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COLOPHON

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FROM THE EDITORS

One of EAZA's aims is to promote cooperation for furthering regional collection planning and wildlife conservation, particularly through internationally coordinated breeding programmes of wild animals such as the European Endangered Species Programmes (EEP). Sustaining healthy populations of species in captivity requires careful assessment and management of genetic and demographic features, such as birth and death rates, breeding rates, levels of inbreeding, population size, movement of animals to and from a population and so on. Studbooks that present accurate and up to date information on populations in a standard format are designed to support collection planning scientifically.

This issue of EAZA News contains several articles that cover collection planning, and these show that collection planning however not just involves collecting and analysing data. The subject can be looked at from many different angles (e.g. background, conservation, education, differences between institutions) and perspectives (directors, curators, marketers, keepers etc.). Clearly, there are many aspects to this topic, and therefore the editors of EAZA News have decided that collection planning will be the focus of the next special issue of EAZA News. EAZA News issue 64, which is due to be published in October 2008, has been chosen for this purpose. People interested in contributing to this issue, for which the contribution deadline has been set on 1 July 2008, are invited to contact jeannette.van.benthem@eaza.net.

For more information on EAZA News and how to contribute, please visit the 'Magazine' section on the EAZA website.

MEMBER OF



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PHOTO MICHAEL PETERSEN



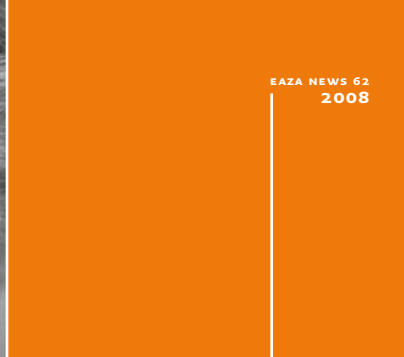
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PHOTO PAUL PEARCE-KELLY



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PHOTO UTE MAGIERA



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COVER *Gyps indicus*
PHOTO CLEMENT FRANCIS

PHOTO
MARJOLEIN OSIECK/SAFARIPARK BEEKSE BERGEN

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FROM THE EAZA OFFICE

PHOTO CHESTER ZOO

EAZA thanks Gordon McGregor Reid



At the end of 2007 Gordon McGregor Reid informed EAZA that he had to retire as chair of the EAZA Research Committee. His many other commitments (not only is he general director of Chester Zoo, but also the current chair of WAZA) had led to this decision. EAZA is very much indebted to Gordon, who has chaired the EAZA Research Committee together with vice-chair Alastair Macdonald of the University of Edinburgh since September 2002, for his tireless commitment to stimulating research by and through EAZA institutions. Under his leadership the committee produced the EAZA Research Strategy, a document that has just been published and distributed to the membership and which will without doubt prove to be a major stimulus and help for all zoos and aquariums in furthering their research activities. EAZA sends a heartfelt 'thank you!' to Gordon and, knowing that his interest in and support for zoo-based research remains unchanged, we look forward to our continued cooperation in this important field.

Gordon McGregor Reid will be succeeded by co-chairs Alastair Macdonald (University of Edinburgh, United Kingdom) and Zjef Pereboom (Antwerp Zoo, Belgium).

Thank you Nicole Anderson

EAZA would like to thank ISIS staff member Nicole Anderson for temporarily joining the Executive Office team in Amsterdam for several weeks. Nicole normally works at the ISIS head office in Minneapolis, providing support to ARKS and MedARKS users. Sander Cozijn, the European ISIS liaison at the EAZA Executive Office, was very suitably replaced by Nicole during his absence. Importantly, the service to ISIS members in the European time zone could be continued by this arrangement, while Nicole's time in Amsterdam also helped to further strengthen the relationship between ISIS and EAZA.

Publications

The EAZA Executive Office received three studbooks in the period between January and March 2008;

- International studbook of the eastern/mountain bongo (*Tragelaphus eurycerus isaaci*)
- European studbook of the white-tailed sea-eagle (*Haliaeetus albicilla*)
- European studbook of the European wild cat (*Felis silvestris grampia*)



We are very grateful to all who have contributed to these valuable publications and are happy to have received these in printed format. For a full list of received publications of interest, please refer to the EAZA website ('Magazine' section). Please continue to send us your printed publications, so we can incorporate these in the online publications list.

EAZA Breeding Programme Management Course

The following 16 participants successfully completed the EAZA Breeding Programme Management Course held at the EAZA Executive Office in Amsterdam, from 10 to 14 March 2008:

| | | |
|--------------------|-------------|--|
| Kate Atwell | Bristol | Kea ESB |
| Neville Buck | Lympne | Scottish wildcat ESB (<i>In preparation</i>) |
| Melanie Cage | Bristol | Agile gibbon ESB (<i>In preparation</i>) |
| Jose Dias Ferreira | Lisboa Zoo | In the process of taking over the Lowland nyala ESB |
| Lesley Garland | Edinburgh | Gentoo penguin ESB |
| Pierre Grothmann | Magdeburg | Red-bellied tamarin ESB |
| Andrzej Kruszewicz | Warsaw | Violet turaco ESB |
| Heike Maisch | Erfurt | Dhole EEP |
| Jan Pluhacek | Ostrava | Common hippo ESB |
| Kim van de Put | Arnhem | Blue duiker EEP, Aardvark ESB and Hooded pitta ESB |
| Delphine Roulet | Paris Zoo | Crowned sifaka EEP and Greater bamboo lemur EEP |
| Harald Schwammer | Wien Zoo | In the process of taking over the African elephant EEP |
| Sabine Fruehwirth | Wien Zoo | In the process of taking over the African elephant EEP |
| Kim Simmons | Linton | Mongoose lemur EEP |
| Emma Stanley | Linton | Mongoose lemur EEP |
| Ben Warren | Bekesbourne | In the process of taking over the Clouded leopard EEP |

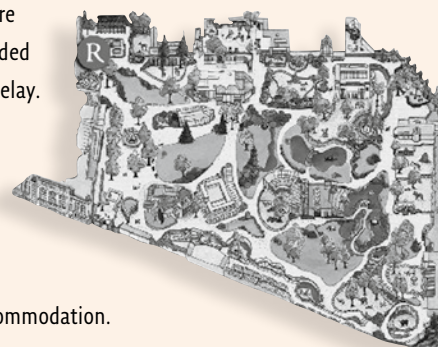
The next course will be held in November 2008. Those who are interested in participating in a course in the future are welcome to contact William van Lint (william.van.lint@eaza.net).

EAZA Annual Conference 2008

The early registration deadline for the 25th EAZA Annual Conference in Antwerp, Belgium, 16 to 20 September 2008, is approaching rapidly; the deadline for early registration and payment is **15 June 2008**.

All EAZA members are therefore recommended to register without delay.

Please refer to the 'Conference' section of the EAZA website for more details on registration and accommodation.



EAZA AMPHIBIAN CAMPAIGN

HAVE YOU REGISTERED FOR THE EAZA YEAR OF THE FROG CAMPAIGN?

Bengt Holst and Quentin Bloxam,
EAZA Amphibian Campaign Planning Group

It is now more than half a year ago that we launched the EAZA Amphibian Campaign – Year of the Frog. Many zoos and aquariums have already started their activities and others are preparing to launch their activities this spring. So far 178 institutions (138 EAZA members and 40 non-EAZA institutions) have registered for the campaign with a total pledge of over €375,000. That is not bad at all, but also not good enough. As you all know from the launch we have a goal of 100% participation and a goal for the fundraising of €750,000. Some may say that this is an unrealistic goal and that we cannot expect to fulfil that goal.

But why not? We all agree on the importance of conservation, and we all refer to conservation when asked about the purpose of our institutions. So, now it's time to put action to the words! If you have



amphibian ark
2008 YEAR OF THE FROG



not yet registered for the campaign, please do so as soon as possible. If you are still in doubt, please contact the EAZA Executive Office and ask them to guide you through to an active participation. Last, but not least, if you do not want to participate for one reason or another, please let us know the reason, so that we have a chance to adapt the campaign or to discuss any other valuable conservation effort for the amphibians with you. But please do not just neglect this call for action and pretend there is no problem. The amphibians and the zoo and aquarium world deserve better!

THE 'SILENCE OF THE FROGS'; A TRAINING COURSE FOR TEACHERS

Lothar Philipps, Cologne Zoo, Germany

To promote the Year of the Frog, Cologne Zoo is running a special exhibition on European amphibians. As part of the activities, an amphibian training course called 'Silence of the frogs' was organised for teachers of primary schools. During this course the teachers were

informed about the amphibian crisis and what zoos and aquariums worldwide are doing to save amphibians. After a theoretical introduction, practical training was provided focusing on the difference between amphibians and reptiles. Furthermore, the teachers were asked to test and evaluate the amphibian worksheets that were newly developed for educational purposes at the zoo (see: www.vzp.de/amphibienkrise.htm).

Thanks to the training course, these teachers will spread the message of the EAZA Amphibian Campaign within their network and to the



PHOTOS COLOGNE ZOO

pupils at the schools, thereby raising awareness and stimulating them to support the campaign.

AMPHIBIAN INFORMATION MATERIALS PROVIDED BY STIFTUNG ARTENSCHUTZ

Birgit Benzing, Stiftung Artenschutz,
Germany

More than half of the German EAZA member institutions had registered for the EAZA Amphibian Campaign by March 2008. As some of the aims of Stiftung Artenschutz are to promote zoos as conservation organisations and to assist zoos' conservation projects through funding, administrative support and coordination of joint projects, the conservation foundation happily accepted the coordination of the campaign in Germany.

As part of this task, Stiftung Artenschutz translated the Campaign Info Pack into German and a flyer and a poster have been offered to all zoos, containing space to be filled with contact details and donation accounts of each zoo. Over 100,000 copies

were produced in the first print. Comprehensive web pages on the foundation's website aiming to inform the public are under development. Amphibian related news will be announced in the 'Amphibian news' section, including press releases, zoo events and workshops, to show the zoos' diverse engagement in the campaign and in amphibian conservation efforts. The next step is to prepare an educational brochure for zoo educators, schoolteachers and other multipliers in cooperation with the Verband deutschsprachiger Zoopädagogen (VZP). This brochure will contain background information, and detailed worksheets will be available for downloading. Several zoo associations agreed to share the printing costs, so the brochure will be offered to all zoos for free.

Last but not least, Stiftung Artenschutz will present the EAZA Amphibian Campaign at the CBD Conference of the Parties (COP) 9 in Bonn in May 2008, at the 'Plaza of Diversity', demonstrating the profound conservation abilities of zoos worldwide, and particularly in Germany, to both politicians and the general public.



The campaign materials provided by Stiftung Artenschutz, as well as other campaign materials can be found on the 'Campaign' section of the EAZA website.

EAZA AMPHIBIAN CAMPAIGN

FIGHTING FOR AMPHIBIANS

Zsuzsa Petró, Sosto Zoo, Hungary

Sosto Zoo not only aims to provide comfortable habitats for its own animals, but also to protect the natural habitats of wild animals. That is why the zoo participates in each EAZA Conservation Campaign and why it is fighting for the protection of amphibians this year. The visitors are informed about the EAZA Amphibian Campaign through information panels and a photo exhibition that presents the current threats to amphibians. The zoo magazine provides information on the campaign and shows details about all campaign related events.

The zoo's teachers have teamed up in a 'frog squad' together with the pupils that attend the zoo's study group, forming a group of about thirty people. The children raise funds on the zoo premises by offering visitors small handcrafted items such as frog figurines made of beads, masks, pencil cases, wind chimes, origami and plush animals. In addition, the frog squad joined the local nature conservation society to assist with its spring effort to save the frogs that migrate to their breeding sites.

The zoo is also involving local kindergartens and schools; a drawing contest was organised for the younger kids. For older pupils another competition (still ongoing) was organised: a three-round quiz focusing on the Hungarian amphibian species, which are all under protection.

'Amphibian days' will be organised in a weekend in May at the zoo hotel, where various entertaining activities and lectures on amphibians will await both young and old visitors.

IN A FEW YEARS TIME YOU WON'T HEAR A SINGLE CROAK!

Mercè Bofill, Barcelona Zoo, Spain

Barcelona Zoo is raising awareness for the EAZA Amphibian Campaign in several ways. The zoo opted for a communicative campaign involving communication both within and outside the zoo that would be attractive to the zoo visitors. In order to achieve this, the zoo played with commercial and marketing principles and thought of a slogan, a generic image to unify any message related to the campaign: "In a few years time you won't hear a single croak!".

Communication within the zoo begins with two campaign banners at the zoo entrances, two campaign stands provide information (in Catalan, Spanish and English), and an information panel indicates the route to the campaign point from the zoo entrances and the campaign point itself. The campaign point consists of an information hut and five information panels. Furthermore, the Aquarama area includes an exhibition on five water habitats and more information is provided at the terrarium, where an exhibition on one land habitat is shown.

A 'self-guided tour' can also be downloaded from the zoo's website, enabling visitors to make their own campaign tour through the park. In conjunction with the self-guided tour, informative posters are placed at all zoo facilities, including descriptions and images of amphibians and the campaign logos. Educational jigsaw puzzles focusing on amphibian species that are close to extinction will soon be sold at the information hut.



PHOTO BARCELONA ZOO

Furthermore, the zoo's educational department has planned several campaign activities, such as 'Let's talk about animals' during weekends, 'Mornings at the zoo' on Saturdays, and 'Family mornings' for families and zoo camps.

To communicate the campaign outside the zoo, Barcelona Zoo's publicity campaign will this year focus on 'The Amphibian Crisis; the day of the frog at the zoo', a combined promotion with a newspaper, which amongst others will involve the distribution of frog masks for children and advertisements in several magazines.

Barcelona Zoo has committed itself to actively participate in the protection of *Alytes*

muletensis, *Leptodactylus fallax*, *Mantella aurantiaca* and *Dendrobates azureus* and in the captive breeding of *Coelotriton arnoldi*. The zoo also protects and looks after amphibians that appear on site, such as *Rana perezi*, *Alytes obstetricans* and *Hyla meridionalis*. This year, a natural habitat will be created in the zoo, in order to support the survival of these local species.

Barcelona Zoo's fundraising actions focus on selling T-shirts, key rings and educational jigsaw puzzles. Furthermore, donations will be collected on site, both through money boxes and a giant plastic frog in which children can throw their coins.

DISCOVER THE WORLD OF AMPHIBIANS

Anne-Sophie Boursier, Lille Zoo, France

Though Lille Zoo does not exhibit amphibians, the zoo is actively involved in the EAZA Amphibian Campaign. The campaign was launched on 10 February 2008 and will last until 31 August 2008. For the event several educational panels have been set up around the zoo, focusing on amphibians, the threats they are facing, the relationship between humans and amphibians and the role of amphibians within the different ecosystems. Furthermore, various educational activities are organised for children during special weeks and weekends; they can make puzzles, masks and drawings, do games or have a photo tour. Parents can also sign up their children for small workshops organised every Wednesday and during school holidays. During these 'Amphi-Arts' workshops, children can discover the world of amphibians with an



PHOTOS LILLE ZOO

educator of the zoo through games focusing on amphibian metamorphosis and amphibian identification or via fun activities such as creating frog memo boards or other hand-crafts.

The 'Nord-Pas de Calais' region is full of dynamic associations that actively participate in the conservation of amphibians and their natural habitats (e.g. the Conservatoire des Sites Naturels du Nord-Pas de Calais and the Espaces Naturels Lille Métropole). The EAZA Amphibian Campaign is an opportunity for Lille Zoo to join these associations in their attempt to explain and display the actions in

favour of the regional protection of amphibians. 'Pond-discovering' activities in the city of Lille are planned in collaboration with the city's public environment departments.

Two admission-free lectures will be held at Lille Zoo in April and May 2008, including; 'Worldwide amphibians: biodiversity and threats' by Florent Lamiot of DIREN, the French Board of Environment, and 'Slag heap amphibians' by Vincent Cohez of the 'Slag heaps chain' association. The slag heaps form exceptional human-made, wild habitats, which are typical for the northern parts of France.



SAVING FROGS FROM TRAFFIC

Péter Fercsik, Jászberény Zoo, Hungary

Jászberény Zoo began with EAZA Amphibian Campaign activities well before the start of the visitors' season this year. A frog-saving activity was organised, aiming to protect frogs from traffic while they migrated from their natural habitat to their breeding area. Zoo staff, together with some volunteers, built a protective fence near the road that would be crossed by the frogs. The frogs that gathered near this fence were collected every day during their breeding season and taken to the other side of the road. Thanks to this activity, the zoo has managed to save over 10,000 common spadefoot toads (*Pelobates fuscus*).

The zoo also carried out other activities. One of the zoo's educators informed the nearly 50,000 visitors of an international tourism exhibition in Budapest in February about the Cranwell's horned frog (*Ceratophrys cranwelli*),



PHOTOS JÁSZBERÉNY ZOO

the current situation of amphibians and on the importance of their protection. The zoo also launched a children's photo and drawing competition and a photo exhibition will be presented on the zoo premises from April to November 2008. Here visitors will get to know the amphibian species living in Hungary, as well as some tropical species. Through an interactive system, visitors will also be able to hear the frogs.

During the annual zoo night, one of the highlights will be an introduction to the frogs living in the Hungarian lakes and visitors will be able to listen to a 'frog concert'. As part of the campaign, the zoo also built a poison dart frog exhibition. Because of the colourful and exotic appearance of these 'animal jewels' and the mystical stories surrounding them, the zoo feels it can successfully influence people to start thinking in a more 'frog-friendly' way.



Bengt Holst

Hobbies Going for a walk in the forest or sitting on the top of a mountain or near the sea, enjoying and getting my thoughts right. I also like writing, but unfortunately seldom have time for that. My dream is to one day write a book about us, human beings, seen in the framework of the nature that surrounds us; why do we act as we do and where does our biological background take over from our cultural surface? Last book read The first book of a trilogy on Alexander the Great, written by Italian writer Valerio Massimo

Please describe your career path. In 1983 I got my masters degree at the University of Copenhagen, writing a thesis on the roosting behaviour of Corvids. This did not have much to do with zoos, but my supervisor, member of a special council under the Ministry of Culture overseeing zoos, asked me whether I would like taking on a position as scientific assistant at Copenhagen Zoo. I saw a huge potential in the zoo world and did not have to think twice; after getting my degree on a Friday (3 June 1983), I started at the zoo the following Monday.

During the years, former zoo director Bent Jørgensen was a big support. He gave me a free hand to further develop the zoo's scientific aspects and introduced me to the international zoo world whenever possible. As one of the first 'exotic' tasks he sent me to Frankfurt Zoo, Germany, for four weeks, to learn about bird keeping in practice. At the end of this period I received a 'Fensterputzschein' from Dr. Faust, the former director of Frankfurt Zoo, as window cleaning was what I had done most!

In 1987 I became head of the animal department at Copenhagen Zoo and slowly started to develop an international framework. My focus was mostly on environmental enrichment and I did my best to spread the message about the importance of this part of zoo management to the outside world; an exciting job which linked with the university world. When the former zoo director retired, I became vice director; 'Director of science and conservation'. This new title clearly described in what direction my job had turned and my focus more and more turned towards the international scene.

In the late 1980s I became acquainted with the Conservation Breeding Specialist Group (CBSG) and was thrilled with its concept. I attended the annual meetings and became increasingly involved. Ulie Seal was my idol; he was the one that turned my eyes towards the *in situ* conservation world. His enormous enthusiasm and positive attitude towards new ideas fascinated me and probably provided me with many of the human-related and technical tools I use today when working with conservation. In 2002 this fascination made me propose a European branch of CBSG and CBSG Europe became a reality in 2003.

Today, I use over 50% of my time for international tasks, be it for EAZA, CBSG or for other international relations. I see Copenhagen Zoo as a piece in a big international network. The network cannot do without the zoo, and the zoo cannot do without the network.

What other work do you do at Copenhagen Zoo? Being head of the scientific staff and vice director, I of course also have ordinary management tasks and strategic tasks. But there is no such thing as a typical day for me; some days I am totally focused on international issues, others I only focus on zoo issues and sometimes I deal with both. I travel up to three months a year and have full support from the zoo in doing this, as international cooperation is essential. I am also lucky to have a family that supports me and understands the fascination for my work.

My 'typical' zoo work includes strategic planning, following up on existing plans, technical discussions within the framework of collection planning/animal management and consultancy to other zoos, organisations and authorities. Finally, of course, further development of the zoo's research and conservation activities.

You seem to have a very positive attitude towards everything?

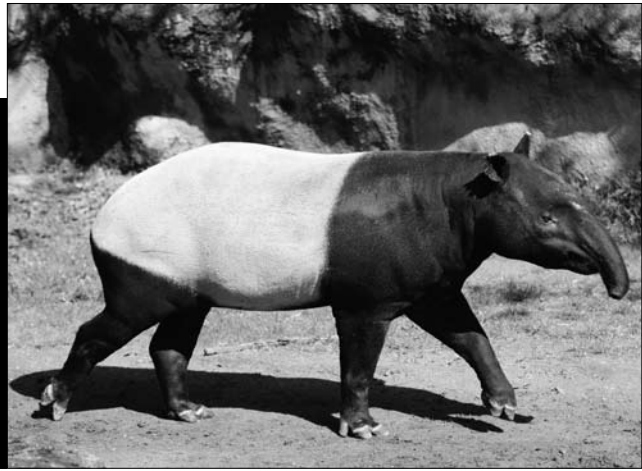
I was lucky to be brought up with the attitude that 'a glass is always half full'. I try not to look at the obstacles; we live in a fantastic world with a lot of opportunities, but it is of course up to us to grab these. Through opportunities we can actually develop things, obstacles will only slow us down.

Of course I get frustrated now and then, especially when people say one thing and then act differently; like when zoos or aquariums work directly against what they have themselves been approving at other times. I do not have any problems with disagreements or discussions. I like to have transparency and honesty in all actions we take.

"The glass is always half full."

Are you a vegetarian? No, I am not. Actually, I very much like a big steak and would not exchange it for a bowl of salad. Why should I be a vegetarian? I am a human being and as such I eat a bit of (nearly) everything. To me eating

Last movie seen 'Dances with wolves' with Kevin Costner, seen about four to five times now. Favourite celebrity Male: Mel Gibson, Female: Meg Ryan. But above them my late father who, without knowing it, created the basis for my present fascination for nature. Last trip made abroad Malaysia, to get an MoU with the Malaysian Wildlife Department (DWNP) regarding a tapir project in Taman Negara



meat is absolutely no ethical problem, just as I see no problems in hunting, as long as it is done properly and sustainably.

What are the main challenges for you as chair of the EEP Committee? The main challenge is to keep up the 'EEP spirit', the attitude that made the first zoos go for cooperation instead of 'ego trips', and to find the right balance between having necessary rules of conduct but still avoiding unnecessary bureaucracy. This is a difficult balance, since we need to have a common framework when cooperating in collection planning, but we also need to be sensitive to the different cultures within Europe and the different ways of running zoos. My personal view is that cooperation cannot work without a minimum of set rules and procedures, just as we need rules and procedures to run a zoo. We must accept bending the rules now and then to make things work and to be fair to those who do not necessarily fit into the set scheme. But, when the approved rules and procedures are challenged in general in order to gain more benefit for oneself, I will fight back. Not in order to win per se, but in order to sustain efficiency.

“ We need to have a common framework when cooperating in collection planning, but we also need to be sensitive to the different cultures within Europe and the different ways of running zoos.”

“ Cooperation cannot work without a minimum of set rules and procedures, just as we need rules and procedures to run a zoo.”

When the EEP spirit is integrated in all we do we can be sure to be on the right track. Furthermore, it will lead us in the right direction as long as we touch ground now and

then to make sure we do not become too hypothetical in our ways of thinking and acting. I feel confident that we are able to meet these challenges.

What do you hope will be accomplished through the extensive efforts of the EEP and Conservation Committees in the near future? I want to work towards a world where international breeding programmes are seen as true *ex situ* conservation activities that can make a difference for many species. And, towards a world where zoos and aquariums are considered honest and efficient conservation organisations and where zoos and aquariums themselves do their utmost best to live up to that brand. How far along these routes we will get is difficult to tell, but I can at least assure you that I will do my best to get as far as possible, both on the European scene and on the global scene.

What do you hope to see happening in the zoo world in the next ten years? A united zoo and aquarium world that takes its responsibilities seriously and that is ready to invest in a common future with a common vision. To be honest I am afraid that, to a certain extent, we will experience a division of the zoo world into zoos and aquariums that really take their responsibility and invest in the common vision and those that may use this vision as a brand, but are not willing to invest in what is needed to accomplish it. This is a question of attitude; small and poor zoos can, and will be, part of the first group, and large and rich zoos can easily be part of the second group. However, I am optimistic enough to trust that in the end most European zoos will join the first group. Perhaps not within the next ten years, but at least within the next twenty years. •

PHOTO ANDRES TAPIA/TSG



NEW ENCLOSURES

PHOTOS MICHAEL PETERSEN



New savannah and hippo house at Copenhagen Zoo

Lars Lunding Andersen, Copenhagen Zoo, Denmark

During the summer of 2007 a new savannah covering an area of approximately 1.5 ha opened at Copenhagen Zoo, followed by a new hippo house with a total area of 1,140 m². Three hippos moved into this new enclosure in the far southern corner of the savannah in the autumn. A 700 m long path surrounds the new savannah, and this article describes what zoo visitors will encounter when walking along this path.

Having passed through the tunnel to the southern part of Copenhagen Zoo, zoo visitors get a first glimpse of the new savannah. In the foreground they will see two enclosures. These enclosures provide the opportunity to separate the rhinos, both from each other as well as from the other savannah animals. A series of oak pillars form a barrier between the enclosures and the rest of the savannah. However, the distance between the pillars allows free access for antelopes, blue wildebeests, and other 'slim' savannah animals.

Part of the fence separating Copenhagen Zoo from the surrounding public park has been replaced by glass, which gives the visitors to the park a free glimpse of the savannah.

Following the path

The path continues in the southern direction, west of the children's farm, where visitors now have a panoramic overview of the savannah. In addition to the white rhinos and the blue wildebeests, the visitors can see blesboks, impalas, zebras, ostriches, crowned cranes, guinea fowl and a white stork. They can also see the giraffes, the tallest inhabitants of the savannah, in the background. The path continues west of the Galapagos tortoise enclosure, approaching the new hippo house and the hippos' outdoor pool,

the latter covering an area of 130 m². Again a number of oak pillars prevent the hippos from having close encounters with the rhinos, but the distance between the pillars allow the zebras and antelopes to access the pool.

The path now makes a sharp right turn, leading the visitors to the entrance of the hippo house. Here they can experience Africa, surrounded by tropical plants. Through thick glass panels (80 mm) the visitors can watch the hippos under water in their indoor pool (220 m²). Together, the outdoor and indoor pool of the hippos contain 400,000 l water. An efficient water purification installation ensures clear water at all time, with a capacity of purifying 600,000 l/h. Three large hippo stables (together covering 190 m²) are located behind the scenes. There is an exhibition in the public area telling the story of both wild hippos and the hippos at the zoo; at Copenhagen Zoo the famous female hippo 'Maren' had 18 calves before she died in 1977 at the age of 54.

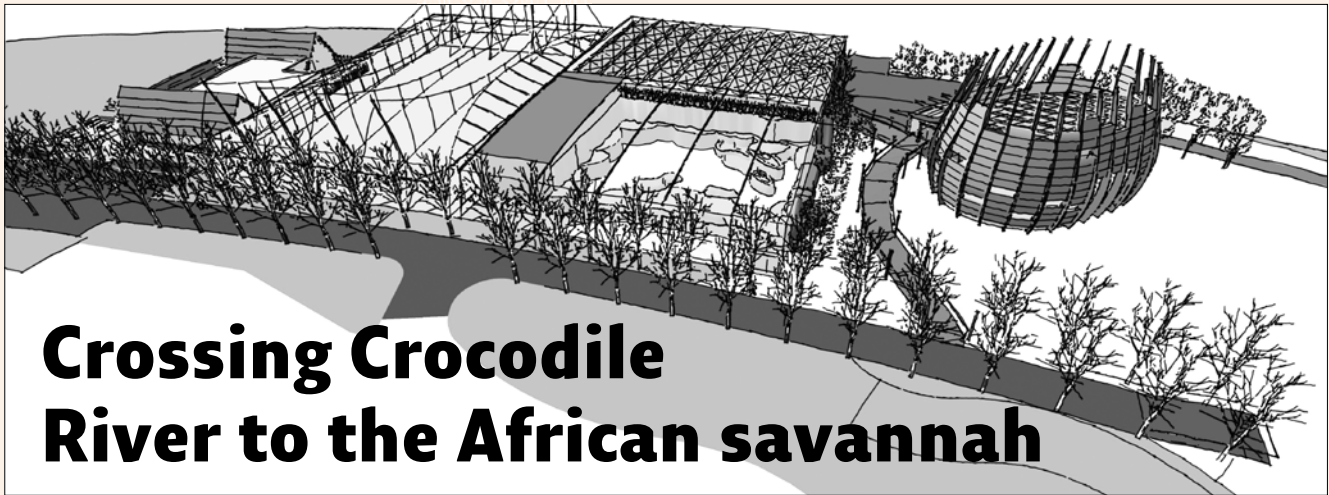
Like national parks, Copenhagen Zoo has a 'boma' for isolation of individual animals. The zoo's boma is set up as a series of closed yards around the savannah stable. When the zebras, blesboks and ostriches go to their respective stables they cross the visitor path. After the



boma, the path leads north along the existing adventure trail with the savannah to the right and the African forest with okapis to the left.

The new savannah, the hippo house, the renovation of the rhino stable and a new stable for the blue wildebeest together cost about 11 million euros and was possible thanks to a generous donation from Annie & Otto Johs. Detlefs' Philanthropic Foundation. Furthermore, the foundation has financed the (White rhino EEP-approved) purchase of two female white rhinos from Pilanesberg National Park in South Africa and the transport of three rhinos (1.2) from Pilanesberg National Park to Copenhagen, the male being a gift from Pilanesberg National Park. ●

ILLUSTRATION LAM ARCHITECTS



Crossing Crocodile River to the African savannah

Gerard Visser and Robert van Herk, Rotterdam Zoo, The Netherlands

Train passengers passing Rotterdam Zoo cannot overlook the strange and impressive onion-shaped building which is momentarily being erected on the zoo premises. It is the new giraffe house (17.6 m high), which is the most prominent evidence of the zoo's current 'construction fever'. The giraffe house will be part of the new African savannah, a crucial part of Rotterdam Zoo's African continent.

In fact, the African savannah is the biggest building project at Rotterdam Zoo since the Oceanium, which opened in 2001. The new area consists of several enclosures loosely positioned around the actual savannah, an open space of 3,000 m², bigger than the zoo's Mongolian steppe and the outside exhibit for the Asian elephants. According to many, the African savannah was the number one missing biotope of the zoo, so expectations are high.

Follow our birds to Africa

Surprisingly, the 'savannah-experience' starts with a new aviary for migrating birds (finalised in 2007). In a convincing, typically Dutch polder-landscape, visitors are introduced to relatively common birds such as ruffs, avocets, redshanks and godwits. Encountering these birds is a totally new experience for some visitors, and for those visitors already familiar with these birds this is probably the first time they realise that these Dutch birds are not 'as Dutch as they seem'. That is why Rotterdam Zoo chose to use the slogan 'Follow our birds to Africa'. When the visitors follow the birds, continuing their route through the aviary, they will enter a southern European swamp with spoonbills, glossy ibises and European bee-eaters. Travelling more south (symbolically that is) the visitors leave the aviary to enter the first African habitat.

Crossing Crocodile River

This habitat is a riverine forest somewhere north of the savannah exhibit. Free-ranging carmine bee-eaters compete in beauty with their European counterparts in the swamp. They are not the only birds; hoopoes are less obvious, but as colourful. Visitors can discover them between the lush African vegetation, in which acacia trees and euphorbias stand out. These African plants will hopefully thrive in the 8 m high glass house covering the riverine forest habitat. A range of smaller African animals inhabit the shores of the small river, including long-eared hedgehogs, klipspringers, rock hyraxes, spurred tortoises, plated lizards, large catfish and locusts, to name a few. But of course the most thrilling inhabitants will be the large Nile crocodiles and an older pair of slender-snouted crocodiles. A slowly ascending boardwalk will allow the visitors to first admire these reptiles underneath the water's surface, and later to view them basking on the river's bank. A convincing model of a female crocodile guarding her nest and hatching offspring will deliver the closest encounter.

The actual savannah

People will leave Crocodile River at a boardwalk height of 2.5 m; high enough to enter the Savannah House (the onion-shaped giraffe

stable) to look into the eyes of the female giraffes. The natural (and of course sustainable) building materials provide an African aspect to the architecture, especially the thatched surface and wooden pillars.

After the relative intimacy of the riverine forest, the openness of the African savannah will surely have an exciting effect. Visitors can look as far as 300 m away at some points. Reticulated giraffes, Mhorr gazelles and greater kudus will actually be mixed (though there are some 'no-go' areas for giraffes), while in the background zebra's and ostriches complete the picture. The latter are housed separately, but the only division is a watering hole. There are many different viewing points on the African savannah; visitors that climb the artificial and highly educational baobab tree have a view from 6 m high, while visitors standing on the river banks have a much lower view. The large central savannah exhibit will be enriched with smaller enclosures for meerkats, hyena's, yellow mongoose and a 'kopje' with servals and guereza monkeys. Animal visibility is thus guaranteed.

Crocodile River will open in June 2008 and this autumn the savannah itself will follow. When finished, five million euros will have been invested in the described area. ●

NEW ENCLOSURES

PHOTOS ROBERT ZINGG/ZURICH ZOO



Little Gir forest at Zurich Zoo

Robert Zingg, Zurich Zoo, Switzerland

Zurich Zoo recently opened a new exhibit for Asian lions (*Panthera leo persica*). This exhibit, covering approximately 5,400 m², consists of a landscaped indoor enclosure, two outdoor enclosures, a separation or research enclosure, off-exhibit facilities and an information centre. The new building has an Indian style design, and the enclosures are modelled after the natural habitat of the Asian lions: the Gir forest.

The indoor facilities, which opened in June 2006, have been built in the modified building structure of the former cat house. Representatives from the Gir forest and the Kuno project were among the guests invited to the opening ceremony. The Kuno project is an initiative to establish a second Asian lion population, and Zurich Zoo supports research for this purpose. A 120 m² visitor centre, which can also be used for events, provides a view into the landscaped indoor lion enclosure and houses the exhibition 'Human and lion; a relationship between fear and reverence'.

A relationship between fear and reverence

The lion was, and still remains, a symbol of power and pride. Consequently, the exhibition contains numerous art objects dedicated to the animal's reverence. However, the lion is also still considered an enemy and hunted – out of fear or for pleasure –, which explains why the lion disappeared in vast parts of its original habitat; i.e. from Africa to Europe all the way to Asia and North America. The lion exhibition is divided into four zones: Europe, the Mediterranean, Africa and Asia. Objects exhibited were chosen to reflect a large diversity in terms of age, origin and use; amongst others the exhibition displays a 1716 Zurich Thaler (a former Swiss silver coin) depicting a lion, a royal gold ring with an engraved Ghanian lion, a Massai lion fur hat from Kenya, an Assyrian relief depiction of a dying lion, a

3,500 year-old Mykenian ceremonial dagger from Greece and a reproduction of the archaeological excavation of an approximately 3,400 year-old mummified lion from the burial chamber of the wet nurse of Pharaoh Tutankhamen.

In addition, an electronic display panel shows the current world human population (more than 6.5 billion people) compared to the world wild lion population (less than 23,000 lions). This makes it quite clear how the relationship between man and lion could possibly end.

The outdoor enclosure

The lions have direct access to the outdoor enclosure and via artificial rockwork they can access the off-exhibit facilities. These consist of three boxes littered with bark, a cubbing

box and access to the outside and the hidden research enclosure. There is also an infrastructure to integrate birds (a first attempt with Alexandrine parakeets has failed) and boxes and tunnels for small clawed otters (currently not yet mixed with the lions) are present. The outdoor enclosure was opened in spring 2007, after giving the plants nearly a year's time to grow roots. The outdoor enclosure covers approximately 1,700 m² and can be divided in a small and a large area. The visitors have a close view of the lions through a 'gorge' and can playfully interact with them there by turning a crank which moves a rope inside the exhibit. Another outlook from a shelter provides a view of the part of the enclosure that is above a pool fed by a small stream of circulating water. The visitors can observe the larger part



NEW ENCLOSURES

of the enclosure from an elevated viewpoint on one edge of the enclosure. Different materials, e.g. broken lava, soil, sand, gravel and lumps of rocks have been used as substrates. Further furnishings are logs, an artificial termite mound, several (even heated) resting places and a number of feeding boxes. The enclosure is planted with various trees, shrubs and grasses with yellowish or brownish leaves to create an impression of a rather dry habitat. The pond in the smaller part of the enclosure allows underwater viewing.

Several ways to feed

The animals will be challenged in their hunt for prey by a complex feeding system that includes irregular feeding intervals and hours, food from boxes with timely limited access, suspended food, hidden food portions as well as alternation

of large and small food rations. Moreover, new and continuously changing environmental stimuli will be placed in the enclosure, including scents of different animals (e.g. via excrements or twigs from other animal enclosures), spices and essences (e.g. perfumes, conifers prepared with essential oils) or traces of prey that has been dragged through the enclosure. A wire mesh tunnel connects the research enclosure with the adjacent enclosure of the Mongolian wolves. As already practiced with the tigers, the wolves from time to time have access to the outdoor lion enclosure (when the lions are inside) so they can explore a different area and leave different traces to be explored by the lions.

The first 'king' of this new realm is the nearly 19-year-old male 'Bhagirath', which arrived in 1991 from Sakkarbaug Zoo, nearby the Gir

forest. Two females, 'Aipani' and 'Joy', from Helsinki Zoo and Frankfurt Zoo respectively, joined him. However, because the females did not get along very well, they were separated after four months, so that only Bhagirath and Joy initially moved into their new housing. It was expected that Bhagirath would die early last year, but he had a sort of revival and spent a nice summer in this enclosure, until he died end of March 2008. His successor, a young male from Besancon, has already arrived.

The Asian lion EEP included 35.50.0 lions in 33 institutions in early 2007. Three males died at the end of 2007, resulting in an even more skewed sex ratio. Adding new animals from India would be important, but for political reasons this is currently not possible. ●

BIRTHS AND HATCHINGS

Zurich SWITZERLAND

SAMUEL FURRER AND ROBERT ZINGG

A **Fiji banded iguana** (*Brachylophus fasciatus*) hatched at Zurich Zoo on 30 September 2007, after an incubation period of 149 days at 29°C. The parental pair was obtained from a private breeder in 2005. Since then, the animals have been kept in an outside enclosure whenever possible on warm summer days. The female laid four unfertilised eggs in 2006, and another four eggs in 2007, one of which was fertilised and did develop. It is hoped that the fertilisation rate will increase with time and that the second pair of adult

Fiji banded iguanas present at the zoo will also start breeding in the near future.

Zurich Zoo imported ten mouse lemurs from Madagascar in 2005. Imported as *Microcebus rufus* they were identified as the newly recognised species **Goodman's mouse lemur** (*Microcebus lehilahytsara*) shortly thereafter. During the quarantine period three of the animals died, but finally six males and one female could be introduced into the 11,000 m² Masoala rainforest exhibit. Two young were

born in 2006 and the zoo was able to exchange some individuals with the University of Hannover in Germany where another colony of Goodman's mouse lemurs is held, resulting in the acquisition of three additional females. The activity of the animals in the Masoala rainforest is monitored by an automatic transponder reader and a video camera. These methods were of assistance in observing that several young were born in 2007: five have been captured, a further one has been observed and the remains of another one have been found.

PHOTOS ROBERT ZINGG/ZURICH ZOO



BIRTHS AND HATCHINGS

Liberec CZECH REPUBLIC

LUBOŠ MELICHAR

The **golden takin** (*Budorcas taxicolor bedfordi*) is classified as 'Endangered' on the IUCN Red List. The main reasons for its continuing decline are habitat loss and harvesting. As part of an international cooperation with Chinese zoos in 2002, Liberec Zoo received two golden takins: a male, originally from Beijing Zoo, and a female from Xian Zoo. Both animals were not yet adult then (takins are mature at about thirty months), and were put in the necessary quarantine for several months. Thereafter they were placed in a newly-built facility in the zoo. The takins grew up together without any problems; no aggression or other social or health problems were observed.

The pair started mating in mid 2003, resulting in the birth of a male calf in 2004. He weighed 10.5 kg at birth and appeared to be very healthy from the first moment. The mother reared him without any human assistance. Three females have been born since then, and all have been reared by the mother. The last female was born on 19 January 2008. At three days of age she weighed 11.5 kg, measured 49 cm in length and had a shoulder height of 54 cm. She is developing well. There are now 1.4.0 takins at Liberec Zoo, and the young male has been sent on loan to Chomutov Zoo.



PHOTO LIBEREC ZOO

The golden takins at Liberec Zoo are the only golden takins being kept outside Asia. As efforts of several zoos to import new animals from China have failed, it is hoped that through the births occurring at Liberec Zoo a prospective blood line can nevertheless be developed in the future.

Duisburg GERMANY

ACHIM WINKLER

The first **koalas** (*Phascolarctus cinereus*) arrived at Duisburg Zoo in 1994. Only one year later the first birth at the zoo was recorded, and this young was also the first koala successfully raised in a European zoo. A total of 14 young have now been reared at Duisburg Zoo, and the zoo held a total of 1.4 koalas as of the end of 2007. Duisburg Zoo is one of the leading institutions in koala husbandry and breeding in Europe.

Koalas are still rarely held in zoos outside Australia. Few zoos are able to supply the daily fresh browse from specific eucalyptus species

that the Koalas require. Today, koalas are held at only seven European institutions, with most of these zoos importing their eucalyptus browse from overseas on a weekly basis. Though this is costly, koalas do generate funds due to their high popularity among the zoo visitors, despite the fact that they are largely inactive throughout the day.

The most recent joey was born at Duisburg Zoo early in 2007. The father of the joey, 'Jannali', was born in 2001 in San Diego (USA) and the mother 'Allora' was born in 2001 at Fort Worth (USA); both have been at Duisburg Zoo since

2002. The joey, which has no name yet, is Allora's third youngster. As is typical for marsupials, the joey, which is only 2 cm long, naked and blind at birth, finds its own way from the mother's cloaca to the pouch, where the youngster attaches itself to one of the two teats. For the next six months little is seen of the joey, other than an increasingly large swelling of the pouch as the youngster grows, and the odd movement within the pouch. At six to seven months the joey leaves the pouch, now fully furred and weighing approximately 500 g. The joey born in early 2007 left its mother's pouch in early November 2007. Initially the joey sat on the mother's belly, regularly retreating into the pouch when it was disturbed. As of December the joey was constantly riding on the mother's back and thus was well visible to the public.

While breeding successes have continued at Duisburg Zoo, there have been some setbacks. Following the death of Duisburg Zoo's original breeding male 'Kambara' in 2005, the original breeding female 'Yuri' died in 2007. Both animals suffered from tumours, which commonly occur among adult koalas. Fortunately, with the additional four breeding females presently held at the zoo, the future development of this group appears to be stable.

PHOTO ZOO DUISBURG



Sharjah UNITED ARAB EMIRATES

CHRISTEL GRIFFIOEN

PHOTO CHRISTEL GRIFFIOEN

The seven-year-old female **striped hyena** (*Hyaena hyaena sultana*) 'Helga' of the Breeding Centre for Endangered Wildlife in Sharjah, gave birth to a litter of three pups on 2 November 2007, after a gestation period of 88 days.

Both Helga and her male partner 'Hagar' were wild-born in Saudi Arabia and arrived in Sharjah in 2000 at an estimated age of five months. The pair had their first young in 2003, which were raised successfully by Helga, and she reared another litter successfully in 2005.

The pair was transferred to Arabia's Wildlife Centre from the breeding centre in January 2006 due to a lack of holding space at the breeding centre, and because the hyena pair, with offspring, would make an attractive display for visitors. The pair settled down nicely in their new enclosure at Arabia's Wildlife Centre, but Helga did not raise any of the three litters she gave birth to in this enclosure in 2006 and 2007. This was probably due to the lack of an enclosed nesting den and the fact that Arabia's Wildlife Centre, unlike the breeding centre, is open to the public and therefore provides a more noisy environment. Helga was observed becoming progressively more restless with all three litters, carrying the neonates around the enclosure within a few days after giving birth, presumably looking for a quieter den suitable for her and her pups.



Helga was provided with an artificial den built out of sandstone in an attempt to make her feel more comfortable raising her pups. However, despite the sandstone den, in November 2007, Helga was again observed carrying around the neonates, three days after giving birth to the fourth litter at the wildlife centre. Due to Helga's restlessness and the negative experience with the past three litters, it seemed probable that she would not rear the pups successfully.

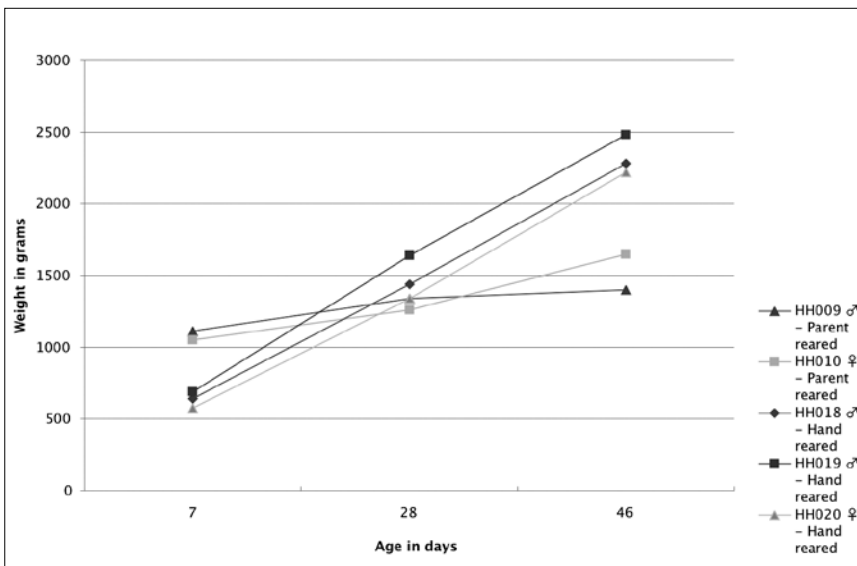
There is a growing interest in striped hyenas within EAZA institutions, and based on conversations with the ESB studbook keeper it was decided to remove the pups from the den for hand-rearing. To our knowledge there are no (sexual) behavioural or other (negative) effects

of hand-rearing striped hyenas. Since this is a litter of three, the pups have each other to play and socialise with and therefore expectations for the long-term are optimistic.

At an age of three days the pups (2.1) weighed 682 g, 631 g and 615 g, the female being the lightest. Since the three pups had been reared by their mother for three days, they had received vital passive immunity through the colostrum (the first milk). With very little literature available on the composition of hyena milk for reference, it was chosen to raise the hyena pups with Esbilac, a milk formula used for dogs, which has been used successfully by other institutions hand-rearing hyenas. The milk formula was diluted with babylite (electrolyte fluids) for the first few days. The pups initially refused to drink, but slowly they started to take some milk on the second day. They lost some weight in the beginning, but after four days they started gaining weight at a consistent rate.

From the graph (see Figure 1) it can be seen that the hand-reared pups weighed less than the mother-reared pups during the first month of their life. However, thereafter they gain more weight per day and after another month their body weight is more than that of the parent reared pups. All three pups are developing well. They opened their eyes at 11 days and their ears started to become erect when they were 22 days old. At twenty days their incisors erupted and their canines erupted at 48 days.

Figure 1 Weight gain striped hyaena pups



South Asia Vulture Recovery Plan; an update since 2005

Nick Lindsay, Zoological Society of London, United Kingdom



Tens of millions of vultures used to soar across India, Pakistan and Nepal, but since the early 1990s three vulture species have undergone catastrophic declines. Populations of the Oriental white-backed vulture (*Gyps bengalensis*), the long-billed vulture (*Gyps indicus*) and the slender-billed vulture (*Gyps tenuirostris*) have decreased by at least 97% in India over the last 12 years and 92% in just five years in Pakistan. Vulture numbers continue to decline at around 40% a year, placing these three critically endangered species on the brink of extinction.

Extensive research has identified the cause of the vulture declines to be diclofenac, an anti-inflammatory drug routinely administered to livestock in Asia. Vultures are exposed to the drug when they consume carcasses of animals that were treated with diclofenac. Diclofenac is highly toxic to vultures, causing them to die of kidney failure. The South Asia Vulture Recovery Plan aims to halt the vulture declines and to minimise the ecological and social costs of the decline in the three species. Through an active programme of research, captive breeding and advocacy it is hoped that the survival of these vultures can be assured in Asia.

Achievements so far

Since the last article in EAZA News on the vulture declines (see EAZA News 51, page 24), there have been considerable achievements in the programme:

- In 2006, the governments in India, Pakistan and Nepal all banned the manufacture of diclofenac.
- A safe alternative non-steroidal anti-inflammatory drug, meloxicam, has been found.
- There are now three conservation breeding centres in India managed by Bombay Natural History Society, holding over 150 vultures of all three species in total.
- The first successful hatching of the Oriental white-backed vulture within the programme was recorded in India in 2007.
- A new conservation breeding centre has been developed in Pakistan, with increasing numbers of Oriental white-backed vultures now in safety.
- A new centre is to be built in 2008 in Nepal to take on Oriental white-backed vultures and slender-billed vultures.
- A 'safe cow' programme has been established in Nepal in one community area close to vulture breeding colonies; diclofenac supplies have been removed and replaced with meloxicam, with encouraging results.
- Zoos in India are joining the battle under the Central Zoo Authority species programme.
- Major awareness programmes are underway in all three countries.

The Vulture Conservation Breeding Centre in Pinjore, India is now a very impressive site. It has three huge aviaries that can hold up to thirty adult vultures each and have space for flying. It also has a number of smaller breeding aviaries, laboratories and an incubation room. This is now a model facility for the programme.

A continuing risk

Despite the tremendous progress made over the past years, the scale of the challenge faced cannot be underestimated. With diclofenac still in the farming system, vultures continue to be at risk. Every effort is being made to capture as many vultures as possible in the coming years. However, the continuing decline means that finding and catching vultures gets harder each year. Taking fledglings from the nest seems to be most effective, but this is slow and time-consuming.

A successful outcome will only be possible through long-term partnerships between the governments and international and national non-governmental organisations. The Zoological Society of London, the National Bird of Prey Trust, the International Centre for Birds of Prey and the Hawk Conservancy Trust provide funding and crucial technical support to the programme, especially on the care and management of the vultures in the breeding centres in India, Pakistan and Nepal. Other partners, such as the Royal Society for the Protection of Birds, Bombay Natural History Society, Bird Conservation Nepal, the National Trust for Nature Conservation, WWF, the Environment Agency and many central and state government departments, provide other technical and moral support and much needed funding.

More partners needed

To help ensure the success of the programme, more partners are still needed. This is not just a project to save a few birds, it is a huge programme aimed at ensuring that species that have played a key role in the region's ecosystem will have a future and can once again contribute to a complex balance of both domestic and wild species. People interested in supporting the project, please contact Nick Lindsay (nick.lindsay@zsl.org).

For more information please visit www.vulturerescue.org. •

Pied tamarins; hope on the road to extinction

Dominic Wormell, coordinator Pied tamarin EEP,
Durrell Wildlife Conservation Trust, Jersey, United Kingdom



PHOTO GREGORY GUIDA

A tiny tamarin is in deep trouble in the heart of the Amazon. A corpse hangs from the wires of an overhead power cable; a pied tamarin electrocuted as it tried to flee its devastated forest. Others are killed while crossing roads, attacked by urban dogs, or trapped to be sold as pets.

PHOTO MARCELO GORDO



These are some of the fates facing the Amazon's most threatened primate, the pied tamarin (*Saguinus bicolor*), classified as 'Critically Endangered' on the IUCN Red List. The city of Manaus surges out in a wave of concrete, engulfing and isolating the surrounding forest. Tamarins are forced into ever smaller pockets of forest, which eventually can no longer sustain them, either in terms of food resources or genetic viability. This incredible primate, with one of the smallest geographic ranges of all tamarins, is facing extinction in the wild if the tide of destruction does not change.

Losing ground

The roads that radiate out from Manaus greatly speed up the rate of destruction of the remaining forest. Added to this enormous threat, the species seems to be losing ground to the more common and widespread red-handed tamarin (*Saguinus midas*). Subirá (1998) and Röhe (2006) suggest that in the last twenty years there has been a reduction in the pied tamarin's distribution.

There is some hope. Those working hard to reverse the trend include Marcelo Gordo and his dedicated team at the Federal University of Amazonas (UFAM), who have formed the 'Projeto Saium-de-Coleira' – the Pied Tamarin Project – to address the species' rapid decline. Through rescue, translocation and reintroduction, alongside assessing the physical and genetic health of the remaining population, working with the authorities to identify key conservation units, and studying the relationship between the two rival species, there is a chance pied tamarins can be saved.

Work in progress

Work is already in progress on all of these issues. Marcelo Gordo has set up quarantine stations and holding cages to deal with rescued and translocated animals. The release enclosures are large (15 m x 6 m x 5 m), with much native vegetation, allowing the tamarins to behave naturally. More triage cages are needed to deal with the ever increasing pressure to house animals coming in from the front line, and collapsible cages are required to act as orientation enclosures when groups are translocated or reintroduced to new territories in the forest. Telemetry equipment is needed to help field researchers as they follow up released animals, providing supplementary food and monitoring how they cope. Evaluating the genetic health and physical well-being of the remaining population is an ongoing task. There is some indication that wild animals become increasingly vulnerable to parasites as resources are reduced, as is the case with these fragmented populations. Many animals confiscated by the authorities will need to go through a period of assessment and rehabilitation before they are deemed fit enough to be released; if not suitable they will help the captive population, which needs new founders. All of these activities require increased cage capacity.

Further studies

Some areas of forest where releases occur already have their own populations of wild tamarins; whether these forests can cope with the introduction of more tamarins only further studies will show. Early genetic studies on hair follicles have shown that fragmented populations are starting to show the effects of inbreeding, with reduced gene diversity. Key fragments of forest will have to be protected and the connections between these forests will be vital if genetic diversity and a healthy wild population is to survive.

A safety-net population

Some twenty years ago it was decided to set up a safety-net population, but only recently has the species started to breed successfully in captivity. The pied tamarin's very confrontational nature and susceptibility to stress had led to very high rates of mortality, with few institutions having sustained levels of breeding. With nearly ninety animals the EEP now holds more than two thirds of the captive pied tamarins world-wide, and its efforts, including sending 15 animals to the USA in 2007, have helped make sure the population is viable. Pied tamarins continue to be a challenge, but as we learn more the overall health of the captive population improves. As the species' future in the wild is precarious, this safety net is imperative, not only as genetic backup for the species, but to highlight its plight in the wild and nurture support for conservation activities. •

Conservation in a snail shell; a brief update on the Partulid Global Species Management Programme



Paul Pearce-Kelly, coordinator Partulid Global Species Management Programme, Zoological Society of London, United Kingdom

The Partulid Species Management Programme is currently celebrating its 20th anniversary, so this is a timely opportunity to provide colleagues with a brief update on the progress to date.

The programme currently includes 17 participating collections in Europe and North America which together care for 21 taxa. In addition to annual international studbook publications, 2007 saw the revision of the husbandry guidelines, an international review meeting and a ten year programme action plan.

A long-running effort

In addition to ensuring the continued survival of 15 'extinct in the wild' taxa, the Partulid programme has been the driving force behind the long-running *in situ* conservation effort for French Polynesia's endemic tree snail species. This has been the case throughout the initial crisis rescue phase (1985 – 1996) and the investigation of predator spread and mitigation phase (1994 – 2003). This continuity of effort forged strong *in situ* relationships with a diverse range of individuals, NGO's and governmental agencies, essential for taking the conservation process forward to the current phase of the programme (2003 – present) involving formal collaboration with the Delegation à l'Environnement de Polynesie Francaise to undertake intensive survey work and to develop an action plan for the government to conserve the region's endemic tree snails and their montane forest habitats. This represents a major conservation advancement and provides the mechanism by which the EEP and SSP Partulid populations will be reintroduced.

Measuring success

The success of the *in situ* conservation element of the programme is best measured by the ongoing close collaboration and active support of the French Polynesian government to help take forward the implementation elements of the action plan. The extensive species status data obtained during this work has been used to review the IUCN Red List category status of all the region's Partulid species.

Without the collaborative effort of the Partulid programme member institutions, these achievements could not have been realised. The strategy of pooled resource support to realise conservation outcomes beyond the capacity of individual programme partners (including governmental) provides a valuable case study for the wider conservation community.

Conservation Action Plan

The successful realisation of the survey work and the resultant conservation action plan is detailed in the report for Direction de l'Environnement de

la Polynesie Francaise entitled 'Conservation Action Plan for the long-term protection of French Polynesia's last surviving populations of endemic tree snails of the genus *Partula*, *Samoana* and *Trochomorpha*'. Principle outcomes included: a) clarification of remnant surviving Partulid populations, b) greatly enhanced understanding of the introduced predator species status and interaction dynamics with the native mollusc species, c) the successful incorporation of key endemic snail habitat sites in the French Polynesian government's biodiversity priority areas schedule, d) greatly raised public awareness of the Partulid snails conservation story and the danger of introduced predators and e) a clear set of action plan implementation recommendations. The ten year Partulid Action Plan also incorporates an evaluation of climate change impacts on Partulid species on islands where there are no apparent stresses on the snails.

Review and follow-up

Throughout the course of the project, detailed monthly progress reports enabled ongoing internal programme review. Comprehensive annual reports for the Direction de l'Environnement de la Polynesie Francaise enabled wider project review at each year end. The extensive updated field data enabled significant revisions to be made to the Partulid IUCN Red Data list, using the latest category evaluation criteria. The Direction de l'Environnement de la Polynesie Francaise has again showed its approval of the project's results with a follow up three year commission for the Partulid programme's field biologist (Dr. Trevor Coote) to assist with the implementation phase of the action plan. This work is being enabled through the same collaborative funding partnership of the French Polynesian government and the international Partulid programme member institutions.

Snails and ZIMS

Last but not least it is also worth mentioning that the Partulid programme has provided the main case group for ensuring that ZIMS will be able to track and manage group managed species. It is also being used to improve PM2000's ability to determine genetic relatedness in group managed populations.

The Partulid programme is currently looking for new participants to provide additional much needed breeding capacity, including the field establishment phase for the programme. Please contact ppk@zsl.org for further information. ●

A personal experience; completing the EAZA Breeding Programme Management Course

Ernesto Arbeláez Ortiz,
ALPZA studbook coordinator
of the Galápagos giant tortoises,
Zoológico Amaru and Bioparque
y Zoológico de Cuenca, Ecuador.



An experience that I never will forget and which taught me a lot was the trip I made to Europe, including the opportunity I had to participate in the EAZA Breeding Programme Management Course in Amsterdam, from 19 to 23 November 2007 (see EAZA News 61, page 5). First, because of the professionalism of all people involved – the course participants and the EAZA Executive Office team – and secondly, because of the subjects and information taught to us through presentations, conversations, exercises and examples of real experiences. I learned the basics of the importance and functions of studbooks; their production process and the scientific and statistic analyses that are involved. Studbooks are useful tools to reach certain population management goals (genetically and demographically) necessary to guarantee the sustainability of animal populations in captivity over the long term. We also tried to incorporate the impact of collection planning and managed programmes into activities and objectives for modern zoos, as they are important instruments in the conservation of endangered species of fauna.

I think that by promoting and assisting in population management, EAZA is showing its commitment to cooperation within the zoo community and in working in favour of animal welfare and conservation. With assistance from EAZA, the ALPZA association is also working on helping incorporate population management programmes within the ALPZA member institutions. An example of the interest in and efforts for these programmes is the organisation of a studbook meeting and training course in Panama from 25 to 29 February 2008. The training and course were realised with the assistance of ten different studbook coordinators from the ALPZA region.

PROGRAMME UPDATES

As approved by the EEP Committee

CHANGES TO EXISTING TAGs

EAZA Callitrichid TAG

Aude Haelewyn Desmoulins (vice-chair), St-Aignan
5 February 2008

CHANGES TO EXISTING EEPs

White rhinoceros EEP

(*Ceratotherium simum*)
Lars Versteegen, Hilvarenbeek
7 March 2008

Mongoose lemur EEP

(*Eulemur mongoz*)
Emma Stanley, Linton
12 February 2008

Maned wolf EEP

(*Chrysocyon brachyurus*)
Rudiger Dmoch, Frankfurt
24 January 2008

Black-footed cat EEP

(*Felis nigripes*)
Andre Stadler, Wuppertal
7 January 2008

NEW ESBs

King bird of paradise ESB

(*Cicinnurus regius*)
Richard Switzer, Alwabra
5 February 2008

CHANGES TO EXISTING ESBs

Tamandua ESB

(*Tamandua tetradactyla*)
Cornelia Bernhardt, Krefeld
26 February 2008

Greater kudu ESB

(*Tragelaphus strepsiceros*)
Jiri Hruby
7 January 2008

4TH SCORE WORKSHOP

The 4th SCORE Workshop will be held in Puerto Rico and is scheduled to take place from 17 to 26 August 2008.

Previous SCORE workshops have helped to establish coral live stocks in public aquaria around the world. The corals are used for breeding, scientific and educational purposes. The development of the coral recruits is carefully monitored and the data will help improving aquaculture and breeding methods. An important achievement of the workshops is that they provide a good basis for scientific fieldwork, which has resulted in some scientific breakthroughs. Last but not least, the workshops offer excellent possibilities to start a dialogue on coral conservation with locals.

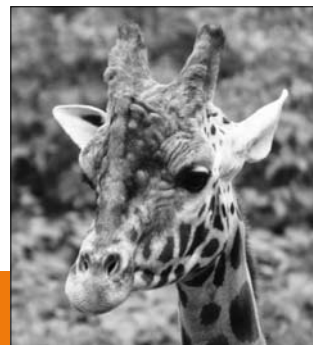
For more information, please visit www.score.org.



score
sexual
coral
reproduction

Tall blondes in the picture; Giraffe EEP celebrates twenty years

Marc Damen, coordinator Giraffe EEP, Zoo Parc Overloon, The Netherlands



The Giraffe EEP was established in 1988 for reticulated giraffes (*Giraffa camelopardalis reticulata*) only. Today all giraffes kept in EAZA institutions, including hybrids, are coordinated through one of the largest EEPs with regard to the number of participants. It is expected that this year 140 EAZA institutions will keep giraffes, which constitutes more than half of the EAZA membership keeping animals. Time to look back, and forward!

When the Giraffe EEP was established in 1988, only 26.43 (69) living reticulated giraffes kept by twenty institutions were registered. In the first EEP annual report the EEP coordinator, Dr. Brotzler from Stuttgart Zoo, Germany, wrote that one of the major problems was that many institutions kept both pure giraffes plus hybrids in a breeding situation. Nowadays this problem is still not completely solved. Dr. Brotzler also kept an unofficial register for all other giraffes known to him, and in 1991 EAZA decided to expand the Reticulated giraffe EEP into the Giraffe EEP, which includes also hybrids and giraffes of unknown origin. Dr. Brotzler had developed his own software programme to register all giraffes. Unfortunately this programme was not compatible with SPARKS, consequently a few years ago well over 3,000 giraffes had to be entered into the ISIS studbook software. Dr. Brotzler retired in 1995; his position was not taken over by one person, rather his duties were distributed amongst his colleagues at Stuttgart Zoo.

Because of the workload of this growing EEP, in 2003 it was decided to split this EEP into two separate EEPs, each for a number of subspecies, together still covering all giraffes, and Marc Damen took over the subspecies grouped with the Baringo giraffe. In 2006 Stuttgart Zoo decided to stop coordinating the reticulated giraffes after 18 years of hard work, after which both EEPs were reunited into one Giraffe EEP again.



Husbandry guidelines

By invitation of Zoo Dvur Kralove (Czech Republic), one of the most experienced giraffe keeping institutions in Europe, eight persons gathered in 2004 to discuss giraffe husbandry and to prepare a first draft of husbandry guidelines. This draft was circulated amongst the two then existing species

committees, and was finally published in 2006. When the Giraffe EEPs were reunited it was decided to include all species committee members in the new Giraffe EEP; there are twenty species committee members now. The EEP also has advisors for nutrition, veterinary matters, genetical issues and conservation projects. The previous EEP coordinator, Dr. Günther Schleußner, serves as a general advisor.

Current numbers

At the moment 720 giraffes kept in 146 institutions are included in this EEP. The largest number of giraffes currently kept by one institution is 33 (9.24) at Zoo Dvur Kralove. This institution has a very successful history in keeping giraffes. A total of 205 giraffes have been born at Dvur Kralove since this zoo started keeping giraffes in 1969. Zoo Dvur Kralove now keeps both Baringo (*Giraffa camelopardalis rothschildi*) and reticulated giraffes, of course in different enclosures to avoid hybridisation, and multiple adult males serve as sires in each subspecies to avoid over-representation of one male.

The Baringo giraffes currently constitute 39% of all giraffes in the EEP, and both their number and proportion are growing fast. The Baringo giraffe population is healthy, with many founders and not much inbreeding. Reticulated giraffes comprise approximately 16% of the total giraffe population; their number is growing too and each year one or two new holders can be welcomed. Kordofan giraffes (*Giraffa camelopardalis antiquorum*) form 9% of the EEP population; this subspecies is mainly kept by French zoos due to their historical relationship with western Africa. Most likely due to inbreeding, the number of Kordofan giraffes is not really growing. Cape giraffes (*Giraffa camelopardalis capensis*; 6%) are only kept by a few institutions scattered around the EAZA region, from the United Arab Emirates, the Russian Federation and France, which makes an exchange of animals almost impossible. Angolan giraffes (*Giraffa camelopardalis angolensis*) represent only 3% of the total population, and are kept by two German zoos and two on the Iberian peninsula; a very close and active cooperation between all four institutions is needed to maintain this subspecies in Europe. The last pure subspecies is the Masai giraffe (*Giraffa camelopardalis tippelskirchi*) of which there are five females in Switzerland plus a male in Israel. Last but not least, 27% of the total number of giraffes is hybrids. This number is decreasing, but only slowly.

COLLECTION PLANNING

New holders

On the average four new holders join the EEP each year, either because they are new members of EAZA that were already keeping giraffes, or they are EAZA members starting to keep giraffes. The studbook data show that mortality in new institutions is much higher than in experienced institutions. This can be explained by the lack of husbandry and management experience, and the new facilities, which sometimes have starting problems. Therefore it has been agreed within this EEP that all new holders should start with a single sex group first, either males of one or more subspecies or hybrid females. Currently there are around thirty single-sex groups in the EAZA region. Several participants have indicated that they want to continue keeping males only, as there is much more activity in a bachelor group than in a breeding group.

The discussion on subspecies

One of the major challenges is the discussion about subspecies in giraffes. These discussions are not only at individual giraffe level (the EEP studbook), in which a conservative approach is needed (if the subspecies cannot be proven, it is by definition of unknown subspecies), but also on the broader level. There is still no consensus amongst scientists regarding the exact number of subspecies in giraffes. Fortunately there is one subspecies less in Europe since last year. A study (Hassanin *et al.*, in press) carried out under supervision of the Muséum National d'histoire Naturelle, the organisation to which Paris Zoo belongs, revealed that all giraffes in Europe previously believed to be Nigerian giraffes are instead pure Kordofan giraffes, as are all the giraffes in Europe that were believed to be crossbreeds of these two subspecies. Both populations were only kept in Europe in low numbers and now this situation looks much more promising. An even more comprehensive study (Brown *et al.*, 2007) showed that there is much genetic variation between the subspecies of giraffes, leading the authors to propose considering them separate species instead of subspecies. Both publications have been sent to all participants in this EEP and are available to others in digital format from the EEP coordinator.

Factors influencing decision-making

Genetics is only one of the factors which influence decision-making in the Giraffe EEP. There are many other practicalities to keep in mind. Apart from the subspecies and genetic relationships (which can all be calculated by using SPARKS and PM2000), blue tongue disease is also playing an important role these days. There are still many problems and restrictions in possibilities to transport giraffes across blue tongue areas. Most zoos have alternative stables available for other hoofstock in case of transport problems, but there are not many places where one can easily keep a giraffe for another couple of months, once the giraffe stable is full.

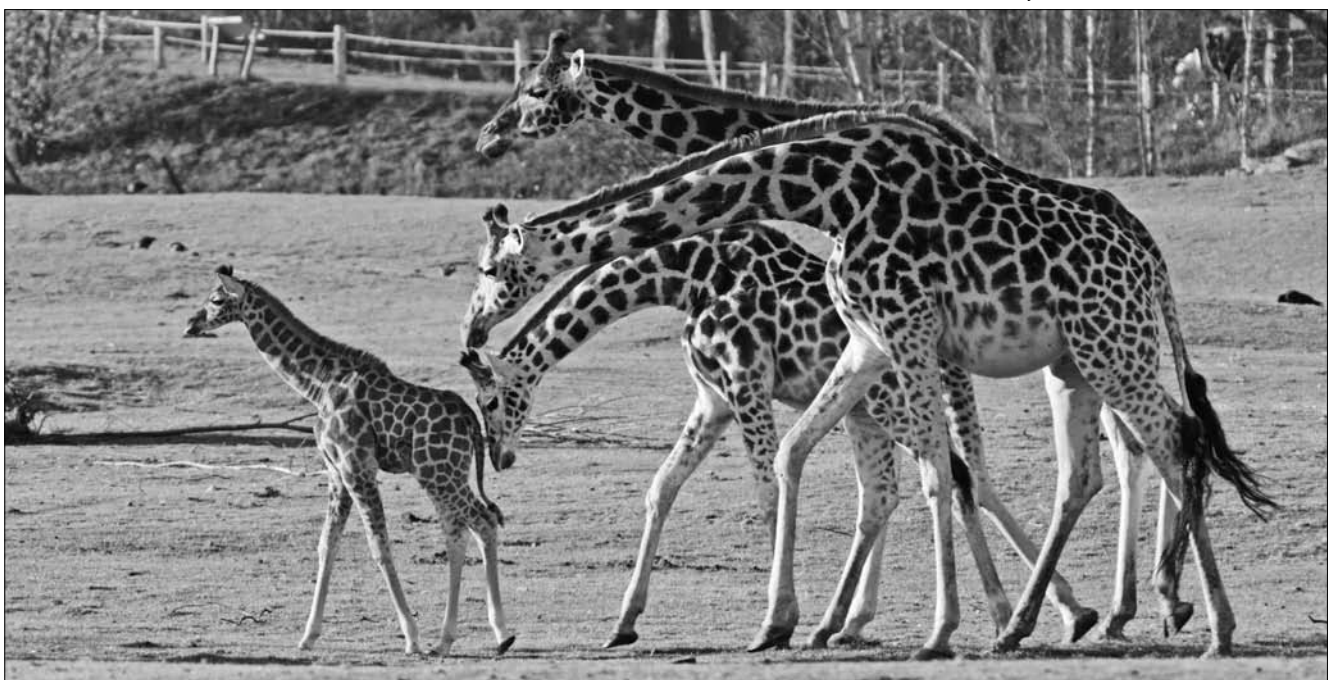
Other veterinary problems arise too. Many state veterinary authorities request negative blood samples for brucellosis and a negative tuberculosis skin test. Because of the risk of death, many zoos refuse to anaesthetise a giraffe for a blood sample, especially not for brucellosis, a disease that does not occur in many EU countries. Some transports have been cancelled for this reason and alternatives had to be found.

Giraffe transports are very expensive and they are risky; each year 10% of all transported giraffes die during loading, transport or offloading. Therefore it sometimes makes more sense to allow a little more inbreeding than to incur huge expenses and take the risk of losing a genetically important giraffe.

The future

We need to reduce the number of hybrids in the next few years, to allow populations of pure subspecies of giraffes to grow. It can be expected that the growth in number of participants in the Giraffe EEP will slow down. The Giraffe EEP is going in the right direction, but still has a long way to go, especially with such a delicate and high-profile species. •

PHOTOS MARJOLEIN OSIECK/SAFARIPARK BEEKSE BERGEN



Diverse bird populations in EAZA institutions; to be or not to be?

Kristin Leus, chair EPMAG, and Laurie Bingaman Lackey, ISIS, Minnesota, United States of America

Despite an exemption for birds intended for zoos, the now indefinite bird import ban imposed by the European Union since 11 January 2007 (to help prevent the spread of avian influenza and other diseases), will not be without consequence for our EAZA bird populations.

The import into the European Union (EU) of both captive and wild hatched birds for zoos will be governed principally by the Balai Directive, which has a different interpretation and rate of implementation among the various EU member states. In addition, the import may not be for commercial trade but should be for conservation purposes. This is likely to lead to a case by case evaluation of import applications whereby the outcome is not necessarily easily predictable. Furthermore, bird dealers and private breeders are not exempt from the import ban (unless they are Balai approved) and zoos will therefore largely have to do their own imports. Looking on the bright side, the latter does hold the opportunity to ensure that sustainability and animal welfare are guaranteed in each step of the process. All of this begs the questions: “Are, or can, EAZA bird populations be sustainable” and “what do we mean by sustainable”? Sustainability in terms of animal populations has two different components: demographic and genetic. Both are important, but demographic sustainability is a pre-condition for genetic sustainability. Genetic diversity comes ‘wrapped up’ in birds. A bird population that is losing birds is therefore always losing gene diversity fast; when the birds are gone the genes are gone.

Demographic sustainability

Are EAZA bird populations demographically sustainable? Demographic sustainability implies that on average the number of hatchings and imports is as high, or higher, than the number of deaths and exports. If imports into the EU are likely to be restricted, then we have to rely on hatchings in EAZA collections, or ‘kosher’ private collections in the EU, to counteract deaths and removal of birds from the population for other reasons. This is easy to say, but hard to track; firstly, although it is fabulous that the number of EAZA institutions joining ISIS has rapidly increased over the years, some zoos are not yet members, not all zoos have already entered all their data, data are not always up to date, and the origin of birds is not always clear. Analysing the EAZA data in ISIS will therefore be time consuming and not always successful. As a first step a quick scan was made of the EEP and ESB populations for which ISIS had data. A few warnings with regard to the interpretation of the data are in order. Firstly, a rapid scan necessitates a standardised treatment of all data sets (e.g. same time frame for demographic analysis). Furthermore, some data sets are more up to date or in better condition than others. Finally, some data sets just have too few data for analysis. Using PM2000 the age specific birth and death rates were calculated for each population. Then it was checked whether, assuming the calculated hatch and death rates stayed the same, the populations were likely to increase,

PHOTO ROB DOOLAARD (IZP)/ROTTERDAM ZOO



stay stable or decrease in the future. Thus, only the birth and deaths are taken into consideration, not imports and exports. Table 1 shows that of the 96 investigated populations, almost half did not contain sufficient data (hatchings and deaths) to be able to do this analysis. For species with short life spans for which the programme has been running for some time, this may imply that the population cannot sustain itself through hatchings alone. For species with longer life spans and/or more recent programmes this is not necessarily so. Only about half of the programmes for which the analysis could be carried out had a stable or increasing projection.

Table 1 Sustainability of bird programmes

| | | Increasing projection | Stable to increasing projection | Stable to decreasing projection | Decreasing projection | Cannot calculate |
|-------|----|-----------------------|---------------------------------|---------------------------------|-----------------------|------------------|
| EEP | 40 | 7 | 6 | 5 | 5 | 17 |
| ESB | 56 | 6 | 7 | 8 | 7 | 28 |
| Total | 96 | 13 | 13 | 13 | 12 | 45 |
| | | 26 | | 25 | | |

Genetic sustainability

What about genetic sustainability? Only 11 EEP/ESB programmes had 75% or more of their overall pedigrees known. For 34 other populations the analysis could for various reasons not be carried out at all. For the majority of the programmes genetic sustainability could therefore not be determined. How important is genetic diversity? If we wish to maintain a diverse bird collection in EAZA zoos, we may well be forced to just make the best out of whatever we have for those species the TAGs consider important to maintain in zoos (for whatever reason). Is a population that is demographically healthy but that has a low genetic diversity and a high inbreeding level guaranteed to go extinct? No. However, we should be aware that as evolutionary potential decreases, the chance that the population will experience reduced fitness increases. Which traits will be affected by inbreeding and to what degree

is unpredictable (you may even get different results with two populations of the same species). Apparently healthy stocks may be unable to survive under changing, more stressful conditions. While ensuring demographic health at all time, it is therefore important that we also strive for the best possible genetic health under a given set of circumstances.

Making investments

If we wish to reliably maintain diverse bird collections in EAZA zoos, it is

essential that we make serious investments of time and resources, so that our bird populations can be maintained largely through hatchings. In addition, it would be wise to explore ways to safely work with private breeders, not only because they are a potential source of birds, but also to share space and husbandry expertise. To guide this work and help set priorities, there is a lot of analysis work ahead. Populations that cannot be analysed in a standard way will have to be assessed on a case by case basis and we will have to find ways to evaluate the non-managed populations. ●

EAZA Passeriformes TAG workshop at Cologne Zoo

David Jeggo, chair EAZA Passeriformes TAG, Durrell Wildlife Conservation Trust, Jersey, United Kingdom and Theo Pagel, vice chair EAZA Passeriformes TAG, Cologne Zoo, Germany

Representatives of 17 EAZA institutions attended the EAZA Passeriformes TAG workshop held at Cologne Zoo on 11 and 12 February 2008. The workshop focused on revising the TAG's Regional Collection Plan and on the future impact of the EU wild bird import ban.

During the workshop a revised Regional Collection Plan (RCP) was drawn up, which recommends about fifty species of Passeriformes to be kept and established in EAZA institutions. All workshop participants agreed that if a variety of birds are to be kept in EAZA institutions, self-sustaining populations of the different species need to be established, as commercial importation as a source of birds is no longer an option.

Consequently, more effort and resources will be required and the EAZA Passeriformes TAG recommends the following:

- 30% of an institution's bird collection should be kept off show; many bird species seem to breed better off show than in mixed exhibits. This provides a back up to exhibits by enabling additional pairs of some species to be kept, it provides space for offspring to be held and it provides facilities for the development of husbandry techniques to be able to manage species better.
- Several pairs or flocks of some species should be kept.
- Species and subspecies should be correctly identified.
- Passeriformes species listed in the RCP should be kept in preference to species not listed in the RCP.

Creating sustainable populations

The low numbers of many species held will need to be increased if populations are to become sustainable and, if this is to be achieved, breeding success will have to be improved (according to ISIS, of the species in the revised RCP ten are represented by over ten individuals and a further seven by over twenty individuals; only eleven of the species have a population of over a hundred individuals). It is important to find ways to work with non-EAZA institutions and private breeders to share resources. Most species require at least an individual to monitor and champion them, and ESBs and EEPs are required for some, for the situation to improve.

While in the future it may be necessary to carry out organised importations from the wild, and the import ban does not prohibit zoos from doing this, there is currently no recommendation for immediate importations.

Captive programmes are possible

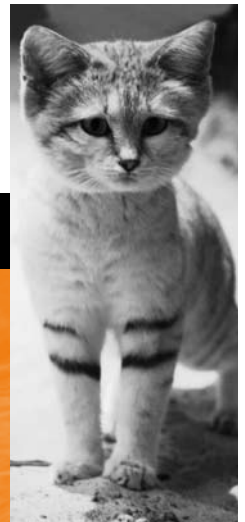
The success with the Bali starling (*Leucopsar rothschildi*) demonstrates that captive programmes for Passeriformes are possible and that, while many of the species kept are not threatened, the skills and techniques that can be developed through their captive management can be applied to the conservation of endangered species in the wild. Current work with the Mauritius olive white-eye (*Zosterops chloronothus*), which is 'Critically Endangered' (IUCN), is an example of this. ●

Leucopsar rothschildi PHOTO GARY WARD



Wanted: New holders for the Sand cat EEP

PHOTOS UTE MAGIERA



Ute Magiera, coordinator Sand cat EEP, Osnabruck Zoo, Germany

The sand cat (*Felis margarita*) is listed on the IUCN Red List as 'Near threatened'; the wild population is estimated to include less than 50,000 individuals, with a declining population trend due to devastation of its habitat and declining availability of prey animals. This beautiful small-sized cat has only been kept in EAZA institutions since 1990. The Sand cat EEP, established in 2000 and currently coordinated by Osnabruck Zoo, is looking for new holders.



The sand cat is a small felid with big ears and a broad and flat face. It lives in the sandy and stony deserts of north Africa and southwest Asia. There are four subspecies of the sand cat, but only the subspecies *Felis margarita harrisoni* is kept within EAZA collections, with approximately eighty individuals in 22 institutions.

Two problems

From a demographic point of view the *ex situ* sand cat population is self-sustaining, but two problems affect the European population adversely; as in many small populations the individuals are closely related to each other and the breeding success is low. Only nine institutions kept potential breeding pairs in 2005 and from these, six pairings resulted in a hypothetical high inbreeding coefficient equal or greater than 0.125. Hence, the major tasks in the last two years have been dissolving close genetic relationships by establishing more unrelated breeding pairs. Currently 14 institutions keep potential breeding pairs and the average inbreeding coefficient has reduced slightly. However, regardless of these efforts breeding success has not increased; in both 2006 and 2007 only one third of all kittens survived. The exact reason for this high mortality rate is unknown. The circumstances of death should be analysed in order to get more information and to reverse this trend.

With the current size and founder base, the captive sand cat population will maintain low levels of adaptive potential and result in individuals with high inbreeding coefficients and a high probability of reduced fitness. As discussed during the EAZA Felid TAG meeting in 2007, recruiting new founders and increasing the population size to at least a hundred individuals may improve the situation.

Finding new founders

A good start has already been made this year, two institutions will start keeping sand cats, which they will receive from Al Ain in the United Arab Emirates. The next step will be to find more institutions keeping sand cats in Arabia and/or Israel with the aim of getting more new founder animals. As soon as these founder animals are available, at least two EAZA institutions are needed that are willing to accommodate and breed with these important new animals. If things go well and the population increases in the near future, more sand cat holders will be needed.

The Sand cat EEP aims to publish sand cat husbandry guidelines next year and to carry out studies on the low breeding success and on stress levels amongst the cats during transport. Currently, students work on a nutrition study and a chrono-ethological behaviour study focusing on two sand cat pairs, and a PhD student is trying to determine the sand cats' genetic diversity through blood samples. Another study is described on the next page of this magazine. Future field studies are needed to gain knowledge on the actual distribution of all sand cat subspecies.

In addition to being very attractive, sand cats are also quite active during the daytime in zoos, compared to their nocturnal life in the wild. Males particularly seem to be very curious. Above all, sand cats can be used to inform visitors about their habitat, the desert and the ability of animals to adapt to this unique environment. Institutions interested in keeping sand cats need to take into account that separable enclosures are necessary to be able to breed with this species.

For more information, please contact magiera@zoo-osnabrueck.de •

Activities, interrelations and use of space in captive sand cats and in Pallas' cats

Cécile Régazzi, Laboratory of Animal and Human Biosociology, Paris, France

Like most of the representatives of the felid family, both the sand cat (*Felis margarita harrisoni*) and the Pallas' cat (*Otocolobus manul*) are known to be solitary in their natural habitat. However, zoos often choose to house them in pairs or in groups. Thus, these animals are forced to adapt their solitary lifestyle to an intraspecific cohabitation in an unnatural physical as well as social environment.

A study has been undertaken that focused on describing and quantifying the behaviour of a group of captive sand cats (1.3) and of a pair of Pallas' cats (1.1), by recording their repertory of activities, their interrelations and their use of space. Some specific goals were to identify and characterise social interactions occurring between individuals of these solitary species. In other words, how did these animals manage to live together with no possibilities to really escape contact within a limited area?

Collecting data

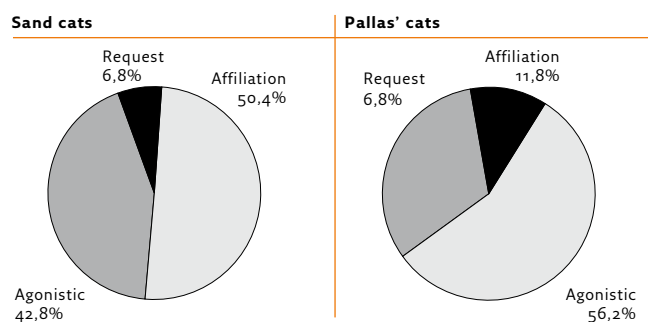
The observations of the sand cats and the Pallas' cats were carried out at Zoo Mulhouse, France, between July 2000 and June 2002. Behavioural data were collected during daylight hours via direct observations and according to the ethological methods described initially by J. Altman (1974). Activities were divided into motor behaviours (e.g. locomotion, stereotypy, exploration and auto-grooming) and non-motor behaviours (e.g. resting together, resting alone and alert). The interrelations were divided into direct interactions (classified according to three categories: affiliation, agonistic and request) and into indirect interactions which corresponded to marking behaviour (urine spraying, scratching, rolling, rubbing and flehmen). Detailed maps of the enclosures were made to study use of environmental resources, and the enclosure was divided into several sections to study space utilisation.

Comparing sand cats and Pallas' cats

The results of this study showed that the captive sand cats and the captive Pallas' cats seem to have different behavioural answers when they are put in the same situation (see Figure 2). The group of sand cats showed a certain degree of sociability; there were repeated and durable relations, as determined by bouts of social resting observed. The positive direct interactions (affiliate behaviour) were more important than the negative direct interactions (agonistic behaviour). A portion of the space was used and shared in a common way. Regulated access of this space among individuals indicated a comparatively complex system of social organisation. These behaviours helped the solitary sand cats adapt to a communal housing situation.

On the other hand, the behavioural pattern of the pair of Pallas' cats indicated that they had difficulty adapting to communal life. They did not perform social resting behaviour, resting alone and distant from each other.

Figure 2 Distribution of affiliate, agonistic and request behaviours (%)



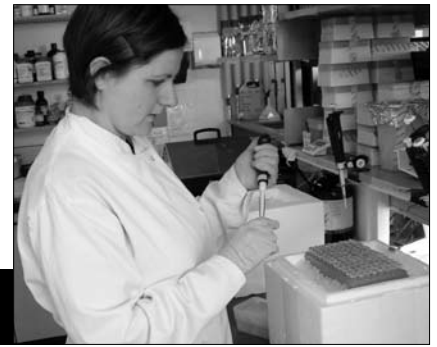
Agonistic behaviours were more prevalent than affiliate behaviours. Although this study was limited to the observation of a single group of both species, the results suggest that the sand cat can potentially adapt to intraspecific cohabitation in a closed environment. This behavioural flexibility (adaptation from solitary to communal life) may also be present in some other species, when a conjunction of various factors provides a favourable environment for development of a social structure, while fulfilling the individual requirements. Enclosures for groups or pairs of naturally solitary species should be designed to provide places where individuals can meet and engage in positive social contact, but also to provide opportunities for individuals to retreat or escape. ●

Otocolobus manul PHOTO ROB DOOLAARD (IZP)/ROTTERDAM ZOO



A productive decade; ten years of research

Amy Plowman, Whitley Wildlife Conservation Trust, Paignton, United Kingdom



The Whitley Wildlife Conservation Trust is the umbrella organisation for three zoos (Paignton Zoo, Living Coasts and Newquay Zoo) and three nature reserves in the southwest of England. Since its foundation in 1955 'the promotion of scientific and educational study and research, and the publication of the useful results of all such study and research' has been a high priority.

Paignton Zoo's science department was established with one staff member in 1997, to carry out research into animal behaviour and welfare within the zoo and to develop *in situ* conservation projects. In 2007 the zoo celebrated the department's tenth anniversary and a new name, the 'Whitley Wildlife Conservation Trust (WWCT) Field Conservation and Research Department', which better reflects the zoo's role across the whole organisation. The department now has seven staff members and plays an active role in both the BIAZA Research Group and EAZA Research Committee.

To date the zoo has achieved 24 peer-reviewed research publications and has given over thirty national and international conference presentations annually. Although the zoo has been awarded several small research grants from various sources such as the British Ecological Society, most of the work is funded directly by the WWCT zoos, which reflects their genuine commitment to carrying out zoo-based and other conservation research. Each year the department carries out or facilitates over hundred research projects, primarily at MSc or PhD level, which fall into three core research areas:



1) Behavioural husbandry and animal welfare

This was the original research focus of the department and a large amount of applied research is still carried out in this area, with the aim of improving housing and husbandry techniques. For instance, for several years various factors have been investigated, such as enclosure design, group size and structure, reproductive state and personality, that may affect the welfare of Sulawesi crested macaques (*Macaca nigra*). Animal nutrition and veterinary research are also included in the area of behavioural husbandry and animal welfare. For example, another long-term investigation into the efficacy of different antihelminths and their administration method for treating whipworm (*Trichuris trichiura*) was conducted in Eastern

black-and-white colobus monkeys (*Colobus guereza*). Factors that affect individual parasite burdens have also been identified, including stocking density, age, gender and dominance status.

2) Behavioural ecology and cognition

The WWCT strongly believes that its zoological collections are a valuable scientific resource and, within its ethical constraints, should be fully utilised to further scientific understanding. Working closely together with the universities of Exeter and Plymouth, particularly the psychology departments, it investigates the many aspects of non-applied animal behaviour and cognition such as social learning, concept discrimination and resource bargaining. For instance, a long-term project has been started investigating how play and grooming relationships in infant and juvenile hamadryas baboons (*Papio hamadryas*) may influence alliances in adulthood. In addition, social interactions between male gorillas have been the focus of research for one staff member, leading to a completed PhD.

3) Conservation, ecology and environment

WWCT undertakes many ecological projects on the zoo grounds and in the nature reserves, aimed at improving the management of these areas for native wildlife. For instance, the effectiveness of a coppicing regime in one of the woodlands in enhancing the diversity of plants, invertebrates and small mammals has been evaluated. Currently, field trials are being run to investigate the effectiveness of several possible techniques for meadow restoration in another of the reserves. In addition, conservation research is conducted at other sites, both in the United Kingdom and abroad. One staff member recently completed a PhD on the ecology and genetics of meadow thistle (*Cirsium dissectum*) which is a key species of a threatened local habitat Rhos pasture. Another is conducting PhD research into potential dispersal barriers for the endangered Abbot's duiker (*Cephalophus spadix*) in Tanzania, using DNA markers extracted from faeces.

The future

Research will continue to be carried out in these three core areas, to aid in the management of all three WWCT zoos and the nature reserves and ensure that they all fulfil their potential as valuable scientific resources in the future. To assist in this goal, the zoos and the reserves will each shortly have a written research strategy detailing the research focus for each site and setting targets for research staff and student numbers and presentation and publication rates. ●

Spotlight on science for conservation

Zjef Pereboom, Centre for Research and Conservation, Royal Zoological Society of Antwerp, Belgium

The Royal Zoological Society of Antwerp (RZSA) held its first zoo-research symposium in December 2007. The objective was to communicate research activities to RZSA staff, collaborating institutions and schools, and the government, but also to reinforce existing partnerships. Ultimately, the RZSA aspires to organise annual symposia with specialist workshops for the wider zoo community, and to establish new collaborations with researchers worldwide.

Locomotion PHOTO KRISTIAAN D'AOÛT/RZSA



Conservation strategy

One of the aspirations of the World Zoo and Aquarium Conservation Strategy (WZACS) is that zoos and aquariums be "integrated into the research community as serious, respected scientific institutions that make significant contributions and sound scientific decisions for wildlife conservation". Even though an increasing number of zoos perform research *ex situ*, including scientifically managed captive breeding programmes, and contribute to *in situ* conservation and research programmes, very few European zoos have a dedicated research team, a research strategy, or their own conservation research programmes (EAZA Research Survey, 2006). In order to address the WZACS challenge, and to encourage zoos and aquariums to develop research facilities and employ research staff, EAZA recently published the EAZA Research Strategy.

Centre for Research and Conservation

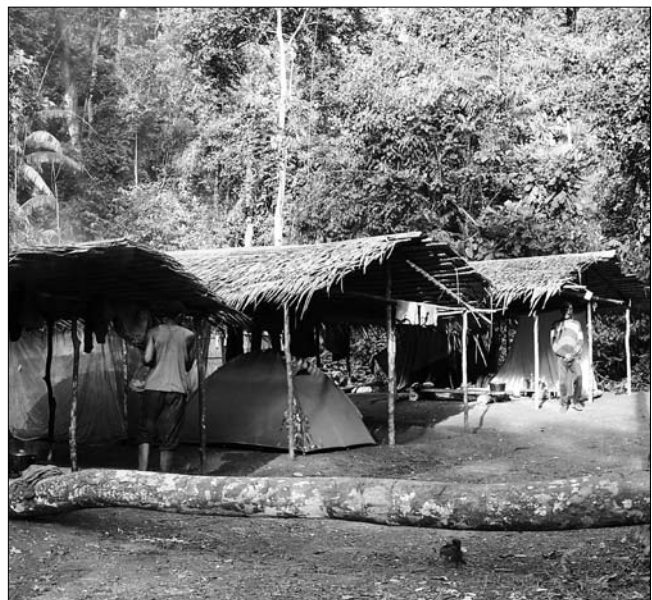
One of the institutions involved in the development of the EAZA Research Strategy and its implementation is the Centre for Research and Conservation (CRC), the research department of the Royal Zoological Society of Antwerp (RZSA). Research is one of the RZSA's instruments to contribute to wildlife conservation, and along the lines of the society's commitment towards conservation and sustainability, research is focussed on sustainable population management.

Two-third of the scientific activities of the CRC are core-funded by the Flemish government. The latest research assessment exercise and the new RZSA Strategic Plan for Scientific Research 2007-2011, resulted in a renewed five-year joint agreement with the government and continued partnerships and collaborations with Flemish and international universities and research institutes. With 12 FTE research and assisting staff, an average of six PhD students and several undergraduates, and supported by its own modern laboratory and veterinary facilities, the RZSA combines strictly zoo-related applied research with fundamental scientific research in conservation biology, ethology, veterinary medicine and functional morphology.

Four disciplines

Research on subjects such as pedigree analysis, DNA analysis in support of *in situ* and *ex situ* population management, and modelling of wild populations is the focal point of the conservation biology department. Combining fundamental and applied ecological research with capacity building, the *in situ* projects focus on threatened and endangered species in fragmented or degraded habitats. The 'Projet Grands Singes' in Cameroon, for example, is an integrated conservation and development project that aims to develop a sustainable hunting and management plan for the non-protected and exploited forests bordering the Dja Faunal Reserve. From a purely biological perspective, research is centred on socio-ecology of great apes, plant-animal interactions, the impact of commercial bushmeat trade, and consequences of forest degradation.

Field research PHOTO NIKKI TAGG/RZSA



RESEARCH

In Brazil, the project 'BioBrasil' concentrates on the ecology and behaviour of golden-headed lion tamarins (*Leontopithecus chrysomelas*) in fragmented and disturbed habitats, and on the planning and implementation of practical conservation measures such as ecological corridors and community forests.

Closer to home the RZSA has owned and managed the in-country wetland nature reserve 'De Zegge' since 1952. With water being critical to De Zegge's ecosystem and biodiversity, the CRC has combined forces with the University of Antwerp in a research project to develop management measures, based on the studies of the relationship between hydrology, vegetation types, and nutrient availability.

Applied and fundamental research in the ethology department is used to study the physiological and evolutionary processes that underlie differences in social organisation, reproductive strategies, social behaviour, cognitive abilities, and other factors that may affect successful conservation, captive breeding, welfare and management of threatened species. Ongoing projects focus on social relationships and the role of sexual strategies and mate choice in various primates and birds.

The veterinary unit conducts both opportunistic research in practical veterinary medicine, crucial for the daily welfare of the zoo's stock, and

fundamental research in infectious diseases, important for the success of breeding programmes, reintroductions and active management of wild populations. Examples of projects are the study of abortive agents in ruminants, microbiological evaluation of bio-floors, identification, culture and treatment of gastrointestinal parasites, and nutrition and digestion in various animals in the collections.

Fundamental biological questions related to 'how animals move' are addressed by the functional morphology unit. Moreover, the CRC makes optimal use of the large number of exotic animals in the parks as model species, and applies newly developed methodologies to study morphological issues arising from life in captivity; studies which are essential for ensuring welfare and successful husbandry. Fundamental locomotion research focuses on bipedalism, climbing and brachiation in primates, and topics directly related to captivity focus on claw and hoof problems in ungulates.

Need assistance?

Along with all the EAZA Research Committee members, the RZSA research team is happy to provide guidance and assistance to zoos wishing to start up or expand their research activities. For the Strategic Plan for Scientific Research 2007-2011 and further publications and details, please visit <http://webho1.ua.ac.be/crc> •

ZIMS

Important changes in the ZIMS project

Jaime Meyer, ISIS, Minnesota, United States of America

Over the last three years, ISIS has paid approximately USD \$2.5 Million to CGI for the development of ZIMS. Given the complexities that have been encountered, the delays to the project and differing views regarding the project scope and final steps, ISIS and CGI have jointly and amicably agreed in principle that ISIS will work with another software development partner to complete the final steps of the project. In order to facilitate completion of the project, CGI has agreed to provide ISIS with the project's code, designs, documentation and other related work produced to date. In addition, CGI has agreed, without any admission of liability, to contribute USD \$4.3 million towards completion of the project, as well as approximately USD \$600,000 of CGI staff resources (at current staffing rates) to assist in the transition of the project to a new partner.

The final development of ZIMS will be funded by cash from this amicable separation. ISIS is in possession of all work done on ZIMS so far, and will guide ZIMS to completion with a different vendor and a different methodology. ISIS expects to soon announce the new vendor(s) and a new schedule of completion and release date for ZIMS.

Behind the scenes, ISIS has recently engaged experts from two companies, Microsoft and Altos, to conduct a comprehensive review of the existing ZIMS code and architecture. Based on these reviews, much of ZIMS will go unchanged, but some of it will be modified or replaced. ISIS has the exciting opportunity to refine the usability and functionality of ZIMS as ZIMS moves into this final phase of construction. The primary goal is to deliver a highly functional ZIMS to ISIS members as soon as possible. This may mean that some of the perfection that we are striving for will be rolled into subsequent versions.

Software technology has advanced swiftly in the last three years. As ZIMS moves forward with a new vendor ISIS will be able to take advantage of the newest cutting-edge tools that will boost the speed and improve the usability of ZIMS. ISIS will directly oversee the completion of ZIMS using an agile development methodology called 'Extreme Programming', with the focus on four key words: communication, simplicity, feedback, and courage. ISIS will hire the subcontractors on a time-and-materials basis rather than on a fixed price. This will boost collaboration, interactivity and response times. •

Public relations in a crisis

Alex Downing, Colchester Zoo, United Kingdom

Crisis PR is probably any press officer's worst nightmare because of the fear that any form of bad news can be misinterpreted by journalists and therefore the wider public beyond. However, press relations surrounding a bad news story should really be no different to the PR work that surrounds the birth of an endangered species, which is the type of story that we are all happy to promote every day.

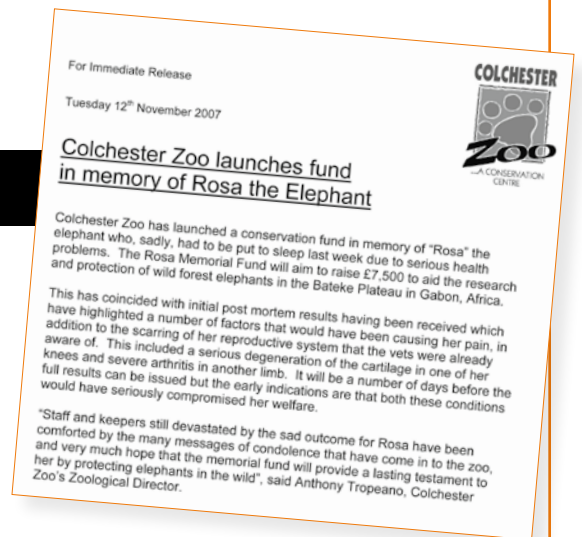
Every well planned public relations programme must begin by asking the simple question, why? Why do we need to communicate with the press over this issue? Is there a specific problem or marketing objective that needs to be taken as a starting point? What do we need to achieve in this communication? In a crisis situation, the questions that need to be asked are no different but may need to be dealt with quickly and efficiently in close consultation with the management team.

None of us have complete control over what might happen in our zoo, so it is always wise to be prepared for any situation. Whilst some will say that you should have press releases already written for any scenario that might occur it is still unlikely that you will have covered everyone eventually. However, what is important is that you have put together a generic crisis PR plan that you are able to draw on at any time should the need arise. This should detail the chain of command within your zoo, showing those who need to be informed of a news story and the authorisations required for a press release to be sent, details of those who would act as spokes-people in which subject areas and most importantly an order to follow in activities carried out. This is generally the same for any story, be it good or bad news.

An example of the need for a PR plan

The press relations surrounding the eventual euthanasia of Colchester Zoo's African elephant (*Loxodonta africana*) 'Rosa' was a prime example of the need for a PR plan in any organisation. Rosa's health deteriorated

Rosa and Jambo PHOTO COLCHESTER ZOO



over a long period after the birth of her baby Jambo. Vaginal scarring was potentially affecting the nerves in the pelvic area, which was suspected to be causing bouts of extreme discomfort. Eventually none of the medication prescribed was having any effect and a team from the Berlin Institute of Zoo and Wildlife Medicine examined her in May 2007. At that stage a decision was taken to try a drug that would shrink her uterus, preventing her from being able to breed but hopefully relieving the discomfort that she was feeling. Unfortunately, however, this did not produce the desired effect and after no improvement it was felt necessary to resort to euthanasia in November 2007.

At each stage, prior to and after each examination, the same procedure was followed in a specific order to ensure that the zoo communicated correctly with the press and other interested parties:

- A meeting was held between the key personnel and the press officer to ascertain all the facts and agree precisely how the news should be communicated.
- A memo was supplied to all staff so that they were aware of the situation and able to answer enquiries from visitors.
- A letter was sent to all of Rosa's adopters so that they were aware of what was happening before the press was informed, to prevent the adopters from reading the upsetting information first in the papers.
- Information for the zoo visitors was displayed at the elephant house.
- The zoo's website was regularly updated and additional relevant information placed on the staff intranet.
- An eLetter was sent out to Colchester Zoo's 40,000 subscribers to keep them updated.
- A press release was sent to all media, once the spokesperson had been nominated.

Being honest and straight forward

Unfortunately, the eventual outcome was very sadly that Rosa had to be euthanized, but by communicating with all parties at each stage as the story developed, everyone was kept informed and was properly prepared for this outcome. Ultimately, the response the zoo received was extremely supportive and kept everyone involved while going through what was an extremely difficult time. ●

S.O.S. Ocean Campaign; a pocket guide

Patricia Filipe, Oceanário de Lisboa, Portugal

The future of the oceans is in our hands. Excessive consumption and other demands for marine animals are leaving many species in a vulnerable state. It is therefore critical for us to ensure that marine ecosystems remain balanced and that we move towards sustainable use of the oceans. When buying products from the sea, people need to know where and how these were caught, or reared, and whether this was done in a sustainable and healthy fashion. In short, choosing wisely will make an 'ocean of difference'.

Marine ecosystems face many threats. Some are evident to the general public, e.g. pollution and habitat loss. Some are less obvious but equally significant, such as over-fishing. Fish are highly nutritional: abundant in micronutrients, minerals, essential fatty acids and protein, they form a valuable supplement to vitamin and essential element deficient diets. In 2004, wild-caught and aqua-cultured fish supplied mankind with 106 million tons of protein, which corresponds to 16.6 kg per capita (FAO, 2006). Fish and other marine-related products constitute up to 20% of the animal diet of over 2.6 billion people.

Sweeping the ocean

To satisfy such global needs, the world's fishing fleet (four million vessels in 2004) annually sweeps the oceans and catches the absolute maximum allowed per country (usually even more). Statistics show that over 75% of fish stocks worldwide are currently being fully exploited or over-exploited (FAO, 2006). This is seriously endangering marine resources, which are in fact a common heritage to all. The really worrying part is that the demand for marine products is closely related to the world's population size, which is estimated to grow from the current 6.7 to a whopping nine billion people by 2050!

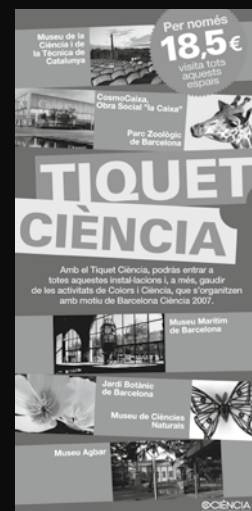
"Choosing wisely will make an ocean of difference."

In practice, the necessary conservation measures have not been adopted by all fishermen, so consumers play an important role. Properly informed consumers can make wiser and more sustainable decisions when purchasing marine products, which in turn puts pressure on dealers, merchants and fishermen. Oceanário de Lisboa tries to inform its visitors that it is important to make such decisions through the S.O.S. Ocean Campaign, which was launched in June 2006.

The Science Ticket; an alliance between seven institutions

Carmen Maté Garcia, Barcelona Zoo, Spain

Throughout history, science has helped people understand and relate to their surroundings. New knowledge provided by scientific research and applications derived from research change the way people view the world, their habits and their value systems. Science can even transform societies. The objective of the Barcelona Science Year 2007 was to bring the world of science closer to society, to give society a greater participating role, and to increase knowledge of scientific culture. As part of this objective a combined admission ticket to seven scientific institutions was launched in the Catalan capital.



Seven scientific institutions decided to team up and organise activities focusing on science, with a common theme 'Colours and Science' that could be carried out in each institution in a different month. An agreement was drawn up, stating that this collaboration would be expressed through sale of a 'Science Ticket'. For only €18.50 people could visit the Natural Sciences Museum, the Botanical Gardens, CosmoCaixa (a science museum and planetarium), the Maritime

Museum, the Agbar Museum (Barcelona Water Company), the Catalan Museum of Science and Technology and Barcelona Zoo. The agreement also focused on how to promote the ticket and how profits were to be divided in relation to the institutions' entrance fees and the amount of tickets sold by each.

All activities organised in the different institutions (see next page) were well-visited, and in

the end a total of 2,628 Science Tickets was sold. During its assigned month, Barcelona Zoo welcomed 230 children in the summer camp activities and fifty people (both children and adults) at the talks in the open classroom. The largest number of participants, 700 people, was received for the weekend workshops 'Let's talk about colours'. Barcelona Zoo sold most of the tickets and also received the largest amount of visitors (2,227) using the ticket.

for healthier fish choices in Portugal



S.O.S. Ocean pocket guide

Following the example of the 'fish guides' used by other zoos (e.g. Monterey Bay Aquarium and Rotterdam Zoo), Oceanário de Lisboa developed the S.O.S. Ocean pocket guide in March 2006, together with the IPIMAR (Portuguese Fisheries Research Institute). The wallet-sized card assists consumers in making wise and sustainable choices while buying fish or shell-fish harvested in Portugal through three different coloured columns, the green one representing the species that are abundant and/or captured or reared in a sustainable and environmentally friendly way.



The S.O.S. Ocean card also features nutritional information on the species listed. For example, species that are known to have low cholesterol or are a good source of Omega-3 acids, magnesium or potassium are duly

noted. On the other hand, fish with high heavy metal contents are also mentioned, as these should be avoided by pregnant women and children.

S.O.S. Ocean Campaign

Oceanário de Lisboa celebrated World Ocean Day on 8 June 2007 and during a press conference presented the pocket guide. Several other activities were organised. For example, a barbecue was arranged in partnership with a local restaurant where sustainable seafood was sold, and a temporary exhibition on sustainable fish consumption was set up at the aquarium entrance hall, where fishermen interacted with the visitors. Visitors could also learn how to make seaman's knots, how to setup a fishing line and how to sew fishing nets.

Oceanário de Lisboa constantly endeavours to engage its public in conservation and ocean protection campaigns by providing information, alternative solutions and expert advice on how to use ocean resources. One should not forget that there are hundreds of large public aquariums and zoos worldwide, welcoming millions of visitors every year. Imagine if, suddenly, 6.7 billion people start making well-informed sustainable decisions? The future of the oceans is in our hands and in our hands only. ●

This can be explained by the fact that, out of the seven participating institutions, the zoo has the highest entrance fee and the largest public. A person visiting the zoo could buy the Science Ticket by paying only €4 on top of the normal entrance fee.

In December 2007, all institutions agreed that the Science Ticket initiative has been a positive experience and indicated that they are willing to continue the collaboration and develop a programme with another theme in 2008. In the future, profits will probably be shared differently; the new proposal is that the extra ticket income of the institution that sells the largest amount of tickets will be divided among the other centres in relation to their entrance fees.

It is hoped that with what was learned during this first experience, and with a more active publicity campaign, sales of the Science Tickets in 2008 will double, so that more people can take advantage of this new cultural offer in the city of Barcelona.

The chosen common theme for collaboration was 'Colours and Science'. At the end of January 2007 a press release was sent out, promoting the Science Ticket as an opportunity to come into contact with science from different perspectives: from the maritime culture of Spain to the lives of wild animals and the floral diversity of the Mediterranean, visiting the water supply of large cities, discovering collections of rocks, fossils and minerals or following a path along the history of material and emblematic buildings, such as the royal shipyards of Barcelona. Activities organised at the seven institutions are described below:

THE COLOURS OF THE UNIVERSE

A set of workshops was organised at CosmoCaixa in March and July to show and explain the reasons behind the colours of the planets and stars; a theatrical presentation explored whether all the stars were the same colour and showed other relevant heavenly bodies to determine whether the objects of the universe change colour with time.

THE HIDDEN COLOURS OF NATURE

The Botanical Gardens set up an exhibition in April 'showing' the colours that cannot be perceived by the human eye, but can be seen through other eyes (e.g. insects). Workshops on natural tints were also organised to discover the colouring properties of some natural elements.

THE RAINBOW; THE COLOURS OF WATER

The months May and August were allocated to the Agbar Museum, which organised weekend workshops that showed that water, far from being insipid and

colourless, is actually formed by seven colours; the colours of the rainbow.

THE COLOURS OF MINERALS

In June the Natural Sciences Museum of Barcelona focused on the colours of minerals, the origin of their colour, the relation between colour and mineral structure, what makes a mineral perfect or not, and when and why minerals are considered gems.

THE LANGUAGE OF COLOURS

Barcelona Zoo organised activities in September including a self-guided tour to learn about the different colourations of animals and explanations for these colourations. The tour involved 15 installations spread out in the zoo, encompassing the disruptive colouration pattern of zebras, the big cats and the giraffes to colours used to draw attention in mating rituals or to camouflage in moments of danger. Furthermore, different workshops were organised, such as 'Let's talk about colours' and talks were given on how animals see. There were specific activities on the colours of animals for summer schools as well.

THE COLOURS OF LIGHT

Later, in October, the Catalan Museum of Science and Technology held an exhibition on the colours of light.

THE COLOURS OF THE SEA

Finally, in November, the Maritime Museum presented an exhibition consisting of a tour through the museum presenting a dialogue between the fish on display and the colours present. The display went into detail about the relationship between the sciences and the colours that can be seen in different elements related to the sea and the culture surrounding it. ●

Ex situ projects; crucial or 'counter-productive' for in situ conservation?

Simon Bruslund Jensen, Vogelpark Walsrode, Germany and Guntram G. Meier, ZGAP, Berlin, Germany

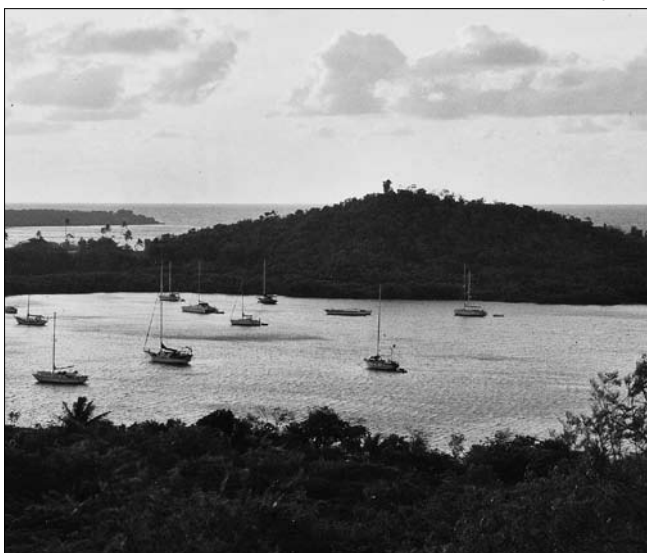
Captive breeding, ex situ conservation and conservation breeding are common terms linked to the work with endangered animals in zoos in the 21st century. A recent attempt to support the protection of an endemic dove by the establishment of an ex situ project, a conservation measure which had been proposed a decade before, was finally rejected as 'counter-productive' by the parties involved in the field conservation work. Was that decision based on the particular situation or did it actually reflect a deeper division within the conservation communities?

Zoos have clearly contributed significantly and actively to conservation projects on many occasions. Expert knowledge and a wealth of experience in handling, manipulating, maintaining and breeding animals in captivity and under artificial conditions are particularly valuable in many cases. It is indisputable that this contribution has been crucial to the rescue of entire species from extinction in dozens of cases, and that such skills are only sparsely available from any other source than the zoos.

The value of experiences

Taking such experiences into account a project proposal was made in 2007, to rescue the Grenada dove (*Leptotila wellsii*) from a devastating development within its very last known distributional stronghold. The species is estimated to have a world population of only 100 to 180 birds, all living on two sites on the Caribbean island of Grenada and with none in captivity. Listed as 'Critical Endangered' by IUCN for more than a decade, this dove has already been a recipient of conservation efforts in the form of a Global Environment Facility (GEF) funded conservation project worth more than US\$ 1.12 million. The gazettement of a national park was seen as a considerable step forward, until the news spread in November 2006 that the government had decided to sell parts of the national park and surrounding area to make room for a high class hotel and villa complex, and had declassified the national park in preparation for this.

Grenada's Hog Island



PHOTOS GUNTRAM MEIER/INGRIP



Organisations such as BirdLife International protested world-wide, and together with partners on the island attempted to influence the plans, if not to stop them. After eight months it appeared that no success was being achieved and time seemed to be running out. As establishing a captive population as backup for the species was a declared aim of the species recovery plan (and was stated as such on the current Red List), a number of EAZA member institutions volunteered to take on this task.

Missing that last chance?

Within a short time more than 15 zoos and two aviculture societies from five European countries, as well as AZA institutions from the United States and Mexico assured their assistance. Funds, aviary space, trained staff and quarantine facilities were quickly made available. Individual expert biologists, veterinarians and nutritionists also pledged their support. Flanked by a few other conservation organisations, the Vogelpark Walsrode Fund offered to finance the project, and to bring in professional help in assessing the situation on site in Grenada in preparation for a potential ex situ project. The suggestion and offer of help were initially put forward to the government of Grenada as the responsible entity, and thereafter to the other stake-holding parties engaged in the discussions.

No response was received from the government however, and there was immediate rejection without dialogue by the other conservation parties involved. The classification of the project idea as politically 'counter-productive' was their final assessment of this initiative aiming to protect this last Grenada dove population, which may well be lost.

Fears were expressed that such a project would facilitate clearance of the habitat, with the excuse that the dove is already 'safe in captivity' and that it could actually finally wipe out this bird instead of rescuing it. Achieving progress on *in situ* discussions and improvements of the development plans were mentioned as the tactics to be pursued, thus an *ex situ* programme would not be needed. While these aims are of course welcomed by everyone as ideal goals for conservation they have yet to materialize in a positive result.

Key for future success

So what was the reason for such an ambivalent interpretation of how to approach the conservation of the Grenada dove? The captive rescue and breeding proposal was based on the most valid official documents for the recovery of the species, thus it was not an unreasonable suggestion. No money from *in situ* conservation would have been reallocated, and continued *in situ* efforts were always considered the highest priority. No commercial interest existed, nor was captive breeding seen as a permanent solution. Involvement of both EAZA and AZA as well as consultation of experts from the IUCN/SSC Conservation Breeding Specialist Group assured all parties that the official requirements were considered in the proposal, and the need for cooperation was always stressed. So, why did it just not work out in the end?

Only the future will determine whether the correct decisions for the conservation of the Grenada dove have been made. The opportunity should not be missed to learn a lesson on how it can be done better in the future and how all parties aiming for the same goal could work together synergistically to achieve success. While sticking to *in situ* priorities have ruled out *ex situ* support in this case, it was not so the other way around. Perhaps these two such different approaches can be seen as a case of 'fire and water'; the message of the importance of conservation breeding in zoos may not be very deeply anchored in the minds of those working with other aspects of conservation.

Is the planning and implementation of *ex situ* conservation projects strictly for others to request and not for zoos to suggest, or is it only a question of a communication challenge for zoos? When is the right time to intervene using *ex situ* measures in order to save a species from extinction? Is a better understanding between the people working with *in situ* and *ex situ* conservation desired from both sides, and if yes how can this be achieved? Does *ex situ* conservation need a better image or is it really just 'an argument' that zoos use in order to procure animals?

The example of the Grenada dove shows how urgently further dialogue seems to be needed; therefore more discussion and input on this topic is appreciated. ●

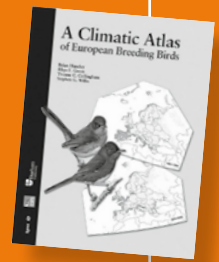
Opinion? We hope that through sharing opinions on modern zoo-related topics in EAZA News, we can stimulate thought and communication about these topics and eventually evoke discussions among zoo colleagues. Those people who would like to respond to the article above can write an e-mail to jeannette.van.benthem@eaza.net. Responses will be published in the next issue of EAZA News and/or on the EAZA website.

B. HUNTLEY, R.E. GREEN, Y.C. COLLINGHAM, S.G. WILLIS (2007)

A climatic atlas of European breeding birds

This atlas is a comprehensive exploration of the relationships between the distributions of birds breeding in Europe and the present climate, and how future climatic change may alter each species' potential breeding distribution. Results are presented in detail for 431 species and brief accounts are included for a further 48 native and 16 introduced species.

Pages: 528 ISBN-13 978-84-96553-14-9 (hb) Price: €60.00
To be ordered from: Lynx Edicions (www.hbw.com)

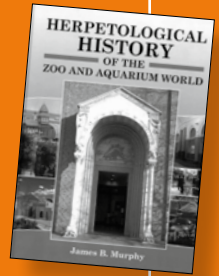


J.B. MURPHY (2007)

Herpetological history of the zoo and aquarium world

This book describes the changes in zoo and aquarium communities by looking at the development and expansion of the discipline, the evolution of ideas which led to greater conservation awareness and activity, vignettes of interesting historical moments, and pioneers in zoo herpetology. Portraits of a selected number of zoos and aquariums throughout the world are presented to show the chronology of herpetological discovery, people who worked at those places, and the breadth of the programmes that were put in place.

Pages: 344 ISBN 1-57524-285-0 (hb) Price: US\$79.50
To be ordered from: Krieger Publishing Company (www.krieger-publishing.com)



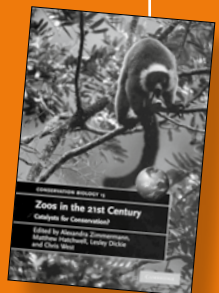
A. ZIMMERMANN, M. HATCHWELL, L. A. DICKIE AND C. WEST (EDS., 2007)

Zoos in the 21st century; catalysts for conservation?

Series: Conservation Biology (No. 15)

Modern zoos and aquariums are playing an increasingly active and important role in protecting and managing global biodiversity. Many zoos explicitly include wildlife conservation in their mission and have started changing the focus of their institutions in order to increase even further the benefits of their activities for *in situ* wildlife conservation. In parallel with this voluntary movement, legal requirements for zoos to support conservation in the wild are also becoming more stringent. This book defines a new conservation vision for zoos and aquariums that will be of interest to those working in zoos, alongside practitioners and researchers in conservation.

Pages: 388 ISBN-13: 9780521853330 (hb) Price: £75.00
To be ordered from: Cambridge University Press (www.cambridge.org)

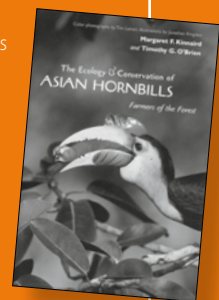


M.F. KINNAIRD AND T.G. O'BRIEN (2007)

The ecology and conservation of Asian hornbills: Farmers of the forest

Building on fourteen years of research, in this book the authors offer the most up-to-date information on the evolution, reproduction, feeding ecology, and movement patterns of 31 species of Asian hornbills. They address questions of ecological functionality, ecosystem services, and keystone relationships, as well as the disturbing influence of forest loss and fragmentation on hornbills. The book is complemented by full-colour images by renowned photographer Tim Laman that provide rare glimpses of hornbills in their native habitat and black-and-white illustrations by Jonathan Kingdon that highlight the intriguing aspects of hornbill behaviour.

Pages: 352 ISBN 978-0-226-43712-5 (hb) Price: US\$45.00
To be ordered from: The University of Chicago Press (www.press.uchicago.edu/)



The impacts of climate change on *in situ* and *ex situ* conservation management

Paul Pearce-Kelly, Zoological Society of London, United Kingdom

The conservation community has become increasingly aware of the profound threat that global warming generated climate change presents to biodiversity. Fortunately, how we might best evaluate these diverse and complex threats and develop effective conservation responses is also becoming increasingly clear.

A world in flux

As detailed in the recently published fourth IPCC Assessment Report, climate change is already having a major impact on animal and plant species around the world with resultant range shifts and breeding and growing season alterations. Climate change is also a major driver of increased spread of invasive species and disease, threatening both wildlife and human populations. The occurrence of extreme events, such as droughts, storms, hurricanes, floods and wildfires is set to increase, placing ecosystems under even greater pressure. The associated increased socio-economic pressures are certain to escalate human-wildlife conflicts and reduce available conservation recourses.

The marine environment is having to contend with rising temperatures and sea levels, salinity changes and shifting currents. Ocean acidification directly threatens species with skeletons derived from calcium carbonate, such as the reef-forming corals and critically important food-chain pteropods (that feed the southern ocean fish that feed the penguins that feed the seals that feed the killer whales). The resultant impacts on aquatic ecosystems are likely to be as severe as those expected on land.

Identifying species most at risk

Current efforts to better incorporate climate change impact dynamics into mainstream threat evaluation and management tools/abilities such as the Red List process and PHVAs have been greatly advanced by the clarification of species-level vulnerability trait considerations. These traits were extensively reviewed in an IUCN workshop in October 2007. They can be divided into diagnostic traits and general vulnerability traits. The diagnostic traits include specialised habitat and/or microhabitat requirements; narrow environmental tolerances or thresholds that are likely to be exceeded due to climate change at any stage in the life cycle; dependence on a specific environmental trigger that's likely to be disrupted by climate change; dependence on interspecific interactions which are likely to be disrupted by climate change and poor ability to disperse to a new or more suitable range. General vulnerability traits include low reproductive rate, small population size, extreme fluctuations in population sizes, long generation times and low genetic diversity. This identification of traits should greatly assist the review of current and proposed new species programmes. Indeed it is likely that some of our current species programmes can provide valuable insights into real world species-level climate change responses.

What to save?

When climate change dynamics are sufficiently taken into account it is very likely that the conservation community will increasingly be faced with species evaluation outcomes that project complete viable range habitat loss (think of all those upward shifting montane habitats) or other equally catastrophic situations. The traditional conservation approach has always been to prioritise the most threatened species, but these climate change considerations are going to challenge the viability of this approach, especially when it comes to prioritising our all too limited *ex situ* breeding facilities.

Rethinking reintroduction concepts and protocols

Climate change driven shifts in ecosystem boundaries are likely to mean that current protected areas will increasingly be less likely to contain the species and habitats they were established to protect. These considerations raise the need for reviewing the current IUCN reintroduction protocols so as to better cope with shifting ranges and novel species assemblages etc. Planned reintroductions will need to assess the vulnerability of habitat to climate change together with the target species climate change vulnerability traits. We will also need to identify potential sites that are not currently protected, but which may have a higher conservation status under a changed climate.

PHOTOS PAUL PEARCE-KELLY



A vital engagement role for zoos and aquariums

As the prospects of realising viable conservation responses to the expected consequences of the mid to high level emission scenarios are effectively zero, efforts to limit the extent of global warming must be regarded as an essential conservation priority. With its huge public reach and engagement potential the international zoo and aquarium community is uniquely placed to address this need, while there is yet time to make a difference. With such real threats as the loss of Amazonia and the world's corals we certainly have compelling subject matter to work with. ●

DO BOTANICAL EDUCATORS EXIST?

PHOTO ROB DOOLAARD (IZP)/ROTTERDAM ZOO

Zoo educators put a lot of effort in explaining animal wildlife. Unfortunately, the educational possibilities of plants and trees are often overlooked. That is why on **13 June 2008** a special day for zoo educators is organised during the botanical EZG Conference at Rotterdam Zoo, The Netherlands (10 to 14 June 2008).

All EAZA educators are invited to participate. In the morning there will be interesting lectures on the Rotterdam Zoo approach of botanical education and during the afternoon, workshops will trigger your botanical conscience.



For more information and registration, please visit:
www.diergaardeblijdorp.nl/botanical



DIRECTORY UPDATES

PERSONALIA

As per March 2008, Mrs. Christine Morrier, former director of Parc Zoologique d'Amiens, France, is the new director of **Parc Zoologique de Paris**, France. She replaces Dr. Bruno Lassalle.

As per January 2008, Mr. Laszlo Torok is the new director of **Kittenberger Kálmán Növény-és Vadaspark** in Veszprem, Hungary. He replaces Dipl. Ing. Istvan Sigmond.

ADDRESSES AND TELEPHONE/FAX NUMBERS

The new phone and fax number for **Westfälischer Zoologischer Garten Münster**, Germany, are:

Phone: +49 2518904205



Fax: +49 2518904130

RECTIFICATION


The article 'The EAZA Plant Conservation Network and Plant Conservation Day' in EAZA News 61, was written by Edwin Mole, chair of the EPCN Steering Group, Bristol Zoo, United Kingdom (see EAZA News 61/2008, p.25).

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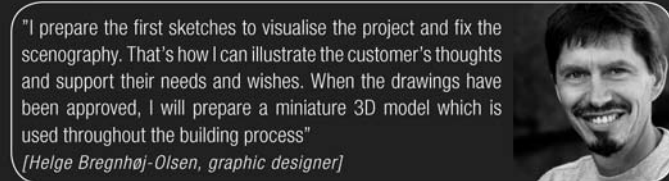


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[Helge Bregnhøj-Olsen, graphic designer]

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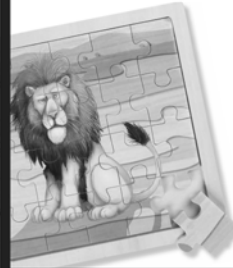
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The supply of high quality food has become a major topic since the recent food crises in Europe. Local and European rules and regulations on zoo foods are currently being reviewed. The new legislation does not only affect us as suppliers, but are also 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.

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WHO

The Visitor Studies Association (VSA) is today's premier professional organisation focusing on all facets of the visitor experience in museums, including zoos and aquariums. With individual and institutional members in 18 countries, the organisation is committed to understanding and enhancing visitor experiences through sharing research, evaluation and dialogue with professionals in all fields.

WHAT

VSA was founded by twenty people in 1988 in the USA as a professional peer-to-peer network of academics and practitioners who sought to promote advancement in understanding of why and how museum and other informal learning environments work. Since that modest beginning, the organisation has grown in scope and witnessed a large growth in publications and professionalism across the field. Today, the association promotes innovation in visitor research under the practice of sound ethical practices. Through workshops focused on advanced training in research methods and expanding the capacity of museum professionals to understand and appreciate their audiences, the association is committed to an ongoing exchange of knowledge across the museum community.

WHY

VSA is an international network of professionals committed to understanding and enhancing visitor experiences in informal settings, because it sees the role of informal learning spaces like zoos and aquariums as important places where citizens in a community develop their values and become more active in society at large.

HOW

VSA accomplishes its goals through website and journal publication, management of professional development programmes and shared dialogue at its annual conference. Visitor Studies, the peer-reviewed journal, is distributed to members as part of their annual membership dues or by subscription from the publisher, Routledge. The VSA website maintains a rich archive of past publications and conference abstracts that are also indexed at www.informalscience.org and continues to increase access to resources online. This year's annual conference is scheduled for 15 to 19 July in Houston, Texas, United States of America.

WHERE

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