

QUARTERLY PUBLICATION OF THE EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

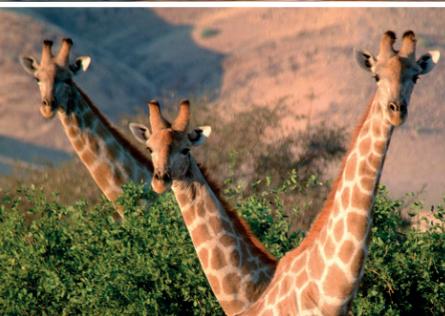
ZOOQUARIA

SUMMER 2014

ISSUE 86

DEADLY DANGER

WORRYING FUTURES
FOR EUROPE'S VULTURES



A tall story

HOW THE ONE PLAN APPROACH CAN HELP
THE WORLD'S GIRAFFES

Building bridges

CREATING NEW RELATIONSHIPS BETWEEN EAZA AND THE IUCN



MARINE

nutrition

sustaining life

HERRING	<i>Clupea harengus</i>
SPRAT	<i>Sprattus sprattus</i>
MACKEREL	<i>Scomber scomber</i>
WHITING	<i>Merlangius merlangus</i>
TREVALLY	<i>Pseudocaranx dentex</i>
SANDEEL	<i>Ammodytes marinus</i>
POUTING	<i>Gadus luscus</i>
PACIFIC SAURY	<i>Cololabi Saira</i>
CAPELIN	<i>Mallotus villosus</i>
ROACH	<i>Rutilus rutilus</i>
TROUT	<i>Oncorhynchus mykiss</i>
PANGASIU	<i>Pangasius Pangasius</i>
TILAPIA	<i>Oreochromis Niloticus</i>
SIGNAL CRAYFISH	<i>Pacifastacus leniusculus</i>
SHRIMP	<i>Crangon crangon</i>
KRILL	<i>Euphausia superba</i>
KRILL	<i>Euphausia pacifica</i>
ARTEMIA	<i>Artemia Salina</i>
MYSIS	<i>Mysis relicta</i>
PEELER CRAB	<i>Portinus pelagicus</i>
HERMIT CRAB	<i>Pagurus bernhardus</i>
EDIBLE CRAB	<i>Cancer pagurus</i>
SHORE CRAB	<i>Carcinus naenas</i>
CLAM	<i>Paphia undulate</i>
MUSSELL	<i>Mytilus edulis</i>
COCKLES	<i>Erastoderma edule</i>
RAZOR	<i>Ensis ensis</i>
DAY OLD CHICKS	<i>Gallu gallus domesticus</i>
HORSE	<i>Equus</i>
RABBIT	<i>Cuniculus</i>
MICE	<i>Mus, Muris</i>
RATS	<i>Rattus</i>
OCTOPUS	<i>Octopus vulgaris</i>
SQUID	<i>Loligo Opalescens</i>
BLOODWORM	<i>Chironomus sp</i>
CYCLOPS	<i>Cyclops cyclops</i>
POLYCHAETES	<i>Perinereis aibuhitensis</i>
LUGWORMS	<i>Arenicola defodiens</i>
SALMON	<i>Salmo salar</i>
RED PLANKTON	<i>Calanus Finmarchicus</i>
BREAM	<i>Abramis brama</i>
LAMPREY	<i>Lampetra fluviatillas</i>

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Zooquaria

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FROM THE DIRECTOR'S CHAIR

Have you heard of the 'Non-regression Principle'? It basically states that once a progressive law is put in place then that law should not be repealed, '*requiring norms which have already been adopted by states may not be revised in ways which would imply going backwards on the previous standards of protection*'. It has more commonly been applied to human rights laws but more recently is gaining considerable traction in application of environmental law.

It's a principle that is under onslaught. More and more we see previously progressive environmental agreements (both national and international) either repealed by nations or more commonly undermined and blocked or simply not applied. The environment and conservation of nature are slipping down the political agenda, and the recent EU Parliamentary elections were a case in point. Unless you were reading the manifesto of an avowedly 'green' party, then it would appear that the mainstream parties and groups seemed to be unaware that there is a crisis unfolding around us and it's not the economic one.

In 2011 there was a clear demonstration of regression when the Canadian government denounced the Kyoto Principle during the Conference of the Parties of the Climate Change Convention. In my own country (United Kingdom) the outgoing head of the Environment Agency - yes, the Environment Agency whose job is to secure our environment for people and wildlife for all time, not just current short-term economic gain - has said that he thinks fracking for shale gas should be allowed in the National Parks of England and Wales. Let's look at the two statutory aims for national parks in England and Wales;

- to conserve and enhance the natural beauty, wildlife and cultural heritage of the area, and
- to promote opportunities for the understanding and enjoyment of the park's special qualities by the public.

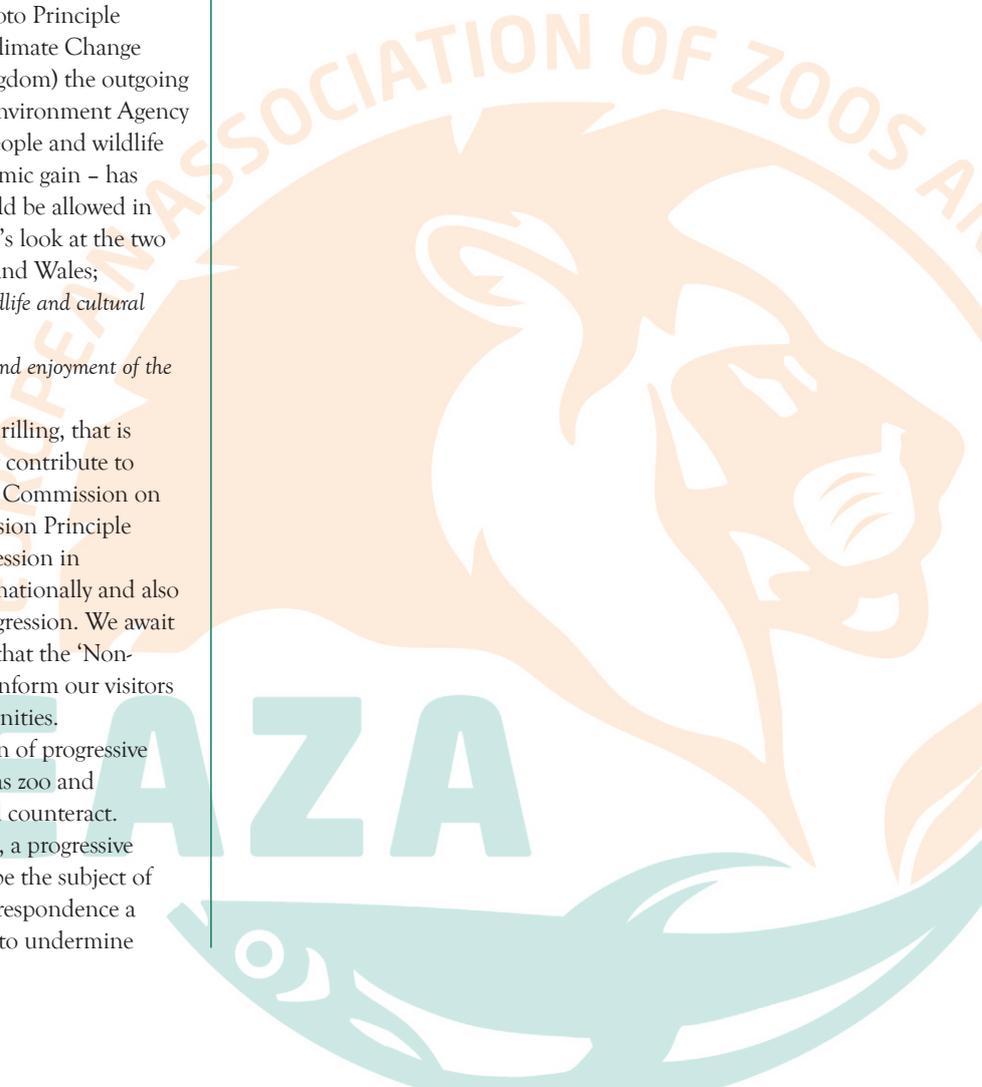
How on earth can fracking, or indeed the drilling, that is already taking place in some parks, in any way contribute to the statutory aims detailed above? The IUCN Commission on Environmental Law has formed a 'Non-regression Principle Knowledge Forum' to gather evidence of regression in environmental laws both nationally and internationally and also to find ways to take action to promote non-regression. We await their findings with interest. It also strikes me that the 'Non-regression Principle' is something we should inform our visitors about wherever there are appropriate opportunities.

But it also strikes me that the non-regression of progressive policies and statements is something that we as zoo and aquarium associations should be aware of and counteract. In 2013 we developed a recessive alleles policy, a progressive and forward-thinking document that should be the subject of non-regression. And yet, recently, I saw in correspondence a zoo association member of EAZA attempting to undermine

this document, a document that had been developed in full consultation with members and unanimously approved by Council, the elected governing body of EAZA. There are other policies and statements that fall within this purview and short-term self-interest should not undermine what are good and progressive policies. Indeed if EAZA is to continue to advance as the most progressive zoo and aquarium association in the world then we have to guard against such developments.

It will take bravery and good sense. I think we have that in the association in abundance, so roll on non-regression.

Dr Lesley Dickie
Executive Director, EAZA



NOTICEBOARD

EAZA ANNUAL CONFERENCE



THE EAZA ANNUAL CONFERENCE 2014, hosted by Budapest Zoo and scheduled for 22-27 Sept, is still open for registration. With the conference programme now finalised, EAZA is confident that the event will prove to be the biggest and most comprehensive yet. With delegates from all over the world coming to take part, this year's annual conference is set to build upon the success of the Joint TAGs meeting held this June, as well as introduce keynote speakers and plenary sessions on subjects from conservation to veterinary issues. To register, please visit www.eaza2014.com. Conference delegates and other EAZA members are also invited to display relevant posters at the Conference. Please submit your proposal (with a maximum of three posters per member institution), including the title, author affiliations, abstract and, if available, PDF version to mirko.marseille@eaza.net. The poster submission deadline is 31 August.



THE FATHER OF ZOOLOGICAL MEDICINE

ZOO VETERINARIANS WORLDWIDE ARE mourning the loss of Dr Murray E Fowler, writes Jacques Kaandorp. He died aged 85 on 18 May about 10 days after a severe stroke. He was the true founder and father of exotic animal medicine, and was widely regarded for his teaching and clinical practice and training of veterinarians around the globe.

Dr Fowler was the author or editor of at least 27 books and more than 250 academic papers. After he finished his study in 1955 he went into private practice, and in 1958 he was appointed as equine surgeon in the faculty of California Veterinary School at Davis and was connected to the Sacramento Zoo for more than 46 years. He officially retired from UC Davis in 1991 as Professor Emeritus, but continued to train students and professionals at the conferences he attended in more than

60 countries.

The founder and charter diplomate of the American College of Zoological Medicine, he edited eight editions of the 'bible' for zoo veterinarians: Fowler's Zoo and Wild Animal Medicine. The last edition (2015) made it to print just before he died and is now on sale (Elsevier). In this last book the 82 chapters include authors from 15 countries on six continents. He knew them all and all of them knew him and admired him.

Dr Fowler developed the first teaching courses on captive and free-ranging wild animals and he established the first residency programme in zoological medicine in 1974. His books on camelids, elephants and restraint and anesthesia of wild animals are, even today, leading books in zoo and wild animal medicine. He was a member and Past President of the American Association of Zoo



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Veterinarians (AAZV) and was also a member of the European Association of Zoo and Wild Animal Veterinarians (EAZWV) since its origin in 1995, and a regular visitor of its conferences. For me, one never-to-be-forgotten experience was sharing a round table with him at the 2013 Vienna conference on medical failures and complications. He was open and kind to everyone, he answered questions without delay, and he remembered and appreciated European zoo veterinarians and students who would come over to the US for the annual AAZV conferences.

Dr Fowler is an Honorary Member of EAZWV and received many awards in the veterinary field. We will miss him.

NOTICEBOARD



DIRECTORS DAYS 2014 AND THE MEMBERSHIP & ETHICS COMMITTEE

This year's Directors Days were hosted by Bioparc Doué la Fontaine at Saumur in the Loire Valley. The theme 'Communicating Character' was covered by a wide range of speakers including communications experts, EAZA member directors and others. For a fuller summary of the outcomes of the meeting, please see the Chairman's Report on page 10. Prior to the Directors meeting, the Membership and Ethics Committee also met to discuss recommendations on membership, including:

NEW FULL MEMBERS

Zoo de Guyane, French Guyana, France;
Kattegatcentret, Denmark

NEW TEMPORARY MEMBERS 1 YEAR

Parc des Mamelles, Guadeloupe, France;
Nordsoen Oceanarium, Denmark

EXTENDED TEMPORARY MEMBERSHIP WITH ONE MORE YEAR

Parc des Pyrenees, France; Parco Faunistico Le Cornelle, Italy

EAP SCREENINGS: FULL MEMBERSHIP

Highland Wildlife Park, UK; Paignton Zoo, UK; Chester Zoo, UK; Aalborg Zoo, Denmark; Zoobotanico de Jerez, Spain; Jardim Zoologico de Lisboa, Portugal; Tierwelt Herberstein, Austria (reinstated from temporary membership)

DENIED

Maubeuge zoo, France (following a two-year temporary membership period)

BEST PRACTICE FOR BLACK RHINO

EAZA BEST PRACTICE GUIDELINES are produced by the various TAGs to merge expert husbandry knowledge and make it widely available within and outside the borders of the EAZA community. The EAZA Best Practice Guidelines for black rhino, which were produced by Mark Pilgrim and Rebecca Biddle (Chester Zoo) from the EAZA Rhino TAG, are the first to be approved by the EEP committee for publication according to the newly established procedure. They can be found by going to the EAZA website and navigating to EAZA Activities > Collection Planning > Best Practice Guidelines.

The guidelines show best practice standards, which EAZA zoos aim to achieve. They are of particular interest when building new enclosures, when deciding upon the nutrition of animals or when seeking information on the biology of the species. EAZA Best Practice Guidelines will, over time, replace husbandry guidelines. All TAGs are therefore encouraged to (re-)publish their husbandry guidelines using a standard format, available in the EAZA Population Management Manual. It provides clear guidance on the procedure of publishing and suggestions on structure and chapters.

Questions? Please contact the EAZA Executive Office; we are happy to assist.

EAZA CONSERVATION FORUM 2014, LEIPZIG, GERMANY

From 6-9 May 2014 the biannual EAZA Conservation Forum was hosted by Leipzig Zoo in Germany. The theme was 'One Species, One Plan' – exploring the One Plan Approach in a zoo and aquarium context. The Forum was preceded by a highly successful one-day EAZA Academy seminar on integrating social and emotional aspects into conservation programmes. 100% of participants stated that they would recommend this training and found the discussions, case studies and practical activities engaging and beneficial to their varied conservation work.

During the Forum a range of inspiring keynote presentations were given. The One Plan Approach for conservation was introduced by Onnie Byers (CBSG) as a method which integrates species conservation planning of both *in situ* and *ex situ* populations, enhancing global collaboration and communication, accelerating the evolution of species conservation planning tools, and contributing to the achievement of the Aichi Biodiversity Targets. Steve Burns (Zoo Boise) explained the philosophy behind his successful initiative to introduce a Conservation Fee for his visitors, Piero Genovesi (Chair IUCN SSC, Invasive Species Specialist Group) talked about the patterns, threats of and responses to invasive alien species in Europe and the role zoos and aquariums can play in mitigation. Mark R Stanley Price (Chair IUCN SSC Sub-Committee for Species Conservation Planning) introduced participants to the revised 'IUCN Guidelines for Reintroductions and other Conservation Translocations' and how to responsibly implement these guidelines. Around 80 people from both the *in situ* and *ex situ* world participated. This provided a great exchange of knowledge, many interesting presentations and workshops on varying topics. These ranged from examples of successful One Plan Approach projects inside as well as outside Europe, lessons learned, brainstorming on possibilities to join or start up such projects, the use and importance of social science and molecular biology in conservation and much more. Throughout, participants were able to enjoy the wonderful setting of Gondwanaland and welcoming staff of Leipzig Zoo. Proceedings are available for EAZA members on the EAZA website under News & Events > Conservation Forum > Proceedings. We look forward to welcoming you to the next Conservation Forum in 2016.

INTERNATIONAL ZOO EDUCATORS CONFERENCE 2014

The 22nd Biennial Conference of International Zoo Educators will be hosted by Ocean Park Hong Kong on 2-6 September 2014.

The International Zoo Educators Association (IZE) is dedicated to the improvement of education programmes at members' facilities, provision of access to the latest thinking, techniques, and information in conservation education and the support of excellence in animal care and welfare.

The conference in 2012 at Chester Zoo, UK was attended by 161 delegates, representing 34 countries. It proved an excellent forum to share knowledge of current and future educational trends, as well as network with colleagues from around the world. It is anticipated that the 2014 conference will be equally as successful. The theme of this conference will be 'Education Success – what does it look like and how do you measure it?'

The conference is preceded by a workshop (1-2 September) on Community Based Social Marketing. This interactive workshop is given by Dr Doug McKenzie-Mohr, the author of 'Fostering Sustainable Behaviour: An Introduction to Community-Based Social Marketing'. Dr McKenzie-Mohr has worked internationally with a diverse array of governmental and non-governmental agencies, assisting them in identifying the barriers to behaviour change and in developing and evaluating community-based social marketing initiatives to overcome these barriers. This topic is becoming more and more relevant to the educational work of zoos and aquariums, and the workshop will be an excellent way to learn more about how to apply it in your institution.

Registration for the conference costs HK\$ 3,900 (around €370). This includes breaks, lunches, welcome reception, two conference dinners, conference materials and various social events. There is a separate fee for the pre-conference workshop. More information about the programme and how to register can be found at <http://www.oceanpark.com.hk/ize2014/en/>.

NEW CORPORATE MEMBERS

Carl Stahl, Germany: Carl Stahl Architektur offers innovative solutions in the fields of rope and lifting equipment, architecture, TechnoCables and personal protective equipment against falls. **Wildtex, Netherlands:** Merchandising specialists for zoos with products including apparel, plush toys and other high quality products. **Zoologistics, Netherlands:** Zoologistics is an airfreight-agent that takes professional care of the import and export of (zoo) animals. Zoologistics has good relations with the airlines and the border inspection and converts your business logistical wishes into a custom made solution.

BIRTHS AND HATCHINGS

AGE IS NOT AN OBSTACLE

BIRDS OF PARADISE are among the world's most known and famous bird species due to the often colourful and very exceptional plumage of the males, writes *Anne Hoppmann*. Weltvogelpark Walsrode keeps various species of these famous birds, and one of the larger ones is the twelve-wired bird of paradise (*Seleucidis melanoleuca*) which inhabits rain and swampy forests in the lowlands of New Guinea and the western Papuan Islands. In 2008 Walsrode received a male called Van Dyke, from Bronx Zoo in New York, and as the bird is now 30 years old, it had been thought that he would no longer be viable for breeding purposes. Not so! Despite his age, since September 2012, a total of seven chicks have been successfully hand-reared.

Our female made a nest by herself out of coconut fibres, twigs and leaves in her enclosure in our rainforest hall. The pair is housed in a large aviary, but the male was always very interested in the nest and the female, and he destroyed the first eggs that were laid. After that, all future eggs were transferred to an artificial incubator.

The eggs were exchanged with dummy eggs, so that the female could continue incubation. Meanwhile the real egg was artificially incubated at 37.4 °C and a humidity of 55 % until it hatched. Candling the egg after approximately one week can quickly reveal if the egg is fertilised or not, and this procedure was used on all the eggs that were laid. After hatching all the nestlings were transferred into the care of the keepers, the vet and the biologist of Weltvogelpark. They were placed into a steel bowl padded with paper towels, an anti-slide-mat, coconut fibres or wood wool and housed in a closed and heated rearing machine.

Weltvogelpark Walsrode is very proud to have successfully reared twelve-wired birds of paradise. As it turns out, we have been very lucky with our chicks – four males and three females! We are now looking forward to seeing the young birds grow up and to caring for them until they are sexually mature at the age of four to six years.



CROCODILE SMILES

IN LATE 2007 a pair of Philippine crocodiles (*Crocodylus mindorensis*) arrived at ZSL London Zoo, writes *Iri Gill, Deputy Team Leader Herpetology Department, ZSL*. They were prone to be aggressive towards each other, but in mid-2013 they were housed alongside one another with a mesh divide separating them. During this time there was a lot of interest and interactions through the mesh from both animals. A few months later the female was introduced to the male, in his larger enclosure, and multiple matings were observed. After around an hour, the aggression began once more, so the female was returned to her smaller enclosure.

She was provided with nesting materials, comprising coir, dried leaves, bark chip and grass cuttings. After a few days she began to dig and move around the substrate, but no actual nest was constructed. During the next few months no obvious nesting or maternal behaviour was observed. In early 2014, however, there was again a lot of interaction between the two animals, through the mesh, and they were reintroduced. As previously, several matings were observed only this time there was no aggressive behaviour witnessed and they both went to opposite sides of the enclosure. As the larger part of the enclosure had a more suitable nesting area, it was decided to remove the male this time

and leave the female in the larger side.

A week later the female had constructed a nest. A few months later her behaviour changed, and she became extremely aggressive towards keepers. This is when the nest was checked and eggs were identified – 13 were removed, of which seven showed clear banding.

The eggs were incubated at 30°C in vermiculite media. A few weeks after the typical longitudinal cracking was seen on the eggs, they were uncovered to maximise oxygen transfer to the developing embryos. Six animals hatched, the first 'pipping' at the end of June, indicating that the eggs were laid around early April, based on an incubation period of around 85 days.

The six juveniles ranged in weight from 37g to 48g, with the last two to hatch being the lightest. Their total lengths were all 24cm. At present, their diet consists of a variety of terrestrial invertebrates, live river shrimp and small pieces of fish. Food is offered four times a week with a different item being offered at each feed. These young crocodiles are still very shy feeders and prefer to feed late afternoon or evening.

ZSL is delighted to be breeding this rare crocodylian and contributing to the EAZA ESB programme. Through this success we aim to raise the profile of the species and its plight for survival in the Philippines.





LESSER FLAMINGO SUCCESS

IN 2004, WE STARTED TO BUILD a group of lesser flamingos for Leipzig Zoo's African savannah and, after a while, totalled more than 70 birds with a more-or-less even sex ratio, writes *Ruben Holland*. The birds were housed outside in summer and inside in winter. A big problem with the group was that there were never more than two eggs laid per season and only once was a chick hatched in the incubator and successfully hand-reared. All breeding behaviour was always during the summer when the birds had a mud island to build their nests. In winter 2013/14, therefore, we brought mud into our inside enclosure, put mirror foil on the windows, brought more light into the stable and minimised disturbance, all calculated to encourage breeding.

The success was awesome! More than 40 eggs were laid and one chick was parent-reared in this time period. When the group went into the outdoor enclosure again we collected the last eggs and brought them to the incubator. Two of these eggs were fertile but failed to hatch. A chick hatched from a third egg but died after two days. Now we have to think about why there were only two chicks hatched from more than 40 eggs. Are most of the eggs infertile or did the fetuses die in the eggs?

Overall, I think we are on the right track and we did a lot right to create an efficient breeding situation. Next year we will try some small changes to increase the hatching rate and, all going well, get more chicks. For now, however, it has been a great success rearing our first chick since 2008.

THE WHITE DIRECTION



THE ENDANGERED WHITE-WINGED WOOD DUCK (*Asarcornis scutulata*) from Southeast Asia had an ESB created for them in 2013 which is coordinated by William van Lint in the EAZA office. At Bristol Zoo, two pairs of birds were brought in from WWT Slimbridge in 2011 and 2013 and housed in two different aviaries. Pair one is mixed with black hornbill (*Anthracoceros malayanus*) and pied imperial pigeons (*Ducula bicolor*), while pair two is mixed within the rainbow lorikeet (*Trichoglossus moluccanus*) feeding aviary.

In 2014 both pairs laid clutches of ten and four eggs respectively. At the ten-egg clutch the keepers were able to candle the eggs to determine fertility and found all ten were fertile. From this clutch half were left with the female and half were removed to the incubator.

Both pairs successfully hatched ducklings with pair one hatching four and pair two hatching four, but at the time of writing rearing two. Two of the incubated eggs hatched, and the young are being reared with a clutch of marbled teal ducklings.

Once thought to be common throughout Southeast Asia, the species is now in serious decline with estimates of only approximately 1,000 individuals remaining in the wild, mainly due to habitat destruction, degradation, disturbance, opportunistic hunting and egg collecting.

Forward thinking

EAZA DIRECTORS DAYS 2014 SHOWED HOW WE ARE MOVING TOWARDS A STRONGER, MORE UNIFIED FUTURE

Simon Tonge, Chairman, EAZA

The annual Directors Days meeting, this year hosted by BioParc Doué La Fontaine in the heart of the Loire valley in France, was the first meeting of EAZA directors since the media storm surrounding the euthanasia of a young giraffe and four lions at Copenhagen Zoo. With a broad range of opinion surrounding the issue, and cultural differences across the Association's network, there was considerable concern in the Executive Committee that the meeting would expose and deepen rifts within the membership, and could have serious consequences for our future.

The meeting was intended to allow all of these points of view to be heard, discussed and mediated, with a focus on moving past recriminations towards a concrete plan of action. Excellent speakers including some of our most active and distinguished members, as well as communications experts and welfare scientists, laid out the basis for EAZA's response to the worldwide media attention, and invited open and frank discussion of management euthanasia as a policy, and the way we respond to criticism from the public.

It was heartening to see all 100 or so directors, while facing such a challenge for the Association, engaging positively and calmly, agreeing to disagree where necessary, but aiming without hesitation towards a solution which would leave EAZA stronger. While some criticism was leveled at Copenhagen and EAZA for the response to the crisis, it became clear during mediated discussions that, in principle, directors supported the use of euthanasia for the management of populations. The primary concern then, was not that Copenhagen had decided to cull the young giraffe, but that cultural sensitivities, from all perspectives, should have been respected, and that a framework for better communication was needed.

To fulfil both of these needs, EAZA proposed the re-establishment of a

committee for communications. The new committee, which is in the early stages of constitution, will have as its mission the creation of a strategy to help the public understand why we have to do what we do, from the principle of keeping animals in human care to the difficult decisions we need to take in order to keep our populations physically, genetically and psychologically healthy. This should also make comparisons with the management of animals in the wild, where culling is sometimes necessary to ensure healthy long-term populations. We also need to ensure that the public understand that animals rights groups' opposition to such management will ultimately imperil not only *ex situ* populations, but will hamper conservation in the wild. The committee will review EAZA's mission statement to make sure that, from the very start, we will communicate our *raison d'être* and maintain the transparency we need in order to continue to build public support for good zoos and aquariums across Europe and the world. The committee will also work to agree a communications framework that takes account of different cultures, and will include members from right across our network.

The directors also agreed to the creation of a formal committee for the national associations. The associations have long been an integral part of EAZA's decision-making process, and the new committee will ensure that we have a full range of opinion from across the continent. Its first order of business is to review EAZA's euthanasia policy, adopted by Council in 2011, to ensure that all members can accept its terms and the language it employs. The statement was developed over three years (2008-2011), went through many revisions and had previously been seen by all countries before being unanimously voted in at Council, but it was felt



prudent to once again ask the national associations to review the document, which has been available on the public pages of the EAZA website since 2011. Any changes proposed by the associations will be reviewed at the annual conference in September, and we trust that the process will lead to increased member and public confidence in the policy and the tools needed for maintaining healthy populations.

As the Association moves forward, I believe that we now have a strong mandate from the directors: a mandate to unite our members behind sound scientific principles of conservation, education and research; a mandate to continue to inform the public and include them in our thinking and decision-making; and finally a mandate to act as the discussion forum for some of the most challenging and controversial issues we face. If we do not face such discussions then animal rights activists will hamper our ability to do the work mandated to us under Article 9 of the Convention on Biological Diversity. If we don't do this work, then who will?

I urge all of us to continue to work in the spirit established by the dedicated and passionate leaders who attended Directors Days 2014, towards a stronger, more unified Association; an Association that uses its highly capable head but is not afraid to speak from the heart; and an Association that consistently and clearly demonstrates that we exist because of the love we all hold for nature and the animals in our zoos and aquariums.

LED from Pole to Pole

WITH 140 MILLION VISITORS A YEAR AND A STRONG COMMITMENT TO EDUCATION, EAZA ZOOS AND AQUARIUMS ARE PERFECT SHOWCASES FOR INNOVATIVE TECHNOLOGIES SUCH AS LED LIGHTING, WHICH CAN HELP COMBAT CLIMATE CHANGE

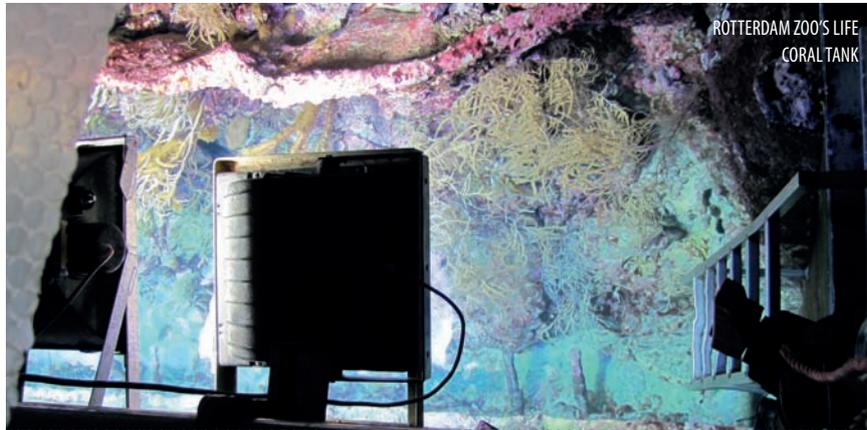
Joeke Nijboer, Rotterdam Zoo

European zoos and aquariums are taking on a new role in the fight against climate change by becoming pilot sites for energy-saving solutions. Pioneer zoos and aquariums around Europe have been installing LED lighting recently with several aims: saving energy, reducing costs, improving the visitor experience and raising awareness of energy-saving technologies. Switching to LED lighting technology can help cut energy consumption expended on lighting by 70% – and in institutions such as zoos and aquariums, this adds up to considerable savings in emissions.

THE ILLUMINATE PROJECT

Rotterdam Zoo has already been running several programmes to save energy (Solar Photovoltaic panels for instance) and took the opportunity provided by a pan-European project called ILLUMINATE to scale up its LED lighting installations. Joining the project allowed us to benefit from the technical expertise and experiences of 13 partners from all around Europe. The aim of the ILLUMINATE project is not only to install demonstration sites so as to save energy and test innovative lighting solutions but also to raise awareness about these new LED technologies among citizens and visitors. Besides Rotterdam Zoo, participating aquariums include the Genoa Aquarium, CretAquarium and Lithuanian Sea Museum. The other pilot sites target different user groups (citizens, local authorities, politicians etc) and different types of buildings, namely the Belfast City Council Hall in the United Kingdom, Experimentarium (the Danish Science centre in Copenhagen), and the Old Quay Area in Genoa.

At Rotterdam Zoo, 1,035 fluorescent lamps have been replaced by LED lights in various areas: in technical premises and staff areas but also and more importantly in public areas such as restaurants and animal facilities, and 80% of the lighting in the zoo now comes from LED technologies.



ABOUT LED

Light-emitting diodes (LEDs) are semiconductor devices that emit light when an electric current passes through them. Initially used to produce a red indicator light such as in electronic devices, LEDs are now available in a wide range of colours and light intensities. They can be found in traffic lights, automotive brake lights and headlights, Christmas lights, flashlights and cell phone screens, to name a few. More importantly, they are increasingly being used for lighting in homes and businesses. LED bulbs, in addition to being energy-efficient, are also extremely durable: their effective life can be up to 100,000 hours. Highly robust and containing no breakable filaments, they are the most resistant of all commercially available bulbs. LEDs produce very little heat unlike incandescence and halogen lamps and have very low voltage. This lack of heat emission also makes them highly suitable for situations where constant temperature is important.

Visitors can see LED lights in the coral tanks, the king penguin area and the elephant house, and wherever possible and needed, motion sensors control the LED lighting and help to further reduce energy consumption. At the time of purchase, the material and installation costs were seven times higher than the original lighting system. But with the savings achieved the payback period is three to four years and the lighting quality is much better.

WHAT ARE THE RESULTS?

The total cost of the system (after the EU grant from the ILLUMINATE project) was €300,000 and the new lighting system saves about €40,000 a year; not just in energy consumption but also in maintenance costs as the LED lights have a much longer lifetime than any other light. In terms of energy consumption, the zoo now uses 170,000 kWh a year which saves nearly 97 tons of carbon dioxide a year.

To raise awareness of the benefits, visitors are informed through a small exhibition and informative panels. Tests have also been carried out in the zoo which show that the flexibility the lights offer can also help in recreating a better environment for the animals.

The project, while independently initiated, is a great demonstration of new technologies for the reduction of carbon emissions, and ties in effectively with our communications relating to the Pole to Pole campaign. Indeed, with the savings in energy offered by LED lights, encouraging our visitors to follow our example and install the new bulbs could have a material effect on emission reduction in the greater Rotterdam area, and go some way to help building a more secure future for species being affected by climate change.

More information can be found at www.illuminateproject.eu. Results are at www.youtube.com/user/illuminateLEDproject.

The master list

HOW ZOOS AND AQUARIUMS CAN HELP CELEBRATE THE RED LIST'S 50 YEARS OF GUIDING CONSERVATION PRIORITIES

Lesley Dickie, Executive Director, EAZA



In 1964 a very straightforward idea came to fruition: the first IUCN Red List. The Red List identifies the most threatened species and sub-species on Earth via transparent criteria that can be measured on a regular basis. This allows us to identify the species at most risk of extinction, thereby guiding where species conservation efforts should focus.

The Red List is the result of significant amounts of unseen work by Red List assessors to contribute to the production of the famous lists under the categories (see box). Major contributors to the Red List as assessors include Birdlife International, ZSL's Institute of Zoology, the World Conservation Monitoring Centre and hundreds of volunteers via the Species Survival Commission's Specialist Groups.

To celebrate the success of the Red List a series of events is being planned including a lighting event from 15-22 November in London that we would like to extend to colleagues across Europe. Prominent buildings across the UK capital will be bathed in red light in the evenings throughout the week to celebrate the work of the Red List.

What we would like to propose is that EAZA zoos and aquariums join in the celebrations by lighting the entrance to their zoo or aquarium in red light throughout the week or on an evening during that week. We know that the Red List is essential to collection planning for responsible zoos and aquariums and that some of you have contributed to Red List assessments. In addition, when assessing the approximately €100 million that EAZA members spend in the field, the Red List plays its part in guiding this collective conservation spend. So, it would be fantastic to further highlight the Red List to the general public and media by using our facilities as showcases.

In addition to the lighting activities there will be a prestigious dinner taking place at the Natural History Museum



OWSTON'S PALM CIVET (VU)

RED LIST CATEGORIES

- Extinct (EX)** – No known individuals remaining.
 - Extinct in the wild (EW)** – Known only to survive in captivity, or as a naturalised population outside its historic range.
 - Critically endangered (CR)** – Extremely high risk of extinction in the wild.
 - Endangered (EN)** – High risk of extinction in the wild.
 - Vulnerable (VU)** – High risk of endangerment in the wild.
 - Near threatened (NT)** – Likely to become endangered in the near future.
 - Least concern (LC)** – Lowest risk. Does not qualify for a more at risk category. Widespread and abundant taxa are included in this category.
 - Data deficient (DD)** – Not enough data to make an assessment of its risk of extinction.
 - Not evaluated (NE)** – Has not yet been evaluated against the criteria.
- When discussing the IUCN Red List, the official term 'threatened' is a grouping of three categories: Critically Endangered, Endangered, and Vulnerable.

on 22 November. The Biophilia Ball will be a glittering affair raising funds for conservation. A joint collaboration of the IUCN and Synchronicity Earth, the ball will also feature the stunning artwork of Alice Shirley who will be painting individual masks for the ball featuring threatened species. The ball is also the launch pad for Synchronicity's larger campaign, Biophilia. Please contact Synchronicity Earth (www.synchronicityearth.org) for further details.

And what next for the Red List?

Well, the job never ends as the assessments will also go on, hopefully with downlisting but also ensuring that we know which species need our help. In the future there will also be a counterpart, the Green List, suggested by the Wildlife Conservation Society and partners, which will highlight species that are thriving parts of a healthy ecosystem and will emphasise that conservation is about more than just preventing extinction. We look forward to the future of both the Red List and the Green list.

JUVENILE TOMISTOMA AT MESANGAT



Help needed ASAP

INTRODUCING THE ASIAN SPECIES ACTION PARTNERSHIP

Will Duckworth, IUCN Asian Species Action Partnership

The Asian Species Action Partnership (ASAP) is an interagency coalition of organisations from the international conservation community aimed at minimising the extinction risk among the most threatened non-marine vertebrates of Southeast Asia. For many of these species, extinctions are all but inevitable within the next two to three decades. The partnership was a response to the alarming results of the Global Mammal Assessment in 2008, a comprehensive assessment of the conservation status of world's mammal species for the IUCN Red List of Threatened Species. This showed Southeast Asia to hold a startling concentration of species on the edge of extinction. A meeting of conservation organisations shortly thereafter clarified that other heavily traded groups containing many hunting-sensitive species (eg large reptiles) showed similar patterns. ASAP acts as an emergency call to mobilise support where it is urgently needed, drawing on the collaborative expertise of conservation practitioners, pooling resources and efforts to maximise efficiency and galvanise political will.

South-east Asia has this alarming concentration of highly threatened species for two reasons: (i) trade for wildlife meat and medicinal products has exploded over the last 10–30 years, a result of the region's rapid economic growth; and (ii) it holds two of the

world's great archipelagos. Island species, confined to small areas, often face inherently higher extinction risks than do continental species.

The ASAP species are the non-marine vertebrates of Southeast Asia (the members of the Association of Southeast Asian Nations, plus Timor-Leste) categorised on the IUCN Red List of Threatened Species as Critically Endangered (CR), the highest category of extinction risk. The last criterion is objective – it defines the most threatened species – but the others are pragmatic boundaries to allow a manageable start, rather than struggle with all CR species all over the world.

About a third of the total of the approximately 160 ASAP species are fish, and the true proportion that would be fish, if every species' correct Red List category were known, would be much higher. Large parts of Southeast Asia lack an analysis of extinction risk for fish, and even for the one area comprehensively assessed – the mainland north of Malaysia – over 40% were assessed as Data Deficient, ie had insufficient information to allow categorisation. About a third are mammals, a quarter are birds, an eighth reptiles, and only a handful are amphibians. These figures are likely to underestimate seriously the number of reptiles and amphibians due to the long time since the last comprehensive assessment of the latter, and the lack of

one, ever, for reptiles. Many additional freshwater turtles warrant CR status, for example.

The single most shocking thing about the ASAP species list is that most of the species have neither active conservation programmes, nor priority within any conservation organisation. About a third are collateral beneficiaries of action for less threatened but higher public profile animals, but for almost a half, their inexorable extinction trajectory reflects oversight. Among the priorities for ASAP, therefore, is to bring these species' plight to wider notice and to harness more resources for action in their favour. Forthcoming *Zooquaria* articles will explore the several clear directions in which EAZA is ideally positioned to take a lead role in this shared endeavour, after a discussion on this topic which will take place at the Budapest annual conference. In the interim, several of IUCN SSC's specialist groups will be profiled in *Zooquaria*. The SGs are SSC's main tool for overseeing species conservation, but many operate below potential through chronic resource shortage. Consolidation of the specialist groups to be able to meet the ASAP challenge is an essential part of the whole programme.

To find out more about how EAZA can work with IUCN Specialist Groups, please turn the page.

Building bridges between IUCN and EAZA

THERE ARE EXCELLENT OPPORTUNITIES TO DEVELOP STRONGER RELATIONSHIPS BETWEEN IUCN SPECIALIST GROUPS AND ZOOS AND AQUARIUMS, TO THE BENEFIT OF ALL

Rachel Roberts, SSC Network Coordination Officer

The International Union for Conservation of Nature's (IUCN) Species Survival Commission (SSC) is a volunteer network composed of over 9,000 species experts including scientists, field researchers, government officials and conservation leaders worldwide, working together to halt the decline in biodiversity and ensuring that SSC is an unmatched source of information and advice to influence conservation outcomes.

Members of SSC belong to one or more of 130 Specialist Groups (SG), Red List Authorities (RLA) and Task Forces (TF), each focusing on a taxonomic group (fungi, plants or animals), or topical issues such as sustainable use and livelihoods, reintroduction of species, wildlife health, climate change and conservation breeding. These groups constitute the main working units of SSC, providing the breadth of expertise and commitment that drives the Commission, delivers on its objectives and makes its achievements possible.

Each group operates on a voluntary basis which presents an essential need for small-scale but stable support in order to maintain the high quality outputs received from the SSC network. Many zoos and aquariums now make significant and wide-ranging contributions to field-based biodiversity conservation beyond their own facilities and breeding programmes, and have a great deal of expertise in population management, veterinary medicine, husbandry and research, and are looking to contribute to species conservation in additional, meaningful ways.

The SSC believes that there is a valuable opportunity to establish mutually beneficial relationships between zoos and aquariums and SGs. These relationships will, among other things, provide expertise and credibility and specific opportunities to further engage in field conservation to zoos



and aquariums and administrative, organisational and financial support to SSC SGs. Several zoos already either host SGs, or have very interactive and dynamic relationships with them, providing not only financial support to projects *in situ*, but often donating the time of veterinary and other staff. In turn, many SG members are actually curatorial and/or managerial staff of zoological gardens or aquariums.

EAZA is actively supporting closer linkages between its zoos and aquariums and the IUCN SSC SGs, and is beginning to trial out a process of identifying institutions who would agree to serve as the 'champions' for several SGs. It is hoped that by developing these relationships and building bridges between *in situ* and *ex situ* conservation, the two approaches can become less distinct by harnessing complementary expertise to make for a more holistic contribution to the protection of wild species.

We recognise that these relationships will require time to evolve and mature, and the precise scope of the collaboration and benefits will vary depending on the groups, their specific aims and constraints, access to resources and availability of time.

Obviously, the opportunities for doing so are greatest where there is some overlap in particular species of interest. As examples of this process, we highlight two groups.

ASIAN WILD CATTLE SPECIALIST GROUP

The mission of the Asian Wild Cattle Specialist Group (AWCSG) is the promotion and long-term conservation of Asian wild cattle species and their habitats by means of information-sharing, identification of conservation priorities and facilitation/delivery of these priority actions through collaborative conservation work. The SSC would like to approach the EAZA membership with the possibility of encouraging institutions to become champions for the AWCSG. The AWCSG seeks the following opportunities for collaboration:

- EAZA institution staff to donate time to the role of a part-time Programme Officer which could provide extremely valuable help to the SG.
- Support of the publication of an SG newsletter by providing staff time to assist in the role as editor, and recognising this support by having the logo of the institution on the publication and contributing to the design and content.
- Assistance with fundraising for SG activities.
- Assistance with travel costs to enable the SG Chair to attend meetings essential for the activity of the group.
- Assistance with the building of international partnerships in Indonesia for the *in situ* and *ex situ* conservation of anoa and banteng.

- Assistance with supporting research and conservation *in situ* actions.
- Contribution to *ex situ* conservation in range countries: following the successful studbook training for 12 studbook keepers in Indonesia it would be beneficial to have mentoring of some of these studbook keepers, by EAZA institution staff.

The IUCN SSC Saola Working Group (SWG) is part of the AWCSG. Collaboration is key to the SWG's work, and the group is currently a partnership of 20 members drawn from range government partners and conservation organisations working in the saola's range. EAZA's adoption of the saola for the logo of its Southeast Asia campaign made a huge impact in terms of raising the saola's profile and educating the public of its existence. In addition to financial support from the campaign, EAZA is supporting the SWG through an 'Intensive Management of Saola Advisory Group', established within EAZA's Cattle and Camelid TAG.

PRIMATE SPECIALIST GROUP

The IUCN SSC Primate Specialist Group (PSG) has more than 450 members, and its overall mission is to maintain the current diversity of the order Primates, ensuring the survival of the endangered species wherever they occur.

The PSG's mandate includes the 'establishment of conservation-oriented captive breeding programmes for threatened taxa', and the expertise of those involved in the management and husbandry of captive primates is essential for programmes of rescue and rehabilitation, reintroduction and translocation, plus field research and health studies. With more than 700 million people visiting zoos each year, their vital role in education about the need to save wildlife, while promoting and catalysing the required measures, is undisputed.

One of the pioneer successes, coming from a close interaction between zoos and an *in situ* conservation program, is the Golden Lion Tamarin Conservation Programme begun by the National Zoo, Washington, DC, in 1983, but preceded by, and based on, research in captivity on behaviour, physiology and husbandry. The conservation programme (*in situ* and *ex situ*) for the golden-headed lion



tamarin took off after the success of Durrell Wildlife Conservation Trust in repatriating a large number of the species that were illegally taken from Brazil. They comprise the founders of a healthy captive population and collaboration with the Durrell Wildlife Conservation Trust, amongst others, inspired the conservation measures and field research in place today.

Another example, still in its early days (begun in 2005) but showing immense promise, is a conservation programme for the white-footed tamarin that occurs in a small part of northern Colombia in the Magdalena basin, where its forests have been extensively devastated and it is hunted for the pet trade. The Beauval Nature Conservation and Research Association of Beauval Zoo, France, initiated this programme through the Callitrichid Taxon Advisory Group (TAG) of EAZA, involving 25 EAZA zoos and institutions that provide funds and act as technical consultants, working in direct collaboration with their Colombian counterpart, the Association of Colombian Zoos and Aquaria (ACOPAZOA). The conservation programme for the Critically Endangered yellow-breasted capuchin was also inspired by collaboration with European zoos.

The continued support and sponsoring of collaborative *in situ* and *ex situ* endangered species conservation programmes has proved to be a powerful force for a number of threatened primates. The PSG would very much welcome stronger links with the zoo

community and present the following as ways in which this support could benefit the group most.

- The PSG produces four newsletters: financial assistance to support the production of these would be gratefully received.
- The PSG is now in the process of revising the IUCN Red List assessments for the world's primates. It has recently completed a full assessment of all Madagascan primates, showing that 94% are threatened. We are actively seeking partners in this time-consuming, but critical, process, especially those who may be prepared to help host workshops and with associated local hosting costs.
- The Madagascar Section of the PSG has recently published a three-year strategy for the conservation of the lemurs of Madagascar and is now seeking funding for its implementation.
- The IUCN SSC's Primate Specialist Group's Section on Small Apes (SSA) is responsible for coordinating gibbon conservation activities globally. The SSA would benefit greatly from the donation of zoo staff member time for the role of a media officer who can help to support communications by maintaining the group's facebook page, create and manage a website, and ensure members are receiving timely updates.

For more information on any of these activities, please contact Rachel Roberts at rachel.roberts@iucn.org

Dark clouds for Europe's vultures

ZOOS HAVE BEEN CRUCIAL FOR THE RECOVERY OF SEVERAL VULTURE SPECIES, BUT DICLOFENAC THREATENS TO WASH AWAY DECADES OF EFFORT AND GAINS

José Tavares, Director, Vulture Conservation Foundation (VCF)

Once upon a time, the word 'vultures' would evoke images of Indian landscapes or towns awash with the birds, or scenes of kettles of white-backs and lappet-faced flying around a dead animal in the vast African savannahs. Today, if you want you want to see vultures in quantity, you should come to... Europe!

Indeed, Europe probably offers some of the best vulture concentrations and densities anywhere in the world. It is not rare to see 1,000 griffons flying around a carcass dump in Spain, and I have recently seen up to 60 black vultures feeding together in Turkey. Some sites in the Pyrenees regularly boast 30 bearded vultures picking up bones, and in a few areas (like the Pyrenees and Turkey) you can actually see the four European species of vulture in one day.

This is because, with the exception of the Egyptian vulture, vultures in Europe are doing extremely well. On the other hand, their Asian and African cousins are facing extinction or severe decline. In the Indian subcontinent, the veterinary drug diclofenac has wiped out hundreds of millions of vultures – several species have declined abruptly (many up to 99%) – and today you can drive hours, even days, without seeing a vulture there. The drug was finally banned in 2006 in a number of countries, but vulture populations are only now starting to recover.

Europe, on the other hand, boasts more vultures now than at any other time in recent history, with several species reintroduced or recolonising areas where they went extinct.

Only the Globally Endangered Egyptian vulture is bucking this positive trend for vultures in Europe – populations across the continent mirror the global situation and continue to decline. Only the French population (90-100 pairs) and some regional populations in Spain are slowly increasing, after a considerable conservation effort put in place by a number of conservation organisations. Elsewhere, the picture is bleak –



extinction looms in Italy (8 pairs left) and the whole of the Balkans (40-45 pairs left). This is a priority species for concerted conservation action, and the Vulture Conservation Foundation (VCF) will certainly focus some of its programme here.

NEW THREAT

However, dark clouds are in the horizon – not only for the Egyptian vulture but for all European species. Most unexpectedly, the veterinary drug that caused the well-known vulture crash in the Indian subcontinent, and that was banned there in 2006, has made an ugly reappearance in Europe. Veterinary diclofenac is legally available for use in Italy and Spain!

This fact, uncovered last year by the VCF and a number of other conservation organisations, defies all

common sense. Europe is often regarded as a reference model for the rest of the world – so how could a drug that has a well-known, and extremely heavy impact on wildlife, be allowed legally, when alternative, non-toxic alternatives are available? This is a question that remains unanswered – but probably has to do with poor guidance on EU risk assessments for all non-steroid anti-inflammatory drugs. There is no obligation to conduct eco-toxicity tests, and so Italian and Spanish authorities failed to pick up the threats to vultures – a gross negligence that the EU can now correct, by starting a formal referral (re-evaluation), that could lead to a ban of the drug.

Veterinary diclofenac causes fatal renal failure, and is therefore highly toxic to vultures and eagles. A recent paper in *Bird Conservation*



VULTURES IN EAZA

All four European vulture species are managed by the Falconiformes TAG with the Bearded Vulture EEP and European Black Vulture EEP in existence since the 1980s. Aside from maintaining a healthy safety net population in human care to raise awareness, and conduct research about their (breeding) behaviour, both programmes have provided substantial numbers of juvenile birds for release in historic European ranges. More than 200 captive-bred bearded vultures have been released over the years, and they form the basis for the successful recovery of the species in Europe. Annually 2-3 juvenile European black vultures have been released over the years and contributed to the recolonisation of parts of its former breeding range.

The Eurasian griffon vulture and Egyptian vulture have both been managed since 2000, with success for the former but challenges of pedigree for the latter; different subspecies, birds of unknown background and even hybrids hamper the Egyptian vulture programme. However, the EEP coordinator has been very active in improving breeding results, and hopes to be able to provide birds for release in the future, given the worrying developments in the wild.

EAZA has been active in its support for VCF's campaign against diclofenac, and will continue to provide support until the drug has been withdrawn.

International uncovered evidence that steppe eagles, a close relative of golden and imperial eagles, also died in India due to this drug. Even though the interaction between cattle and vultures is not the same in every continent, the VCF suggests that risk to European vultures is indeed significant, in spite of all the regulations on the provision of livestock rests to vultures – as the drug stays in the body of treated animals for up to seven days, it is impossible to guarantee that a treated cow or sheep will not be available to vultures in the extensive livestock regions in Spain, where most of Europe's vultures live. Also, vulture-feeding stations in Spain, Italy and elsewhere use tons of animal carcasses and parts every week, often coming from industrial operations. With the current veterinary controls in place, it will be impossible to trace and prevent a diclofenac-treated carcass from being dumped there – and any additional control would cost millions and would be difficult to implement.

One diclofenac-laced carcass can easily kill tens of griffon vultures. Given that there is a safe, equally cheap alternative drug available (named Meloxicam), and with all the strong scientific evidence available, there is really only one solution – the EU should

ban this drug.

VCF and others (including EAZA) have indeed asked for this – the matter is now with a scientific committee within the European Medicine Agency. FATRO, the Italian manufacturer of the drug, has been extremely unhelpful – we have asked for a voluntary withdrawal, but this was refused. Weak EU regulations on Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) have not encouraged a change of heart at FATRO, and as a result the best remaining option for protecting carrion consuming raptors is to aim for an all out legislative ban on Diclofenac.

Europe, and the rest of the world, are now waiting carefully. Whatever happens this decision will create a precedent that could impact upon vultures worldwide. Vultures consume hundreds of thousands of carcasses from European fields every year, avoiding costs with carcass removal. The EU has invested millions in their conservation, and so have many zoos – will we allow this work to go down the drain for a handful of quick euros by one greedy company?

To find out more about about the campaign against veterinary diclofenac, please visit www.4vultures.org.

Going to new lengths

THE AUTHORS CALL FOR A 'ONE PLAN APPROACH' TO GIRAFFE PROJECTS IN ZOOS AND IN THE WILD

Julian Fennessy, Giraffe Conservation Foundation/IUCN SSC Giraffe & Okapi Specialist Group (julian@giraffeconservation.org) and Paul Rose, Sparsholt College Hampshire / University of Exeter / IUCN SSC Giraffe & Okapi Specialist Group (paul.rose@sparsholt.ac.uk)

FOR MORE INFORMATION ON GCF:
 Website: www.giraffeconservation.org
 Facebook: www.facebook.com/pages/Giraffe-Conservation-Foundation/213643668667273
 Contact: info@giraffeconservation.org

FOR MORE INFORMATION ON WGD:
 Website: www.worldgiraffeday.org
 Facebook: www.facebook.com/worldgiraffeday
 Contact: info@worldgiraffeday.org
 WGD merchandise: www.cafepress.com/giraffeconservation



Giraffe conservation collaborations between the wild and captive worlds have been less of a 'One Plan Approach' and more of an 'Unplanned Approach' to date. Whilst the *in situ* and *ex situ* giraffe worlds have been working together on projects and often looking towards the same ultimate goal, it has not necessarily been undertaken in a formalised way. The time is right to help nurture this approach and the Giraffe Conservation Foundation (GCF) is taking the lead to engage EAZA (and AZA) colleagues as a first step.

In May 2014, EAZA held its biennial conservation forum in Leipzig, Germany, and a month later hosted a combined TAG Chair meeting in Alphen aan den Rijn, Netherlands. GCF's Dr Julian Fennessy spoke about the future of giraffes in the wild and those held in captive collections – with the input of Paul Rose – at both meetings, with the aim of establishing closer links between *in situ* and *ex situ* worlds. This information, from two seemingly world-apart areas of giraffe biology, were brought together to sow the seeds within delegates' minds on the feasibility of a more integrated approach to managing and conserving and the giraffe into the future.

The giraffe is often termed Africa's forgotten megafauna and despite being one of the more charismatic of herbivores, its numbers are declining in the wild. The management of captive giraffes, and especially the good management of endangered subspecies, such as the Rothschild's giraffe (*Giraffa camelopardalis rothschildi*), enables a strong conservation link to be built between field workers and zoo-based staff, scientists and conservation biologists. The zoo world recognises the conservation potential held in the captive population of Rothschild's giraffe and therefore greater collaboration between the zoo world and the wild world can bring benefits in securing a future for this well-loved, but poorly understood creature.

A key aspect of a giraffe 'One Plan Approach' is the way in which links can be established between those in zoos and those out in the wild. The current captive giraffe population is relatively substantial. And the large audiences that zoos reach has a multitude of conservation, education, financial and advocacy benefits for those attempting long-term conservation strategies for the giraffe. The sliding scale of management suggested by the IUCN's 'One Plan' initiative that promotes an integrated conservation planning for specific species would be of great benefit to both captive and wild giraffes.

Captive giraffes are great ambassadors for their wild cousins. Genetic purity and well-managed breeding herds enable the 'Ark Paradigm' of the modern zoo to be fulfilled. It has been shown with other large ungulates that reintroduction of populations extirpated from native rangelands is possible, and ultimately successful, by using captive-bred stock. Protection of the giraffe's habitat, work with local communities and engagement with those that live alongside wild giraffe herds enable long-term preservation of the ecosystem that the giraffe needs. Explanation of the threats to giraffes as well as raising awareness of the steep decline in the overall number of this animal left across Africa is a role that zoos, by using their giraffes, can really get involved in.

RESEARCH CROSS-OVERS

Research findings from wild giraffes can be translated into a more evidence-based system of animal management for those in zoos. Information gained on activity patterns and behavioural rhythms can enable improvements to animal wellbeing and ultimately the establishment of baseline positive welfare conditions within the zoos. Nutrition and dietary presentation of captive giraffes remain an issue. Recent developments in the use of browse, forage and species-specific concentrate feeds have helped reduce the occurrence of several nutritionally linked pathologies but giraffe can still suffer when fed inappropriately. Surveys of wild diet selection, alongside data on time spent eating and alterations in browse choice with season, can continue to inform how food for zoo giraffes is manufactured, prepared and presented.

Conservation is ultimately all about people, and the will that people have to work together to preserve species into the future. The giraffe is one of the world's most widely kept zoo animals and an instantly recognisable species to many. As of June 2014, ISIS (the International Species Information System) states that there are 328 zoos worldwide holding 1,654 animals.

Current IUCN Red List estimates for wild giraffe numbers (inclusive of all subspecies) are outdated but a decreasing population trend according to GCF is continuing with an approximate total population of fewer than 80,000 individuals. Breaking this down by subspecies, however, shows an even less healthy picture, with the West African giraffe (*G. c. peralta*) estimated at <400 and Rothschild's giraffe at <1,100 individuals. Others such as the Nubian giraffe (*G. c. camelopardalis*) could number fewer than both of these, while the Kordofan giraffe (*G. c. antiquorum*) numbers <1,900 individuals. The relatively substantial captive population for certain subspecies – and some are postulating that they may even be distinct species – therefore has a vital role to play in ensuring that those visiting giraffes in zoos are aware of the plight of their free-living counterparts.

The genetic diversity of giraffes in EEP herds and in SSP herds can be managed with the long-term future goal of potential reintroduction to range states and augmentation of existing wild herds (after the neutralisation and removal of current threats to these populations). This has been undertaken with other threatened populations of large mammals such as gorillas, Amur leopard, scimitar-horned and Arabian oryx, and Przewalski's horse. Movement and translocation of giraffes between areas in Africa already takes place, although sometimes with poor scientific basis as to whether the range state or region was originally 'home' to that subspecies. It is therefore feasible to intervene within managed giraffe populations to ensure the long-term viability of these herds. This is needed before it is too late for meaningful action to have a positive impact, and something which, together, we must do before numbers continue to dwindle.

Finally, with herds in captivity being subject to similar movements

for genetic health and to ensure future breeding potential remains high, information on behavioural and social components of fitness (sociality, bonds between individuals, dispersal ages and movements of males and females, and preferred associations) that have been measured or observed in wild giraffes can be used to guide future decisions applied to exchanges of captive giraffes between institutions participating in managed breeding initiatives.

COLLABORATION

Both the wild giraffe and the captive giraffe population would subsequently benefit from a 'One Plan Approach' and the increased collaboration and expertise that this brings. The endorsed support of the EAZA EEP towards the GCF as the key giraffe conservation partner was encouraging and a real interest to form a collaborative relationship with the IUCN SSC Giraffe & Okapi Specialist Group.

One of the big first steps towards the collaboration was 'World Giraffe Day' (WGD) on 21 June – a new and exciting initiative from GCF to celebrate the longest-necked animal on the longest day or night (depending on geography!) of the year. Not only is WGD a worldwide celebration of giraffes, but it seeks to be an annual event to raise awareness and support, shedding light on the challenges giraffes face in the wild. Zoos, schools, NGOs, governments, institutions and conservation organisations around the world hosted events on and around 21 June 2014 to raise awareness about the issues that giraffes are facing. Such events give people a chance to show their support for efforts to ensure a future for the giraffe. The timing of WGD was 'spot-on' as the international giraffe community came together to celebrate this amazing animal. Significant resources were raised in the first year to help conserve giraffe in the wild and with GCF leading the way, next year's plans are already underway!

Sharing ideas, information and experiences is critical and although more dialogue and more conversation is needed, it is hoped to be able to build a more secure and more robust conservation action plan for this most enigmatic of ungulates. The future of giraffe is in our hands and together we can help save it before it's too late!

HANDS ACROSS THE WORLD

A MEETING OF THE JOINT TAG CHAIRS FROM ACROSS THE GLOBE HAS HELPED TO DEVELOP EVEN STRONGER INTERNATIONAL CONNECTIONS

David Williams-Mitchell, Danny de Man and William Van Lint, EAZA



Long-term sustainable management of animal populations in human care has always presented a challenge, right across various areas and disciplines within the scientific community of zoos and aquariums, including demographic and genetic diversity and husbandry. Discussions have been under way for some time among TAGs as to the optimal management of populations within regional associations, but over time the need for a global approach for some taxa has become apparent.

This need created the momentum among regional associations and WAZA to call for a meeting of TAG Chairs from across the globe to share experiences, and EAZA's Danny de Man stepped in to organise the event, the first of its kind. Held early in June at Avifauna, located in Alphen aan de Rijn, the Joint TAG Chairs meeting was designed to provoke discussion on some of the most challenging aspects of regional and global collection planning via a series of networking events, presentations and workshops. Avifauna provided an ideal location for the roughly 140 delegates from all associations and facilities all over the world. John de Hoon's team at Avifauna did a seamless job of organising the conference and creating the right atmosphere for the talks.

PUTTING FACES TO NAMES

Many of the TAG Chairs present had never met their counterparts from the other regions, so in the first instance, the meeting provide the opportunity for experts to meet and share experiences with peers. The importance of establishing strong personal connections for global collection planning cannot be overemphasised, and the enthusiasm and dedication to the task brought to the meeting by all the delegates was impressive.

DEVELOPING THE GLOBAL FRAMEWORK

The principal challenge for all regional associations has been the long-term sustainability of populations in human care. In his keynote presentation EAZA Chair Simon Tonge emphasised the need for excellent husbandry in ensuring sustainable populations and the need to investigate legislative blocks to efficient animal transfers. He also noted the real cultural differences between the regions that needed to be understood. In the discussion forum that followed the talk, TAG Chairs worked to build a definition of what further cooperation would look like, what its priorities should be, and what obstacles would need

to be overcome in order to make it a reality. The afternoon zoomed in on animal transfers, exploring the existing frameworks and listing the obstacles and solutions per taxonomic group.

Discussions on day two turned to the One Plan Approach: conservation with full involvement from stakeholders both *ex situ* and *in situ*. Following a broad range of talks exploring the many angles that are important to get aligned including data management, capacity building and cooperation with IUCN SSC Specialist Groups, Kathy Traylor-Holzer from CBSG and Bengt Holst, Chair of the EEP Committee led a series of workshops on these topics.

LOOKING TO THE FUTURE

Following the presentation of case studies illustrating success in regional and global cooperation the final session presented the findings of the afternoon's workshops demonstrating not only the depth of knowledge and experience of the TAG Chairs, but also their enthusiasm for a joined-up approach to conservation. Feedback from the meeting has been extremely positive, and there is little doubt that more Joint TAG Chair meetings will follow in the future.

EAZA MID-YEAR TAG MEETINGS

Following hot on the heels of the Joint TAG Chairs Meeting were the mid-year TAG meetings of EAZA. Participants from the joint TAG chairs meeting were invited to take part and many colleagues from outside EAZA did just that. The meetings provided an excellent opportunity for specialists to get deeper into the detail of their taxon specific work. EAZA is currently looking at the results of a survey sent to participants of both meetings to try and learn how to evolve the idea of a TAG joint mid-year meeting and how often it should be held.

All of the presentations and a full report of the proceedings will be made available on www.eaza.net over the summer.



MISSION: GREAT NORTH EXPLORER

In collaboration with PBI and a French company that specialises in environmental education, the Mulhouse zoo education centre has created a game that invites young visitors and families to become Great North explorers. The aim of the game is to find evidence of climate change, understand why the musk ox is threatened by the warming of the Tundra permafrost and so on. Playing to learn and to become part of the climate plan is the main role of the game.

NEW LOOK AT THE ARCTIC

A NEW 10,000M² SPACE HELPS VISITORS TO UNDERSTAND THE THREATS AND THE ACTIONS THEY CAN TAKE TO LIMIT CLIMATE CHANGE AND ITS EFFECT UPON THE ARCTIC ENVIRONMENT

Brice Lefaux, Director, Mulhouse Zoo

In June 2014 the Zoological & Botanical Park of Mulhouse launched its brand new Espace Grand Nord (Great North Space), the biggest area to be renovated at the zoo for the last 40 years. Built in 1974, the enclosure had been feeling its age and was no longer meeting the norms of polar bear husbandry. With the improvement of animal welfare in mind, Mulhouse council decided to renovate the enclosure in 2008, and the zoo and community of Mulhouse drew up a plan two years later for a large-scale project to renovate the enclosure and integrate the polar bear exhibit into a bigger themed space. The polar bears became the ambassadors of the city's official climate plan, and the project was completed by the zoo, in association with city services and local companies following European husbandry guidelines for the bears, with the additional aim of preserving the natural surroundings of the site area. Project partners Polar Bears International (PBI) offered us fantastic photos by renowned Arctic photographer Daniel Cox and materials to supplement the educational aspect of the exhibit. The support of the EAZA Bear TAG was also essential in ensuring success.

From 2008 to 2014, €3.5 million has been spent on these enclosures for musk ox, polar bear and Arctic fox as well as a unique educational pathway, altogether covering an area of 10,000m². Since 2008, the Mulhouse zoo stall at the city's Christmas market has raised €160,000 to help build the new area, and the zoo would like to offer special thanks to the citizens of Mulhouse for their generosity. Moreover, a French gas company (GrDF) donated 40% of the budget needed for the education pathway.

A UNIQUE SPACE

Just inside the entrance at Mulhouse Zoo, panels invite the visitors to discover the three ecosystems of the Great North – tundra, taiga and ice. They then enter the immersive experience of a forest housing Arctic foxes and musk ox in naturalistic exhibits. Some 87 trees and 2,951 plants, mainly sourced from Nordic countries, have been planted; hundreds of tons of rocks have been imported from local suppliers for the musk ox enclosure, while locally sourced wooden barriers have been installed to hide the bear enclosure's metallic fence, providing a more realistic taiga environment.

The enclosure design also encourages visitor interest with information about global warming and sustainability placed strategically along the path. This messaging comes in the form of interactive panels which present the natural life of the animals, eyewitness accounts (by actors) of climate change presented in adapted replica Inuit cairns, educational props such as polar bear skulls, and panelling outlining a typical research trip of a PBI researcher. The path culminates at a 'research station' and the polar bear exhibit, which features a plunge tank so that visitors can get up-close views of the bears swimming.

As well as engendering public awareness and a positive emotional response, the enclosures are also fully functional for the management and breeding of animals, having been designed with help from EAZA specialists including Polar Bear EEP coordinator Janos Szantho; in the polar bear exhibit, the facilities feature an isolated maternity den with camera monitoring.

Go for the galago

RECENT CHANGES IN GALAGO TAXONOMY MEAN THAT WE HAVE TO LOOK AFTER OUR LESSER GALAGOS VERY CAREFULLY

Pavel Brandl, Prague Zoo

Several decades ago, we were happy with six galago species in a single genus on the African continent. Today, we have almost 20 different species in five genera. Galago systematics and taxonomy is at a similar stage as other small nocturnal primates: using not only morphology, but also behavioural ecology, bioacoustics and molecular markers we can understand the diversity of the family, and new forms are still emerging while several taxa are awaiting formal description. How has this new information influenced our breeding programmes for the 'lesser galagos' – the genus *Galago sensu stricto* – and are our populations safe from extinction?

Large lesser galago colonies, producing dozens of offspring, had been vanishing from our zoos in recent decades, but the present numbers look good again, especially in comparison with the population status five years ago, when the European studbook was founded. In 18 institutions, there are now about 140 lesser galagos – nearly double the population of five years ago – and only about half a dozen other prosimians enjoy similar or larger populations. From that angle, the lesser galago future looks bright.

A second look gives less cause for optimism. The population is biased towards males with several zoos housing no females at all. In addition, the number of institutions successfully breeding galagos is rather small – the most successful facilities are Moscow, Prague, Riga, Ostrava and Amersfoort zoos. Furthermore, the taxonomic status of our galagos was until recently unclear, and a high percentage of animals had been mislabelled.

To solve the puzzle of our galago status, all the major lines in Europe have been sampled for DNA. The results are interesting – besides about a dozen southern lesser galagos (*Galago moholi*) in four institutions, the other lesser galagos are true northern lesser galagos (*Galago senegalensis*). But they are clearly separated into two



different clusters, according to their origin. The separation is so sharp, that the ESB decided to keep them as two different gene pools. To support this, a bioacoustics study is also underway. There is also behavioural support – the so called 'Guinea' line is represented by animals that mostly live only in pairs or small groups. The 'Ghana/Togo' line is represented by tolerant animals living in large multimale-multifemale groups, with the very occasional fatally aggressive incident. Splitting the whole population into the two asymmetric parts again put the problem of numbers back on the table. While 'Ghana/Togo' animals are quite numerous and most of the breeding is done using that line, the 'Guinea' galagos number only 32.

Southern lesser galagos are another story. They were always less numerous, but as they were originally thought to be *Galago senegalensis* subspecies, they were on many occasions mistakenly mixed with the latter. After thorough analysis of the studbook data it appears they never bred together, as would be expected by their differing taxonomic status. The only exception was an interbreeding of a captive-born *Galago moholi* with a male of unknown status imported from Somalia, possibly a Somali galago (*Galago gallarum*) – but this hybrid line has now died out. A

year ago, the southern lesser galagos were facing extinction, after the collapse of one of the last two breeding European colonies. Only two females in breeding age were left. Prague Zoo has gathered all the residual animals and exchanged the surplus with SSP. This increased our female stock and there is still hope.

Several years of preparation, research and discussions led to an improvement of our galago populations. The total number almost doubled and several new institutions started to keep the species. Almost all holders should be in potential breeding situations soon, before the end of 2014. Breeding has restarted in Berlin Zoo and Rostock is the first of the new participants to enjoy successful reproduction. Traditional holders are still continuing their work, and in the first three months of this year, Moscow Zoo witnessed the birth of no fewer than 20 young!

We are still far from the safe point, but it looks as if these diminutive nocturnal acrobats from the African bush will flourish in our night houses. They are fantastic animals for nocturnal mixed exhibits – with springhares, aardvarks and many others. But they can also live also in mixed exhibits with diurnal species – hyraxes, small porcupines and so on – offering an unexpected bonus for visitors.

Back in the pink?

ONCE ON THE BRINK OF EXTINCTION, THE PINK PIGEON OF MAURITIUS IS INCHING ITS WAY BACK, THANKS TO A COORDINATED BREEDING PROGRAMME



Catherine Francescon, Mauritius Pink Pigeon EEP Coordinator, Bird Keeper, Durrell Wildlife Conservation Trust; David Jeggo, Head of Bird Department, Durrell Wildlife Conservation Trust; Kristine Schad, Population Biologist, EAZA Executive Office

The Pink Pigeon (*Nesoenas mayeri*) is endemic to the island of Mauritius in the western Indian Ocean, where it was once common. Since colonisation, Mauritius has undergone massive habitat destruction so that only 3% of native forest remains. In addition, introduced macaques, mongoose, rats and feral cats predate nests and adult pigeons, and invasive plants reduce the suitability of surviving forest for pigeon breeding and foraging. The island also suffers periodic cyclones which cause further degradation to the forest.

When Gerald Durrell first visited the island in 1976, only 20 to 30 pink pigeons survived in the wild. They were confined to the remaining forested regions in the Black River Gorges, the Savanne Mountains and Bel Ombre, and by 1990 that had declined further to a mere 10 wild individuals.

A captive breeding programme was established in 1976 at the Gerald Durrell Endemic Wildlife Sanctuary in Mauritius. By 1984, sufficient birds were available for a trial release and, in 1987, releases into areas of native forest began. Led by Carl Jones, release methods have been perfected and combined with other intensive management techniques provided by the Mauritian Wildlife Foundation (MWF), resulting in a population of free-living pink pigeons. There are currently seven sub-populations in forest fragments throughout the

..... south of the island, one of which is on Ile Aux Aigrettes – an off-shore island. The entire population is monitored daily by MWF through supplementary feeding stations, identifying birds three times daily at the feeding stations, nest watches, disease prevention and predator control.

ADDING POPULATIONS

..... The free-living population has reached 400 individuals and struggles to surpass this threshold. In 2012, the seventh sub-population was formed in Petrin, an area of forest close to two of the other sub-populations and transfer of some birds has been seen amongst the three. This has increased carrying capacity of the area and in the coming years, three further sub-populations will be formed which will give the opportunity for the population to push closer to the target population size: 600 free-living pink pigeons.

..... Further population growth is limited by introduced disease, in particular *Trichomoniasis gallinae*, which was brought in by exotic pigeons and doves. Due to the lack of suitable habitat, food shortages also persist so that free-living pigeons rely on supplemental feeding at each site.

..... The IUCN Red List Category therefore remains as Endangered, though it is hoped that its status will be down-

listed to Vulnerable in the not too distant future. In 1977, the captive breeding programme expanded to Jersey. Offspring from Jersey were distributed to other institutions and in 1992 the Pink Pigeon EEP was approved, then one of only 19 bird EEPs. At the end of January 1992, the EEP comprised 93 birds, an increase of 26 over the first year. In 1982, 16 birds were also sent from Mauritius to the US, where a Species Survival Plan (SSP) was established and grew to 90 pigeons by 1998.

Pink pigeons can prove challenging to breed in captivity and institutions sometimes struggle to produce offspring at all. Problems can be overcome with the correct husbandry and a colony of 'foster doves' which can aid with rearing the squabs. Greater success is achieved when institutions can hold more than one pair so that there is opportunity to exchange birds if, as commonly encountered, birds are not compatible.

Population numbers, both here in Europe and the US, are not currently at their peak, and haven't been for some time, so a more intensive management evaluation and strategy is currently underway. In March 2014, the Mauritius Pink Pigeon EEP held a meeting at the Durrell Wildlife Conservation Trust. The EEP Coordinator, Species Committee, and advisors participated in assessing the demographic and genetic status of the EEP population and how it relates to the free-living population in Mauritius.

CURRENT NUMBERS

As of March, the EEP population consisted of 53 individuals (30 males, 22 females, and 1 unknown sex) at 13 institutions. Ten of these 53 individuals are currently at AZA (Association of Zoos and Aquariums in North America) institutions, but will soon transfer to EAZA institutions, after AZA made the tough decision to phase out this species. Two breeding groups will remain at San Diego Wild Animal Park, who plan to join the EEP to work in close cooperation with this ongoing recovery programme.

The EEP Species Committee determined that the Mauritius Pink Pigeon EEP will uphold a conservation role in EAZA by:

- maintaining a demographically and genetically stable and behaviorally competent assurance EEP population for reintroduction to the free-living population in Mauritius
- further integrating the EEP and free-living Mauritius populations through consistent pigeon transfers to and from these populations
- continuing and strengthening the relationship with Mauritius by providing institutional support, volunteers, research, and other expertise. For more information: <http://www.mauritian-wildlife.org/>
- functioning as an ambassador and fulfilling an unique conservation education story (e.g., island species, almost extinct, reintroductions, etc.).

Due to the small size of this population, breeding for demographic reasons is a high priority. The EEP will increase reproduction to meet demographic needs, while at the same time attempting to prioritise breeding among the most genetically valuable animals (ie those with the lowest mean kinship and from under-represented founder lineages) in order to maximize the genetic potential in the population. The Mauritius Pink Pigeon EEP pedigree is 95% known, but increases to 100% after pedigree assumptions. The EEP population is descended from 19 founders with no additional

potential founders remaining in the population. The gene diversity is 88.44%. Based on current population parameters and historical population growth rate (deterministic life table $\lambda = 1.085$), this population is projected to retain 54.1% gene diversity for at least 100 years. However, with such a short-lived species, it may be more appropriate to look at the gene diversity maintained for the next 10 generations (32 years; generation length (T) = 3.2 years). With this length of time, the population is projected to retain 74.8% gene diversity for 32 years.

GENETIC ASSESSMENT

Faye Willman and Jim Groombridge at Kent University, UK are currently working on a molecular genetic assessment of the EEP population and comparison with the free-living population. Preliminary results indicate unique alleles found in the EEP population that are no longer found in the free-living population. Based on their final results, we will re-evaluate whether certain lineages should be prioritised for reintroduction into the free-living population.

With such a small population, we initially need to concentrate reproduction by holding more breeding pairs at fewer institutions that agree to a five-year commitment of holding three to five breeding pairs with additional backup breeding males at either their institution or a geographically close institution. These core breeding institutions will initially hold one to five breeding pairs along with a foster colony for rearing eggs and squabs. However, as the population size increases, more institutions will be needed.

To grow the population to the EEP Species Committee's recommended target size of 100 individuals in the next five years, at a rate of 13% growth ($\lambda = 1.13$), the population needs to produce approximately 21 to 30 hatches per year. To compare these projections with the past five years, the annual number of hatches has ranged from 6 to 31 per year, so these goals may be a little high, but could be realistic with institutions focusing more on breeding all reproductively mature females. There are currently only 20 reproductively mature females and many of them are currently not with a male or need to be transferred themselves (some from AZA), so reproduction in this first year may be low while there is little room for reproductive failure in the future.

To fulfill the role of integrating the EEP and free-living Mauritius populations, five pigeons from the EEP population are recommended for transfer to the Gerald Durrell Endemic Wildlife Sanctuary, Mauritius. The current goal is to set up 10 breeding pairs in order to reintroduce offspring to the free-living population with the aim of building to 600 birds. In the future, pigeons will also be transferred from Mauritius to the EEP population to maintain the link between these two populations.

The EEP population will be re-evaluated at the next long-term management plan in approximately five years. Once the free-living Mauritius population has been determined to be stable, the EEP population role and goals will also be re-evaluated.

The dodo and blue pigeon, both endemic to Mauritius, were quickly wiped out during the colonisation of the island. It seems that the pink pigeon narrowly escaped following them into extinction and with the help of the EEP it may have an even more secure future.

Rat packs



CLOUD RATS ARE EXCELLENT FOR MIXED EXHIBITS, AND ONE SPECIES IN PARTICULAR IS CALLING OUT FOR NEW HOLDERS

Pavel Brandl, Prague Zoo

Big, strikingly black-and-white and fluffy, Northern Luzon slender-tailed cloud rats (*Phloeomys pallidus*) successfully occupy a niche in several EAZA nocturnal houses. The first four animals came from Avilon Zoo, Luzon, to Prague Zoo seven years ago. Growing interest in the Philippine fauna meant that a further 16 specimens soon arrived, either from Avilon or NY Bronx zoos. Fifteen of these have now bred and formed the base for the current population of 67 cloud rats in the ESB, and almost 100 young have been born in Europe during the past seven years.

With a strategy of establishing as many breeding pairs as possible, the population dynamics are very healthy, and the programme currently enjoys a surplus of young animals. As relatively short-lived animals, rodent populations have to reproduce constantly to maintain and improve populations. In recent years, the surplus has been able to be taken up, but the productivity of the current season (10 offspring born so far) means we need to make a call for new holders of the species.

Phloeomys cloud rats are the biggest murid rodents in the world, weighing

more than 2kg. They are arboreal and nocturnal, and youngsters adapt to this life by clinging firmly to their mother's nipples, travelling all night through dense canopies under her belly. As cloud rats are leaf- and bud-eaters, they tend to be easily overfed in captivity, so the diet should be well-balanced, avoiding sugar, and using as many greens and as much browse as possible. Despite having big teeth, cloud rats are gentle giants and they easily kept in the mixed species exhibits, including bettongs, *Dorcopsis* kangaroos, tree kangaroos, squirrels, small porcupine species, mouse deer and, best of all, tupaia. The preferable types of exhibit are the nocturnal houses, with the reversed light regime, but cloud rats can live also in normal exhibits with other diurnal species.

In their native land, Northern Luzon, the slender-tailed cloud rat is the only large arboreal rodent not immediately facing the threat of extinction. On the other hand, in some local areas they are definitely overhunted. Despite their still positive conservation status, they make a fine ambassador species for the conservation of other cloud rats, as all

the other species are threatened on various levels. We can also practise our cloud rat skills with this easiest of species to keep. Most of the European holders of Vulnerable Southern Luzon slender-tailed cloud rats (*Phloeomys cumingi*) or Endangered Panay cloudrunners (*Crateromys heaneyi*) first gained their experience from keeping the Northern Luzon slender-tailed cloud rat. Two of them, in fact – Prague and Pilsen zoos – actually keep all three species.

As about two-thirds of the European animals were born in three Czech zoos, the informal council for the species is held by Prague, Jihlava and Ostrava zoos. They still have about 40% of European rats and, as they are located close together, the ability to make decisions and set up new pairs for interested holders is usually quick. More zoos now keep them – the newest collaborators being Chester, Paris and Moscow zoos – but the ambition is to establish a network of about 25-27 holders with a combined population of about 100 specimens.

So do contact the ESB – there's a young cloud rat just waiting to be added to your exhibit!

On the Vietnamese front line

IN VIETNAM, A RAGING BATTLE IS BEING FOUGHT TO PROTECT SOME OF THE WORLD'S MOST CRITICALLY ENDANGERED WILDLIFE

Douglas Hendrie, Chief Technical Advisor, Education for Nature – Vietnam

Rapid economic growth in Vietnam over the past 20 years has resulted in the emergence of a wealthy class with plenty of disposable income, and thus consumer demand for luxury foods and traditional medicines that were formerly beyond reach has also risen sharply, far beyond sustainable levels.

Vietnam's own native species are among these foods and medicines, with the first major casualty being the killing of Vietnam's last rhino in 2010. Tigers and elephants, along with the recently discovered saola and a few of the world's most critically endangered primates, are not far behind as wild populations are barely holding on. Rising consumer demand in Vietnam also threatens global populations of some species; as numbers decline in Vietnam, suppliers are pushed to source animals and products from neighboring countries and beyond.

The battle being fought in Vietnam has gained global attention in the past few years, largely inspired by the devastating loss of rhinos in South Africa and indications that Vietnamese consumers, along with those from China, are responsible for these losses. However, the fight is not new to the passionate and young team at Education for Nature – Vietnam (ENV) who have been working tirelessly for nearly 15 years to suppress rising consumer demand in their own country, and protect endangered wildlife in Vietnam and around the world.

ENV was founded in 2000 as Vietnam's first nature and wildlife-focused organisation. ENV focuses 100% of its efforts on the protection of wildlife and it has remained steadfastly committed to a strategy that incorporates three critical components; reducing consumer demand, strengthening enforcement, and working with decision-makers at the central and provincial levels to both strengthen the law and advocate for sound policy decisions in relation to

SMART APPROACH

Recognising the opportunities presented by the rise in use of smart phones in Vietnam and the need to move with technological advances to effectively engage the public, ENV has been working with developer James Campbell over the past nine months to create an application that would provide an easy and practical means for the public to report crimes to ENV.

The process is simple: for example, if someone observes a gibbon, the user only needs to open the application, snap a photo or two, fill out a few simple fields describing the violation, and then 'submit' the report with the touch of a button. The information, along with the photos and GPS coordinates of the violation, will be immediately transferred to ENV's Wildlife Crime Unit. ENV can then contact the appropriate agencies with precise information about the nature and location of the violation, permitting a more effective and timely response by the authorities.

ENV would like to thank James Campbell for his dedication in developing this app and IT consultant Nguyen Manh Canh for his support in setting up and testing the application in Vietnam. ENV also wishes to thank the Humane Society International – Australia for its support in developing this important tool, which is currently available for Android devices, and will soon be released for IOS and Windows mobiles. It can be downloaded at www.envietnam.org.

wildlife protection.

While ENV's activities are critical to the long-term protection of wildlife, social attitudes do not change overnight, and reaching the tipping point in broad societal awareness may take longer than the time some species have left, given the immense pressure they are currently facing.

As a result, ENV focuses an equal amount of attention on supporting and strengthening enforcement agencies and activities, which can have impact 'right here and now'.

No single activity in this field in Vietnam is quite paralleled in terms of impact than the development of ENV's Wildlife Crime Unit (WCU). Established in 2005, the WCU operates a toll-free hotline, through which the public can report wildlife crime. The initiative is aimed at engaging the public and securing their active involvement in helping protect wildlife by reporting crimes.

When crimes are reported, case officers immediately respond by transferring critical information to the appropriate law enforcement agencies and then tracking each case through to conclusion, documenting the outcome and results on ENV's Wildlife Crime Incident Tracking System database. Since 2005, more than 7,000 cases have been handled by WCU, resulting in the confiscation of hundreds of animals ranging from bears and otters to gibbons, lorises, and turtles. Markets have been closed, and more than 1,000 businesses have also voluntarily met compliance requirements, such as removing exotic meat products from restaurant menus, after ENV issued warnings after receiving reports of violations.

ENV also maintains an army of volunteers, mainly in prominent urban areas in 32 provinces, that serve as members of the ENV's National Wildlife Protection Network, helping to monitor business establishments in their areas and ensuring their compliance with the law.

Since 2008, the crime unit has evolved and now works on investigations in support of law enforcement agencies, organising 'sting' operations involving high priority species sales, and continually developing a growing informant network that has provided critical



information which has led to both seizures of pangolins and other wildlife. This work contributes the mapping and profiling of major criminal networks operating in Vietnam.

Perhaps the greatest achievement resulting from the establishment of ENV's Wildlife Crime Unit has been the increased level of transparency and accountability of authorities in the handling of wildlife protection. Where cases were once resolved internally with little or any external visibility, ENV's sustained focus on the outcome of each case, including the documentation of major seizures of wildlife, punishment, and disposition of confiscated animals, has succeeded in delivering a new level of transparency to wildlife protection and increased attention on wildlife crime, that has led to a steady level of improvement across the board.

Building upon ENV's crime fighting success, new campaigns to target consumer crime were developed in 2013. ENV's consumer crime campaign in Hanoi and Ho Chi Minh City involved inspections of all 2,326 restaurants, bars, pet shops, and

traditional medicine shops in four districts of each city, the results of which were reported to the authorities. Working with district authorities, ENV was able to secure an overall 42% reduction in consumer crime over the eight districts surveyed, with individual districts ranging from 24% to 61% reductions in violations after a four-month period. Currently, additional consumer crime campaigns are being carried out in further districts in Ho Chi Minh City, Hanoi, Hue, and Da Nang, and several other major cities.

However, the constantly increasing level of internet use in a rapidly developing Vietnam has also created new challenges and battlegrounds, as online adverts for illegal wildlife products can now be found on websites, forums and social media networks. ENV responded by initiating an internet crime campaign in late 2013, resulting in the logging of 1,039 advertisements on websites and forums offering wildlife. As a result, 849 of the links, accounting for 81% of the total, were successfully removed. A second phase of the internet campaign is now under way.

ENV is also engaging with technological advances in terms of crime reporting; in July, ENV released a smart phone application which will enable users to easily and quickly provide photos, the GPS location, and the other necessary details of violations to ENV, enabling an efficient and timely response by the authorities.

The battle to protect wildlife will not be won with a smart phone application or a successful consumer crime campaign, but ENV sees that the tide is turning. The collective efforts of many young Vietnamese people, working to protect their wildlife, and sharing in Vietnam's global responsibility for wildlife protection, are beginning to yield results. The only question remains: will the impacts arrive in time to save many of the species that are teetering on the edge of survival?

Find out more about ENV (English language website) at www.envietnam.org. Its latest newsletter can be found here: http://envietnam.org/images/Spring_2014.pdf. To donate to ENV visit <http://www.envietnam.org/index.php/how-you-can-help/donate>.

Don't exit through the gift shop

WHY CREATIVITY, CONNECTION TO NATURE AND INSPIRING ANIMALS ARE KEY TO MOTIVATING PEOPLE

Ralph Underhill, Public Interest Research Centre

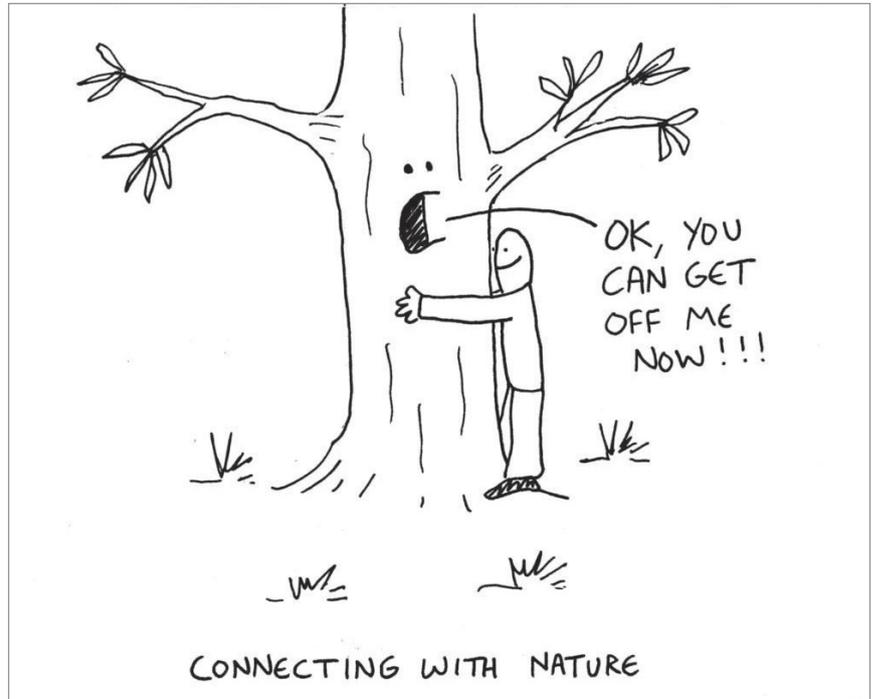
Sometimes I think I prefer animals to people. I find it hard to muster the same level of enthusiasm for telling stories about people that I can when talking about the natural world. Ironically, this love for the natural world has actually pushed me closer to people: through my work in conservation for the RSPB and other organisations I realised that saving the things I care about would only be possible if others cared about them too. After trying to avoid them for much of my life the species I now spend most of my time researching is *Homo sapiens*.

While working for the Public Interest Research Centre (PIRC), I have learnt a lot about human motivation. Although I love a good graph or statistic, psychological research shows that facts alone don't motivate people. If they did, don't you think adverts – the ultimate science in human persuasion – would have a lot more graphs and a lot fewer meerkats?

Our rational, fact-processing mind is just one constituent part of something far more complicated. Although many of us may think we are responding to evidence, it is actually our values and emotions that most influence our response.

Research has shown that we all hold the same underlying values and can therefore be motivated about the same things; it's just that we prioritise our values differently. We all have values that make us care more about the natural world and values that make us think more about ourselves, and our surroundings are key to deciding which set of values we give priority to.

Studies have shown that our values can be engaged by what we read or experience. If I read about sloths I may feel more connected with nature, engaging my values that relate to concern for the natural world. If the piece includes amazing photographs then this engagement effect is likely to be even stronger. Experiences are more powerful still. If I see a real sloth in a zoo this is likely to have more



10 TIPS FOR COMMUNICATING:

- 1) **Nature is amazing:** Talk about how amazing and inspiring the natural world is.
- 2) **Wildlife is awe-inspiring:** Use amazing pictures to highlight the beauty and wonderful weirdness of wildlife.
- 3) **Facts aren't enough:** If facts motivated people don't you think adverts would have a lot more graphs in them?
- 4) **Explain the issue:** If people don't understand the problem or how to fix it they won't get involved.
- 5) **Get active:** Let people know what they can do to help.
- 6) **Get creative:** Encourage people to get involved in creative ways.
- 7) **Fear can paralyse:** Highlight the problems but don't overdo the threats – when people feel threatened, they are less likely to take action.
- 8) **We can all help:** It's not about lone heroes, it's about people pulling together to take collective action. We can't succeed on our own and messages should reflect this.
- 9) **Nature is priceless:** Putting a price on something changes how we feel about it (for the worse). Try to avoid the economic case for nature.
- 10) **People are nature too:** Show our connection with the natural world by showing people in the natural world.

impact than any words or images. Finally, seeing an animal in its natural environment is likely to be the most powerful: anyone who has seen any animal in the wild from a hedgehog to a sloth instinctively knows this to be true. When these values are engaged, we are more motivated to act in ways that align with them. This means that the experience of seeing a hedgehog,

or a sloth, is likely to temporarily make us more likely to want to help these animals out.

Advertisers have used this knowledge of psychology to sell products. They know that they can get us to buy things by appealing to values associated with our self-interest. They sell us cars not on their safety record or fuel efficiency but as status symbols. They use fun

and excitement, to encourage us to book holidays and so on. If your only objective is to sell products to a mass audience, this approach works well.

However, conservation is not a product that can be sold. The belief that we can appeal to people's self-interest in order to create concern about the environment or support for conservation is misguided. While we might increase membership by using special offers, free gifts with memberships and celebrities – ultimately these are all likely to reduce the motivation of our members to act on behalf of the environment. In our attempts to 'meet people where they are', we are presuming that people are self-interested (the research shows clearly that most of us are not!), and we are making them more likely to stay 'where they are' as we are simply reinforcing the values that work against our goals.

Repeated experiments have shown that experiences and communications that appeal to self-interest simply make people more self-interested. By using such techniques it is likely we are encouraging apathy and a passive membership. However, if we are to face up to the immense challenge of the decline in wildlife we need active citizens.

Many of the messages in our society and the media are focused on self-interest and wealth. Why is it that the news updates us quarterly on the profits of supermarkets, but not on the successes of our conservation effort? It is important that conservation organisations provide a counter to these messages and aim to inspire people.

So how can we motivate people to care like this? Getting out into nature, advocating the wonder and beauty of the natural world and creating a sense of community are all things that increase people's motivation to act in environmentally positive ways – even in those few who give more importance to self-interested values (power and status for example).

WHAT DOES IT MEAN IN PRACTICE?

In the report released last year, Common Cause for Nature, we sought to apply an understanding of values to the communications and work of conservation organisations. All zoos and aquariums produce a lot of written



6 TIPS FOR VISITOR EXPERIENCES

Get hands-on: Petting zoos and talks where kids can touch and interact with animals is likely to increase their connection with nature.

Give visitors opportunities to be creative: Provide opportunities for visitor to express themselves.

Talk to people: Make sure there are opportunities for people to find out more, don't push membership on people at every opportunity.

Make it accessible: Find ways to help those who can't usually afford to visit.

Measure novel outcomes: Don't just look at visitor numbers look at other indicators that reflect wider experiences.

Don't exit through the gift shop: Make sure there is something to do after the gift shop and before the visitor leaves.

material, whether it is interpretation, newsletters, press releases or your website. An understanding of a values approach shows you that all of these have the potential to have a positive or negative motivational impact on the audience (see box).

But although incredibly important, communication is only one thread. We need to bring an understanding of values into all our work. The Common Cause for Nature report also outlines recommendations for several work areas as well as ways in which organisations themselves can adopt working practices to strengthen their own values.

Zoos and aquariums are amazing places for people to connect with nature, especially for those with limited access to the countryside. My own

passion for wildlife and the natural world was ignited by trips with my dad to the zoo.

There are massive opportunities to foster values associated with environmentally beneficial behaviours in this environment. Do we put as much emphasis on what people think about when they leave as the impression they get when arriving, for example? First impressions certainly count but so do last ones. What is the last thing a visitor experiences when leaving after a great day out? Is it something that makes them feel inspired by the natural world or is it an argument with their child about whether or not the purchase of a kaleidoscope is necessary?

That the gift shop provides much needed revenue for the running of your organisation is not in doubt but is it possible that by seeking to maximise the revenue we have lost something else from the experience?

Try and produce signage that is clear about why you have a shop and think about something between the shop and the car park that is likely to inspire people. It could be a member of staff available to answer any burning questions about animals. It could be signage about British wildlife to look out for when you get home. It is a simple step but it says something about what your organisation feels is most important.

Most of you reading this will already be putting a lot of this into practice. I have heard about and experienced a lot of great work in zoos. For example I recently heard that one aquarium uses a metric of 'interesting conversations' with visitors as a way of recording their effectiveness. The Common Cause approach basically sets out scientific rationale for why some of the great stuff we already do feels right. So keep doing the amazing stuff you do already and use these tips to make the experiences you offer and communications you produce even more effective.

For more information about PIRC and Common Cause for Nature visit <http://publicinterest.org.uk/> or email ralph@publicinterest.org.uk.



Veterinary matters

TWO STORIES FROM THE WORLD OF VETERINARY WORK

HORNBILL RECONSTRUCTION



Attica Zoo has been keeping and successfully breeding African grey hornbills for the past six years, writes *Jean-Jacques Lesueur, Director, Attica Zoo*. In early 2013 the male from our breeding pair started showing some erosion of the upper mandible of his beak. We attributed this to some sort of fungus, or lack of minerals, or vitamin imbalance, and he was treated accordingly, but over the months the erosion continued and in early April, one morning we found out that most of the upper mandible had dropped off. Only two little extensions had remained on both upper sides of the beak, and of course he was unable to eat or drink.

The only solution was to try and build a replica of the upper mandible and attach it to the remaining parts.

For this we used thermo-plastic veterinary bandage ('Vet-Lite') which we use as support for broken limbs. This product comes in the form of rigid netting which is dipped in hot water to shape it. Before doing this on the bird's beak,

we tested it twice on a piece of wood, as this material dries very quickly. When we were sure we could do it properly, we hand-molded it and fitted it directly on the remaining part of the beak. For added security we filled in some gaps with super glue and then coloured it the natural colour of the upper beak. The whole procedure took no more than 45 minutes. The hornbill's first reaction was to scrub his beak on his preferred perch, and after 15 minutes he was eating pinkies, his preferred treat. He is now using his new beak as if nothing had happened.

Attica would be grateful to hear of other cases of African grey hornbill mandible erosion, and would be glad to share the benefits of their experience with reconstruction with other keepers of large-billed birds. While we are still unsure as to the causes of the illness, the least we can say is that with a little ingenuity, there is no reason to write off animals suffering from it.

VETERINARY CONFERENCE NEWS

In May 2014 over 350 zoo vets converged on Warsaw to attend the International Conference on Diseases of Zoo and Wild Animals, writes *Stephanie Sanderson, Director of Science and Education, Chester Zoo*. This annual conference of the European Association of Zoo and Wildlife Veterinarians, and the Leibniz Institute for Zoo and Wildlife Research (IZW), brought together wildlife scientists and veterinarians from all over the world to share knowledge and to stimulate future research on the health care, diseases

and conservation of both free-ranging and captive wildlife.

This conference is always highly interactive and this year was no exception. Workshops were conducted on anaesthesia, avian orthopaedics, hoof trimming and reptile medicine. Facilitated discussions were held on TB, ethics and complications. The annual meeting also provided an excellent opportunity to further the work of EAZWV Infectious disease, TB and Veterinary Advisor groups – all topics that feed into the collaboration

between EAZA and EAZWV.

Conspicuous by his absence this year was Murray Fowler, former President of AAZV and a member of EAZWV, who died aged 85 and will be sorely missed by the zoo and wildlife veterinary community (see page 5).

Warsaw Zoological gardens were wonderful hosts and are to be congratulated on delivering an excellent scientific and social programme. We are now already planning our next meeting to be held in Barcelona from 13 to 16 May 2015.

RETURN OF THE DINOSAURS!

2015 will see dinosaurs return to the big screen in a big way. Take advantage of the heightened interest in these prehistoric creatures with an outdoor exhibit of our popular animatronic dinosaurs at your zoo!



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