QUARTERLY PUBLICATION OF THE EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

ZOOQUARIA

WINTER 2016

ISSUE 95

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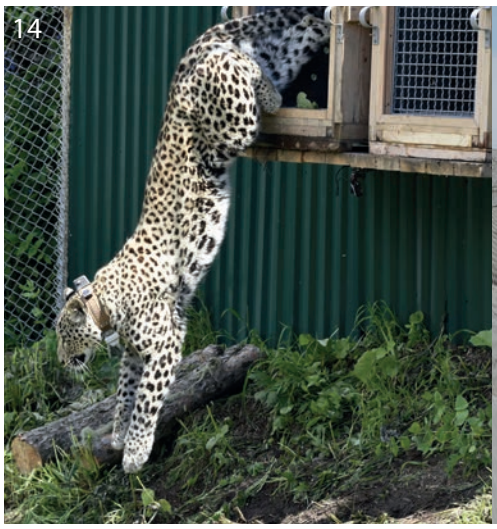

Zooquaria

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FROM THE DIRECTOR'S CHAIR

In the previous issue of *Zooquaria* I wrote about differences between perception and reality. I focused on the importance of cooperative working and communications to ensure that people's perceptions meet the reality that is presented by modern, progressive zoos and aquariums. Making sure that we are honest, transparent and proud of our work is essential, so that more and more people understand and support what we do. Since writing that article I have been fortunate enough to attend a range of conferences where there have been many opportunities to bring the perception of 'what zoos do' closer to the reality. In the rest of this article I will speak mainly about the IUCN World Conservation Congress. You can find out more about our own Annual Conference on page 8 and the WAZA Annual Conference on page 10, in an article written by WAZA Executive Director Gerald Dick.

The IUCN World Conservation Congress in Hawaii was attended by more than 10,000 people, who took part in thousands of presentations, workshops, knowledge cafés and high-level discussions on a diverse range of conservation-related topics. Having received a few 'Why are you here?' and 'What do zoos have to do with conservation?' queries when I attended the IUCN Regional Forum back in December last year, I was interested to see if this perception also held true on a global scale. Whilst I concluded there is still work to be done to raise the profile of what we do, I also came away feeling that much had been done to address the misconception that zoos are not involved in conservation. During the Congress, zoos and aquariums were able to demonstrate the variety of conservation work in which we are involved by taking part in a number of presentations and workshops. These included a presentation on EAZA's support for the IUCN SSC Asian Species Action Partnership; an SSC Pavilion Event showcasing the role of living collections in species conservation; the launch of the new IUCN Guidelines for Assessing Species' Vulnerability to Climate Change – made possible by a partnership between the IUCN Climate Change Specialist Group and Yorkshire Wildlife Park Foundation (YWPF) – and some groundbreaking ideas in the EAZA co-supported workshop on 'The Art of Species Conservation' led by former EAZA Director Dr Lesley Dickie, EAZA Education Committee Chair Sarah Thomas and Synchronicity Earth's Jessica Sweiden. These are just a few examples of how zoos and aquariums have been able to bring our diverse conservation efforts to a wider audience.

During the Congress it was also pleasing to see the range of Motions that zoos and aquariums were involved in co-sponsoring and actively supporting. These Motions set the work priorities for IUCN and its members into the future. EAZA was delighted to be involved in co-sponsoring a range of successful motions, from calling for the closure of domestic markets for elephant ivory and ways to reverse the decline of Africa's iconic giraffids megafauna to preventing electrocution and collision impacts of power infrastructure on birds and mitigating the impacts of oil palm expansion and operations on biodiversity. The more that zoos and aquariums engage with IUCN – through direct membership, involvement with Specialist Groups, support of red-listing processes, joining the #NatureForAll campaign and in many other ways – the greater our involvement is and the louder our voice will be. In this way we will be able to change the perception about the lack of conservation work that we do into the reality that zoos and aquariums are key players in conserving wild animals and places. If you or your institution are not already involved in some way with the work of IUCN, I encourage you to get involved.

To finish, I'd like to make a link between the IUCN Congress and our own Annual Conference. In her opening speech of the Congress the IUCN Director General, Inger Andersen, said 'We are done discussing, it's time for action.' I had that quote very much in my mind during my own opening presentation in Belfast, but not because I felt the need to apply it to EAZA Members; in fact, the exact opposite. Yet again I was faced with preparing an opening presentation summarising all the work EAZA has carried out over the last 12 months and agonising over not being able to fit everything in. Yes, we are a community where it is essential to discuss our current and future activities but, boy, do we also take action! I'm immensely proud of all that we have achieved in the last 12 months and would like to thank every one of you for your continued good work and EAZA spirit. I can't wait to see what next year will bring.

Myfanwy Griffith
Executive Director, EAZA

NOTICEBOARD

COUNCIL DECISIONS ON MEMBERSHIP

THE EAZA COUNCIL met on Friday 23 September and approved the following membership changes that had been recommended by the Membership and Ethics Committee:

1. New Applicants

a. Full Member status granted
i. Drayton Manor Zoo, UK
ii. Zoo du Bassin d'Arcachon, France
iii. Parc Animalier d'Auvergne, France
iv. Parc ZOO du Reynou, France
v. Ölands Djur & Nöjespark, Sweden
vi. ZOO Košice, Slovakia (former CFM)
b. Denied Membership
i. Dartmoor Zoo, UK
ii. Kirkley Hall Zoological Gardens, UK
c. Candidate for Membership (New)
i. Kiev Zoo, Ukraine

2. EAZA Accreditation Programme Screenings

a. Maintain Full Membership
i. Wildlands, Emmen, Netherlands
ii. Curraghs Wildlife Park, Isle of Man, UK
iii. Birdland, UK
iv. La Palmyre Zoo, France
v. Kittenberger Kálmán Növény- és Vadaspark, Hungary
b. Delay decision until April
i. Belfast Zoo, UK
ii. Amneville Zoo, France – 1 year temporary membership has been extended by six months to April 2017.
c. Candidate for Membership (downgrade from Full Member)
i. Novosibirsk Zoo, Russia
ii. Almaty Zoo, Kazakhstan
iii. Nikolaev Zoo, Ukraine

3. Corporate Membership

a. Corporate Membership approved for the following companies:
i. A. Hartrodt
ii. Lamartine Construction
iii. KaGo & Hammerschmidt
iv. TAA Group GmbH Co. KG
v. Deerns Nederland BV
vi. Arie Blok Animal Nutrition
vii. TVK Zoo Design

IUCN NEWS

Jon Paul Rodríguez has been elected Chair of the IUCN Species Survival Commission. Jon Paul is one of the best-known biologists in Venezuela and was responsible for the creation of the Red Book reference guides to the country's fauna. He has previously worked in the Commission for Ecosystems Management applying Red List techniques to habitats and will continue to advocate for close links between the SSC and the worldwide zoo and aquarium community.

EAZA REPRESENTATION

EAZA Accreditation Officer April Adams attended the WAZA Accreditation Summit in August, hosted by Singapore Zoo. The summit aimed to use the experience and expertise of EAZA, AZA and ZAA to help regional and national associations from across the world to start the process of designing their own accreditation regimes. The summit reviewed existing schemes and compared them to an 'animal welfare only' accreditation system devised by Wild Welfare based on the Five Domains model of welfare science. The EAZA Accreditation Programme stood up well in comparison to all the models presented, and EAZA will continue to work with WAZA to assist other associations in the implementation of similar programmes worldwide – a major step forward for the world zoo community. The summit featured representatives from ALPZA (Latin America), CAZA (Canada), AZA (USA), ZAA (Australasia), JAZA (Japan), SEAZA (Southeast Asia) and PAAZA (Africa).

EAZA MEMBERS RAISE MONEY FOR CONSERVATION WITH POKÉMON GO

Pokémon GO, a location-based reality game for mobile phones, was launched during the summer and created a wave of interest around the world. Players use their phone's GPS to locate and 'capture' little virtual creatures who appear on the screen as if they were in the same real-world location as the player. After the launch of the game, EAZA Members noticed more and more visitors searching for virtual creatures during their visit. A number of zoos had the idea of allowing players to stay in the zoo during special opening hours for a small donation, but this rapidly evolved into a huge opportunity to raise public awareness and funds for conservation.

Bristol Zoo was one of the first EAZA Members to open after hours especially for Pokémon GO players; more than 3,000 users attended a fundraising event based on the game. A couple of weeks later Antwerp Zoo attracted 15,000 visitors to its Pokémon event, raising €12,000 for conservation. Other EAZA Members have followed suit, including Amersfoort Zoo (4,000 visitors) Allwetter Zoo Muenster (3,000 visitors), Vogelpark Avifauna (2,200 visitors) and Wuppertal Zoo (1,500 visitors). Most of these events replaced entrance fees with a suggested donation to conservation causes.

Whether by organising special events or by linking Pokémon to their real-life endangered counterparts in the animal kingdom, EAZA Members have found many creative ways to use Pokémon GO to place conservation work front and centre in the public consciousness.

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NEW ARRIVALS

ANDREW OWEN, CHESTER ZOO

THE JAVAN GREEN MAGPIE – COLLABORATIVE CONSERVATION IN ACTION

THE JAVAN GREEN MAGPIE (*Cissa thalassina*) is a member of a uniquely coloured Asian lineage of tropical crows. This beautiful bird is adorned with bright apple-green plumage, rich chestnut wings, red legs and a coral-red bill. A distinctive black band extends from the base of the bill to the nape under a short green crest. Black eyebrows can be raised when the bird is alarmed or excited.

And it certainly has a lot to be alarmed about. This critically endangered bird, endemic to the lush mountain forests of west Java in Indonesia, truly is teetering on the brink of extinction. This near-mythical species is regarded almost as the Holy Grail for ornithologists visiting Indonesia, with fewer than a handful of sightings in the past decade. Sadly, the Javan green magpie has not eluded the keen eyes and ears of the bird trappers and is high on their hit list due to the insatiable and unrelenting demand for the caged bird trade.

But where there is life, there is hope, and in 2011 – and at the eleventh hour – advised by experts from Birdlife International and TASA (the Threatened Asian Songbird Alliance), a plan was hatched. Supported for many years by the Zoological Society for the Conservation of Species and Populations (ZGAP) and a number of EAZA institutions, the Cikananga Conservation Breeding Centre (CCBC), part of Cikananga Wild Animal Rescue Centre, established a conservation-breeding programme for the magpie using a nucleus of birds rescued from the trade.

The aim was to build an insurance population, with the longer-term aim of returning captive-bred birds to the wild in the future – assuming that safe, trapper-free havens can be found. Within a year, under our guidance, CCBC had reared their first offspring. The population was growing steadily when, in 2014, disaster struck as a series of robberies resulted in almost 150 birds being stolen.

Although the Javan green magpies were not the main target, it was felt it would be prudent not to keep all of our eggs in one basket and to establish sub-populations of the birds in other locations. Five birds were sent to Taman Safari, Bogor as the first step towards establishing a regional breeders' network, and in October 2015, after more than a year of detailed planning and negotiations, six pairs arrived at Chester Zoo as the founder birds for a new EEP.

The birds had come from Cikananga via a six-month quarantine period at Taman Safari and, despite a nerve-shredding 38 hours in transit, they all arrived safely. After quarantine at Chester, a pair was sent to Durrell Wildlife Conservation Trust in Jersey and another pair to Prague Zoo.

As with any breeding programme, the first 10 months has not been without its highs and lows, including the death of one adult male at Chester, the rearing and then loss of two young at Prague and health issues with the female at Durrell. However, great progress has been made and the population has grown by almost 34 per cent thanks to the successful rearing of four young birds from two of the Chester pairs.

The programme to save this very special bird from extinction is a truly collaborative one involving species champions, conservation partners, husbandry advisors and dedicated keepers across two continents. With hope and hard work, the future for this amazing bird may be a little brighter.

GREAT BLUE TURACO FLEDGED

IN 2013 VOGELPARK AVIFAUNA received 5.6 great blue turacos (*Corythaeola cristata*) through a confiscation in The Netherlands. Of those 5.6 birds, 1.2 were loaned out to Weltvogelpark Walsrode in Germany, which already kept a single male. With the remaining 4.4 birds, attempts were made to breed, 2.2 were placed in the tropical house (one in an aviary and one in a large free flight) and 2.2 were kept behind the scenes.

The species is known in aviculture to be difficult to breed, and figures show that in the care of zoos fewer than 25 per cent of the chicks that hatch actually survive. At Avifauna, sadly, it proved to be no different.

Eggs were laid in multiple pairs and chicks were born, but none survived to the fledgling stage. The worst setback occurred when the breeding female in the free flight enclosure of the tropical house died (due to haemorrhaging caused by an acute bacterial infection) whilst she was on the nest with two chicks; the chicks also subsequently died.

Things changed for the better in February 2015 when Avifauna received a 2013 zoo-bred female from Antwerp Zoo to replace this lost female. The newly established pair had their first clutch of

GAIAZOO

BAT-EARED FOXES BORN IN GAIAZOO

IN 2008 A BAT-EARED FOX COUPLE (*Otocyon megalotis*) named Ziggy and Stardust arrived in GaiaZOO *writes Minke Geense, headkeeper carnivores, GaiaZoo*. The following year they produced offspring and were able to rear one female, Che-che, taking good care of the cub together. In 2010, Ziggy and Stardust had another cub. Unfortunately the one-year-old youngster interfered a lot with the new cub, and it died after a few weeks.

Luckily, we found another zoo for Che-che, so that Ziggy and Stardust would be able to take care of any new offspring. In 2011 Stardust delivered young in a self-dug hole and, the following year, in a nestbox we made for the couple. Unfortunately all of the young died and disappeared within some days, and for some years after that, there were no further offspring.

As an experiment, a few weeks before the breeding season, we moved Ziggy to a separate enclosure in another part of the zoo. After three days he was reunited with Stardust, around the date on which they had copulated in previous years. Within a minute of being reunited, they copulated. Nine weeks later, we heard sounds from the nestbox from the parents which indicated that they had young. Strangely enough, the offspring did not survive and disappeared within a few days. We tried this strategy for three years in a row without success. In order to understand what was going wrong, last year we installed cameras in the nestbox and were able to see that the parents took good care of the young at first. One of them was with the young at all times, and we could see that they were suckling well. However, we also noticed that Ziggy was sometimes very rough in the nestbox; he would dig vigorously and the young would be thrown around the nestbox. After a few days, the young became weaker and died one by one, and were later eaten by Stardust.

In 2016 we were able to build a new, bigger and sunnier enclosure for our bat-eared foxes. It is more open but there are plenty of natural places planted with high grasses where they can hide and observe the visitors. They mostly spend their time in front of the grass, but when alarmed, they can run into it to hide. We also provided better digging opportunities, providing sand that is easier to dig in and a hill where they can also dig. However, we believe that what really made a difference for the animals is that the fence is no longer closed, but is open and much lower, so that they can see what happens around them and are part of the bigger world.

We decided to not interfere this time and just see what would happen. In March we observed a copulation. We prepared two nestboxes and installed cameras in them, but the foxes preferred a self-dug hole. In May, Stardust remained in the den, so we presumed she had delivered her young there. Luckily, a few days later she showed up in one of the nestboxes – and she was not alone. Thanks to the camera, we could see two healthy young, with both parents taking good care of them. We were able to do a health check on the young and they are doing very well. The parents are very protective; we needed three keepers to catch the young when they needed deworming. Soon after that, Stardust took the young back to the self-dug den, so we weren't able to observe them very often. But as they grew, the young appeared with more frequency each week. They are a male and a female; we called them Megan and Otis, and we hope they will contribute to the ESB in the near future. We are convinced that the new enclosure contributed to Ziggy's and Stardust's wellbeing and their success in raising their cubs this year.

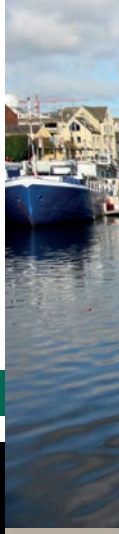
IN VOGELPARK AVIFAUNA

two eggs by July 2015 in the free flight of the tropical house, and on 2 August one egg hatched, but the chick died within five days. Fortunately the birds were seen nesting again in early 2016 and in January the first clutch of the year was laid. On 13 February, after an incubation of 30 days, two chicks hatched; one unfortunately died after five days, but the other was successfully reared and became the first great blue turaco to fledge in Vogelpark Avifauna. The story got even better when a second clutch was laid in June, resulting in one chick hatching on 29 July. It was wonderful to see the young bird from the first clutch assisting its parents in rearing the new chick; this chick also fledged successfully. At the time of writing, the pair are incubating the third clutch of this year and both youngsters are still around; we hope they will assist in rearing another offspring of this beautiful species in Vogelpark Avifauna.

United in Belfast

EAZA'S 2016 ANNUAL CONFERENCE WAS DEFINED BY AN ATMOSPHERE OF ENTHUSIASM, COMMITMENT AND OPTIMISM FOR THE FUTURE

David Williams-Mitchell, EAZA Communications and Membership Manager



KEYNOTE SPEAKER STEFAN LEINER WITH EAZA CHAIR DR THOMAS KAUFFELS

The EAZA Annual Conference is the flagship event of the Association and the premier forum for zoo professionals in Europe. This year's event, hosted by Belfast Zoo at the state-of-the-art Waterfront Centre, was no exception, and brought in more delegates than ever before. The agenda was, as usual, packed with meetings planned months in advance, as well as those chance encounters that lead to some of our most progressive work. Unusually for Northern Ireland at the end of September, the weather was very nearly as kind as the welcome from the people of Belfast and the staff of the zoo.

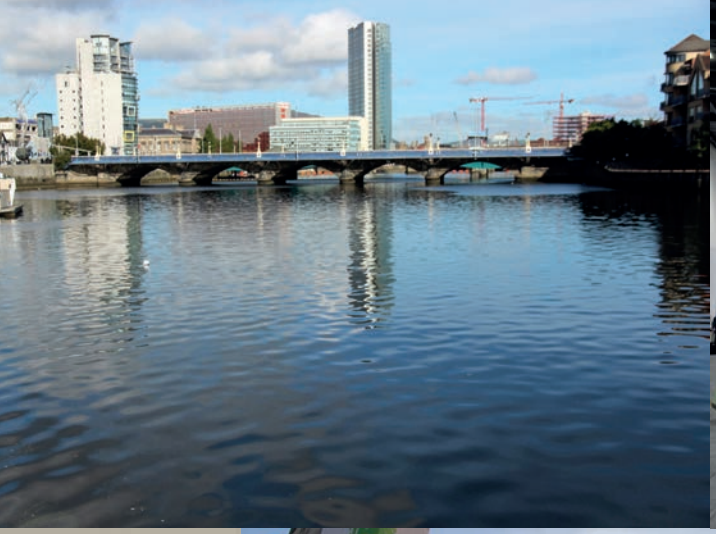
The organisation of the conference was, of course, not without challenges. Things had changed significantly since the original bid to host the Conference was made and accepted in 2012; the financial situation of the zoo has been well documented in the media, but the decision of zoo staff and the City Council to go on with the Conference points to a strong commitment to the continued operation of the institution, and gives heart to the zoo's friends both in Belfast and in the EAZA community. Given that the situation was not easy either for the hosts or the Association, it is a testament to both that meetings, training sessions and social events all went off with very few complications.

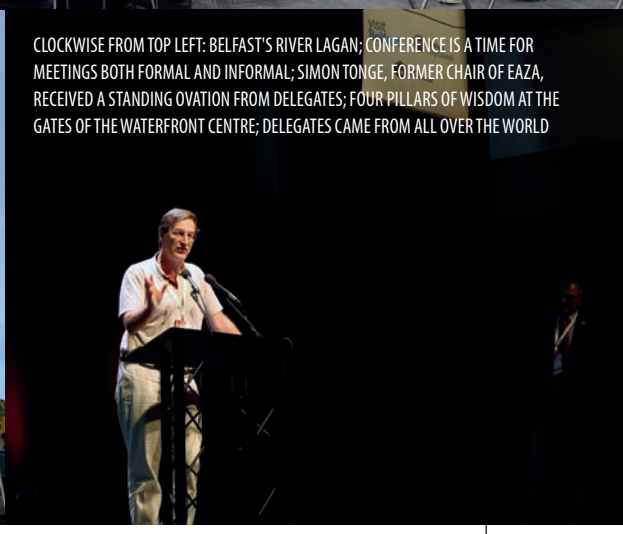
The Conference icebreaker event was held in the spectacular Belfast City Hall, a monument to the city's central role in the worldwide trade in linen, as well as a reminder of the essential role that shipbuilding has played in the city's history. The latter was underlined by the sight of the gantries of the Harland & Wolfe yards across the Lagan river as well as the regenerated area of the Titanic quarter, site of the Titanic museum and venue for the gala dinner four days later.

These great symbols of past certainties could not help but act as reminders to the zoo and aquarium community that structures, however successful in the past, must evolve constantly in order to meet the needs of the modern world. Nowhere was this more apparent than at the Annual TAG Chairs meeting held on Tuesday 20 September, where planning for a new EEP structure continued. With strong direction from TAG Chairs regarding the requirement to tailor objectives and goals for EEPs according to the conservation, education and research needs of each species, EAZA breeding programmes are set to become one of the world's most focused and effective *ex situ* conservation resources. The structure is due to be submitted for approval by the EAZA Council in April of 2017.

The role of EAZA Members in conservation worldwide and within Europe was also highlighted by two keynote speakers in the opening plenary on Wednesday 21 September. Dr Braulio Dias, Executive Secretary of the Convention on Biological Diversity, stressed the importance of zoos to conservation and education, recognised that the world is currently not yet on track to fulfil the CBD's Aichi Targets by 2020, and called on zoos and aquariums to continue to do more to engage the public in biodiversity awareness. Stefan Leiner, Head of the Biodiversity Unit at the European Commission's Directorate General of the Environment, reinforced this view by providing an assessment of the state of play of the EU's own Biodiversity Strategy and the role of EAZA Members in helping the Union to catch up on the fulfilment of its targets. He also provided updates regarding the Invasive Alien Species Regulation (stressing that EAZA Members should not assume that derogations would be available for zoo collections) and the REFIT assessment of the EU Zoos Directive. What was clear from both speeches was that the speakers' organisations understand zoos and aquariums to be a vital part of conservation, research and education initiatives to protect nature, an important reassurance in what is sometimes a hostile political environment.

The Conference also featured three themed plenary sessions, focusing on the work zoos and aquariums can do in communities both local and virtual; on the work being done by Members in Southeast Asia to conserve endangered species, including the Bali starling (*Leucopsar rothschildi*) and the saola (*Pseudoryx nghetinhensis*); and on the work being done by EAZA's





CLOCKWISE FROM TOP LEFT: BELFAST'S RIVER LAGAN; CONFERENCE IS A TIME FOR MEETINGS BOTH FORMAL AND INFORMAL; SIMON TONGE, FORMER CHAIR OF EAZA, RECEIVED A STANDING OVATION FROM DELEGATES; FOUR PILLARS OF WISDOM AT THE GATES OF THE WATERFRONT CENTRE; DELEGATES CAME FROM ALL OVER THE WORLD

Committees towards maintaining the high standard of collaborative work between Members. The last of these provided a number of insights into not only the breadth of the cooperation being carried out by EAZA Members, but also the depth of the value that this brings to individual institutions, both large and small, and pointed to the fulfilment of Dr Dias's call for stronger outcomes from the community. EAZA would like to thank all of the inspiring plenary speakers for their time and infectious enthusiasm.

The EAZA Academy provided well-attended workshops during the Conference, including an introduction to the workings of the European Union, and tutorials on the use of two of the Association's most important new resources, the new EAZA Member Area website and the EAZA Conservation Database. The EAZA Population Management Advisory Group (EPMAG) also ran events to introduce their work and encourage more Members to become involved in work that will continue to prove vital with the new EEP structure upon its adoption.

As ever, Committee, TAG and EEP meetings made up most of the Conference programme. The importance of these meetings towards defining and fulfilling strategies for taxa, species and the community cannot be overstated, and EAZA is grateful for the commitment and enthusiasm shown by everyone involved. EAZA Executive Director Myfanwy Griffith pointed out at several opportunities that becoming involved in the work of these groups is not only relatively simple, but also essential for the future of *ex situ* conservation and public education and engagement in Europe; we would encourage all Members to check the Member Area regularly for opportunities to join these groups, or to contact the EAZA Executive Office for more information.

This spirit of democracy is also embodied in the EAZA Council, which met on the Friday evening of the Conference. While the Council's decisions are listed on page 5, it is worth noting that this, the first full meeting of the Council elected in the early part of the year, demonstrated a continued commitment to the progressive tone set by its predecessor. The value to Members of this direction was demonstrated as the Conference honoured two of its most illustrious leaders, retiring Great Ape TAG Chair Tom de Jong, and Simon Tonge, whose six-year tenure as Chair of the Association came to an end in April. Current Chair Thomas Kauffels paid tribute to both at the closing plenary, which also featured the traditional handover of the EAZA flag to next year's host, Wildlands Adventure Zoo in Emmen, the Netherlands.

If we can learn anything from the 2016 Annual Conference, it is that, regardless of the challenges of both coordinating a large and growing membership organisation for zoos and aquariums and organising a conference for its Members, Europe's zoo professionals are supremely adaptable, open-minded and ready for the future. In contrast to the great empty yellow cranes on Belfast's skyline, we should look to the communities of the city to understand that progress comes not from staking one's future on impressive but empty symbols, but from heartfelt discussion and the willingness to work towards solutions that may be less visible, but no less important for that.

EAZA thanks Belfast Zoo and City Council for their gracious hosting of the event, and thanks the conference organisers for all their assistance in making the event successful. Until next year in the Netherlands!

Leading the way

THE 2016 WAZA CONFERENCE FOCUSED ON HOW ZOOS AND AQUARIUMS MUST BE AGENTS OF CHANGE FOR CONSERVATION ACROSS THE WORLD

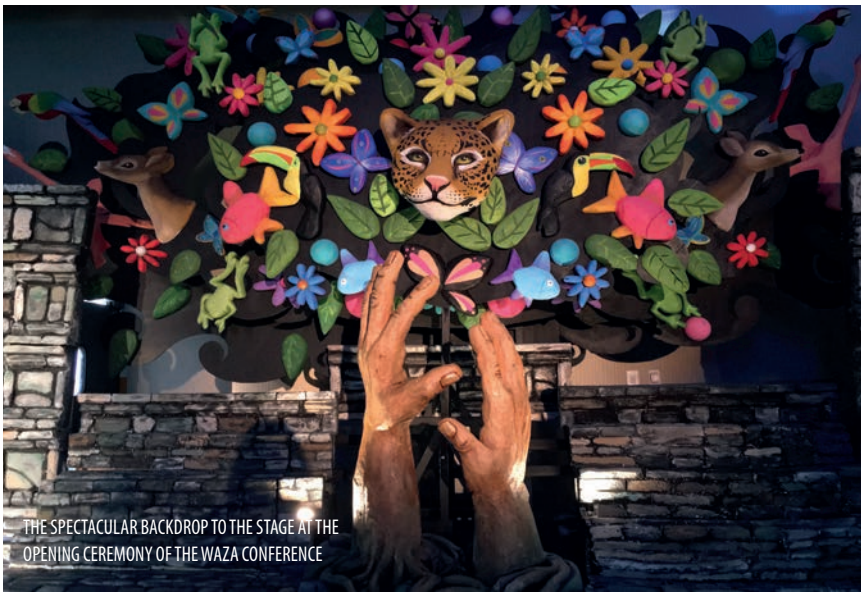
by Gerald Dick, WAZA Executive Director

The 71st WAZA Annual Conference theme – People and Conservation: Zoos and Aquariums as Agents of Change – defines one of the many challenges that the zoo and aquarium world faces as we try to fulfil our obligation to conserve biodiversity. With our in-house experts in zoological science, veterinary care and scientific research, we are uniquely poised to discover and integrate biological and socio-cultural solutions that are inclusive, comprehensive, and sustainable in the long-term.

This year's conference was held in Puebla from 9–13 October with outstanding support from the host, Africam Safari Puebla, and was a huge success. During the first administrative session, $78,000 (USD) was donated to WAZA partner TRAFFIC, the wildlife trade monitoring network. Earlier in the year, WAZA and TRAFFIC officially joined forces to combat the illegal wildlife trade by signing an MoU to intensify collaboration. Some of the key aims of WAZA member donations to the initiative will be to support TRAFFIC's policy and advocacy work on illegally trafficked species, which include critically endangered pangolins as well as tortoises and songbirds. Another focus will be data collection and analysis of trade information.

A spectacular opening ceremony initiated by local shamans kicked off the first day of the conference. Setting the tone for the rest of the week, keynote speakers Cristián Samper of the Wildlife Conservation Society and Lorenzo Rojas Bracho of Instituto Nacional de Ecología y Cambio Climático (INECC) discussed the importance of the role zoos and aquariums can play as agents of change on the global stage. Mr Bracho went on to cover the plight of the vaquita (*Phocoena sinus*), a critically endangered porpoise endemic to the northern Gulf of California and Mexico.

During the opening panel discussion entitled Biodiversity in Latin America – The Road to Cancun, announcements were made on collective community conservation action. It is worth noting that Mexico is the fifth most biologically diverse country in the world, making it an appropriate stage for a discussion of the urgency of the biodiversity crisis.



THE SPECTACULAR BACKDROP TO THE STAGE AT THE OPENING CEREMONY OF THE WAZA CONFERENCE

A number of innovative approaches to conservation challenges were presented by WAZA members such as Carolina Falla, Executive Director, Colombian Association of Zoos and Aquariums (ACOPAZOA). Ms Falla discussed how her organisation had worked to achieve the donation of land to the national parks of Colombia, via a joint programme involving European and Colombian zoos. Efforts led by the programme successfully reintegrated the white-footed tamarin (*Saguinus leucopus*), a species endemic to Colombia but highly endangered due to trade.

During the dinner sponsored by the Disney Conservation Fund at the Museo Amparo, Dr Mark Penning, Former WAZA President and current Vice President at Disney, announced that the Disney Conservation Fund will be supporting WAZA members to reconnect people to nature via a new grant scheme. Disney has established a similar grant programme with the AZA, called 'Nature Play' with the goal of better engaging families with nature. The new global grant administered by WAZA and powered by the Disney Conservation Fund will be open to WAZA members in 2017.

To conclude the conference, WAZA presented two prestigious international awards. The Heini Hediger Award for outstanding leadership in the zoo profession was awarded to former Houston Zoo Director Rick Barongi. The WAZA Conservation Award for excellence in conservation action was presented to Durrell Wildlife Conservation Trust. Presenting the awards, Susan Hunt, CEO Perth Zoo and WAZA President, said: 'It gives me great pleasure to announce this year's winner of the highest honour in the world zoo and aquarium community, the Heini Hediger award. Rick Barongi has proven his dedication to outstanding zoo leadership with a career in wildlife management and conservation that spans over 40 years. We are doubly honoured this year to present the first ever WAZA Conservation Award to Dr Leslie Dickie on behalf of Durrell Wildlife Conservation Trust. Durrell serves as a prime example of how zoos and aquariums can make a significant global impact. On behalf of WAZA, I want to thank you both for helping define what excellence in zoo leadership and conservation truly means.'

Promoting good practice

AS THE EU ZOOS DIRECTIVE UNDERGOES EVALUATION, EAZA MEMBERS ARE ENCOURAGED TO TAKE PART IN ITS FUTURE BY RESPONDING TO THE REFIT QUESTIONNAIRE

Daniel Nuijten, EAZA EU Policy Manager and Natascha van den Bosch, EAZA Capacity Building Coordinator

Conservation and sustainable use of biodiversity is regulated within the EU through the Birds and Habitats Directives, the EU Biodiversity Strategy, the EU Wildlife Trade Regulations (implementing the provisions of CITES) and the Regulation on Invasive Alien Species, all of which contribute to achieving the objectives of the Convention on Biological Diversity (and other international agreements). These regulations mainly focus on measures in the wild, on *in situ* conservation. However, *ex situ* conservation is also a requirement of EU law. In this context the EU Zoos Directive (Council Directive 1999/22/EC) was adopted to promote wild animal protection and conservation by strengthening the role of zoos in the conservation of biodiversity *ex situ*.

Member States are responsible for applying the provisions of the Zoos Directive and ensuring that they are enforced by adopting measures for the licensing and inspection of zoos. These measures ensure that zoos fulfil the conservation requirements laid down in the Directive.

DEFINING GOOD PRACTICE

Throughout the years a lot of good practice approaches have been developed by zoo associations and EAZA Member institutions. Building on this experience, in July 2015 the European Commission published the EU Zoos Directive Good Practices Document[1]. This document summarises the current state of knowledge and highlights good practices to support zoo professionals and Member States' competent authorities with a view to helping them achieve the overall objective of strengthening the role of zoos in the conservation of biodiversity.

The Good Practices Document deals with the background, aim and scope of the Directive (Chapter One) and addresses key elements from the Directive: the requirements applicable to zoos (Chapter Two) and the implementation and enforcement (Chapter Three).

The knowledge on good practices with regard to the provisions set out in Article 3 of the Directive are described in Chapter Two. Article 3 of the Directive contains the requirements for zoos: zoos should implement conservation measures. These measures consist of carrying out conservation, research and training activities, promoting public education and awareness, providing good accommodation for animals, preventing escape and intrusion of pests and keeping up-to-date records of the zoos' collections.

In Chapter Three, good practices are shared by Member States on licensing and inspection, zoo inspector training and penalties for zoos in case of non-compliance.

EAZA TRAINING

EAZA has developed a Zoos Directive Implementation Training aimed at Member States' competent authorities and zoo professionals, to give insight into the Directive and the Good Practices Document, as well as to provide guidance on the implementation of the Directive. The training consists of three parts: a theoretical part as an introduction to the theory behind and the key elements of the Directive (Good Practices Document); a practical part wherein a tour around a zoo is being undertaken to see and discuss how the zoo is implementing the Directive; and a concluding part wherein best practices are being shared.

VITAL FEEDBACK

The Directive itself is under evaluation as part of the European Commission's Regulatory Fitness and Performance Programme (REFIT). This programme involves a comprehensive evidence-based assessment of whether the current regulatory framework is proportionate and fit for purpose and delivering as expected. As part of the REFIT process, three different questionnaires have been sent out: one addressed to zoos in selected Member States, one addressed to selected federations (under which zoo associations fall) and one public consultation addressed to all interested parties and zoo visitors worldwide.

As the Directive has been of overall benefit to the European Zoo Community and does add value to underpin the work that we are doing, Members were encouraged to fill in the questionnaire(s) addressed to them. Some stakeholders within the EU questioned the need for a Zoos Directive as they felt there was no European added value, ignoring all the work that is being done by zoo associations and ignoring that some Member States might use a retracting of the zoo licence as an excuse to save costs and stop inspecting zoos. EAZA Member participation was therefore crucial.

If you would like more information on the EU Zoos Directive (Good Practices Document), the REFIT programme or the Zoos Directive Implementation Training, or want to participate in the training, feel free to contact EAZA's EU Policy Manager or Capacity Building Coordinator at daniel.nuijten@eaza.net and natascha.van.den.bosch@eaza.net

[1]The EU Zoos Directive Good Practices Document is available on: http://ec.europa.eu/environment/nature/pdf/EU_Zoos_Directive_Good_Practices.pdf

Missing the gorilla in the room

HOW ZOOS, GARDENS AND MUSEUMS CAN EMPHASISE THE IMPORTANCE OF CONSERVING LOCAL SPECIES

Danielle de Jong, EAZA Biodiversity Communications Coordinator

In 2010 a video popped up on the internet that showed six figures playing basketball. Viewers were asked to count the number of times the ball was passed. However, while they were focusing on the ball, many viewers missed a man dressed as a gorilla who walked between the players. The video was part of a research project into 'inattention blindness' ('The Invisible Gorilla' by Christopher Chabris and Daniel Simons, 2011), which showed that people often miss what is right in front of them. Unfortunately, a similar phenomenon sometimes occurs when it comes to wildlife conservation. While the public is focused on the rhinos, tigers and gorillas who need saving, they forget what is right in front of them – their own local species, who also need help.

This is where zoos, botanical gardens and museums can step in. Many such institutions understood the importance of local species and biodiversity and communicated it to their visitors long before Let It Grow was launched; but it is these same institutions that also understand the benefit of communicating this throughout Europe and signing up for the Let It Grow campaign. Joining the campaign also gives institutions a chance to renew and improve upon the great work that they are already doing. Parc Zoo de Reynou and the Natural Sciences Museum of Barcelona are both Let It Grow participants; here we explain how they have used the campaign to increase the effect of what they were already doing for local biodiversity.

PARC ZOO DU REYNOU

Already involved in the protection of its local biodiversity, Parc Zoo du Reynou joined the Let It Grow Campaign at the beginning of 2016 and set up various different activities and features focusing on biodiversity. Located at the starting point of the zoo tour, a natural path called 'sentier nature' has been made, which creates a direct and real link between the visitors and nature. Some panels along the trail provide information and advice on simple actions that can be taken to protect biodiversity.

Different 'edutainment' activities on local fauna and flora have also been created that appeal to visitors of all ages. The main aim is to raise public awareness of the species that we live with on a daily basis and how we can all help to protect them. The activities are in the form of games, including a quiz that covers various species (at different levels of difficulty), a card game (habitat, food chain and threats), a puzzle on hymenoptera (bee, wasp, bumblebee, Asian and European hornet) and a treasure hunt around the landscaped part of the zoo. Two biology students encourage visitors to participate, and provide additional information where needed. Information panels offer further detail about a number of current local species as well as some locally extinct species. Visitors can read the panels and use them as a tool to answer the quiz.

LEFT SPACE WITH LOCAL VEGETATION IN MONTJUIC PARC OF BARCELONA

Near the trail, a game has been set up using resin footprints that belong to local species. The visitors must identify the species – which can be found within the zoo – to which each footprint belongs. The zoo also houses several beehives, and information panels have been set up near the hives to highlight what can be done to help bee preservation.

From 25 July to 25 August, the attendance rate and preferences for each activity according to age were recorded. The visitors who engaged with the activities were chiefly adults, and children between five and 10 years old. In most cases the adults were parents helping their children, but a few non-parents also took part in the activities. They seemed to particularly enjoy the first level of the game card (habitat) and the hymenoptera puzzle, and the quiz proved popular with adults and children alike. This short study allowed the zoo to devise some improvements to some of the activities. For example, they concluded that the treasure hunt needed to be advertised more, and from another location within the zoo. The zoo also plans to develop activities that will appeal specifically to teenagers and children aged four and under.

NATURAL SCIENCES MUSEUM OF BARCELONA AND BARCELONA ZOO

The Natural Sciences Museum of Barcelona and Barcelona Zoo, members of Ecsite and EAZA respectively, were interested in the Let It Grow campaign from the beginning and have set up a variety of collaborations with public and private institutions within the city that are engaged with urban nature, green spaces and biodiversity.

The most important partner in this cluster of alliances is the Barcelona City Council, which is responsible for the

BIODIVERSITY OBSERVATION DURING BIOBLITZ BARCELONA 2016

management of the city's green spaces, urban nature and urban biodiversity. In particular, the Ecology, Urban Planning and Mobility Area provides municipal services linked to the public areas and city services that make life easier for people who live and work in the city.

In 2013 Barcelona City Council presented its Barcelona Green Infrastructure and Biodiversity Plan 2020. This demonstrated its commitment to preserving and improving the ecological infrastructure so that green spaces in the city created a real green network for the benefit of all citizens, constituting not only an environmental but also a social service to meet the challenges of the future. For a visual impression of the plan, view the video at https://youtu.be/yAgVz1gCG4c.

One of its key projects is the naturalisation of green spaces, which enriches and improves biodiversity, making ecosystems more resilient and less vulnerable. During this coming winter, in 20 parks in Barcelona, an area of 500 square metres will be naturalised either by setting it aside or even by sowing a meadow in it. These areas will be marked as part of the Let It Grow campaign run by Ecsite, EAZA and BGCI and will bear the signature of Barcelona City Council and the Natural Sciences Museum of Barcelona.

The Natural Sciences Museum of Barcelona will also participate in this initiative with two different activities, which will take place in these same spaces: installing 'bee hotels' and running surveying activities.

The Museum is working to understand and promote the presence of pollinators in the city and has already installed two bee hotels (which in fact are homes for pollinators) in its Botanical Garden. They intend to install further bee hotels in the Let It Grow spaces.

BioBlitz Barcelona is a biodiversity measurement activity organised every year for the last seven years as a collaboration between the Museum and Barcelona City Council. This year, nearly 1000 scientists, naturalists and volunteers raced against the clock to identify as many species as possible at the Montjuïc Hill and the adjacent Botanical Garden in Barcelona. By the end of the blitz, 249 species had been identified (excluding most insects, which need to be identified at the laboratory). Consequently, as part of the campaign, BioBlitzes will be set up in the aforementioned 'left' spaces to survey plants and animals and follow the evolution of these urban areas.

The 2011 inattention blindness study shows that certain people were able to spot the gorilla in the video immediately. Often these people were better at focusing on more than one thing at a time, as they were efficient multitaskers. The same applies to institutions such as zoos, botanical gardens and museums, as they educate people about many different aspects of the natural world and are excellent at performing a great variety of educational, communicative and social tasks. The examples above also show that despite the many activities and initiatives, such institutions do not lose sight of the bigger picture. With a few adjustments and innovations, they have used the Let It Grow campaign to point out the gorilla – or in this case, perhaps, the honey bee – that the public might otherwise have overlooked.

From the zoo to the wild

COLLABORATION BETWEEN THE PERSIAN LEOPARD EEP AND THE REINTRODUCTION PROJECT IN THE RUSSIAN CAUCASUS HAS BEEN A GREAT LEAP FORWARD FOR THIS BIG CAT

Marianne Hartmann, IUCN/SSC Cat Specialist Group and Behaviour Advisor of the Persian leopard EEP; José Dias Ferreira, Lisbon Zoo and Persian leopard EEP Coordinator; Alexander Sliwa, Kölner Zoo and EAZA Felid TAG chair; and Urs Breitenmoser, IUCN/SSC Cat Specialist Group co-chair

The Persian leopard (*Panthera pardus saxicolor*) was once widespread in the Caucasus, but declined in several phases during the 19th and 20th centuries. The final decline came after the disintegration of the Soviet Union. Today, only the occasional disperser is found in the Greater Caucasus, and only two population nuclei with reproduction remain at the southern rim of the Lesser Caucasus.

There is no chance for a spontaneous recovery of the leopard population in the north-western Russian Caucasus, as the source populations in Iran are too far away. Wild-to-wild translocation is impossible without jeopardising the remnant populations. Therefore it was decided to use leopards bred *ex situ* for a reintroduction, with the long-term goal of restoring a self-sustaining population. The reintroduction in Russia is part of a greater joint strategy of the Caucasian countries to protect and restore leopards in the whole Caucasus.

It is doubted that a reintroduction of a large carnivore using animals bred *ex situ* can be successful. However, using the experience of reintroducing smaller cat species such as Eurasian lynx (*Lynx lynx*), Iberian lynx (*Lynx pardinus*) and European wildcat (*Felis silvestris*), we infer that a reintroduction of a big cat can also be successful if the animals are raised with a minimum of human contact and are well socialised and well trained not only in hunting skills, but also in coping with novel situations.

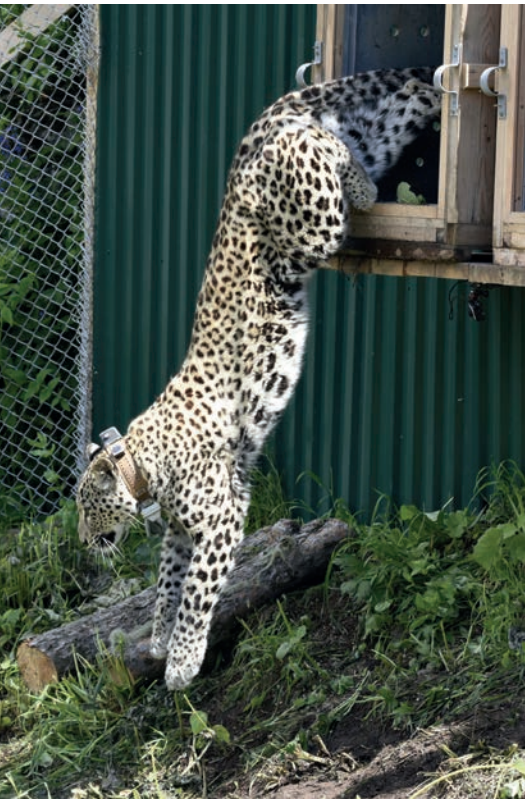
FIRST STEPS

In 2007, the Russian Ministry of Natural Resources and Environment (MNRE) approved a project submitted by WWF Russia and the Russian Academy of Sciences for the reintroduction of the leopard in the Russian Caucasus[1]. In 2009, a breeding and training centre was built in the mountain forest near Sochi, and in the same year two male leopards captured in Turkmenistan were sent to the Sochi Breeding Centre (SBC). Two female leopards from rescue centres in Iran were transferred in 2010 to the SBC as part of an agreement between Russia and Iran to exchange leopards for tigers. However, attempts to breed those leopards failed, and the MNRE began looking for assistance from IUCN and EAZA.

In May 2011, a Russian delegation of the MNRE visited the IUCN headquarters in Gland, Switzerland and made an official request for support for the programme. As a result, in October 2011, a delegation from IUCN and EAZA visited the SBC and the designated reintroduction area. A Memorandum of Understanding was signed on 18 April 2012 between the MNRE, the IUCN and EAZA regarding the collaboration for the breeding and reintroduction of Persian leopards into the Caucasian State Biosphere Reserve (IUCN category I) and adjacent Sochi National Park (IUCN category III). The practical collaboration was delegated to the EAZA Felid TAG, the Persian leopard EEP and the IUCN/SSC Cat Specialist Group.

As a first capacity development action, a delegation of five staff from the SBC were offered a 10-day training workshop at Lisbon Zoo, Portugal, and Nordens Ark, Sweden, in 2013, specifically tailored to the needs of the SBC regarding husbandry and veterinary care of leopards. In 2013 and 2014, several EAZA/IUCN delegations visited the SBC to assist with the improvement of enclosure structures, environmental enrichment, socialisation of cubs and training for living in the wild. For this purpose, the Caucasus Leopard Reintroduction Advisory Group (CLRAG) was

TOP LEFT: © MNRE; BOTTOM LEFT: © N.DRONOVA; CENTRE: © MNRE; RIGHT: © ANTON AGARKOV, WWF RUSSIA



established in 2014, consisting of the four co-authors of this article.

THE CHALLENGE

The Persian leopard EEP changed its strategy according to the needs of the reintroduction programme. The aim is to provide leopards for breeding of animals suitable for release in the SBC, but also young animals born in EEP institutions for direct release after an additional training in the SBC. These animals will be bred in specific facilities with a minimum of human contact. A Long Term Management Plan for the EEP guiding this new direction, funded by the EU LIFE fund, was elaborated in a dedicated meeting at Lisbon Zoo from 20–22 December 2016.

A proven breeding pair was sent from Lisbon Zoo to the SBC, which also stimulated breeding there, and in 2013 the first two litters were born, the very first litter in Sochi to the Lisbon pair. A total of 15 cubs were born in the SBC from 2013 to 2016; two of them died shortly after birth or in the first few weeks, one was hand-raised and 12 were and are currently mother-raised[2]. However, of these 12 cubs, only five are suitable for forming the founder group in the wild for kinship reasons[2].

The most important goal of the first releases at the population level is to immediately create a nucleus of resident animals to allow for reproduction. Therefore, it is crucial to release a sufficient number of individuals in the initial phase of the project to prevent inbreeding in the first generation, to stimulate breeding in the wild as soon as possible and to preserve the highest possible percentage of the founder genomes in the new population. To increase the number of animals for release and broaden the genetic basis, the two-year-old, zoo-born male Simbad was sent to the SBC in 2015 for training and subsequent release.

To support the reintroduction programme, the Felid TAG defined three new goals for the Persian leopard EEP:

1. *Increase the EEP population to provide leopards for further breeding or for release*. To achieve this, new holders were won, new pairs formed and breeding recommendations issued for the existing pairs.
2. *Improve the genetic composition of the EEP.* For this, the EEP gained four new founders by adding Teheran Zoo to the programme and by transferring male leopard Grom (representing two new founders, because his two parents are wild-caught leopards) from the SBC to Parc des Félins, France. In addition, a high-ranked pair was bred through AI at Nordhorn Tierpark.
3. *Improve facilities and husbandry*. This is currently being developed and will be published in another article.

The first three leopards, Akhune (m), Killy (m) and Victoria (f), born at the SBC in 2013 and 2014, were equipped with satellite collars and released in the Caucasus State Nature Biosphere Reserve in July 2016 [2, 3, 4, 5, 6]. They had received hunting training at the SBC by being provided with live specimens of their natural prey species, such as wild boar, ibex and deer, in 1-ha training enclosures featuring natural vegetation and topography for a period of at least one year. Three months after their release, the three leopards are still observed in the larger vicinity of the release site and Natalia Dronova, WWF Russia's species coordinator, has reported that they appear to be hunting successfully. So far, these animals bred *ex situ* seem to be demonstrating that they are able to survive in the wild, but the ultimate challenge will be the coming winter, and the definite proof of success will be the first reproduction.

WHAT'S NEXT?

The next big challenge will be to provide enough individuals of suitable genetic constellation for training and release so that they can form a population nucleus with reproduction but without inbreeding. The next step will be to boost the population growth by further well-targeted releases in order to prevent the loss of rare alleles through genetic drift as a result of a too-slow population growth. It is very important to establish a demographically well-functioning population and to broaden the genetic base as fast as possible, which can only be achieved by facilitating a fast population growth.

As the SBC has a very limited breeding capacity, it will not be able to provide enough animals to reach these goals. Therefore, the EEP is currently boosting the breeding to try to provide a sufficient number of mentally and physically fit leopards either for further breeding or for training for release. The SBC will need additional training enclosures in order to prepare more individuals simultaneously.

A successful reintroduction does not just mean releasing a few individuals into the wild. It needs careful planning of the breeding and of a long-term release concept considering number, sex and relationship of animals to be released. Furthermore, a long-term strategy is necessary for the expansion of the population potentially into human-used areas, as well as for the connection of the reintroduced population with other reintroduced or (recovering) autochthonous leopard populations, and also for the long-term genetic constellation of the population. It is an endeavour that requires a commitment of at least 20 years by all involved parties.

REFERENCES

[1] Rozhnov, V. V. & Lukarevsky, V. S. (2008). Program for reintroduction of central Asian leopard in the Caucasus region. Scientific Press Ltd. 65 pp.

[2] https://drive.google.com/drive/folders/0B015FpZRzoWRcTM4SUVFRzZ6RTg

[3] Kudryavtseva, D. (2016) WWF Russia, Press release.

[4] WWF International (2016) Media release.

[5] WWF Russia (2016) Press release.

[6] http://files.mail.ru/

A European treasure

THE FORTUNES OF THE WHITE STORK HAVE IMPROVED SIGNIFICANTLY IN RECENT YEARS THANKS TO A WIDE VARIETY OF CONSERVATION ACTIVITIES

Andrea Bračko, Zagreb Zoo, Croatia; Peter Galbusera, CRC, Belgium; Ursula Höfle, CSIC-UCLM, Spain; Catherine King, Weltvogelpark Walsrode, Germany; Jill Shephard, Murdoch University, Australia; and Carmina Noguera, Terra Natura Murcia, Spain

In keeping with the current EAZA Let It Grow campaign, which focuses on local biodiversity, here we highlight a sample of the activities that EAZA members have been involved in and/or that have been presented in EAZA forums in recent years regarding the much beloved and very conspicuous white stork.

The white stork (*Ciconia ciconia*) became extinct or nearly extinct in some central and northern European countries during the 1990s, and translocation projects were initiated in at least eight European countries. More recently populations have grown, sometimes dramatically, throughout much of its European range thanks to a combination of conservation activities and the adaptation of this stork to human-dominated landscapes, including changes in migratory behaviour. Glaciation cycles, agricultural intensification, urbanisation and, more recently, anthropogenic mediated climate changes have played a significant role in shaping past and current white stork population distributions and migratory behaviour. Understanding past and present developments in the populations of the white stork is essential for deciding the direction of future conservation efforts, as the natural habitats that are now used by these birds will continue to change.

WHITE STORK MIGRATION IN THE FACE OF CHANGE

Holger Schulz, project leader, and Peter Enggist, managing director of Storch Schweiz (Swiss Association for the Protection of White Stork), explained this project during an EAZA Ciconiiformes and Phoenicopteriformes TAG meeting in 2014. The urban waste landfills in southern Spain that many white storks from the western migratory population have come to rely on for food during the winter rather than migrating to Africa must soon be reduced to only three per cent organic matter in accordance with EU regulations. Project questions focus on what impact the removal of this food source will have on the storks' foraging and their movements and on understanding the trigger for this change in migration behaviour. Stork Schweiz has some partners who are important in this work, as will be seen below.

GENETIC RESEARCH AND CRC

At the same meeting, Peter Galbusera from the Centre for Research and Conservation (CRC) divulged the results of a population genetic study done via CRC in Belgium that characterised the distribution of genetic variation at the scale of the species range and between pre- and post-reintroduction populations. High levels of genetic diversity (which will be of increasing importance for future adaptation, for example to climate changes) were found, and results suggest a significant level of genetic mixing at both temporal and geographic scales; that is to say, there are no genetically differentiated migration pools. Additional samples from the Balkans recently seemed to confirm the genetic homogeneous nature of the white stork. This refutes the possibility that unnatural mixing of individual storks from the eastern and western flyways via translocations is responsible for the recent changes in migratory behaviour. Current avian distributions are strongly linked to the movement in and out of glacial refugia in the Iberian peninsula, Italy and the Balkans. There is only evidence in the existing genetic data to support a link to the Iberian refugium. Future research will look for evidence for genetic signals of the Italian glacial refugium. Furthermore, the genetic basis for migration behaviour will be investigated by CRC.

THRIVING ON WASTELAND – WHITE STORKS AND URBAN WASTE LANDFILLS

Ursula Höfle, a keynote speaker at the EAZA Conservation Forum

in Fuengirola in 2016, described some aspects of ongoing projects by researchers from the National Game Research Institute (IREC) of the University of Castilla-La Mancha in Spain together with Storch Schweiz to study the exposure of urban waste-eating storks to contaminants and pathogens and the effect of these on their physiology, behaviour and long-term survival. To date the studies have shown that storks feeding at the landfills are exposed to multi-resistant bacterial pathogens that pose a threat both to humans and animals, and may in the future make the storks unwelcome visitors to urbanised areas and pastures. Exposure to contaminants such as bromated flame retardants has also been evidenced. Surprisingly, preliminary results show little apparent negative effect of feeding on urban waste on the storks' physiology or genetic ageing at chick age but rather suggest an amazing adaptive response.

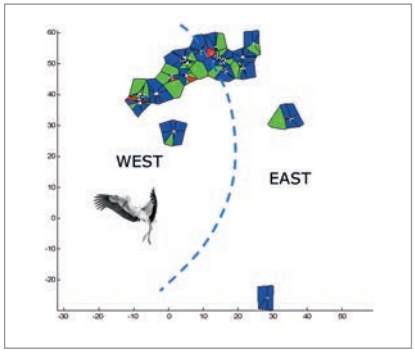
EUROPEAN STORK VILLAGE NETWORK

With the 'European Stork Villages' initiative, EuroNatur has set up a movement to help counterbalance the habitat loss of white storks in Europe. Each year since 1994 the foundation has honoured the contribution of a different village with the title 'European Stork Village'. These communities are internationally recognised as special cultural and natural heritage sites. Candidates for the title are villages or parishes with resident stork colonies in which the local people have put time and energy into the protection of the storks.

Carmen Domínguez Pedrera gave a talk at the Ciconiiformes and Phoenicopteriformes TAG in Lagos in May 2016 during which she told of the creation of additional wetlands in 2015 by the Municipality of Malpartida de Cáceres, one of the 15 European Stork Villages, for use by white storks and other wetland birds with funding contributions from EuroNatur and the Ciconia foundation. Additionally a new observation area for viewing white storks in the village was created.

EAZA ZOOS AND WHITE STORK RESEARCH AND CONSERVATION

Some EAZA zoos are partnering with



GRAPHICAL PRESENTATION OF THE (MITOCHONDRIAL) DNA ANALYSES OF HUNDREDS OF WHITE STORK SAMPLES. GENETIC CLUSTERS (REPRESENTED BY COLOURS) ARE SHARED AMONG (WESTERN AND EASTERN) MIGRATION POOLS, INDICATING (NATURAL) GENETIC MIXING ON A EUROPEAN SCALE. FIGURE BY JILL SHEPHARD.

Storch Schweiz to better understand migration. At Basel Zoo, for example, free-ranging storks living at the zoo have received transmitters to track their movements. Zagreb Zoo has also been tagging white storks in cooperation with the Storch Schweiz to expand the SOS Stork project to cover comparative aspects of white stork migration over the eastern flyway, as efforts previously focused on storks from the western flyway. Two juvenile white storks were tagged with satellite transmitters in Croatia in 2015 and two adults in 2016. Funding came from EuroNatur with a Wet Meadows and Pastures Small Grant for protection of feeding habitats and habitats on the migration route. Zagreb Zoo has been actively involved in a protection of white storks in Croatia since 2006 when it began providing white storks to strengthen the population in Čigoč, the first European Stork Village. Čigoč is part of Lonjsko Polje, the largest protected wetland nature park in Croatia, which is a designated Important Bird Area (IBA), and Ramsar site. A total of 37 juvenile storks have been released on to this site to date. Zagreb Zoo has joined the efforts by CRC in Belgium in 2014 to study genetics of stork migration by providing feather samples from the zoo rehab birds and from nestling Čigoč white storks during ringing.

ZOOS AS BREEDING HAVENS

Free-ranging white storks often breed at zoos, and Terra Natura in Murcia, Spain was pleased to report that a pair nesting over a 12m-high support pole for its 3000m^2 waterbird aviary successfully produced four chicks in 2016. The pair was apparently attracted to the five rehab white storks in the aviary and to the resources available in the park. Breeding efforts had been ongoing since 2013, but 2016 was the first year the pair was successful, and it was also the first time in more than 70 years that free-ranging white storks have bred in Murcia. Two of the chicks have survived to date, and their presence could be the start of white stork re-colonisation in this area in Spain.

ZOOS AS REHABILITATION AND REINTRODUCTION SITES

Some EAZA zoos that care for injured local wildlife receive many white storks, particularly in eastern Europe. Agnieszka Czujkowska, who is responsible for the rehab centre at Warsaw Zoo, which often receives 50 or more rehab white storks a year, is the white stork monitor for the Ciconiiformes and Phoenicopteriformes TAG. Her tasks are to provide an overview of the situation and to try to help place the many rehab storks in suitable zoos and in breeding centres for well-conceived reintroduction projects.

EAZA and other suitable zoos that would like to exhibit white storks are strongly encouraged to acquire rehab white storks, and zoos should limit breeding of surplus captive white storks.

Zoos have historically been sites for breeding and releasing white storks for reintroduction, and some EAZA and BIAZA zoos in the UK are currently involved in white stork reintroduction there. Many of the birds for these projects are being sourced in Poland, through cooperation with Warsaw Zoo.

IN CONCLUSION

There are many ways in which EAZA zoos can be involved in white stork conservation, ranging from contributing to research efforts and restoring and creating habitat to housing rehab white storks and providing our visitors with information about this important bird and how we can all be part of its conservation. Interested zoos are strongly encouraged to contact the Ciconiiformes and Phoenicopteriformes TAG for more information.

Changing places

ZOOQUARIA'S DAVID WILLIAMS-MITCHELL TALKS TO SIMON STUART, OUTGOING IUCN SPECIES SURVIVAL COMMISSION CHAIR, AND HIS NEWLY ELECTED SUCCESSOR, JON PAUL RODRIGUEZ, ABOUT THEIR THOUGHTS ON CONSERVATION AND PLANS FOR THE FUTURE


SIMON STUART

ZQ: Simon, I'd like to thank you on behalf of the European zoo and aquarium community for all that you've done for conservation over the past few years as Chair of SSC. Is there any achievement that you are particularly proud of?

SS: Surviving for eight years in the job! But seriously, I think one of the things I am most proud of is that we were able to gain agreement on IUCN's Key Biodiversity Area Standard. It was a hugely complex and controversial series of discussions, but at the end of the process we can define land, marine and freshwater biomes that contribute to the global persistence of biodiversity – a major achievement. From the point of view of zoos, it has been great to see such a growth in the connections between SSC and the zoo and aquarium community worldwide.

ZQ: Jon Paul, Simon has been very committed to the role of zoos and aquariums in supporting species conservation, especially through the One Plan Approach, and the Building Bridges initiative. Are you enthusiastic about the role that our community can play, and how do you think we can best support SSC during the next few years?

JPR: As SSC Chair, I believe the more we collaborate and combine our strengths the more we can achieve for species conservation. The EAZA community has a great deal of expertise across areas that are not traditionally the strength of our SSC Specialist Groups, (SGs) but could be incredibly useful at informing or driving the best course of conservation action. At the same time, the SSC is an immense network of conservation expertise that is well placed to provide advice and guidance on species conservation priorities and channels at global, regional and local levels. With this in mind, I look forward to expanding our partnerships with zoos, so that at least 30 new partnerships are established between leading zoos, aquariums or botanical gardens between 2017 and 2020, following the model developed by Kira Mileham and Simon Stuart during the last couple of years. I would also like to see at least 20 zoos, aquariums or botanical gardens identify a key species result of the IUCN Species Strategic Plan and take explicit steps to help us fulfil our targets for 2017–2020. The opportunities for collaboration are infinite!

ZQ: As you may know, EAZA is restructuring its EEP breeding programmes to ensure that the needs of species are addressed individually rather than by a 'one size fits all' approach. This implies a more active role for SGs in helping guide Taxon Advisory Groups to design the goals of each programme so that it reflects


JON PAUL RODRIGUEZ

the needs of the species globally, including in the field. How much would you say SGs know about this restructure, and do you believe that they would be willing to play a more active role in shaping EEP goals and objectives?

JPR: Some SGs work very closely with Taxon Advisory Groups and are aware of and involved in this restructure; however, these are the minority. The awareness of TAGs and the importance of connecting with them is something that we are seeing grow amongst SGs. Encouraging this is one of the priorities of Kira Mileham, the SSC Director of Partnerships.

I think it would be to everyone's advantage if TAGs and SGs worked more closely together. The challenge is finding a model whereby SGs, who like TAGs often suffer from lack of time and resources, can sustainably play a more collaborative role in shaping goals and objectives, not just with EAZA TAGs, but also with those from other regions such as AZA and ZAA. Capacity building partnerships between leading zoos, SGs and TAGs – for example a zoo providing a part-time programme officer for a SG – can go a long way to support this and provide a zoo with an opportunity to take a strong global leadership role for a given taxa. I'm sure also that ongoing commitments to the Joint TAG Chairs Conferences and growing communication between the TAGs of different regions as well as the SGs, will continue to be very helpful.

ZQ: SGs are largely responsible for seeking the funds they need in order to do their work. How well do you think that this has worked, and do you have any plans to change this structure? How could zoos and aquariums help with this?

SS: Because SGs are contributing expertise rather than conservation action, the amount of money needed to maintain their work isn't huge; the work done on Red Listing, policy and promoting the species to conservation partners isn't resource-intensive from a money point of view. I think the Building Bridges initiative is very effective in supporting SGs, from donations of running costs to the building of websites and publication of documents by zoos and aquariums. The best and most durable ways to work are specific partnerships, such as the partnership between Marwell Zoo and the Antelope TAG, where support comes from zoo staff, and involvement in the SG is built into their professional development programme.

JPR: My role is to help SGs achieve their diverse goals without interfering too much, and I plan to continue working this way! The partnerships already established between SGs and zoos, aquariums and botanical gardens are very promising and have been successful. I would like to see these partnerships grow, along with the involvement of zoos, aquariums and botanical gardens in the implementation of our Species Strategic Plan. Zoos and aquariums can help by communicating and working with both TAGs and SGs to set joint priorities and invest resources and unique strengths strategically as a coordinated community of the world's leading conservationists.

ZQ: Conservation goals can sometimes lead to controversial outcomes – I am thinking for example of the death of animals during reintroductions and the possible need to capture and breed animals in order to avoid their extinction. Have you seen an increase in animal rights activism against SSC, and do you think that it will hinder the conservation of species over the long term? What solutions do you have in mind to ensure that SSC can continue to work towards scientifically valid

outcomes, even if these become the subject of social media and media criticism?
SS: Animal Rights groups can work on a very emotive basis with a highly romanticised vision of what life for animals in the wild is like. They may be the basis of opposition to conservation capture, mortality of animals in reintroductions and controlling invasive alien species. Opposition from rights groups appears to be a growing problem for conservation organisations as well as zoos, and is one that I think we need to address. We need to be clear that conservation often requires boldness, and that the complexities on the ground often make simplistic solutions neither desirable nor workable. We also need to show that conservation has a moral and ethical basis at least as strong as that of animal rights.

ZQ: The Building Bridges initiative seems to have been quite successful since its inception, but there could be a danger that personal chemistry can hamper the building of links between SGs and EAZA Taxon Advisory Groups. Do you think that there is a way to overcome these obstacles?
JPR: I think that these challenges are part of any professional interaction between people. If conflicts arise we would address them individually, but I think that the best way to avoid them is to be transparent and clear about expectations from the outset. We will also be working more with our SG Chairs to encourage them to designate a member of their group, or a whole working group within their membership, to be a focal point for the *ex situ* community. We hope that this mechanism will empower the most appropriate individual to be the bridge between the SGs and the TAGs and minimise the risk that personal chemistry will create a longstanding barrier.
SS: I hear all of the time that the number of opportunities on both sides to establish relations between TAGs and SGs is too great – demand is so huge on both sides that we should ideally have a 'Building Bridges department'. But I think what Kira is achieving is extraordinary, and we should concentrate on getting those relationships established rather than fixating on what are essentially very small and temporary problems.

ZQ: I'd like also to touch on the Red List process. We've seen that the IUCN is aiming to expand vastly the number of species that have been assessed. How is this going, and is there anything we can do to help?
SS: We will be releasing an update in a couple of weeks, but the number of assessed species is now up to 83,000 – quite an advance.
JPR: A recent, major grant from the Toyota Motor Corporation has contributed significantly to our goal of having 160,000 species assessed or reassessed by 2020 – this partnership will deliver at least 28,000 new assessments during the next few years. Creating and updating the Red List is an important commitment, as it is used as a foundation for informing and prioritising conservation action around the world. However, it is a huge task. The challenge here is of resources, both financial and human. Partnerships with SG aimed at assessing or reassessing species would be helpful. For example, we are currently working with BIAZA and The Deep aquarium to design a partnership model and pilot a Red List training programme for zoo and aquarium staff. Also zoos and aquariums have often been invaluable in supporting Red List workshops through providing venues, travel support and expertise. Hosting these workshops is also a good opportunity for these organisations to provide staff with professional development and present talks to their visitors from global experts.

ZQ: We have noticed that the Red List of Ecosystems is now busy with assessments. How much do you think that this holistic approach to conservation will take over from the species-specific approach of the Red List of Species?
SS: The Red List of Species gives much more fine-grained information, which is used by a huge number of stakeholders and processes – everything from IBAT assessments for corporate due diligence to IFC standards for investment and GEF funding for governments. The Red List of Ecosystems provides a much wider lens, and the data is perhaps at a coarser scale than that for the Red List of Species. But ecosystem information is important and the Red List of Ecosystems is important and will definitely make a contribution, but it won't in any way replace the Red List of Species in cases where accurate species assessments are needed to make decisions.
JPR: I am a big fan of integrating the different knowledge products that are mobilised by IUCN. I don't see one taking over from the other; I think they will complement each other.

ZQ: We get the impression sometimes that conservation is quite a thankless task, with perceptions of public 'crisis fatigue' reported and governments appearing less than supportive at times. What's your assessment?
JPR: I think that we can examine the evidence and highlight the growing number of examples where local communities use biodiversity sustainably; our Sustainable Use and Livelihoods SG is a leader in this work. With regards to the public, I have always thought that we should focus on the successes and demonstrate that the situation is challenging and frustrating, but there are many people trying and succeeding to improve it.
SS: I don't necessarily believe that the public are experiencing fatigue with conservation – you see it reported in the media, but actually there appear to be very few people who are anti-conservation. In terms of government support, we can say that governments are more vocal than ever in their support for ambitious conservation targets and goals. Unfortunately, following the financial crisis, they are often working with much smaller budgets than before, and we have always known that conservation spending is usually high on the list of items to cut back on.

We can show evidence of the effectiveness of conservation as well, but primarily these successes are about slowing rates of decline rather than bringing about actual recovery. What's clear, though, is that without conservation, the situation would be orders of magnitude worse – so actually I am quite upbeat about its effectiveness. We just need to do more.

Land of opportunity

THE DONATION OF A PIECE OF COLOMBIAN LAND HAS GIVEN NEW HOPE TO THE CAMPAIGN TO SAVE THE WHITE-FOOTED TAMARIN

Ana Carolina Falla, ACOPAZOA Executive Director and National Coordinator of the International Conservation Programme for *Saguinus leucopus* in Colombia, and Eric Bairrão Ruivo, Science, Collection and Conservation Director of Beauval Zoo, Conservation Director of Beauval Nature Association and International Coordinator of the International Conservation Programme for *Saguinus leucopus* in Colombia

Since 2006, Colombian and European zoos have been working together to establish the International Conservation Programme for the white-footed tamarin (*Saguinus leucopus*) to save this species from extinction. The white-footed tamarin is threatened not only by habitat loss, but also because of its popularity as a pet. The success of the programme is chiefly due to the integrated approach that has been taken to address the different challenges for the conservation of this endemic species from Colombia, and has involved partnerships with NGOs, government, environmental authorities and universities. Education has also been a fundamental part of dealing with the pet trade, especially in areas where the community is interacting negatively with the primate.

A decade ago, very little was known about this species; the mortality rates in zoos were very high and the rates of reproduction very low. Today, in Colombian zoos there are 116 individuals, 62 per cent of which were born within the framework of the breeding programme that was established. This cooperative programme guarantees the genetic diversity of the population and its viability for eventual future reintroductions.

Several research projects were carried out to increase knowledge at the *ex situ* level (Bairrão Ruivo and Wormell, 2012; Falla *et al.*, 2015). However, the programme has mainly focused its efforts and resources on research of this species in the wild. The research results have proved that 77 per cent of the historical distribution of the white-footed tamarin has been lost. For this reason, and also because the species lives mostly on private land, the programme decided to purchase and donate land to the National Parks of Colombia in order to assure the long-term conservation of the species in the wild.

PIERRE GUIBERT

WHITE-FOOTED TAMARIN (*SAGUINUS LEUCOPUS*).

CEREMONY OF THE LAND DONATION, DURING THE ALPZA CONGRESS IN CALI ON 7 JUNE 2016. FROM LEFT TO RIGHT: CAROLINA FALLA (ACOPAZOA EXECUTIVE DIRECTOR AND NATIONAL COORDINATOR OF THE PROGRAMME), FARAH AJAMI (ACOPAZOA PRESIDENT), ERIC BAIRRÃO RUIVO (CONSERVATION MANAGER FOR BEAUVAL NATURE AND INTERNATIONAL COORDINATOR OF THE PROGRAMME), JULIA MIRANDA (NATURAL NATIONAL PARKS OF COLOMBIA DIRECTOR) AND RAFAEL TORRES (JAIME DUQUE PARK CEO).

This donation was possible thanks to the financial support of the New Horizons Foundation – the Jaime Duque Park Conservation Association, Beauval Nature – the Beauval Zoo Conservation and Research Association, and 25 EAZA members that have supported the activities of the programme since its establishment.

In a written agreement between ACOPAZOA (Colombian Association of Zoos and Aquaria) and National Natural Parks of Colombia, and with the technical support of experts from EAZA, ACOPAZOA and National Parks of Colombia, a 42-hectare piece of land known as El Vergel in the Florencia National Park was chosen. This land is located at the east of the Caldas department and is the only park in the country where the white-footed tamarin occurs. This land will be the first of several that the programme will donate to National Parks of Colombia; the programme will ensure that these lands are integrated into the existing protected areas, and ensure positive economic and social consequences for the land vendors. The foresight of this programme and the exceptional collaboration that led to the land purchase is an excellent example of creative conservation at work, and should ensure the long-term survival of the white-footed tamarin.

REFERENCES

Bairrão Ruivo, E., Wormell, D., 2012. The international conservation programme for the White-footed tamarin (*Saguinus leucopus*) in Colombia. International Zoo Yearbook 46, 46-55.

Falla, A.C., Brieva, C., Bloor, P., 2015. Mitochondrial DNA diversity in the acanthocephalan Prosthenorchis elegans in Colombia based on cytochrome c oxidase I (COI) gene sequence. International Journal for Parasitology: Parasites and Wildlife 4, 401-407.

Only connect

HOW ALPZA AND EAZA COULD ACHIEVE GREAT THINGS BY INCREASING THEIR COLLABORATION

Martín Zordan, Executive Director, ALPZA

Since 2005, ALPZA (Latin American Association of Zoological Parks and Aquaria) has had a Memorandum of Understanding with EAZA, which was extended by five years in September 2015. Its purpose is to increase the contribution of both associations to conservation and animal welfare.

As Executive Director of ALPZA, I see many inspiring collaborations between the ALPZA and EAZA regions, such as the recent acquisition and donation of private lands to Parques Nacionales Naturales de Colombia (Colombia National Parks Authorities), the result of a long-term collaboration between ALPZA member ACOPAZOA (Colombian Association of Zoos and Aquaria) and the EAZA Callitrichid TAG. Thanks to this programme, the habitat of the white-footed tamarin (*Saguinus leucopus*) was finally protected. Another example is that of Ayni, the Andean condor (*Vultur gryphus*), which was born at Puy du Fou in France and sent to Argentina to be reintroduced as part of a conservation programme from Buenos Aires Zoo. Other EAZA Members, including AFdPZ, Zoo Parc de Beauval, and others, have contributed to this conservation programme. In addition, EAZA provided logistical and financial support for the development of the new ALPZA Conservation Strategy, which aims to increase the contribution of Latin American zoos and aquariums to conservation.

However, it must be said that these successes are the exception rather than the norm. A quick overview of the EAZA Conservation Database reveals that there have been 125 conservation programmes supported by EAZA Members that took place or currently take place in Latin American countries where ALPZA has a zoo or aquarium member. Of those, only two projects involve an ALPZA member. This means that only 1.6 per cent of EAZA Members' conservation programmes that have occurred or are occurring in ALPZA range countries involve an ALPZA member.

REPRESENTATIVES OF ACOPAZOA INCLUDING A TEAM FROM PARQUE JAIME DUQUE (BOTH ORGANIZATION ALPZA MEMBERS) AND A REPRESENTATIVE OF ZOO PARC DE BEAUVAL (EAZA MEMBER) DURING FIELDWORK TO EXPLORE PRIVATE LAND ACQUIRED AND DONATED TO THE COLOMBIAN GOVERNMENT. THE LAND IS ESSENTIAL HABITAT FOR ENDANGERED WHITE-FOOTED TAMARIN (*SAGUINUS LEUCOPUS*).

Considering how limited resources for conservation are, it is strongly recommended that ALPZA and EAZA Members do their best to work together and use their resources efficiently. Many of the initiatives of EAZA Members include habitat protection, community education and capacity building, and there is no doubt that Latin American zoos and aquariums can help to increase the impact and long-term sustainability of these programmes. Cooperation between the two organisations might be as simple as assisting a European zoo to complete administrative paperwork for fieldwork in a Latin American country, or can involve a strong partnership such as the one established between ACOPAZOA and the EAZA Callitrichid TAG.

There is a fundamental truth about conservation initiatives by foreign organisations in Latin America, which is that a project is more likely to succeed if it involves a local partner who understands the cultural, legal and administrative contexts, not least because they know what is likely to work or fail when dealing with local communities and authorities. Also these partners are permanently settled in the relevant country, which, logistically and financially, is a significant advantage.

The most likely explanation for why there has been so little cooperation until now is that European and Latin American zoological facilities do not know each other and only occasionally interact regarding animal exchanges exclusively. One easy way to improve this situation is to attend each others' conferences; indeed, the two initiatives in which ALPZA and EAZA have joined forces include people who have participated at an ALPZA conference. And yet there are often almost no ALPZA representatives at EAZA conferences, and usually only two or three EAZA Members at ALPZA conferences. If language or lack of contacts is an issue, both EAZA and ALPZA are able to facilitate communications. Of course, commitment of all involved is required; for example, EAZA Members need to enter data on the EAZA conservation database, and ALPZA needs to create its own conservation database.

I invite both ALPZA and EAZA members actively to look for ways to work together. One easy way to start is to approach the relevant conservation contacts, namely Merel Zimmerman for EAZA (merel.zimmermann@eaza.net) and Martín Zordan (direccion@alpza.com), asking for guidance on finding a partner for a specific project. In addition, we should encourage zoo directors, conservation officers and others to attend each other's conferences, where we might see the start of a great collaboration.

The biodiversity crisis will not decrease in the coming years; zoological institutions in both Latin America and Europe must do their best to become more relevant in conservation. Additionally, the general public will expect zoos and aquariums to increase their direct contributions toward wildlife conservation. Within this dynamic context, both ALPZA and EAZA Members can benefit from stronger conservation collaboration.

MAURICIO MANCIPE

Majestic markhors

HELSINKI ZOO REPORTS ON THE CONSERVATION STATUS AND FUTURE PLANS FOR THE MARKHOR

Nina Trontti, Head of Animal Care Unit, Helsinki Zoo

I once overheard a visitor's question about Helsinki Zoo's species collection. It was a simple question: 'Why are all your animals brown?' Well, I thought, he might be right; indeed, most of our animals are brownish – but they certainly are special. My favourite is Bukhara markhor (*Capra falconeri hepteri*), sometimes called a Turkmenian markhor. Its coat is a mixture of pale and dark shades of brown, and the male's horns grow in a striking corkscrew shape.

Helsinki Zoo coordinates the *Capra falconeri hepteri* EEP and our main task this year has been the transport of two males from Moscow Zoo. This succeeded in May after 18 months of intensive work by the Finnish and Russian authorities as well as the zoo staff. The EU has now approved the import of markhors and muskox with a RUM-A health certificate from Moscow Zoo to Balai-approved zoos in Europe, which means that genetic isolation of European and Russian zoo populations is over.

The EEP programme also extends to Singapore Zoo. At the beginning of October four markhor females were exported from Helsinki to Singapore's quarantine area. Singapore will receive also two males from the Paris Zoological Park when the three months' quarantine time for females is over and these animals will form two new breeding herds.

In addition, in December this year, a specialist from Haute Touche Zoological Park, Dr Yann Locatelli, will travel to Finland to collect semen from the imported Moscow males, with the help of the Helsinki Zoo vet, Sanna Sainmaa. This will be used for the artificial insemination (AI) of our markhor females, and a subsample of the semen will be stored in Haute Touche Zoological Park's semen bank. AI is necessary because males are kept in a separate enclosure for one year with surplus males due to quarantine regulations. It will be very exciting to see if new markhor offspring are born in 2017 in Helsinki Zoo.

Meanwhile, in the US, researcher Cassandra Elliot from Fish Disease and Molecular Biology Lab, State University of New York College of Environmental Science and Forestry (SUNY ESF) is finishing her thesis '*Ex situ* conservation of markhor: A genomic analysis to enhance captive breeding standards'. She is analysing samples from populations in North America and Europe, and also, it is hoped, from the wild population of Tajikistan. In due course this genetic data will be placed in the National Centre for Biotechnology Information (NCBI) Genbank for public access.

MANAGING THE POPULATION

Many holders of this markhor species are struggling with surplus animals. Over the years we have learned that the best way to avoid breeding is simply to separate males and females. (It should be noted that the species can breed outside its normal heat time in December if a male is added to the herd.)

Another option is chemical castration of the male. We treated males twice with a four-week interval with an Improvac injection (immunological castration). One of the animals was castrated approximately one month after the last treatment and the testicles were sent to histological examination. It revealed diffuse bilateral atrophy of seminiferous tubules and hence an absence of sperm production. The changes were similar to those seen in pigs to whom the product is registered.

FUTURE CHALLENGES

In the wild, the species is doing a little better than it was five years ago. Several things might have affected the recovery of markhor populations, including state-controlled legal trophy-hunting, enhanced information from camera traps, and semi-formal private conservation areas.

Climate change might be the next challenge for markhors. One new problem is heavy rainfalls and wet winters; markhors are adapted to a harsh and arid climate so their hoofs turn soft and may crack if animals wander in moist ground, a problem that is also seen in the zoo population. EEP wants to guide markhor holders to better hoof care, and for this purpose Helsinki Zoo is preparing a video entitled 'How to trim hoofs'.

This markhor enjoys a rocky enclosure and this year Obterre Zoo in France has opened a very nice new area for this species. Also Zoo de Doué is building a new enclosure for markhors and they will receive animals in the spring. Other markhor holders should keep an eye on their email, as an evaluation of the EEP will be done before this year ends; we hope it will help to improve the prospects of this extraordinary species.

REFERENCES AND FURTHER READING

Damm & Franco (2014). The CIC Caprinae Atlas of the World Vol. II. Rowland Ward Publications RSA, Johannesburg, South Africa.

Grubb (2005). Artiodactyla. In:Wilson and Reeder (eds), Mammal Species of the World. A Taxonomic and Geographic Reference (3rd ed). Johns Hopkins University Press, Baltimore, USA.

Wilson & Mittermeir (2011). Handbook of the Mammals of the World Vol. 2. Hoofed mammals. Lynx Edicions, Barcelona, Spain.

Planting ideas

HORTICULTURAL INPUT IS AN ESSENTIAL PART OF ZOO DESIGN, CREATING REALISTIC AND SYMPATHETIC HABITATS AND AN AUTHENTIC EXPERIENCE FOR VISITORS

Stephen Butler, Curator of Horticulture, Dublin Zoo

Dublin Zoo, located in the 700-hectare Phoenix Park, is blessed with views of a mature treescape beyond the zoo boundary, and a natural surface water stream dammed to create two lakes that form a central part of the zoo landscape. The horticultural input is based on our design principles, which were formed during discussions with Grant Jones, founder of landscape architects Jones and Jones of Seattle, who developed our masterplan. At the core of our design philosophy is a respect for the living planet: the design respects the land and engages both the aesthetic and intellectual sensibilities. We commit to nature with an ecological awareness to ensure respect and dignity for wild animals, as well as to satisfy and excite the visitor.

Habitat simulation is the key to the Dublin Zoo experience; it entails presenting animals in the most natural way possible by including them in interactive social groups within their respective bioclimatic landscapes – an experience of the animal's world, not of the human world. The designers' – and horticulturalists' – challenge is to create opportunities for visitors to enjoy themselves in the context of the natural world around them. Visiting the zoo and gaining a deeper understanding of nature should be an enjoyable experience, and to achieve this, the design interweaves four ideals: realism, habitat (landscape) immersion, cultural resonance and animal wellness.

These principles drive the horticultural input. For example, when we make a water-surrounded habitat – for animals such as flamingos, gorillas and orangutans – we densely plant along the water's edge, using native plants such as sedge (*Carex pendula*), reeds (*Phragmites australis*), or flag iris (*Iris pseudoacorus*) and non-native plants such as pickerel weed (*Pontederia cordata*) for more colour. Careful selection for non-palatable but non-toxic plants ensures animal wellness, and when the plants are first established we use birch twig bundles, tightly binding the plants within so they can root safely. The whole looks entirely natural, develops into a realistic landscape and blends in well with the lakes. Native waterfowl become part of this zoo habitat very easily, enhancing the experience for our visitors and often giving a close-up view of normally hard-to-see wild birds – for instance dabchick or little grebe (*Tachybaptus ruficollis*). Our temperate climate allows a wide plant choice, but being selective makes each zoo habitat realistic and very different and is the core of the immersion experience.

The **Kaziranga Forest Trail** is a voyage of discovery. The visitor weaves through the bamboo forest, which contains a breeding herd of Asian elephants (*Elephas maximus*) and blackbuck (*Antilope cervicapra*), following a meandering stream under tall arching bamboos, mainly *Phyllostachys* species, dark in places, with lighter openings to view elephants over lower-growing colourful planting. Evergreen large-leaved shrubs such as *Magnolia delavayi* and *Ilex koehneana*, provide contrast. Colourful *Primula*, *Cautleya*, *Rodgersia*, *Lilium* and *Roscoea*, many of which are Asian, clothe the sides of the stream and provide more interest. *Leycesteria formosa*, a 2m shrub which was planted as a quick, cheap screen, has proved valuable and useful; elephants do not touch it, and it has naturally tumbled over a raised mud bank edge.

The **Gorilla Rainforest**, which is inhabited by our troop of western lowland gorilla (*Gorilla gorilla gorilla*) as well as red-naped mangabey (*Cercocebus torquatus*), needed a similarly dense feel, but different entirely to Asia. Inspired by the Mbeli Bai swamp forest in the Congo, this zoo habitat has a diverse landscape, comprising a series of low ridges separated by damp areas and surrounded by a water moat. A balance of carefully researched planting provides a range of natural food within the gorilla zoo habitat, and a variety of non-palatable plants that they largely ignore. The gorillas enjoy eating red clover (*Trifolium repens*), raspberry (*Rubus idaeus*) leaves and fruit, dandelion (*Taraxacum officinale*) leaves, comfrey (*Symphytum officinale*) and the flowers of barberry (*Berberis darwinii*), which they have to slowly and carefully pick to avoid thorns. They do not like rabbit-proof purple willow (*Salix purpurea*), which now forms many good bushes. Similarly, thorny plants such as *Berberis*, *Ulex* and *Pyracantha*, are largely left alone, as are *Paulownia tomentosa* and *Gunnera manicata*. Visitor-side planting includes many tall, vigorous herbaceous plants such as *Inula magnifica* and *Cynara cardunculus*, and red-leaved plants such as *Ligularia* 'Britt Marie Crawford' and *Phormium cookianum* 'Black Adder', keeping it dense but very different.

The **African Savanna**, home to the scimitar-horned oryx (*Oryx dammah*), Grant's zebra (*Equus burchelli boehmi*), ostrich (*Struthio camelus*), giraffe (*Giraffa camelopardalis* and *G.c. rothschildii*), and a breeding herd of southern white rhino (*Ceratotherium simum simum*), is an arid sand and rock landscape for the animals, viewed from a trail gently rising to an escarpment, giving a distinctive wide open feeling. Distant planting of 2m tall *Cortaderia richardii* gives a grassland effect. Nearer the visitors, dense planting of grasses such as *Miscanthus sinensis* 'Gracillimus', spiky-leaved shrubs *Grevillea rosmarinifolia* and acacia lookalikes *Amorpha fruticosa* with scattered trees of *Gleditsia* and *Acacia* give an immersion effect and help to screen visitors from other visitors. A very mixed underplanting, often using African plants that are common in gardens, such as *Kniphofia*, *Moraea*, *Dierama*, *Gladiolus*, *Crinum*, *Nerine* and *Dietes*, gives a realistic simulation of the typical flora and subtly educates our visitors.

THE ORANGUTAN FOREST AT DUBLIN ZOO PROVIDES A NATURALISTIC AND ENRICHING HABITAT

RIGHT: GOOD PLANTING MAKES APPROACHING THE AFRICAN SAVANNAH ITS OWN ADVENTURE

The **Sea Lion Cove** was created for California sea lions (*Zaluphus californianus*) to simulate coastal vegetation, a sandy beach and grasses, backed by a dense planting of conifers of many species and underplanted with a mix of ferns and shrubs, with some plants native to the Pacific North West. The **Flamingo Lagoon** with Chilean flamingo (*Phoenicopterus chilensis*) is accessed through a forest of *Gunnera manicata* and screened by *Podocarpus salignus* (both also from Chile). Dense waterside plants as mentioned above thrive here. Willow (*Salix alba var. vitellina*) 'Britzensis' planted in urban soil under a membrane to reduce compaction from the flamingos, has grown very vigorously, screening the aviary structure in places. Shoots pruned off when planting, inserted as cuttings, have given a real thicket of growth, which will replace the tallest on a coppice cycle.

The **Orangutan Forest**, where the Bornean orangutan (*Pongo pygmaeus pygmaeus*) and Siamang gibbon (*Symphalangus syndactylus*) live, has substantial imitation 10m tall tree stumps in realistically sculpted concrete, supporting ropes over the visitor pathway, with an underplanting of dense tropical foliage. The main island has a mix of shrubs and trees screening the background. We drew on our gorilla experience to select suitable species, and there was remarkably little damage in the first few months after planting. Herbaceous plantings of large-leaved *Cynara* and *Inula* create a tropical appearance at ground level. Further back, a second island is given over entirely to plants, and provides a taller, permanent screen to visually separate visitors from other visitors.

Zoo involvement throughout the early design stage is crucial, ensuring that we allow for sufficient topsoil, irrigation, access and time. We plant densely and thin later, and with young trees we may bundle-plant three to a hole. Heavy mulches of tree surgeon's chips on top of topsoil, put in place by builders, is quicker for us, reduces compaction, reduces weeds, and makes it easier for the horticulture team to plant later. In some zoo habitats soil compaction and mud are eased by using heavy plastic grass reinforcement mesh, covered with 60mm of urban soil (here an in-house mix of 50 per cent 6mm and 10mm round stone, plus 20 per cent wood chips), and then seeded as normal. This has worked incredibly well for okapi (*Okapia johnstonii*) and eastern bongo (*Tragelaphus eurycerus isaaci*). Using the same urban soil mix as a mulch (without plastic mesh) with large cats has also drastically reduced mud issues, and helped grass to grow with less damage.

The horticulture team works in sympathy with native wildlife, avoiding pruning hedges during bird nesting season and pruning sympathetically to leave a natural appearance. They also use copious amounts of zoo manure with tree surgeon's woodchips added to reduce watering needs, drastically reduce weeds (and therefore weedkiller use) and enhance the appearance of the zoo. This also encourages insects – which attract birds – and fungi in the loose topsoil layer.

Much of the research for planting within zoo habitats is strongly influenced by peer advice and experience, for which I am indebted. The EAZA Zoo Horticulture Group is active as an email group, and offers informative annual conferences and a website of plant information (www.zooplants.net) that has proved relevant and highly valuable time and again. It is compiled by zoo horticulturalists from many zoos, and covers not just planting ideas, but also poison issues, useful non-palatable plants, browse production and nutritional value, and is constantly being added to and updated, creating an invaluable resource.

Welcome to the Discovery Cave

A NEW EXHIBIT AT HELLABRUN ZOO IS HELPING ITS VISITORS TO OVERCOME THEIR NATURAL FEAR OF A VARIETY OF UNCHARISMATIC SPECIES

Carsten Zehrer, Curator, Hellabrunn Zoo and David Williams-Mitchell, EAZA Communications and Membership Manager

Caves have always featured heavily in our collective unconscious, and represent many of our fears of the natural world. We can't know what awaits us when we venture into the impenetrable blackness, and few nightmares are complete without hairy-legged crawlies sinking venomous fangs into brave but foolish adventurers. The phobias of our ancestors live on in the daylight of the modern world, and make conservation and appreciation of snakes, spiders and other such taxa all the more difficult. Recognising the problem, and with it an opportunity, Hellabrunn Zoo decided to build a space just for them – the Discovery Cave.

Built under a hill in the Jungle World biome at the zoo, the Discovery Cave aims to introduce 12 species of animals to the public, allowing visitors to learn more about these species and to face their fears. The species on exhibit include four species of tarantula spider, Hissing cockroaches, Giant Asian mantis, two species each of stick insects, snakes and lizards, three-striped poison frogs and land hermit crabs – a good cross-section of the animals found on most people's phobia lists.

The visitor experience includes guided tours of the naturalistic facility, and two levels of workshop to help visitors get over their initial fear of the cave's inhabitants. Run by Ursula Riedinger, a qualified animal therapist and naturopathic practitioner of psychotherapy, the workshops tap into a wide range of techniques to reduce the grip of natural phobias, particularly of snakes and large spiders. These include methods from behavioural therapy, Neuro-Linguistic Programming (NLP), counselling and various relaxation techniques, and are accompanied by short zoological and psychological lectures to take the animals out of the realm of nightmares and offer a more objective view. After an induction session, including therapeutic and animal care instructions, the participants move on to approaching snakes and spiders in the Discovery Cave; crucially they are not put under pressure to get any closer than they want to, but can find their own comfort level.

BLUE-TONGUED SKINK (*TILIQUA SCINCOIDES INTERMEDIA*)

LAND HERMIT CRAB (*COENOBITA RUGOSUS*)

While this kind of facility is familiar to many in the zoo world, the commitment of the zoo to psychological and NLP techniques to help visitors overcome their fears takes things a step further. The zoo believes that it is this element that in the long term will encourage visitors' acceptance of such 'unattractive' species, and make them more receptive to conservation messages about threatened taxa that generally receive less coverage in the media. It also helps to convey the message about the ecosystem engineering that animals such as invertebrates provide, encouraging people to have a greater appreciation of the familiar creepy-crawlies they see in their own gardens.

This is only half the story, however. The facility also provides state-of-the-

DISCOVERY CAVE

MARC MÜLLER

INLAND BEARDED DRAGON (*POGONA VITTICEPS*)

art training for apprentice and trainee keepers. The challenges of providing welfare and suitable conditions for such a wide array of species, from the desert aridity preferred by Chilean rose tarantula (*Grammostola cala*) to the soggier conditions preferred by Heirodula species, give trainees an excellent foundation for the care of terrarium species. The format of the space, which requires a guided introduction to the species on exhibit, also provides an excellent opportunity for trainees to learn about keeper talks and improve their presentation skills, while simultaneously showing them the additional educational value that a keeper's passion for the taxa can provide.

While all of the species on show are relatively common and the dual missions of the facility are clearly defined, Hellabrunn doesn't rule out the introduction in future of more threatened species; and as the zoo's many visitors make the journey from fear to at least acceptance of the cave's inhabitants, there's every likelihood that conservation of invertebrate, snake and other phobia-inducing species will attract more interest over the long term. For now, however, we can look forward to a new generation of intrepid Bavarian speleologists and terrarium specialists, whose fears were overcome in the Discovery Cave.

The third dimension

CAN TELEVISION AND OTHER MEDIA REPLACE THE LEARNING EXPERIENCE OF A VISIT TO A REAL ZOO? *ZOOQUARIA* INVESTIGATES THE LATEST RESEARCH.

David Williams-Mitchell EAZA Communications and Membership Manager

EAZA is at the forefront of educational initiatives in zoos and aquariums, with state-of-the-art Conservation Education Standards, a dynamic Education Committee and a commitment to live up to and exceed the requirements of the EU Zoos Directive. But while research is underway to show the effectiveness of zoo and aquarium education over the short and long term, it remains difficult to measure accurately the power of our institutions to educate and affect behaviour.

A largely unresolved criticism levelled at zoos and aquariums by their opponents is that other means of education (especially the media) can fulfil their educational role, and that there is therefore insufficient 'educational' justification for the keeping of wild animals in human care. Although there is little evidence to support this assertion, it remains a point of contention. While most zoo and aquarium research into the effectiveness of our educational offering is aimed at its continual improvement rather than at countering such arguments, its findings will undoubtedly play a role in answering them – an important benefit in a context where, as Jonathan Swift put it, 'falsehood flies, and the truth comes limping after it'.

The authors of a new report *Investigating the Long Term Effects of Informal Science Learning at Zoos and Aquariums* recognise one major challenge of fulfilling its remit; namely, to disentangle zoo and aquarium learning from other sources of informal learning about the natural world. The report, compiled by a coalition that includes EAZA Member ZSL, WCS and the Universities of Stanford and Lancaster, points to a 'lifelong science learning universe', which inevitably includes television and the internet as other sources of influence. Working out the range of effects of the contribution that zoos and aquariums make to this universe over the long term will be the subject of further phases of the research, and it will be interesting to see what they discover over the course of the project.

Nonetheless, zoo and aquarium educators will be in little doubt that people of all ages are deeply affected by the learning experiences and encounters that zoos and aquariums can provide, especially in the short term. Sarah Thomas, EAZA Education Committee Chair, offers this suggestion:

'I feel that zoos should work collaboratively to produce a framework that will enable different types of practice-based evidence, such as observations by educators, to be drawn together and synthesised to demonstrate the positive contributions zoo education can play in people's understanding, connection and behaviours to the natural world.'

This is an approach that mirrors other aspects of zoo and aquarium work, including the integration of keeper observation into animal welfare science. As EAZA's Animal Welfare Training Officer Sally Binding has said in a previous *Zooquaria* article:

A SCHOOL VISIT TO ZSL WHIPSNADE ZOO

'The input of animal care professionals, who often know their animals better than anyone….is a key element in monitoring [the five domains of animal welfare].'

Observational evidence, then, is becoming less controversial, but as Thomas affirms, it needs to be part of a holistic and objective whole that recognises its limitations as well as its strengths. So while most of us can point to at least one instance of seeing the power of interactions with animals, we need to look at all elements of the zoo and aquarium learning experience as well as other elements of the science-learning universe to be able to counteract the claims of activists that modern media can act as a replacement for a zoo or aquarium visit.

THE ROLE OF THE MEDIA

Critics pointing to television and the internet as more valid educational media make the claim without reference to scientific studies, but it should not be dismissed out of hand. It would be a mistake not to ask how effective the media is as a tool for connecting people to nature, teaching them about biodiversity and promoting sustainable behaviour.

Access to media is nearly ubiquitous these days, even to those from a background we would think of as very deprived. Indeed, Pew Research Center found in 2013 that despite having the lowest internet usage of any income group of young people, US teenagers with a family income of under $30,000 still had an internet usage rate of 89%, a level that is likely to be mirrored in Europe[1]. Researchers Nielsen also found that in 2015, low income groups watched more television than higher income groups[2]. However, they did not outline the watching habits of each income group; high internet usage does not, of course, mean that it is educational. Indeed, observations of zoo visitors can lead us to question whether some of them have ever seen a tiger even in two dimensions, and a considerable body of evidence shows that people continue to act unsustainably despite widespread media coverage of global warming and biodiversity loss.

The research appears to be inconclusive when it comes

LEARNING IN THREE DIMENSIONS AT PARIS ZOOLOGICAL PARK

F G GRANDIN

to the effect of television viewing; while values, attitudes and beliefs tend to be affected by television, behaviour change appears to depend on the level of arousal that the programming inspires – in the case of nature programming, research has shown that viewer arousal is actually diminished by nature programming, thus reducing the potential for positive behaviour change[3]. Social media appears to present an important tool in terms of linking like-minded individuals to demand change from others as well as acting more sustainably themselves. However, there appears to be no consensus on the educational value of social media in the sphere of nature[4]. Indeed, social media's 'filter bubble' points to the idea that those users receiving nature and conservation content are self-selecting, thus limiting the potential of the medium to educate those not previously interested.

In short, while we should certainly not dismiss the value of media in conservation education and behaviour change, there appears to be no conclusive published evidence that demonstrates its superiority over the zoo visit and its learning opportunities. The media is a complex landscape, and while we have an idea of where the strengths of each medium lie, it is increasingly difficult to show positive or negative effects in isolation from each other – that's not how we consume media.

The argument is therefore increasingly irrelevant. There is no reason why zoos and aquariums should not themselves be using new and existing media to improve public awareness of conservation issues and the natural world. Lisbon Zoo (among others) has developed a range of courses to deliver education to audiences worldwide using the Skype network; Chester Zoo and many other EAZA Members deliver education about the role of zoos and aquariums and the animals they care for through 'fly-on-the-wall' documentaries; and zoos and aquariums are no strangers to the production of video and internet resources.

Trying to completely divorce the effects of zoo and aquarium learning from all other sources to solve the ethical issue of whether or not humans are justified in keeping animals in zoos looks like a road to nowhere.

A PLAN FOR THE FUTURE

This is not to say that the report's authors are mistaken in their desire to learn the effects of informal science learning in zoos and aquariums. In order to improve our learning outcomes, we need to better understand where our strengths lie and capitalise on them, as well as identify how we can close any gaps in our offering. The EAZA community is already working towards this through the Conservation Education Standards, a living document that may well evolve in line with our understanding of how and what people learn when they visit aquariums and zoos. Improving our contribution to the lifelong learning universe does not, however, just involve zoo and aquarium learning. We need to understand more about each element of the model, and work together with media owners, non-zoo educators, museums, experts in familial and peer group education and so on to identify the strengths of each learning opportunity and construct a network of learning that capitalises on them in concert. This will be a hugely complex process, which will have to happen over the indefinite long term; further complexity will come from studying whether or not the learning model applies to inner-city children in France as well as middle-class children in Britain, assessing whether it is possible to compare learning from the internet to learning at zoos and whether it is possible to measure the educational outcomes of single or rare visits to zoos and aquariums.

In summary, while concrete evidence for the value of our educational offering is building, evidence to support the assertion that 'learning by documentary' can replace it seems likely to remain far more inconclusive. EAZA Members should not let such assertions go unchallenged.

REFERENCES AND FURTHER READING

1 Madden, M. *Technology use by different income groups* Pew Research Center 2013

2 Nielsen Total Audience Report, 2015

3 Zillman, D. (1982). *Television viewing and arousal* quoted in CCT Reports Issue 11, 1996

4 D.Langley & T. van den Broek. *Exploring social media as a driver of sustainable behaviour* 2010

Required reading

PAY A VISIT TO THE ZSL LIBRARY, WHICH AIMS TO INSPIRE, ENTHUSE AND INFORM

Ann Sylph, Librarian, ZSL

Founded in 1826, the Zoological Society of London (ZSL) is an international scientific, conservation and educational charity devoted to the worldwide conservation of animals and their habitats.

Sir Stamford Raffles, ZSL's founder and first President, was always determined to establish a comprehensive library as part of the Zoological Society. In its early days, ZSL Library moved to various locations across London, including Leicester Square and Hanover Square, but in 1910 it was decided that the Library should be located alongside ZSL London Zoo in Regent's Park, where it has remained ever since.

Information is essential for effective conservation and the ZSL Library is a useful resource not only for our own conservationists, but also for anyone with a vested interest in zoology and the preservation of animals and their habitats. It contains a variety of published works including both modern and historic books on the subject of animals and conservation, a range of journals and magazines, ZSL's Archives (the Society's administrative records), works of art, information about both ZSL London and Whipsnade Zoos and items of 'zoophemera' (zoo-related ephemera) as well as collecting information about zoos around the world.

You can explore and discover more about the Library's collections using its online catalogue http://library.zsl.org, which includes links to many of its online resources as well as information about the printed materials available.

ZSL Library also publishes a monthly blog at www.zsl.org/blogs/artefact-of-the-month, highlighting interesting items in the collection.

As well as being a vital resource, the Library contains many items that are beautiful in their own right, such as the wonderful book *Illustrations of the family of* Psittacidae*, or parrots, the greater part of them species hitherto unfigured…* / by Edward Lear (London: Lear, 1832). It also houses seminal publications such as a first edition of *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*, by Charles Darwin (London: Murray, 1859).

MEET THE TEAM

THE TEAM AT THE ZSL LIBRARY

The Archives are also fascinating, and include such things as the very popular *Daily Occurrences*. These huge volumes are a record of the daily lives of the animals at both ZSL London and Whipsnade Zoos: a sample volume from 1854 has been digitised and is accessible from the online catalogue.

The ZSL Library is located within the ZSL Main Offices on the Outer Circle of London's Regent's Park, near the junction with St Mark's Bridge. It is open to the public on weekdays (excluding bank holidays) from 9.30am to 5.30pm. If you are a member of ZSL, please bring your membership card when you visit. If not, please bring proof of address and photographic ID on your first visit.

Also, why not consider joining ZSL as a Fellow? Details can be found at www.zsl.org/membership/zsl-fellowship. You can join as a non-visiting Fellow and still receive access to the ZSL Library as well as discounted subscriptions to ZSL's publications including *Animal Conservation*, *Journal of Zoology* and the *International Zoo Yearbook*.

If you do intend to visit the Library, it's worth bearing in mind that appointments are necessary to view items from our 'special collections' i.e. certain historic books, the ZSL Archives and some art works and photographs. However, most of our books are available to view without an appointment, alongside stunning pieces of art on display in the Reading Room, where there are also current journals and magazines available for visitors to read. We usually have a special display to enjoy too, so there's plenty to explore.

Can you help us? We are keen to expand and develop our collection of zoo-related material, so please do send us copies of your zoo guides, newsletters and any magazines that you produce. Contact us: ZSL Library, Regent's Park, London NW1 4RY. Tel: 0207 449 6293. Email: library@zsl.org. We can supply scans of items from our collections but only in compliance with copyright regulations and a charge is usually made to cover our costs.

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