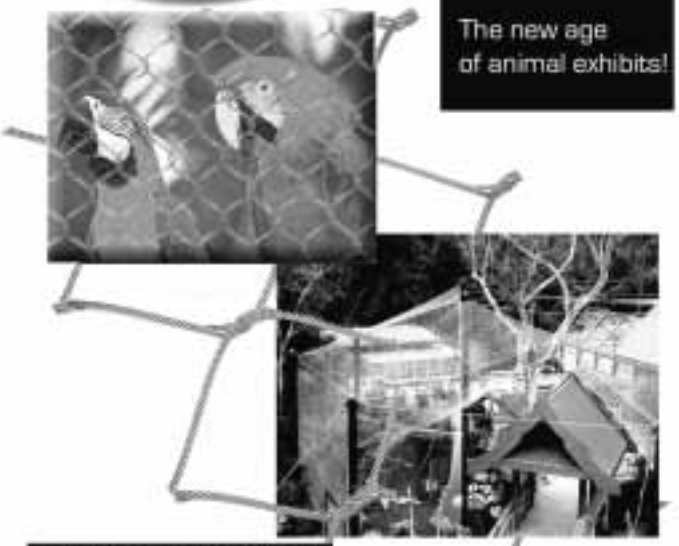

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EAZA ELEPHANT TAG

REVISED EAZA ELEPHANT TAG RECOMMENDATIONS

– 1 –

Place all potential breeding bulls in a breeding situation.

– 2 –

Exchange breeding bulls that have sired an adequate number of viable offspring in one institution.

– 3 –

Place all potential breeding females – especially those under 25 years old – in a breeding situation. Monitor reproductive cycles of all individuals in breeding situations.

– 4 –

Encourage development of matriarchal family units including female offspring, and keep these units intact. However to promote additional stable female groups, and in order to prevent young cows from breeding with their fathers, it is acceptable in some cases to move groups of sibling or half-sibling females away from matriarchal unit.

– 5 –

Facilities without a bull that are temporarily sending potential breeding females to be inseminated at another zoo should send whole female groups, or relevant units of a group, to the host zoo.

– 6 –

Further development of AI techniques should be encouraged; however it should never replace the most important method of reproduction i.e. 'natural' reproduction.
AI must be carried out only upon recommendation and approval of the EEP Coordinator, just like any other breeding recommendation.

– 7 –

All zoos that rebuild elephant facilities should design new enclosures that can hold a bull and more than four cows (number of cows increased from three to four, 2004). If a zoo is not able to start keeping a bull within a reasonable period of time, the Asian elephant EEP and African elephant EEP will treat that zoo as a non-breeding facility and will recommend that the institution only obtains/houses non-reproductive females.

– 8 –

Development of facilities for bachelor herds of several adult bulls is urgently needed. Bulls should be kept in bachelor herds when they are temporarily not in a breeding situation or before they reach that stage. Bachelor herd facilities should stimulate relevant social behaviour between the surplus bulls, and serve as a genetic reservoir.

– 9 –

While it may be desirable, keeping young elephants in their family group until they reach puberty is often not practical for breeding management. Young elephants should preferably not be transferred out of their family units before they are four to five years of age. A young elephant being transferred should be accompanied by at least one other member of the herd in which it was born.

– 10 –

When an animal is transferred, it is recommended that an elephant keeper from the receiving institution spend some time working with the animal at the sending institution first. Additionally, a keeper from the sending institution should accompany the animal to the receiving institution for a suitable period of time when possible.

– 11 –

New/renovated enclosures should be constructed in such a way that it is possible to handle elephants by protected contact,

– 12 –

The situation in Europe is not very different from that in other regional breeding programmes, therefore close cooperation, e.g. exchange of bulls, with other regions is essential.

– 13 –

Although further research is needed, it seems clear that herpes-infections are a very important cause of death of young elephants in Europe. The veterinary committee is preparing a protocol for successful treatment.

– 14 –

Dissemination of information – veterinary, behavioural and management – is essential for the success of this programme.

Photo: Jenny van Leeuwen/EAZA Executive Office