

QUARTERLY PUBLICATION OF THE EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

ZOOQUARIA

WINTER 2023/24

ISSUE 120

Vietnamazing!

SAVING SPECIES IN VIETNAM
WITH THE NEW EAZA CONSERVATION
CAMPAIGN 2024–2025



FROM NEGATIVE TO POSITIVE

A NEW INSIGHT INTO ANIMAL BEHAVIOUR TRAINING

CELEBRATE OUR SUPERPOWER

THE VITAL ROLE OF CONSERVATION EDUCATION







4 From the Director's chair

When sustainability is at the heart of what we do, how can we improve it?

5 Noticeboard

The latest news from the EAZA community

6 Births and hatchings

Doves, ducks and oryx are just some of the recent arrivals at EAZA zoos

8 Kiitos, Korkeasaari!

In September, Helsinki Zoo played host to a busy and successful EAZA Annual Conference

10 Hands across the world

The 2023 WAZA Annual Conference saw a record number of delegates gather at San Diego Zoo

11 Celebrating our superpower

How education is the key to conservation success

12 Taking a deep dive

After a four-year gap, delegates were delighted to reconnect and share their work at EUAC 2023

13 A is for Aquaria

Meet Max Janse, the new President of EUAC

14 Moving forward from EAZA21+

As the EAZA21+ campaign comes to an end, it calls on EAZA Members to scale up their commitment to biodiversity conservation

16 Vietnamazing!

Introducing the new EAZA campaign for 2024–2025

17 Back to Patagonia

The new-style EEP for Grebe will support the prospects of this water bird worldwide

18 Which lizards should we keep in zoos?

How EAZA is protecting our most threatened lizards

20 When negative becomes a positive

A new insight into animal behaviour training

22 Watch, learn and share

Announcing a major expansion of the ZooMonitor app

24 Meet the education snakes

Take a tour of the new custom-built terrarium at Bern Animal Park

26 Working together for a green future

How Kolmården Wildlife Park is taking a holistic approach to sustainability

28 Why zookeepers need more VET

Improving zookeeper skills in Croatia

KEY: a quick guide to frequently used acronyms

CITES: Convention on International Trade in Endangered Species

EEP: EAZA Ex situ Programme

IUCN SSC: International Union for Conservation of Nature Species Survival Commission

LTMP: Long-term Management Plan

RCP: Regional Collection Plan

TAG: Taxon Advisory Group

ZIMS: Zoological Information Management System

Zooquaria

EDITORIAL BOARD:

Executive Director Myfanwy Griffith (myfanwy.griffith@eaza.net)

Managing Editor Sandrine Camus (sandrine.camus@eaza.net)

Editor Joanna Swinerton

Editorial Staff Raymond van der Meer, Lauren Florissin

Designer Louise Tait

Zooquaria is the quarterly magazine of the European Association of Zoos and Aquaria (EAZA).



EAZA Executive Office, Plantage Middenlaan 45, 1018 DC Amsterdam, the Netherlands
Email: info@eaza.net ISSN 2210-3392 . Cover: Vietnamese crocodile lizard © Thomas Ziegler

For information on print subscriptions to Zooquaria visit:

<http://www.eaza.net/about-us/communications>

The views expressed in this magazine are not necessarily those of EAZA.

The paper used for printing is FSC quality (sustainable). Organic inks are used.

Plates for printing are free of chemicals. All waste is disposed of in an environmentally friendly manner. Printed by Euro Mail BV.



FROM THE DIRECTOR'S CHAIR

This issue of *Zooquaria* contains a range of updates from conferences: from our own highly successful Annual Conference held in Helsinki to those hosted by other organisations, where EAZA and our Members had a strong presence. We are seeing the range of local and global in-person conferences and meetings increase again, and it is only to be expected that there are many discussions around the sustainability of such events. Focal area 5 of the EAZA Strategy concerns 'Managing operations to reduce the environmental footprint of EAZA and our Members'. Part of this involves reviews of all our conferences, courses and meetings. We have already made great strides to improve the footprint within our events. For example, the switch to a conference app and no printed hard copy programme has been universally well received; conversely the response to our move towards having a meat-free day, or entire conference, has been more variable. Of course one of the biggest environmental impacts is the journey that participants make to attend. Fully online and hybrid options are being offered depending on the content and format of the various events. However, it is hard to argue against the value of attending in person. I feel this is especially important given our diverse community, many languages and increasingly intense and nuanced topics under discussion. Online events may enable higher participation but not necessarily higher engagement. We commit to consistently reviewing and improving how EAZA events are run so as to achieve our strategic ambitions around sustainability.

Continuing with the topic of sustainability, it was especially pleasing to see not only multiple EAZA Members in the top three shortlist for the WAZA Environmental Sustainability Award, but also EAZA Members winning the Award for the second year running! A big congratulations to all. If you want additional inspiration for how to improve your own sustainability activities, please read the article on page 26. During the WAZA Annual Conference, it was also announced that EAZA has completed the review process and meets the WAZA 2023 Animal Welfare Goal. This goal aims at establishing a global benchmark for regional and national animal welfare evaluation processes. The review of the EAZA Accreditation Programme (EAP) and our animal welfare evaluation process included a peer review involving several experts around the world. We are delighted that our programme is among the first to meet this global benchmark. Endre Papp, EAZA Chair, commented that 'It provides additional validation that the EAP is effective in assessing EAZA Members against a global standard of offering positive animal welfare experiences to the individuals in their care and, recognising the importance of evaluating such experiences.'

External validation for the work of EAZA and our Members was also received via the publication of the IUCN Species Survival Commission (SSC) Position Statement on the role of botanic gardens, aquariums and zoos in species conservation. As a longstanding member of IUCN and partner of SSC, EAZA welcomes this position statement. It clearly demonstrates the crucial and often unique roles of progressive zoos and aquariums in species conservation. The emphasis put on collaboration across *in situ* and *ex situ* conservation activities to enable impactful conservation outcomes is strongly aligned to our own strategic visions to be 'progressive zoos and aquariums saving species together with you.'

As this will be our last *Zooquaria* of 2023, I would like to finish by thanking everyone who has been involved in helping make it another busy but good year for EAZA. The articles in *Zooquaria* showcase a small proportion of the vast amount of work carried out in support of our vision. I look forward to continuing this trend into 2024 and beyond.

Myfanwy Griffith
Executive Director, EAZA

NOTICEBOARD

COUNCIL DECISIONS

The EAZA Annual Conference 2023 was held at Helsinki Zoo (Finland) in September (see the article on page 8 for a full report). During the week the Council approved updates to the EAZA Standards for the Accommodation and Care of Animals in Zoos and Aquariums, a proposal to move to a five-year screening cycle, and a new appeals process for sanctions issued by the Conservation Committee. All these documents will be presented at the AGM in April 2024 for final approval.

Also approved were the **EAZA Communication Guidelines**, which will help the managers and colleagues responsible for communications at Member institutions to improve their audience's understanding of what zoos and aquariums do and what it means to be an EAZA Member (see the next edition of *Zooquaria* for more details); the **EAZA/EAZWV Position Statement on access to and use of vaccination against Highly Pathogenic Avian Influenza (HPAI) in zoo birds in the EU**, which is ready for use in lobby work by individual Members and National Associations; and, as part of a cyclical process, the reviewed **Terms of Reference of the Council, Communication Committee, Conservation Education Committee and Membership and Ethics Committee**.

MEMBERSHIP DECISIONS

The Council approved a large number of membership recommendations by the Membership and Ethics Committee.

APPROVED NEW MEMBERSHIP RECOMMENDATIONS

Temporary Membership: Dubai Safari Park, UAE; The Green Planet, UAE; Parque de la Naturaleza de Navarra, Spain

Associate Membership
Panthera, USA

Temporary Membership to Full Membership and EAZA Accreditation

Les Terres de Nataé, France

Candidate for Membership to Temporary Membership

Braşov Zoo, Romania; Osijek Zoo, Croatia

Temporary Membership under Construction to Temporary Membership

Fife Zoo, UK

Temporary Membership under Construction – 1 year extension

Bark – Biopark Barquinha, Portugal

Corporate Membership

Mazuri USA, USA; Triotech, France; Digitickets, UK

APPROVED EAZA ACCREDITATION PROGRAMME RECOMMENDATIONS (EXISTING MEMBERS)

Temporary Membership

Zoo Saint-Martin-la-Plaine, France; Saarbrücken Zoo, Germany; Thrigby Hall Wildlife Gardens, UK; Bojnice Zoo, Slovakia; Safari de Peaugres, France

Accreditation and Maintain Full Membership

Salzburg Zoo, Austria; Vienna Aquarium, Austria; Magdeburg Zoo, Germany; Hoyerswerda Zoo, Germany; Dudley Zoo, UK; Bern Zoological Park, Switzerland; Lille Zoo, France; Karlsruhe Zoo, Germany; Dresden Zoo, Germany; Zoom Erlebniswelt Gelsenkirchen, Germany; Warsaw Zoo, Poland; Halle Zoo, Germany; Skansen Aquarium, Sweden; Plzeň Zoo, Czechia; African Safari Plaisance-Touche, France

EAZWV APPOINTS NEW DIRECTOR

The European Association of Zoo and Wildlife Veterinarians (EAZWV) has appointed its new Executive Director. Hugo Fernandez Bellon took over the role on 1 October 2023 and started the onboarding process with departing director Stephanie Sanderson.

Head veterinarian at Barcelona Zoo, Hugo has been an active member of the EAZWV community for many years, as Board Secretary and then rotating through the Presidential positions.

EAZA wishes all the best to him in his new role, and to Stephanie for her next professional adventure! We are looking forward to continuing our collaborative work with EAZWV and to exploring many opportunities together.

IUCN POSITION STATEMENT

The IUCN Species Survival Commission

EAZA CORPORATE MEMBERS

AB Aqua Medic GmbH
Africa Style
Animals Concept
Aqua-Sander
Arie Blok Animal Nutrition – Kasper
Faunafood
ArtSystemDeco
Billings Productions, Inc
Bio/Zoo Information
Brogaarden ApS
Bureau d'étude AKONGO
Bureau d'études Bioparc
Carl Stahl Architecture
China Light Festival
Convivous
Crossborder Animal Services BV
Digitickets
Dino Don
Dinosauriosmexico
Dorset Identification BV
EKIPA
Fachjan Project Plants
Fahlo
Fox Consulting
Granovit AG
HMJ Design
Immotion
Instone Air Services Ltd
Jakob Rope Systems
KaGo & Hammerschmidt GmbH
Kiezebrink International
Magic Memories
Marine Nutrition
MAT Filtration Technologies
Mazuri USA
n-gage.io
Nieuwkoop Europe
Pangea Rocks A/S
Petjes World
Ralf Imagen y Comunicacion SL
Rasbach Architekten
Ravensden Plc
Ray Hole Architects
Reynolds Polymer Technology
Saint Laurent SA
Sanero Kunstfelsen SRL
SAS Zoopoli France
Seafoodia
Siane
Triotech
Wild Immersion
Worldwide Zoo Consultants
Zigong Lantern Group
Zoological Adviser
Zoologistics
Zooprofit

recently launched its [Position Statement on the role of botanic gardens, aquariums and zoos in species conservation, recognising the vital contributions of these institutions to species conservation](#).

The 400-plus Members of EAZA from 47 countries form an important part of the international conservation community across the areas highlighted in the statement. It is a great tool for zoos and aquariums to use in their lobby and advocacy work at the local to global level, alongside examples of how they help to save threatened species.

NEW ARRIVALS



© TOMASZ DOROŃ

WHITE-WINGED DUCKS HATCH AT WARSAW ZOO

AT WARSAW ZOO (POLAND), 2023 was an exciting year for several reasons. One was the hatching of seven white-winged ducklings (*Asarcornis scutulata*) at the beginning of June, the first successful breeding of the species at the zoo in almost eight years. Even though our female had incubated her eggs every year in previous seasons, the eggs were unfertilised each time. Two years ago, in consultation with the EEP, we decided to replace the male, and shortly after the birds were introduced, we could see that they had accepted each other, which we considered to be a good omen. In the spring of 2022, the female laid seven eggs, which she carefully incubated. After three weeks of incubation, it turned out that four eggs were fertilised, although unfortunately all the embryos died. However, it gave us some hope. This year in April, again in the same tree hole, the female laid nine eggs, but the hatching went wrong. To our surprise, in June the female laid nine more eggs and, to our great joy, eight ducklings hatched. To ensure the safety of the mother and chicks, we removed the male to prevent any potential aggression.

The white-winged duck is quite a large duck, which, due to the subdued colours of its plumage, does not impress visitors – a pity, because it is a really interesting species. Breeding and habitat requirements are similar to those for other ducks, but for some unknown reason, the breeding success

of these ducks is very low. Even though its population in European zoos is fairly stable (currently 42.55.1), the number of offspring has been very poor in recent years. In 2023, apart from Warsaw Zoo, only two other European zoos managed to breed these birds successfully. It is very important for the EEP that zoos focus as much as possible on creating a stable population for this species. This will allow us to create an insurance population for the white-winged duck, whose population is shrinking rapidly in its natural habitat.

TWO SCIMITAR-HORNED ORYX BORN AT ARTIS ZOO

LAST SUMMER, THREE SCIMITAR-HORNED ORYX (*Oryx dammah*) were born at Artis Zoo (the Netherlands). These are the first births to take place in the new enclosure next to the main entrance, where these oryx have been living with meerkats (*Suricata suricatta*) since last year. Unfortunately, one young died a few days after birth due

ZSL SUCCESS WITH SOCORRO

THE SOCORRO DOVE (*ZENAIIDA GRAYSONI*) was once endemic to the island of Socorro, 600 km off the west coast of Mexico. It has become Extinct in the Wild and is currently found only in zoological collections. Invasive species are considered to be one of the major causes of the loss of this species in the wild, and conservation breeding efforts are urgently needed for this bird.

ZSL London Zoo (UK) has put an enormous amount of work and energy into achieving this goal. In the summer of 2023, the tropical bird walk-through exhibit within the zoo's historic Blackburn Pavilion welcomed six healthy Socorro dove chicks. Given that at present there are only 161 doves worldwide (ZIMS, 2/11/2023), this is a huge boost to the population of this bird. In fact, this has been the most successful breeding season for the Socorro dove since London Zoo began working with the species. What's even more exciting is that two of these chicks are female, which will help to balance the sex ratio of the population, as it is currently greatly skewed towards males.

to a heart defect, but the other two are developing fast and no longer depend on their mother.

The species, listed as Extinct in the Wild since 2000, has been living at Artis Zoo for at least 60 years. In total, at least 100 young have been born in the park. Since 2022, the animals have been given a prominent place in the



© RONALD VAN WEEREN

DOVES AND VICTORIA CROWNED PIGEONS



SOCORRO DOVE (*ZENAIIDA GRAYSONI*)
© ZSL LONDON ZOO
CAMILLE MUNDAY



VICTORIA CROWNED PIGEONS (*GOURA VICTORIA*) © ZSL LONDON ZOO
CAMILLE MUNDAY

ZSL London Zoo has long championed the importance of Socorro doves as integral parts of a healthy ecosystem. It is working closely with the EEP Coordinator of the species, Stefan Stadler (Frankfurt Zoo, Germany), along with the IUCN Conservation Translocation Specialist Group and Mexican partners to plan

the eventual reintroduction of the species to the island, using the ARK population saved by zoo experts.

This year, ZSL London Zoo has also continued to have success with breeding Victoria crowned pigeons (*Goura victoria*). Named after Britain's Queen Victoria, and a relative of the now-extinct dodo, these remarkable

birds, native to New Guinea, are threatened by habitat destruction, including the development of palm oil plantations.

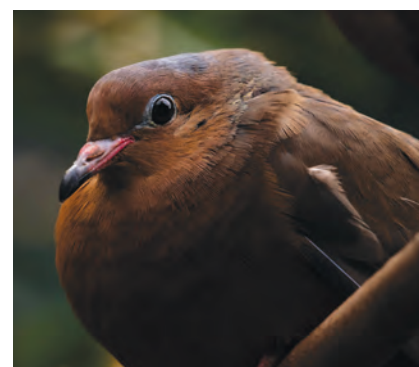
Contrary to the popular belief that birds with high breeding priorities should be kept in a single pair or species aviary, the successful hatching of the Victoria crowned pigeon and Socorro dove chicks at London Zoo demonstrates that a large, diverse aviary with over 25 bird species can also be conducive to breeding. Housing striking and eye-catching species such as these pigeons in a mixed species aviary not only creates an opportunity to highlight the diversity of pigeon species, but also draws visitors' attention to endangered species that are less well known or less alluring and often overlooked, such as the Socorro dove.

park to emphasise the role of modern zoos in conservation. The enclosure is based on the natural habitat of both species: a mixture of savannah, desert and scrub. In the adjacent building, visitors can walk through a simulated office of a 'reintroduction coordinator' and learn about what it takes to protect a threatened species from extinction.

The young scimitar-horned oryx are the offspring of a male that arrived at Artis Zoo in September 2022. The introduction went smoothly and in less than a month he successfully mated with all three females. Just before the first female gave birth in June 2023, the male broke one of his horns in such a way that we had to decide to euthanise him. The herd now consists of five females, surrounded by the group of very curious meerkats.

To monitor the use of the new enclosure and get insights into the

behaviour of the herd, students from Van Hall Larenstein University (the Netherlands) conducted behavioural research using the ZooMonitor application. The research clearly showed that the meerkats were a bit hesitant during the first (winter) months and the oryx often sought shelter in the stables. However, after a few weeks both species seemed to feel more at home. The meerkats often stand guard on the hill and surrounding rocks while the oryx rest on the sand beds and seek shade under the two gigantic (and also endangered) Chilean palm trees (*Jubaea chilensis*) around noon. Although the meerkats initially challenged the young oryx, the young females soon learned to stand their ground. The two species coexist harmoniously, and we hope that the two young can contribute to the EEP in the future.



Kiitos, Korkeasaari!

THE EAZA ANNUAL CONFERENCE IN HELSINKI EMPHASISED THE VITAL IMPORTANCE OF COMMUNITY AND COLLABORATION IN OUR CAMPAIGN FOR GLOBAL CONSERVATION

Sandrine Camus, Communications Coordinator, EAZA Executive Office

From 12–16 September 2023, 887 delegates from 342 institutions and 70 countries met in Helsinki (Finland) for the EAZA Annual Conference.

Despite Helsinki Zoo Director Sanna Hellström's opening joke about Finnish coffee, for which she claimed 'quantity overrules quality', we can all testify that the saying does not apply to the hosts' organisational skills. From the icebreaker held in the beautiful City Hall to the frenzied rhythm of the band's songs at the farewell dinner, everything was superbly planned. Besides 100 working meetings, delegates attended one EAZA Academy course, two thematic sessions, five plenaries (available on the [EAZA Youtube channel](#)), eight special sessions, 11 workshops and, no less importantly, 18 coffee and social breaks.

In the opening plenary, Finnish presidential candidate Pekka Haavisto thanked the zoo and aquarium community for their significant role in saving species, and highlighted the uniqueness of our work. Sirpa Pietikäinen, Member of the European Parliament, echoed his words, placing particular emphasis on our research mission and the importance of understanding diseases of wild animals, as well as on reminding European citizens of their role in the preservation of the species with which they co-exist. Both messages were strengthened by keynote speaker Kira Mileham, who presented various examples of crucial partnerships between EAZA and the IUCN Species Survival Commission over the past decade: from strengthening global networks of species experts to developing tools and actions for assessing species extinction and maximising recovery, as well as collaborative lobbying activities for global priorities at the intersections between wildlife and communities. EAZA Executive Director Myfanwy Griffith also presented the latest work of the Executive Office, starting with

a surprising analogy between a good bucket and the EAZA Strategy. Both need to be large enough to contain everything we need to achieve our mission, but also small enough to remain stable and secure when going along a rocky path. Myfanwy and EAZA Chair Endre Papp recognised and appreciated Members continuing the collaborative efforts in the past few rocky years, with the COVID-19 pandemic, the war in Ukraine and the energy crisis all challenging our work.

The communication plenary saw Sallamaari Muhonen – expert in public affairs and digital communication – stress the need for zoos to switch from reactive to proactive communications. She also discussed with former WAZA Communication Manager Gavrielle Kirk-Cohen (now Species360), EAZA Director of Advocacy and Communication Tomasz Rusek and Helsinki Zoo Communications Specialist Lotta Kivalo how this will help EAZA Members to be prepared in the event of a crisis. This concurred nicely with the approval of the [EAZA Communication Guidelines](#), which are intended to support and encourage all Members to spread similar messages and build a better long-term understanding of what EAZA zoos and aquariums do and stand for.

During the week, the Council also approved updates to the EAZA Standards for the Accommodation and Care of Animals in Zoos and Aquaria, a proposal to move to a five-year screening cycle, and a new appeals process for sanctions issued by the Conservation Committee. Unlike the Communication Guidelines, these documents will be brought to the Annual General Meeting in April 2024 for final approval. Updates to our acquisition and disposition policy were also discussed and will come to Members for approval in due course.

After a busy Thursday filled with TAG sessions, Committee meetings, Working Group gatherings and other workshops, the delegates boarded a ferry to Helsinki Zoo, which is located

on an island a few minutes away from the city centre. As well as climbing up and down the hill to discover more than 150 species – including the shy Pallas's kittens (*Otocolobus manul*) and local wildlife such as the brown bear (*Ursus arctos*), wolverine (*Gulo gulo*) and European forest reindeer (*Rangifer fennicus*) – we were invited to relax and enjoy roasting marshmallows in a fireplace, playing a game of mölkky or embracing our glitter fantasy. At nightfall, the zoo was beautifully illuminated by some 100 candles that sadly represent the number of Amur leopards (*Panthera pardus orientalis*) remaining in the wild.

The next day, the EAZA21+ Campaign was wrapped up during the conservation plenary and the audience reminded of our continued role in the story of the post-2020 Global Biodiversity Framework (GBF), especially in the areas of conservation education, wildlife trade and species conservation. Philip McGowan, Professor of Conservation Science and Policy at Newcastle University, couldn't stress enough how long it takes to see changes in biodiversity and that we are on a long-term journey with targets to be implemented by 2030 and global goals achieved by 2050. While acknowledging the potential that the EAZA community offers, he reassured the delegates that we won't have to do it all alone and that other organisations are pieces of the GBF puzzle. You can find a summary of the EAZA21+ Campaign on pages 14–15 of this issue. In the second half of the plenary, the next EAZA Campaign 'Vietnamazing' (<https://vietnamazing.eu>) was introduced by representatives from the Zoological Society for the Conservation of Species and Populations (ZGAP), Leipzig Zoo, Cologne Zoo (all in Germany) and Mulhouse Zoo (France). It will aim to build a powerful network to highlight and help to conserve the biodiversity hotspots of Vietnam through an applied One Plan Approach. Truong

Nguyen, Vice Director of the Institute of Ecology and Biological Resources (Vietnam), presented the threats that Vietnamese species face and some of the current conservation efforts in place in the country. EAZA Members and other organisations can already register on the [website](#) and start preparing activities related to the Campaign that will officially start on 1 January 2024. Find out more details about Vietnamazing on page 16.

On the last day of a very busy week, the welfare plenary dedicated to animal emotions and cognitive bias testing re-energised the audience with a live demonstration of thermal imaging by Helena Telkänranta (Arador Innovations) on a brave delegate, practical videos and a theatrical performance by members of the EAZA Animal Training and Animal Welfare Working Groups, illustrating some myths and misconceptions about reinforcement, both positive and negative.

Before closing this insightful week, EAZA Chair Endre Papp awarded the EAZA Lifetime Achievement Awards to two key figures of our community for their significant contributions to our association and to species conservation. We congratulate Guna Vitola, Animal Collection Manager at Riga Zoo (Latvia), who has been involved in many areas of EAZA activities for more than 20 years, and Lorenzo von Fersen, Curator for Research and Conservation at Nuremberg Zoo (Germany) and founder of the NGO Yaqu Pacha, which is dedicated to research into and conservation of aquatic mammals in Latin America.

Speaking for the EAZA Executive Office, I can say that we have all enjoyed experiencing the life of the happiest people in the world for a few days. We thank all the participants, presenters, sponsors and the welcoming organising team for making another EAZA Annual Conference so productive! Witnessing the expertise, knowledge and sheer number of excellent collaborative projects shared during this event makes us feel proud to be part of the EAZA bucket, to borrow the phrase from Myfanwy's opening presentation. We are already looking forward to the 2024 edition, hosted by Leipzig Zoo on 8-12 October. Save the date and see you there!



Hands across the world

A RECORD NUMBER OF DELEGATES FROM ACROSS THE GLOBE ATTENDED THE 78TH WAZA ANNUAL CONFERENCE TO TACKLE THE KEY CHALLENGES FACING THEIR COMMUNITY

Tania Kahlon, Communications Coordinator, WAZA

The 78th World Association of Zoos and Aquariums (WAZA) Annual Conference was held from 8-12 October 2023 in San Diego, USA. Hosted by the San Diego Zoo Wildlife Alliance (SDZWA), more than 300 attendees from over 40 regions and countries worldwide met to discuss seminal issues for the zoo and aquarium community. This is the highest number of attendees for any WAZA conference in the last two decades, highlighting WAZA's global membership and reach as well as the value of the work that we do for our diverse community.

There were several panels at the conference, where discussions took place on emerging trends in the zoo community, the prioritisation of conservation education within WAZA and the different Centres for Species Survival.

On the first day, Clément Lanthier, WAZA President, and Paul Baribault, President and CEO of SDZWA, shared their opening remarks, welcoming the attendees to the conference. This was followed by Secretary Wade Crowfoot, California's Natural Resources Secretary, who discussed the value of zoos and aquariums as the world faces a biodiversity crisis. The keynote address, by Joel Sartore from Photo Ark, also shed light on how zoos and aquariums have a crucial role to play in being key partners in the conservation of biodiversity. Taking this theme forward, the WAZA team was also pleased to launch the [Reverse the Red Short Guide](#), highlighting the pivotal role of zoos and aquariums in addressing the decline of biodiversity and safeguarding endangered species.

The second day saw the keynote address by Fanny Cornejo, a Peruvian biologist who has dedicated more than 16 years to working on the research and conservation of endangered fauna in Peru, with an emphasis on the Tropical Andes. She shared details of her work with Yunkawasi, a Peruvian non-profit,

DELEGATES' GROUP AT THE WAZA ANNUAL CONFERENCE 2023 AT SAN DIEGO ZOO © HOFFMAN



where she focuses on the creation and management of conservation areas, biological and social research, conservation education programmes and the promotion of sustainable development of local communities.

Day three keynote speakers Lori Perkins, Jackie Ogden and Kyle Lundby presented on trends in the workforce in zoos and aquariums and sought to understand the barriers that might exist. The day also saw the launch of the IUCN SSC position statement on zoos, aquariums and botanic gardens, a landmark for the zoo and aquarium community.

On the final day of the conference, Vivek Menon, founder, trustee and executive director of the Wildlife Trust of India, shared his insights on the conservation of the Asian elephant (*Elephas maximus*) and the challenges encountered. The day also celebrated the associations that have been successful in the implementation of the 2023 Animal Welfare Goal, such as EAZA, the Zoo and Aquarium Association Australasia (ZAA), the Pan African Association of Zoos and Aquaria (PAAZA), the Latin American Association of Zoos and Aquariums (ALPZA), the Association of Zoos and Aquariums (AZA) and Canada's Accredited Zoos and Aquariums (CAZA).

The conference closed with the gala dinner and the awards presentation. Lee Ehmke, President and CEO of

Houston Zoo (USA), was awarded the prestigious Heini Hediger Award. Lee was a member of the WAZA Council from 2009 to 2020 and served as WAZA President from 2013 to 2015. During his presidency, Lee championed two key WAZA initiatives: *Caring for Wildlife: The World Zoo and Aquarium Animal Welfare Strategy* and *Committing to Conservation: The World Zoo and Aquarium Conservation Strategy*.

Marwell Wildlife (UK) was awarded the Conservation Award for reintroducing extinct-in-the-wild scimitar-horned oryx (*Oryx dammah*). The two other finalists for the Conservation Award were Dallas World Aquarium's The Centro de Rescate Amazónico (CREA) in Iquitos and the Royal Zoological Society of Scotland Edinburgh Zoo's Reintroduction of the Eurasian beaver (*Castor fiber*) to Scotland.

Loro Parque (Spain) was awarded the Environmental Sustainability Award. The institution has long prioritised sustainability, focusing on reducing ecological impact, conserving energy and water, minimising waste, adopting green energy, eliminating plastic and seeking eco-friendly products. The two other finalists for this prestigious award were Kolmården Zoo (Sweden) and Toronto Zoo (Canada).

The next WAZA Annual Conference will be hosted by Taronga Conservation Society Australia in Sydney from 3-7 November 2024.

Celebrating our superpower

AT THE 2023 INTERNATIONAL ZOO EDUCATORS ASSOCIATION CONFERENCE, CONSERVATION EDUCATION EMERGED AS THE SUPERPOWER OF ZOOS AND AQUARIUMS

Antonieta Costa, EAZA Conservation Education Committee Chair and IZE Europe and Middle East Representative 2019–2023, Lisbon Zoo

The International Zoo Educators Association (IZE) bi-annual conservation education conferences are an opportunity to share experiences at an international level and gather together old and new colleagues from around the world. IZE has historically offered conferences on even-numbered years and the EAZA Education Conferences (EEC) historically are in odd-numbered years. But we are emerging from a period of intense and largely unplanned change. The last in-person IZE conference was in 2018, followed by the 2020 virtual IZE conference hosted by San Diego Zoo (USA) and the 2021 virtual International Conservation Education Conference, co-hosted with EAZA's EEC. With the easing of travel restrictions, there was an urgent need to connect in-person again.

Taking as its theme 'Me tiaki, Kia ora! Caring for Animals, Caring for Our Planet, Caring for People', the 2023 edition of the IZE Conference was hosted by Wellington Zoo (New Zealand) from 16–20 October, and 114 delegates (27 from the Europe and Middle East Region) attended from 25 countries worldwide, representing all continents. It was wonderful to see so many educators from across the world take the opportunity to reconnect, make new connections and work together to build a realistic vision and plan for our future.

The conference was preceded by two full-day meetings of the IZE board, where discussions concerned IZE leadership for conservation education professionals involved in social change for conservation, and the implementation of activities to enable members to meet all the recommendations in the World Zoo and Aquarium Conservation Education Strategy.

The theme of this conference also included several engaging sub-themes, such as: Care, Welfare and Wellbeing (for animals, visitors,



WAZA PRESIDENT AND WELLINGTON ZOO CEO KAREN FIFIELD © IZE

students and the environment, diversity and inclusion and nature connectedness); Creativity and Innovation (innovative programmes, adaptation and flexibility and coping with challenges); Strong Together (collaborative programmes, working with our communities, connecting people to our work, engagement with zoo and aquarium colleagues and partnerships with schools or other learning institutions); and Taking Action (Community Conservation, Climate Action and Sustainable Futures).

IZE President Judy Mann-Lang (Two Oceans Aquarium Education Foundation, South Africa) set the tone in her opening speech, emphasising that conservation education is a superpower of zoos and aquariums around the world, connecting us to our visitors and inspiring them to take care of nature. As this superpower is something that educators can uniquely do, the time has come for those involved in visitor engagement to take their place alongside conservationists and professional scientists.

Amazing keynotes really set the scene for the discussions each day. The change champion Mary Haddock-Staniland (EverCommerce, New Zealand) discussed diversity,

equity, inclusion and belonging (DEIB); George Hobson, leader in environmental education, encouraged investment in youth environmental leadership; and WAZA President and Wellington Zoo CEO Karen Fifield MNZM inspired all the educators in the conference by talking about her conservation education journey from zoo educator to international leadership, and highlighting her happiness at being with 'my people'.

All the talks and workshops were powerful and supportive in helping the Conservation Education community to develop its impact. The enjoyable social events were very special, including an inspiring zoo visit and a night visit to the extraordinary Zealandia eco-sanctuary in the heart of Wellington, home to some of New Zealand's rarest wildlife.

The Wellington Zoo team went above and beyond to make all delegates feel welcome, and created a truly positive and warm atmosphere throughout the conference, from the engaging programme and keynote speakers to the enjoyable social events. The inspiration generated by the conservation education community at the IZE 2023 Conference is no doubt still being felt by all delegates, along with memories that will last a lifetime.

Taking a deep dive

DESPITE A FOUR-YEAR GAP BETWEEN CONFERENCES, THE AQUARIUM COMMUNITY HAS BEEN HARD AT WORK ON ITS CONSERVATION TARGETS, BUILDING A FULL PROGRAMME FOR THE EUAC CONFERENCE 2023

Lauren Florisson, Support Officer, EUAC

A cloudy Monday evening at the end of September found 180 delegates in Horta, on the Portuguese island of Faial in the Azores, celebrating the opening of the European Union of Aquarium Curators (EUAC) conference. This edition was especially memorable, not only for the attendance record and the gorgeous location, but also for being the first EUAC conference held since 2019. The event took place from 25–29 September with the theme of ‘Public Aquaria in the Decade of Ocean Science for Sustainable Development’, following the United Nations’ agenda for 2021–2030.

The first day of the conference opened with welcome messages from João Correia (Flying Sharks and conference organiser), Carlos Ferreira (Mayor of Horta), Luís Garcia (President of the Legislative Assembly of the Azores), Alonso Miguel (Portuguese Secretary of Environment and Climate Change) and outgoing EUAC President João Falcato (Oceanário de Lisboa, Portugal). Nine presentations about aquatic exhibits were then given on subjects ranging from the new tanks for hellbenders (*Cryptobranchus alleganiensis*) at Basel Zoo (Switzerland) to a historic overview of the aquarium at Artis Zoo (the Netherlands) and new developments in public aquariums. The afternoon saw updates from the five EAZA aquatic TAGs (Elasmobranchs, Freshwater Teleost, Marine Teleost, Coral and Jellyfish) before the day concluded with educational presentations such as ‘Where do aquariums get their fish from?’ and ‘Can aquariums save the world?’

Day two showed us that yes, aquariums can save the world, with two sessions filled with presentations on husbandry and management. Husbandry presentations ranged from breeding the yellow sally stonefly (*Isoperla bilineata*) to the best husbandry conditions for *Corallium rubrum* and giant butterfly



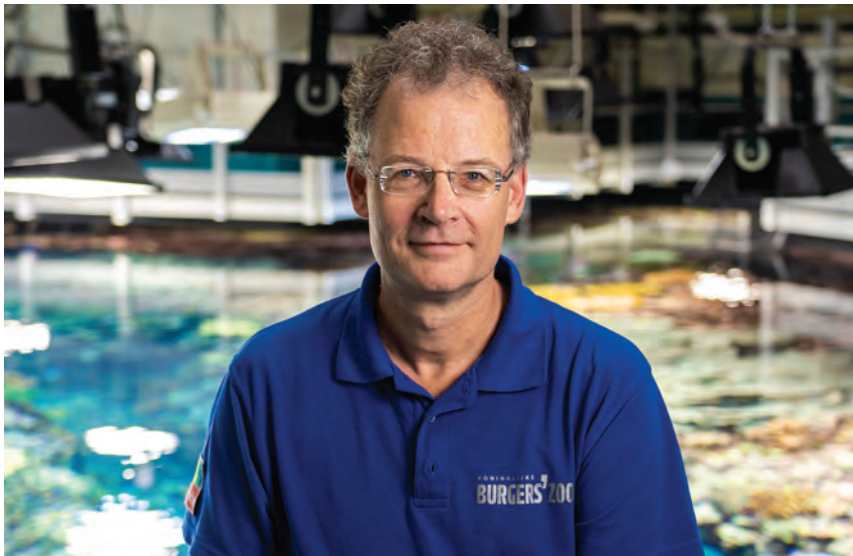
ray (*Gymnura altavela*) to thrive in human care. One thought-provoking presentation was given by McKenna Degors (My Eco Reef Solutions and Océanopolis Brest, France) about the views of European aquariums on marine ornamental breeding. It showed that 96% of European aquariums have attempted breeding with varied success and varied challenges. In the afternoon, after a workshop, more inspirational presentations were given by Sandy Trautwein (Species360) about how animal records can help support the changing role of aquariums, and Ton Weber (Rotterdam Zoo, the Netherlands) on the best way to feed reef fish.

On Thursday, keynote speaker Jorge Fontes (Okeanos, University of the Azores) gave an inspiring talk about the use of non-invasive tags to investigate deep-diving megafauna such as manta rays and whale sharks, which yielded incredible insights into the behaviour of these animals. We stayed on the theme of conservation with talks ranging from turtle rescue and rehabilitation to three freshwater fish *in situ* initiatives in Mexico and Turkey. Peter Petersen (Den Blå Planet, Denmark), EEP Coordinator for the Cichlids EEP, gave a presentation of the 113 Critically Endangered species in this EEP, as many of these colourful freshwater fish are found in aquariums. Paul Cox (Shark Trust, UK) spoke about the Big Shark Pledge (www.sharktrust.org/bigsharkpledge), the next big campaign they are

launching to support oceanic sharks. In an exciting research session, Chris Brown (Sealife Weymouth, UK) gave delegates a unique peek into the lives of long-snouted seahorses (*Hippocampus guttulatus*) and their mating behaviour. Núria Baylina (Oceanário de Lisboa) gave a presentation about their approach to teleost and invertebrate breeding. The delegates were then invited to the gala dinner and an evening full of dancing.

On the last day Nicole Kube (German Oceanographic Museum Stralsund, Germany) engaged the audience with a presentation about a successful genetic testing tool to reveal species determination in *Mustelus mustelus*. This was followed by several enlightening presentations about efficiently managing the technical set-up of an aquarium, such as life-support systems (LSS) and biofilters, and how to future-proof your aquarium by being aware of the carbon footprint of your LSS. After these sessions, the delegates went on a tour of the island to observe the site of the most recent volcano eruption, which took place more than 60 years ago.

Although no EUAC conference has been held for four years, activity in the community has certainly not slowed down. The updates and knowledge shared during the conference emphasised that public aquariums are doing their best to secure a sustainable future for all, not only in the decade of ocean science, but also in the years to follow.



A is for Aquaria

MAX JANSE, THE NEW PRESIDENT OF THE EUROPEAN UNION OF AQUARIUM CURATORS, SPOKE TO TOMASZ RUSEK, EAZA DIRECTOR OF ADVOCACY AND COMMUNICATION, ABOUT HIS NEW ROLE

Max Janse is EAZA Elasmobranch TAG Chair and Curator at Royal Burgers' Zoo in the Netherlands, responsible for Burgers' Ocean. He recently succeeded João Falcato as President of EUAC and aquarium representative in the EAZA Executive Committee.

TR: Max, congratulations on your appointment! To begin, how would you describe EUAC to our readers?

MJ: Thank you, Tomasz. EUAC is a network of specialists from public aquariums and aquatic sections of zoos. It promotes professional development in animal care and aquarium technologies, as well as in the broader challenges such as sustainability and conservation. Most EUAC members work in EAZA institutions. Since I joined EUAC in 1995, it has been very helpful for me as a support network in which we look for solutions together. And of course, being among so many 'fish-heads' gives you that nice family feeling, too.

TR: How have EUAC and the aquarium community evolved over the years?

MJ: This evolution is most visible in population management. In the 1990s, joint breeding was common in the terrestrial part of EAZA, but in aquatics there were still concerns about breeding programmes. A milestone in collaborative work

came with the first two Studbooks in 2007, for the blue-spotted stingray (*Taeniura lymma*) and the zebra shark (*Stegostoma tigrinum*). In 2013, our first aquatic Regional Collection Plan, for elasmobranchs selected the first species to be coordinated.

By the second elasmobranch RCP in 2021, we were already much more professional. The way we manage our *ex situ* populations keeps advancing all the time. In some EEPs, 50% of the animals are now born in human care, thanks to increased breeding efforts and husbandry knowledge, and management of the genetics of the populations. Three of EAZA's five aquatic TAGs (Freshwater Teleost, Marine Teleost and Elasmobranch) have an approved RCP and thus a clear direction to follow.

TR: Speaking of directions, as incoming EUAC President, are you proposing a new direction for EUAC and the aquarium part of EAZA?

MJ: There is no need to change direction, as we have so many stepping stones we can build on. In population management, we have become very good at breeding some species, but there is still a lot to learn for others. We should keep increasing the number of Best Practice Guidelines, courses and workshops, to exchange and establish expertise internally and globally.

There will be new opportunities in species conservation, too. For example, the IUCN SSC Shark Specialist Group, where Núria Baylina from Oceanário de Lisboa (Portugal) and I represent European zoos and aquariums, is opening up to the involvement of public aquariums in conservation and science. EAZA is developing a partnership with ReShark (a global organisation for reintroductions of sharks and rays). The Zebra shark EEP is already part of a ReShark project in Indonesia, where eggs from *ex situ* populations are hatched in a local hatchery and later reintroduced into the wild. We are exploring how our European population can fit genetically. I hope this can be a useful case study for other taxa, too.

Education and advocacy are also very important in our mission. Our aquariums show a piece of an ecosystem, and we have a unique opportunity to expand our communication about this. We already do a lot, both towards individual visitors and in international forums. Together with several other members, EAZA recently joined EU4Ocean, an important European initiative for ocean literacy.

TR: It sounds as if aquariums will play a strong role in EAZA in the coming years?

MJ: The second 'A' in 'EAZA' stands for 'Aquaria', so they are naturally an important pillar. But we all share the same challenge, as zoos and aquariums. We know our direction of travel for the next few years, but we should also look further ahead. What future do we want to create for our zoos and aquariums, for our conservation impact, environmental footprint, and acquisition and disposition of animals? What should an RCP mean for each institution? Why does the anemone fish live in my aquarium, what does it contribute, and what message does it communicate? We should address these questions together as a network, share more of our success stories, and never stop learning. Working in this community has been a fantastic experience so far, and I am excited to be helping it to progress further.

Moving forward from EAZA21+

AS THE EAZA21+ CAMPAIGN COMES TO AN END, IT CALLS ON EAZA MEMBERS TO SCALE UP THEIR COMMITMENT TO BIODIVERSITY CONSERVATION

Alice Albertini and Tomasz Rusek, EAZA21+ Campaign coordinators, EAZA Executive Office

The word ‘reflection’ carries dual significance: seeing your image when looking at a mirror, and thinking deeply about something. EAZA21+ was born in September 2021 as a reflection campaign rather than a conservation campaign in the strict sense. Over the course of a two-year journey, it has entailed a process of self-discovery and profound considerations on how to add our pieces to the big puzzle of biodiversity conservation. Was this reflection campaign effective? Let us briefly revisit its decisive moments.

THE BIG PICTURE

We are all aware that nature is in crisis and more than one million species (or, most likely, two million¹) are threatened with extinction, not to mention the consequences for the entire planet². The big challenge we face extends beyond ‘simply’ halting the loss of biodiversity: it also requires us to reverse this alarming trend. During the 2020 UN General Assembly and Biodiversity Summit, a coalition of global nature and development NGOs, along with business organisations, advocated for the adoption of a Nature-Positive Global Goal for Nature. ‘Nature-positive’ means halting and reversing nature loss by 2030, measured from a baseline of 2020 and aiming at a full nature recovery by 2050.

These pivotal deadlines garnered support from many international strategies and agreements, including at least two that closely align with the work of zoos and aquariums: the EU Biodiversity Strategy for 2030 and the Kunming-Montreal Global Biodiversity Framework (GBF).

THE CAMPAIGN’S ROUTE

The Convention on Biological Diversity (CBD) is a key mechanism for conserving biodiversity all around the world. Since it came into force in 1993, it has seen several frameworks, such as the Strategic Plan for



THE EAZA21+ SPEAKERS AT THE CLOSING PLENARY OF THE EAZA ANNUAL CONFERENCE 2023. FROM LEFT TO RIGHT: PHILIP MCGOWAN, SIMON BRUSLUND, KIRSTEN PULLEN, TOMASZ RUSEK, FRÉDÉRIC HOUSSAYE, ALICE ALBERTINI AND ERIC BAIRRÃO RUIVO. YOU CAN WATCH OUR CONSERVATION PLENARY ON THE EAZA YOUTUBE CHANNEL (@EAZAVIDEO) © EAZA

Biodiversity 2011–2020, known as the Aichi Biodiversity Targets.

The new CBD framework is the GBF, approved at COP15 in Montreal last December. EAZA21+ had its roots firmly anchored in the GBF, yet when EAZA21+ was launched in September 2021, the GBF was expected to be approved well before the end of 2022.

Therefore, we embarked on our journey with a ‘provisional’ compass, relying on the draft version of the GBF (which was called, at that time, the post-2020 GBF) and then adjusted our sails, arriving at the end of the campaign with the wind at our back.

EAZA21+ IN NUMBERS

A quick overview of EAZA21+ in numerical terms reveals the campaign’s extensive reach and multifaceted approach:

- 126 EAZA Member institutions have registered to join the campaign.
- Nine online workshops covered diverse topics such as holistic thinking in your conservation strategy, genetic diversity, conservation education and the GBF and its targets.
- Nine in-person sessions were held, such as workshops on developing a zoo conservation strategy, engaging sessions on the EAZA21+ game (see box, above) and the dissemination

WALK A MILE IN MY SHOES!

The EAZA21+ game 'Walk a mile in my shoes' is a playful take on the 'reflection groups' to connect with colleagues from various job roles and explore diverse perspectives.

Imagine: a sponsor hands you tablets to place anywhere in your zoo or aquarium. Picture yourself as a researcher or a vet. How would each of you use those tablets, and when would you choose not to use them at all? And if you were an educator or a project manager, how would you answer your visitors' questions about the wellbeing of animals that might be looking a bit 'bored'?

Some of your colleagues have already given it a go at EAZA events. Ready to play? Contact us at eaza21plus@eaza.net for cards and instructions.

of campaign updates during EAZA conferences.

- Three 'reflection groups' were organised by EAZA Members: the Swedish Zoo Association at Furuvik Zoo (Sweden); the Royal Burgers' Zoo (the Netherlands) hosting a meeting of zoo educators from 15 German-speaking zoos, including board members of the VZP (Association of German-speaking Zoo Educators); and a three-day education meeting at CERZA Zoo (France) that included an event focused on EAZA21+ with the participation of 42 French zoos.
- One side event was co-hosted by EAZA at CBD COP15, organised by G-BiKE and the Coalition for Conservation Genetics. The main objective was to ensure that parties adopted strong wording, goals, targets and indicators related to genetic diversity in the final version of the GBF.
- Three EAZA benchmarks were set: the new Field Conservation and Conservation Education Standards were produced and approved, and a new animal acquisition and disposition policy is in the pipeline. They align with the core themes of EAZA21+: species conservation, conservation education and wildlife trade respectively.

THE CAMPAIGN LEGACY

We hope that EAZA21+ has helped you to increase your knowledge, confidence and skills in working with the GBF's topics. Nevertheless, the GBF is more than a lesson to be learnt, and its potential resides at national level: it is now your turn to explore the opportunities that the GBF offers for your institution.

While the GBF is designed to be approached holistically, some of its targets are more relevant for our community than others.

We frequently emphasised the significance of Target 4, as it calls for **collaborative efforts between *ex situ* and *in situ* conservation actors** to ensure management actions for the recovery of threatened species. The CBD Secretariat has recently produced guidance notes for each of the 23 targets, not only elucidating their nature and the associated indicators, but also proposing guidance questions for **national target-setting** (see box, below).

Following these guidelines and the EAZA21+ toolkits (to be delivered this winter), can you realistically identify the GBF target(s) to which your institution can contribute the most? Furthermore, to play a more active role in the GBF's implementation, it is essential that you are well informed about your country's

initiatives and that you make full use of your professional network. Rather than waiting for policymakers or conservation managers to reach out to your institution for any type of support in revising your country's National Biodiversity Strategy and Action Plans (NBSAPs), you can **be proactive**. Engage with influential stakeholders, demonstrating your readiness to support the implementation of the GBF target(s) you have chosen. Equip yourself with evidence, be it scientific records, evidence-based success stories or your zoo's conservation strategy aligned with the GBF's objectives and the target(s) you intend to support.

Many of you have already taken the initiative. We highlighted these exemplary efforts during the EAZA21+ webinars and in *Zooquaria* articles. Could you and your zoo/aquarium be the next to share your plans for the implementation of the GBF in your country? Please keep us informed by reaching out to us at eaza21plus@eaza.net. Your contributions and engagement are vital for advancing the collective conservation efforts of zoos and aquariums and achieving our overarching goal of reversing biodiversity loss!

ACHIEVING TARGET 4

Target 4 of the CBD aims to recover threatened species, maintain genetic diversity and manage the human-wildlife conflict by 2030. To monitor their progress, countries are asked, when revising their NBSAPs, to make use of the headline indicators and a series of other indicators. Your country may need your management knowledge, skills and expertise in addressing important questions. Have you ever considered the following ones?

- What species are currently threatened, near threatened or at risk of extinction in your country? Where are threatened species located in your country? Which species are likely to go extinct without urgent action?
- What are the main threats to the threatened species? Which can be addressed through management actions, and which require broader approaches?
- What are the opportunities for and constraints to preventing species from becoming extinct? What are the potential ecological, economic and social costs and benefits of preventing the extinction of certain species?
- What are the sources of human-wildlife conflict in the country? How are these currently being addressed? How effective have these measures been? Who are the actors affected? How can they be involved and their needs addressed? What are the trade-offs to consider?
- What additional resources (financial, human and technical) will be required to take action on this target? How can additional resources be raised? What are possible sources?

Source: <https://www.cbd.int/gbf/targets/4>

1 Hochkirch, A. et al. (2023). A multi-taxon analysis of European Red Lists reveals major threats to biodiversity. *PLoS ONE* 18(11): e0293083.

2 IPBES Report 'Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services', 2019

Vietnamazing!

INTRODUCING THE NEW EAZA CONSERVATION CAMPAIGN FOR 2024–2025



EAZA Vietnamazing campaign team

At the EAZA Annual Conference in Helsinki (Finland), the new EAZA Conservation Campaign for 2024–2025 was revealed – named ‘Vietnamazing’, it will focus on Vietnam’s unique habitats and their threatened biodiversity.

This campaign aims to adopt the ‘One Plan Approach to Conservation’, the holistic approach to species conservation, introduced by the IUCN SSC Conservation Planning Specialist Group. The best way to do this is to work together for Vietnam within EAZA and Europe, and of course with conservationists and experts from Vietnam. Therefore, Truong Nguyen (Institute of Ecology and Biological Resources of the Vietnamese Academy of Science and Technology) and Minh Le (University of Science and Central Institute for Natural Resources and Environmental Studies, Vietnam National University Hanoi) are members of the campaign team.

During the Vietnamazing campaign, the aim is to link conservation planning processes and *in situ* and *ex situ* conservation with habitat restoration efforts, scientific research, conservation education, fundraising and public awareness. In this way, the campaign will raise awareness for threatened species from Vietnam and support their conservation and their habitats for the long term.

The campaign goals are:

- 1 to highlight the uniqueness of Vietnam as a biodiversity hotspot;
- 2 to implement and live the One Plan Approach;
- 3 to build bridges between the EAZA community and Vietnamese and international conservation and research partners;
- 4 to fulfil the objectives of pre-selected flagship projects;
- 5 to provide financial and technical support and create long-term partnerships to advance conservation efforts for selected highly threatened species and their habitats; and
- 6 to strengthen *ex situ* conservation efforts for highly threatened species at EAZA institutions and beyond.

INTRODUCING THE FLAGSHIP SPECIES!

The funds raised will go towards conservation actions for nine pre-selected species:

- Vietnamese giant magnolia snail (*Bertia cambojiensis*) – support to include the expansion of European conservation breeding efforts together with conservation measures directly on site
- Nuichua stick insect (*Nuichua rabaeyae*) – support for a population survey to increase knowledge on this species
- Tiger hillstream loach (*Sewellia lineolata*), present in many zoo collections and a representative of many threatened ornamental fish species in Vietnam, for which conservation breeding potentially can be established
- Mossy frogs (*Theloderma spp.*) –

support for monitoring and research into the extent of species richness of *Theloderma* in Vietnam, potentially building up *ex situ* populations in range

- Vietnamese crocodile newt (*Tylotriton vietnamensis*) – population monitoring, *in situ* conservation and awareness, extension of conservation breeding, potentially repatriation and restocking, genetic analysis for new populations and initiating conservation measures for other threatened congeners (e.g., *T. ngoclinensis*, *T. zieglerei*)
- Vietnamese pond turtle (*Mauremys annamensis*), which is considered functionally Extinct in the Wild by the IUCN Red List and is one of the 25 most endangered turtles in the

world – support for eDNA analyses, habitat assessments, protected area creation, genetic analyses, and potentially reintroductions or restocking are needed

- Vietnamese crocodile lizard (*Shinisaurus crocodilurus vietnamensis*), whose population is estimated to comprise fewer than 150 individuals – support of habitat conservation, continued population monitoring, and threat assessment, as well as expansion of the conservation breeding network and identification of suitable sites for reintroduction
- Vietnam pheasant (*Lophura edwardsi*) – support of the construction of additional breeding facilities in Vietnam, preparatory activities for future reintroductions, working with the EAZA Biobank to help analyse the current populations to be able to exclude remaining hybrids from potential conservation translocations
- Northern white-cheeked gibbon (*Nomascus leucogenys*) will also receive support and planning is ongoing. Keep an eye out for the latest news!



BE PART OF IT!

You can prepare for the 2024 campaign launch at your own institution by signing up and downloading the support materials available in different languages at <https://vietnamazing.eu>. What about launching your campaign at the same time as The Lunar New Year (Tết) on 10 February 2024?

The campaign team would love to hear about your plans and activities, so feel free to connect with us via media@vietnamazing.eu and follow us on Facebook and [Instagram @vietnamazing.eaza](https://www.instagram.com/vietnamazing.eaza).

Joining forces to save Vietnam’s species
EAZA Campaign 2024–2025



Back to Patagonia

THE FOUR AIMS OF THE GREBE EEP WILL SUPPORT SEVERAL SPECIES OF THIS WATER BIRD WORLDWIDE, INCLUDING THE CRITICALLY ENDANGERED HOODED GREBE FROM THE PATAGONIAN PLATEAU

William Costa, Grebe EEP Coordinator, Wildfowl and Wetlands Trust (WWT)

The new-style EEP for Grebe (*Podicipedidae spp.*) was officially established in 2021, sponsored by the Zoological Society of London (UK) and coordinated by William Costa of WWT (UK), with the following aims:

- to develop best practice guidelines for the husbandry of grebe species kept in EAZA collections;
- to increase the number of EAZA holders of grebe species;
- to manage sustainable populations of the two model species within EAZA: little grebe (*Tachybaptus ruficollis*) and black-necked grebe (*Podiceps nigricollis*); and
- to share husbandry experience and best practice with projects working on threatened grebe species *in situ*.

As of 2023, EAZA and associated zoos house 33 grebes of two species, with more than 20 individuals bred in human care this year. Despite the small numbers, these zoo individuals are crucial. Since the EEP was established, we have achieved many important goals, the successful hand-rearing of both model species, the development of transport protocols to reduce mortality and the accumulation of post-mortem data, which is being analysed by the EEP's veterinary adviser. This information feeds into Best Practice Guidelines and is widely shared with *in situ* partners to safeguard threatened species such as the hooded grebe (*Podiceps gallardoi*).

HOODED GREBE

The hooded grebe is a Critically Endangered (Roesler et al. 2011) water bird that breeds in the remote Patagonian plateau lakes of Argentina. First discovered in 1974, the species has since suffered a decline of up to 80%, with approximately 650–800 wild adults left (Roesler et al. 2012, Roesler 2016). A colonial nester, the grebe is vulnerable to invasive predators such as the American mink (*Neogale vison*) and rainbow trout (*Oncorhynchus mykiss*) as well as increasing populations of native kelp



BLACK-NECKED GREBES IN WWT © JONATHAN BALL, WWT

gulls (*Larus dominicanus*). Minks pose the biggest threat, as the presence of a single animal can result in the loss of whole grebe colonies (Roesler et al. 2015). Climate change is also affecting the suitability of the plateau lakes and the growth of the aquatic vegetation necessary for the grebes' nest.

To fulfil its fourth aim, the EEP has been supporting Aves Argentina with their work since 2020, particularly through the 'Programa de recría' project of hand-rearing hooded grebes. Despite laying two eggs, the birds rear only one chick. The project team collects the second eggs, artificially incubates them, hand-rears the chicks and releases them in to the wild to boost the productivity of the colonies. The EEP has provided advice and vital supplies for the project. In June 2023, the project leader Gabriela Gabarain visited the UK for a week of avicultural training and knowledge exchange. Based at two WWT centres (Slimbridge and Arundel), Gabriela worked with WWT's Conservation Breeding and Living Collections teams. She witnessed the protocols for 'headstarting' wading birds (e.g. the collection of wild-laid eggs for incubation, hand-rearing and subsequent release), as well as the breeding of black-necked grebes at the Arundel centre, which boasts the most successful zoological breeding colony of the species worldwide.

The EEP learnt about the complexities of running a close-order management project in the tough conditions of Patagonia as well as the species-specific needs of the grebe that make this iconic species challenging to maintain in human care. We hope this exchange of knowledge and experience will be the first of many, highlighting how developing husbandry to better support our EEP species can have an important role supporting *in situ* conservation work.

If you have any questions, please contact william.costa@wwt.org.uk.

REFERENCES

- Roesler, I. et al. (2011). *Proposal for upgrading the Hooded Grebe (Podiceps gallardoi) to Critically Endangered*
- Roesler, I. et al. (2012). *A new threat for the globally Endangered Hooded Grebe (Podiceps gallardoi): the American mink Neovison vison*. Bird Conservation International
- Roesler, I. et al. (2012). *Hooded Grebe Podiceps gallardoi population decreased by eighty per cent in the last twenty-five years*. Bird Conservation International
- Roesler, C.I. (2016). *Conservación del Macá Tobiano (Podiceps gallardoi): factores que afectan la viabilidad de sus poblaciones*. Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires



FEEDING THE PARTHENOGENETIC SIBLING MALE KOMODO DRAGONS (*VARANUS KOMODOENSIS*) IS A BIG ATTRACTION FOR VISITORS AT PRAGUE ZOO. THE INSURANCE POPULATION OF THE SPECIES IN EAZA IS SIGNIFICANT © IVAN REHÁK



LIZARDS FOR WHICH THE EEP PROGRAM IS RECOMMENDED INCLUDE THE RARE FIJI IGUANA *BRACHYLOPHUS BULABULA* (IMAGE FROM ZAGREB ZOO) © IVAN REHÁK

Which lizards should we keep in zoos?

FIFTEEN NEW EEPS WILL PROTECT THE FUTURE OF OUR MOST THREATENED LIZARDS, FROM THE FAMILIAR KOMODO DRAGON TO THE MYSTERIOUS BORNEAN EARLESS MONITOR LIZARD

Ivan Rehák, EAZA Reptile TAG Chair, Prague Zoo, and Ivan Cizelj, EAZA Reptile TAG Vice Chair, subgroup lizards, Zagreb Zoo

Deciding which lizards to keep in zoos is not easy! Our planet is inhabited by more than 7,000 known species of lizard of different appearances and lifestyles, and although each of them is a remarkable unique creation of evolution worthy of our attention, the space in zoos is limited. The EAZA RCP, which launched in July 2023, can help EAZA institutions decide which lizard species to focus on and to breed. After careful selection, 40 species and subspecies of lizards were selected and discussed individually. Based on a comprehensive assessment according to the One Plan Approach and with a range of criteria in mind – such as conservation status, demographic and genetic assessment of the current population in human care, visitor and species attractiveness and educational utility – 15 new-style EAZA Ex situ Programmes (EEPs) were proposed in order to achieve the selected direct and indirect conservation roles (e.g. insurance role, conservation education, model role) or non-conservation roles.

THE REMARKABLE KOMODO

Let us look at some of the proposed EEP species. Not surprisingly, the

Komodo dragon (*Varanus komodoensis*) is among them. With a length of up to 3 m and a weight of up to 70 kg, it is the largest lizard existing today, a remarkable relic of the giant monitor lizards of ancient times. The species is remarkable in many ways; it has, for example, a toxic bite used for hunting and defence.

The roles selected for this EEP include maintaining a long-term insurance population as well as educating zoo visitors. In EAZA institutions, the breeding of this rare giant lizard is going well and today there is the largest population of this species ever kept in human care. Thanks to the Komodo dragons in EAZA and the involvement of the relevant zoos in the research work – in accordance with EAZA's Research Strategy – it was possible to contribute to a number of new scientific findings, such as the description of the karyotype of the Komodo dragon, participation in the determination of its genome or the revolutionary discovery of facultative parthenogenesis in females, i.e. without the presence of a male, a female can produce exclusively male

offspring by herself. It is conceivable that females colonising an island free of Komodo dragons could produce partners for their own future sexual reproduction. The existing EEP, with the support of EAZA Komodo dragon holders, is exemplary in working with partners in their home country of Indonesia on important conservation and conservation research projects. There is no doubt that the transformation of the present EEP into the new-style EEP will further facilitate and accelerate the development of the selected roles in this management programme.

PROTECTION FOR UNIQUE SPECIES

A completely new EEP was designed for the mysterious Bornean earless monitor lizard (*Lanthanotus borneensis*). It is so evolutionarily and taxonomically unique that its own family, Lanthanotidae, had to be established just for this species. Until recently, little was known about this mysterious lizard. However, EAZA managed to establish a breeding population for the species – so far the only one among all regional zoo associations – whose situation



THE EARLESS MONITOR LIZARD (*LANTHANOTUS BORNEENSIS*) IS ONE OF THE MOST MYSTERIOUS SPECIES OF REPTILE, BUT THANKS TO THEIR BREEDING IN EAZA INSTITUTIONS, MUCH NEW INFORMATION ABOUT THEIR BIOLOGY IS KNOWN © PETR HAMERNÍK



ADULT FEMALE NGURU PYGMY CHAMELEON (*RHAMPHOLEON ACUMINATUS*) AT VIENNA ZOO, WHERE CONFISCATION OF SMUGGLED CHAMELEONS WAS CONVERTED INTO BREEDING SUCCESS © RUPERT KAINRADL



A HATCHLING NGURU PYGMY CHAMELEON AT VIENNA ZOO © RUPERT KAINRADL

in nature is unclear. A completely new EEP has also been designed for another extraordinary Asian lizard: the crocodile lizard (*Shinisaurus crocodilurus*), which is part of a special family Shinisauridae, evolutionarily relatively close to Lanthanotidae. EAZA has also played an important role in the development of its husbandry, and broadly collaborates on research and conservation in its home country of Vietnam.

Another new-style EEP was proposed (and already approved earlier this year) for the Critically Endangered Lesser Antillean iguana (*Iguana delicatissima*). Its population in EAZA was established through coordinated imports as part of an exemplary ongoing wider collaboration with the IUCN SSC Iguana Specialist Group and authorities in the countries of origin to establish an insurance population. A completely new EEP has been proposed for another Caribbean iguana: the Cuban iguana (*Cyclura nubila*). EAZA has an extremely important position in its *ex situ* breeding. Thirty years ago, when EAZA started breeding this species, the iguanas lived only two to three years in zoos elsewhere in the world and

failed to reproduce. Today, they are living long lives in EAZA institutions and reproducing well for generations. For example, in terms of number of offspring, the most important founder male, which was imported as an adult, lived for 31.5 years and its great-grandchildren are currently being born.

Other EEPs have been proposed – for example, for the impressive agamid representative Philippine sailfin lizard (*Hydrosaurus pustulatus*), the Critically Endangered Nguru pygmy chameleon (*Rhampholeon acuminatus*) and Critically Endangered Turquoise dwarf gecko (*Lygodactylus williamsi*) – to make sure the selected direct and indirect conservation roles can be fulfilled. Conversely, for the remaining lizard taxa under consideration, the monitoring by the Reptile TAG of their status in EAZA was recommended. The marine iguanas (*Amblyrhynchus cristatus*) and Galapagos land iguanas (*Conolophus ssp.*) were not recommended for acquisition into EAZA collections. In fact, the TAG discourages the acquisition of these species as advised by CITES representatives during the workshop (for details see Cizelj et al. 2023).

CRUCIAL COLLABORATION

This final RCP for lizards is among the crucial documents for the EAZA Reptile Taxon Advisory Group (RTAG) work. It was published thanks to the collaborative efforts of many people during the workshop, which was organised in May 2022, including the RTAG, lizard EEP Coordinators, ESB keepers, staff of the EAZA Executive Office and meeting participants (including invited non-EAZA experts). Many thanks to everyone who contributed! Understandably, the RCP makes only qualified recommendations. Their implementation will rest primarily with the individual EEP programmes, their Coordinators, committees, advisers, collaborators and all participating zoos. We wish them every success in their responsible and exemplary work!

REFERENCES

Cizelj, I. et al. (2023). *Regional Collection Plan – Sauria – for the EAZA Reptile Taxon Advisory Group – Edition One*. European Association of Zoos and Aquariums, Amsterdam, the Netherlands

When negative becomes a positive

NEGATIVE REINFORCEMENT – THE REMOVAL OF NEGATIVE STIMULI – CAN BE A FORCE FOR GOOD WHEN CORRECTLY USED IN ANIMAL BEHAVIOUR TRAINING

Barbara Heidenreich, adviser to the EAZA Animal Training Working Group, Barbara's Force Free Animal Training

The words 'negative' and 'positive' carry significant meaning in everyday language. It is difficult not to attach emotions to these words. However, in behaviour science 'positive' means to add something and 'negative' means to remove something. When paired with reinforcement, adding or removing something can be used to encourage a behaviour. Animal caregivers have become quite experienced at understanding how to add something to affect behaviour, also known as positive reinforcement. It is now becoming clearer how important it is to the welfare of the animals that we steward to understand how removing something to encourage a behaviour is equally significant. This article explores how negative reinforcement is already affecting animal behaviour and how to harness it to improve welfare.

Animals regularly demonstrate the desire for something to be removed when they try to create distance between themselves and people, objects, other animals or certain conditions. This can be described as a fear response. Examples include animals moving away when strangers are present, when novel items are introduced into their environment, when doors start to close or when a dominant animal comes too close. A fear response may be observed when asking an animal to enter an enclosed space such as a chute or transport container, when a syringe is presented or when a veterinary staff member arrives. When an animal moves away under these circumstances, this provides information that distance or removal from the stimulus is reinforcing. This response is maintained by negative reinforcement.

Animals who cannot remove themselves from the stimulus may emit aggressive responses to drive things away. This can include growling, lunging, biting or charging towards the habitat boundary to move people



AGGRESSIVE RESPONSE IN WOLVES © FRANK RØNSHOLT

or other animals away. The resulting aggressive responses can cause the removal of (or distance from) people or other animals. These are also examples of negative reinforcement successfully maintaining behaviour.

In these examples caregivers are not deliberately inserting something unpleasant into the environment to evoke behaviour. These items are either already in the environment or may need to be present for desired goal behaviours such as voluntary participation in medical care. This is an important distinction. When stimuli are intentionally inserted into the environment to cause animals to move away, the application of negative reinforcement is considered coercive. It is generally recommended to avoid this type of application.

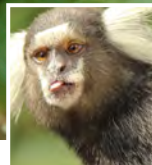
When we see animals using their behaviour to get distance, it can alert us to negative reinforcement already at work. This can then help us to develop an intervention to help shape new desired responses that result in the same distance the animal is seeking. However, it is important to start under conditions in which the animal can succeed. This means starting with the stimulus far enough away that the animal is showing calm and relaxed behaviour. This allows the animal to learn new behaviours to get the distance it wants. These responses are reinforced by the removal of the stimulus (negative reinforcement).

Criteria are gradually increased, such as getting closer or staying close to the animal a little longer. The result is an increase of the desired response, which typically is calm and relaxed behaviour. This then opens the door to positive reinforcement. Animals that were once showing fear responses or aggressive behaviour learn to emit calm responses and become receptive to appetitive stimuli such as food or attention.

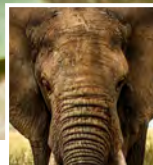
This is incredibly exciting news for animal welfare. Understanding how to shape an animal's behaviour from fear or aggression to calm by providing distance can be transformative. Animals learn to use their behaviour to control their outcomes. Animals that once seemed impossible to reach can become receptive to interactions with caregivers. Training goals can be achieved. Overall welfare can be improved.

It can take some adjusting to add the word 'negative' to your vocabulary. However, an easy-to-understand starting point is to discuss the desired outcome of distance as a reinforcer. Give the animal what it wants and start under conditions in which it can be successful for the best results.

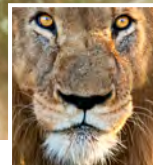
Are you interested in learning more about shaping behaviour with non-contrived negative reinforcement to improve animal welfare? Contact Annette Pedersen Chair of the EAZA Animal Training Working Group.



Primates



Herbivores



Carnivores



Birds



Fish-Eaters

Scientific concepts for

We feel responsible for those we are familiar with. Therefore Granovit Zoofeed partners with zoos to implement scientific nutrition concepts that keep animals strong and healthy.

Participate in science based feeding technology and share our passion for responsible zoo animal nutrition.

www.granovit-zoofeed.com

Contact our distribution partners:

France: SERLAB www.serlab.fr | Scandinavia: BROGAARDEN® www.brogaarden.eu

For other markets: Granovit Zoofeed www.granovit-zoofeed.com | T. +41 61 816 16 16 | info@granovit.ch



Watch, learn and share

LINCOLN PARK ZOO HAS RELEASED A NEW TOOL FOR MULTI-INSTITUTIONAL ANIMAL BEHAVIOUR RESEARCH THAT IS FREE FOR ALL EAZA-ACCREDITED ZOOS AND AQUARIUMS AND ALLOWS US TO SHARE ALL OF OUR INVALUABLE OBSERVATIONS

Jason Wark, Animal Welfare Science Programme, Lincoln Park Zoo

With nearly 500 organisations around the world using the ZooMonitor app to record the behaviour and space use of animals, it has become a leading tool for behaviour data collection across zoos and aquariums. Created by Lincoln Park Zoo (USA) and freely available to all EAZA-accredited organisations, ZooMonitor has proven to be a valuable resource for evaluating individual animals to support internal evidence-based decision-making that can enhance animal welfare. Now, the Animal Welfare Science Programme at Lincoln Park Zoo is excited to share a major expansion of the app to facilitate collaborative animal behaviour research across organisations. These new features will help to bridge gaps across our community and support game-changing multi-institutional research that can advance our collective knowledge of the needs of animals.

THE EVOLUTION OF ZOOMONITOR

Animal behaviour is arguably the most direct and useful measure that zoos and aquariums have to better understand the wellbeing of the animals in their care. By systematically monitoring behaviour, animal managers can identify 'normal'

patterns of an individual and use that information to identify meaningful changes and make evidence-based care decisions.

The need for a user-friendly tool to record behaviour was recognised by Lincoln Park Zoo's president and CEO, Megan Ross, and in 2014, the zoo was awarded a National Leadership Grant from the Institute of Museum and Library Services to create the ZooMonitor app. Designed by the zoo and built by partners at Tracks Data Solutions, ZooMonitor was publicly released in 2016 and made freely available to any organisations that are part of a WAZA-member regional association.

ZooMonitor is a flexible app that can be used on tablet devices to record what animals are doing and how they use their space. Projects can be created to address simple questions, such as how often a behaviour occurs, or complex questions about the motivations underlying why a behaviour occurred, which may include tracking multiple types of behaviour and where they occurred in the animal's enclosure. These data can then be quickly visualised and acted upon. For example, heat maps of pygmy hippos (*Choeropsis liberiensis*) housed

at Lincoln Park Zoo showed which areas of their enclosure they used most frequently, and this information was used when deciding where to place automated feeders.

These behaviour insights can help answer many questions in areas such as social compatibility, evaluating enriching experiences and designing engaging enclosure spaces, to name a few. For example, evaluating how African lions used their previous enclosure at our zoo helped us to understand what they liked about the space. Those insights were used when designing the renovation of the Pepper Family Wildlife Centre: the space incorporated elevated areas, opportunities for warmth and shade and other features the lions had appeared to prefer. In the new enclosure, zoo staff have observed the lions using the entire space, demonstrating the impact that data-informed design can have on animal welfare.

These individual-level insights from ZooMonitor have been valuable, but as the zoo team looked towards the next chapter of the app, they saw an opportunity for impacting zoos and aquariums in an even broader and more transformational way.

POWERING UP: SUPPORTING MULTI-INSTITUTIONAL RESEARCH

Animal welfare research in zoos is frequently restricted to studying a few individuals at a single institution and, as a result, is often limited in its ability to apply to other animals across the Community. From a statistical sense, much of this research is underpowered, so we struggle to draw conclusions with any confidence. Given the number of species cared for in zoos and aquariums, this poses a significant challenge for researchers looking to advance their collective knowledge and inform others how best to care for animals. To address this, Lincoln Park Zoo was awarded in 2020 a second National Leadership Grant to expand the app to facilitate project- and data-sharing across accounts. After three years of hard work by scientists in the zoo's Animal Welfare Science Programme, and with valuable feedback from many colleagues across the globe, Lincoln Park Zoo launched the new ZooMonitor Community to all users in September 2023.

The ZooMonitor Community is a new area in the ZooMonitor 'admin' section, where people can share projects as well as view and request access to join projects shared by others. These new features harness all of the powerful data collection tools that have made ZooMonitor so popular and enable a new level of collaboration. Zoos and aquariums can now observe their animals to generate individual-level insights for their internal needs, while also contributing that data to a large multi-institutional study that has the potential to reveal broad insights into the species, which can shape our care.

To demonstrate the potential of these large collaborative research efforts, the Lincoln Park Zoo team led a study on giraffes to better understand their behaviour patterns across AZA-accredited zoos. This one-year study included 18 participating zoos, and recorded behaviour for more than 60 individual giraffes, representing one of the largest behaviour studies of giraffes ever conducted in zoos. The data are being analysed now. The researchers hope this study will provide new insight into several high-profile behaviours and their relationship to enclosure size. A second ZooMonitor Community study

on weedy seadragons (*Phyllopteryx taeniolatus*) is currently underway and being led by researchers at the South-East Zoo Alliance for Reproduction and Conservation. This study aims to explore the limited reproductive success of seadragons in many aquariums and the potential environmental factors that might be contributing to the lack of offspring. Although the impact of these projects is still being realised, they are exciting examples of the potential knowledge to be gained from more multi-institutional research.

HOW IT WORKS

When creating a shared study in ZooMonitor, a Principal Investigator (PI) can add a description of the project and key details, such as training materials and expectations for how participants will conduct observation sessions. If the project has the support of a population management programme or other group, the PI can include that endorsement on their shared study, which will be highlighted on the project's page in the Community.

Building on the ethos of ZooMonitor, the Lincoln Park Zoo team recognised the need for flexibility to accommodate different types of multi-institutional studies. Projects can be shared in one of three ways:

- 1) open – any ZooMonitor users can view and join the project;
- 2) restricted – only organisations for the specified accreditation group can join the project; and
- 3) private – only invited colleagues can view and join the project.

Projects can even be configured to record identifiable or anonymous data, giving additional options for enhanced data privacy when needed. When

setting up a shared project you can also specify any special requirements for participation in your project, such as the need for participants to collect biomaterials, a particular housing or husbandry configuration, or the need to install cameras or data loggers.

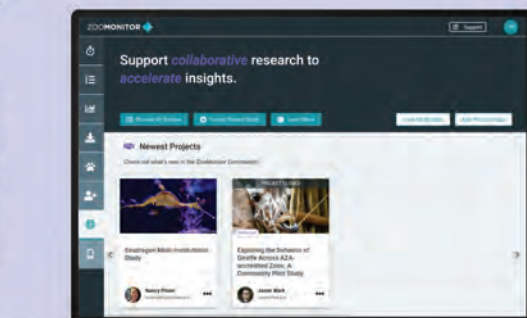
Multi-institutional research requires strong communication and project management, key factors that were considered in the design of the ZooMonitor Community. When people request access to join a shared study, ZooMonitor notifies the PI so they can easily view and approve requests. PIs can track the involvement of participants who are recording data on a shared study, and, if necessary, send them a nudge to complete different actions. PIs can also send important updates directly to participants through the ZooMonitor platform or post them more widely within the Community for others not participating in the project to read. These features are making it easier than ever to conduct multi-institutional research in zoos and aquariums.

GETTING STARTED

We're excited to share these features with you and can't wait to see how others use the ZooMonitor Community to advance the welfare of animals throughout zoos and aquariums. Do start browsing and creating shared projects by going to the Community section in admin!

If you'd like to learn more about the Community, please visit <https://bit.ly/ZMCommunity> (or use the QR code). If your organisation does not have a ZooMonitor account, you can register at <https://zoomonitor.org>. If you are unsure if your organisation is using ZooMonitor, you can email us at ZooMonitor@lpzoo.org.

Learn more about the ZooMonitor Community



BALL PYTHON (*PYTHON REGIUS*) © BERN ANIMAL PARK

Meet the education snakes

A CUSTOM-BUILT TERRARIUM AND A RIGOROUS SET OF STANDARDS FOR HANDLING IS ENHANCING BOTH EDUCATION AND WELLBEING AT BERN ANIMAL PARK

Dina Gebhardt, Curator, Bern Animal Park

Zoos play a crucial role in conserving wildlife and educating the public about the fascinating animals that share our planet. Bern Animal Park (Switzerland), like many other zoos, offers a range of educational events, including guided tours, school courses and reptile encounters. This is in keeping with the [2023 EAZA Conservation Education Standards \(ECES\)](#), which state: *'...people need to be inspired to care about and understand animals and the threats they face in the wild. To do that, EAZA believes everyone should have the opportunity to experience and learn about wildlife first-hand.'* These interactions with ball pythons (*Python regius*) at Bern Animal Park provide visitors with special and emotionally significant experiences, fostering a deeper connection to the animals and their needs. As demand for such encounters has increased, it has become essential to ensure that the welfare of the animals is still guaranteed.

The ball python is renowned for its stunning and attractive coloration.

This unique aesthetic showcases the importance of camouflage in nature, a lesson that resonates with many who encounter these snakes. The snakes are known for their relatively calm demeanour, making them a popular choice in zoos for educational programmes. Especially for a contentious species, it's important to encourage positive connections and emotions. Encounters with these snakes can encourage empathy and motivate pro-environmental behaviours and actions.

However, each snake has an individual character, and not all individuals are suitable for regular handling. Handling animals can be associated with stress, and zoos must carefully consider whether it is justified to have snakes interact with strangers regularly. As the ECES state: *'...it is vital that positive welfare states are promoted for zoo animals regardless of their participation in conservation education activities.'* At Bern Animal Park, this interaction is considered acceptable, provided

that the handlers are well trained by experienced animal keepers. The welfare of the snakes has the highest priority and any handling is put on hold when, for example, a snake has been handled too much already, its health may be or is compromised, or it is about to undergo a critical phase such as shedding.

MEET OUR 'EDUCATION SNAKES'

Until a year ago, our 'education snakes' lived as a pair in a secluded and quiet terrarium behind the scenes. They participated in guided tours, school courses and other special events, where countless people had the opportunity to observe and sometimes even touch these remarkable reptiles. For many visitors, this marks their first encounter with a snake, and they often express surprise, saying, 'It's cold,' or 'It's not slimy at all'. It's always a captivating experience to share with the audience the special sensory abilities of snakes.

Bern Animal Park remains committed to using live snakes carefully while continuing to provide visitors with the opportunity to be captivated by these extraordinary animals. Three new young ball pythons were introduced to the education snake team, which not only caters to the rising demand for educational encounters, but also minimises handling and the potential associated stress for each snake.

Yet the improvement of the welfare of the education snakes at Bern Animal Park doesn't stop at just increasing their numbers. It also extends to the very environment they inhabit, a spacious terrarium meticulously designed to replicate their natural habitat and to meet the needs of all their inhabitants.

A NEW HOME FOR NEW BALL PYTHONS

In the wild, ball pythons are often found living in burrows in the ground, including those under termite mounds. They are primarily nocturnal creatures, venturing out under the cover of darkness to hunt. In recognition of their natural behaviour, Andreas Hofer, our head keeper of reptiles, designed a terrarium offering a more authentic experience to the snakes.



THE SNAKES CAN ENTER THREE HEATED DRAWERS THROUGH HOLES IN THE FLOOR OF THE TERRARIUM © BERN ANIMAL PARK

The new terrarium provides moist, warm burrows beneath the ground, all within a savannah-themed setting. These burrows are in fact heated drawers that can be pulled out when necessary, allowing for the gentle extraction of the snakes when required.

The significance of this terrarium arrangement lies in its dual purpose. First, it offers a stable, aesthetically pleasing environment that eliminates the need for daily or twice-daily disruptions to locate the snakes under decor items. This allows the snakes to thrive in a more relaxed environment, increasing their welfare. Secondly, with this design, extracting the snakes from their burrows is less stressful for both the animals and the staff.

The enclosure measures 200 x 100 x 100 cm, providing space for the snakes to move and thrive. It is furnished with lots of natural wood, stones and dry grass, offering different comfort zones in different areas and allowing the snakes to withdraw from each other and to hide if wanted.

The enclosure is equipped with three drawers as a secure and snug hideaway for the snakes, each designed with specific dimensions: two measure 40 x 60 x 20 cm, the third is 30 x 40 x 20 cm. They are made of plastic boxes filled with soil material and wood chips.



Maintaining the correct temperature is crucial for the snakes' welfare. The enclosure features two thermo mats (*Lucky Reptile*) attached just above the drawers and emitting infra-red radiant heat similar to ceramic radiant heaters. This maintains a stable temperature of 35°C in the drawers, creating warm and cosy hideaways for the pythons. The overall temperature within the enclosure is kept within the range of 23–35°C. The set-up is located behind the scenes of our vivarium.

To replicate their natural habitat, the enclosure is equipped with a combination of lighting sources. Three metal halide lamps (*Reptiles Expert*, 150W) and four energy-efficient LED lights (*Logoterrarien*, 24W) provide a balanced and customisable light source.

The enclosure is built to last – even in an environment with very high humidity – and provides optimal living conditions for the pythons: the bottom, top and back panels are constructed from durable Trespa®

Meteon® solid core board (8 mm), ensuring longevity and structural stability. An intermediate ceiling made of 1 mm mesh fabric with 5 mm spacing acts as a secure barrier while still allowing proper ventilation. The right-hand wall is crafted from 5 mm tempered glass, enclosed in a sturdy angle frame made of CNS (stainless chrome nickel steel), allowing the snakes to be easily observed. The front features a sliding front by AWESO AG (a Swiss company that makes interior and exterior glazing) with a locking cylinder system for added security.

Underneath the enclosure, three RAKO boxes (universal plastic stacking crates) are installed. The guardrails for the RAKO boxes feature an ununlockable pull-out stop to prevent any harm to the pythons. RAKO boxes are lockable with a padlock if needed. The entire enclosure is freestanding and equipped with adjustable feet.

In addition to good husbandry, the welfare of the animals is monitored by the keepers on a daily basis. Furthermore, everyone has to fill in a sheet when they remove an individual for an event. A billboard alongside the terrarium lists the dos and don'ts of handling the animals and provides information when there is a 'no handling' recommendation.

Hygiene is of great importance. Each person handling the snakes, including visitors, are asked to properly clean their hands before and after touching the snakes. This ensures that the animals as well as our keepers and visitors adhere to our health regulations.

In conclusion, Bern Animal Park remains dedicated to providing the public with unique and emotionally significant encounters with ball pythons, while also prioritising the welfare of these remarkable creatures. Their careful handling, the expansion of the 'education snake team', and the creation of an authentic terrarium environment all contribute to the park's ongoing commitment to education, conservation and animal welfare. Visitors to the zoo can look forward to an enriching and respectful experience, fostering a deeper appreciation for these wonderful animals and the natural world they represent.

Working together for a green future

THANKS TO ITS WIDE-RANGING STRATEGY AND UNWAVERING COMMITMENT, KOLMÅRDEN WILDLIFE PARK HAS SET THE HIGHEST OF STANDARDS FOR SUSTAINABILITY IN ZOOS

Gabriella Granditsky, Head of Sustainability and Corporate Communications, Kolmården Wildlife Park

In October, it was announced that Kolmården Wildlife Park (Sweden) was one of the three proud finalists for the prestigious WAZA Environmental Sustainability Award. This award represents the highest recognition for environmental sustainability among zoos and wildlife parks worldwide. Sweden, renowned for its natural beauty and unwavering environmental commitment, hosts this exemplary model of sustainability and conservation. Situated just outside Norrköping in eastern Sweden, Kolmården has emerged as a role model of sustainability, research, education and conservation within the country.

TO LIVE AS YOU LEARN

Kolmården's vision revolves around fostering a harmonious equilibrium between people, animals and nature. This vision demands a holistic approach to sustainability that extends beyond species preservation and research. Christine Karmfalk, the CEO, emphasises the park's broader responsibility.

'If we are to take our conservation work seriously, we must also do everything we can to protect the world on which our animals depend. Animals need ecosystems in balance and our responsibility extends far beyond Kolmården's gates. We are already making a difference today, but we can and will do more.'

LEADING IN SIZE AND IMPACT

Established in 1965, Kolmården Wildlife Park stands as the largest wildlife park in the Nordic countries. Home

to approximately 53 diverse animal species, it actively participates in 33 *ex situ* conservation programmes and supports 15 *in situ* conservation projects through the Kolmården Foundation. Notably, the foundation is also a dedicated member of the IUCN. Kolmården opens its doors to visitors during the summer months and on special occasions, including Easter, Halloween and Christmas. In 2022, the park welcomed an impressive 760,000 visitors, including 25,000 students from preschool to university levels.

CENTRALISED SUSTAINABILITY LEADERSHIP

In an era where sustainability has become a cornerstone for companies worldwide, our organisation, comprising four parks – two zoos, including Kolmården Wildlife Park, and two amusement parks – has taken substantial strides assisted by not only a 'green team', but also a central Sustainability Department. This department, consisting of a Sustainability Manager, a Sustainability Project Manager and an expert in energy and technology, is committed to ensuring that sustainability efforts are strategically embedded across the organisation.

A common strategy unifies our entire corporation, setting forth long-term aspirations and annual goals in various areas. These goals guide our efforts where they can have the most significant impact. Each goal area has its working group led by individuals within operations who possess the authority to make decisions within their respective organisations. This

ensures effective and actionable initiatives. Our Sustainability Department provides guidance, inspiration and regular progress checks, while annual reviews ensure we remain on the right path.

To involve even more of our employees in our sustainability efforts, we have introduced what we call sustainability ambassadors. This initiative started in 2022 and has been an immediate success. Our employees have shown that they view sustainability issues as central, and they have voluntarily signed up as ambassadors. These ambassadors serve as crucial communication channels for our guests and employees and help generate improvement proposals based on their daily reality. Most of them are working operationally in our parks, in areas such as food and beverages, maintenance or cleaning.

STRATEGIC PLANNING TOWARDS IMPLEMENTING CSRD

Our planning for next year's goals begins in the autumn and is finalised once the results for the current year have been compiled, typically early in the new year. All our sustainability endeavours are documented in our annual report, and our measurement scope continuously expands. Just like many of our colleagues in Europe, preparations are currently underway to implement the new legislation related to the Corporate Sustainability Reporting Directive (CSRD). This EU initiative makes sustainability reporting more detailed and standardised for large organisations. For us as a wildlife



© MICKAEL TANNUS ; CHRISTINE KARMFALK © CRELLE

park, it means mandatory reporting on environmental, social and governance aspects. This increases transparency, requires high-quality data and involves engaging with stakeholders.

EDUCATING AND INSPIRING

One of the cornerstones of Kolmården's sustainability efforts is public education. Ensuring that the public is well-informed is crucial for nurturing commitment and enhancing knowledge about animals and the environment. All employees, including seasonal workers, undergo comprehensive training in the park's *ex situ* work, enabling them to effectively educate guests. In 2022, the park conducted over 380,000 animal tours, with more than half of the visitors expressing a deep understanding of Kolmården's sustainability initiatives. Each year, the park hosts thousands of local school students and collaborates with universities, offering courses, internships and opportunities for thesis projects.

A COMMITMENT TO ENERGY EFFICIENCY

Nearly a decade ago, when Kolmården initiated its systematic sustainability efforts, energy conservation emerged as a primary concern. The park, with more than 150 buildings constructed over its almost 60-year history, faces the imperative of extensive renovations to halve energy consumption by 2030. The investment in comprehensive control and regulation systems has been substantial. These systems identify high-energy consumers, allowing resources to be channelled

efficiently. Automation has been introduced in food facilities, shops and restrooms, reducing energy consumption when not in use. The park continues to refine its practices to ensure sustainability from the ground up, adhering to common guidelines for technical equipment purchases.

GREEN ENERGY AND SOLAR INITIATIVES

Operating in a climate that demands significant heating during the winter means that reducing overall energy consumption is challenging. However, Kolmården has prioritised a commitment to running the park on 100% green electricity for over a decade. One of the most significant sustainability investments is the establishment of one of Sweden's largest solar cell park, inaugurated in May 2023. Generating 20 GWh annually, it has the capacity to power not only Kolmården, but also two other parks within the same group.

TOWARDS SCOPE 3 EMISSIONS

Measuring and monitoring emissions within Scope 3 poses one of our most significant future challenges. This entails understanding and reducing our guests' carbon footprint, including their travel to our parks and consumption within. Our aim is to reduce food-related emissions by 25% within five years, which means by 2027. To achieve this, we are introducing eco-friendly options across our menus and replacing several meat dishes with vegetarian alternatives. We have also implemented food waste quantification and launched

the 'Upcycle Challenge' to encourage kitchen staff to minimise waste.

SOCIAL SUSTAINABILITY: DIVERSITY AND INCLUSION

We strive to be a shining example of social sustainability. Our vision is to be a park that opens its gates to everyone, a place where the diversity of society is welcomed with open arms. We believe that our staff should reflect the rich spectrum of individuals that make up our community. To put this vision into practice, we are dedicated not only to recruiting a diverse and dedicated workforce, but also to creating a culture that celebrates diversity and inclusion. Our work goes beyond traditional boundaries, and we have a special focus on supporting groups such as newcomers, seniors and those who are currently far from the job market.

LEADING THE WAY WITH RESPONSIBILITY

Our sustainability journey is an ongoing commitment to a greener future. Through collaboration, engagement and clear goals we are determined to make a substantial impact. Kolmården shows that it is possible to run a successful business while taking responsibility for the environment and the conservation of endangered species.

'We are proud of how far we have come but also very humble that a lot is left to do,' says Christine Karmfalk. 'Like most businesses that have been around since the 1960s, we have major challenges regarding various aspects of sustainability. It can be overwhelming but we choose not to shy away but rather to take one step at a time. The journey we are on is both long and important.'

Christine Karmfalk concludes with a call to all wildlife parks:

'I am convinced that a sustained commitment to climate, environment and biodiversity is crucial for a zoo's long-term legitimacy. For us at Kolmården, this is something we want to prioritise, but we also see that we must do it to maintain the support from our stakeholders. Kolmården has a high level of trust linked to conservation, animals and nature and I intend to do my utmost to ensure that Kolmården continues to be that credible voice.'

Why zookeepers need more VET

A NEW SCHEME IS UNDERWAY IN CROATIA TO IMPROVE VOCATIONAL EDUCATIONAL TRAINING (VET) IN ZOOS AND ESTABLISH ZOOKEEPING AS A PROFESSIONAL QUALIFICATION

Ivana Kovarik Antonović, Zoologist, Andrea Bračko, Zoological Director and Davorka Maljković, Vice Director and Head of Research and Development, all at Zagreb Zoo

With the exception of four zoos, one of which dates back almost 100 years, the zoo scene in Croatia consists mainly of smaller, private collections. Therefore, it is not surprising that zookeepers do not have the formal educational background that is required nowadays. Without appropriate professional qualifications and a clear framework for in-house training, there is a risk that outdated or inadequate information will be passed on to them during their work.

Inspired by the need to improve the skills of animal keepers, Zagreb Zoo (Croatia) joined the Erasmus+ project coordinated by EAZA from 2015–2018, the European Professional Zookeeper Qualification Framework (EPZQF). The goal of the EPZQF project was to develop a framework that could help zoo professionals to identify and learn more about the key knowledge, skills and competences that zookeepers need to successfully meet professional expectations.

PUTTING PLANS INTO ACTION

The first version of the EPZQF was presented in September 2017 and can be found at www.zookeepers.eu, translated into several languages. The framework enables zookeepers and their employers to clearly understand what skills and competences are required in their work and to identify areas of improvement.

For our institution, this document proved to be extremely useful for further areas of action, namely:

- 1) improving the in-house training we provide to our zookeepers;
- 2) improving the practical training and experience for vocational students of veterinary medicine, natural sciences and agronomy, organised and led by the Zagreb Zoo staff;
- 3) responding to calls by the Agency for Vocational Education and Training and Adult Education (AVETAЕ) to provide additional training for teachers in vocational



education. At such a workshop, the zoo is presented as a place of purposeful practice for students and a place where students acquire practical knowledge for future jobs; 4) responding to the AVETAЕ's calls for partners to take part in the project 'Modernisation of the Vocational Education and Training System in Croatia', co-financed by the European Social Fund.

This partnership was a first step towards creating a curriculum related to zookeeping and incorporating it into the education system in Croatia.

MODERNISATION OF THE VOCATIONAL EDUCATION AND TRAINING (VET) SYSTEM IN CROATIA

The main instrument that regulates the system of qualifications in Croatia is the Croatian Qualifications Framework (CROQF) Register. Its purpose is to achieve a better connection between the education sector and the labour market, and a connection with the European Qualifications Framework (EQF) and European labour market.

The CROQF introduces qualifications standards. While the same qualification can be acquired at different educational institutions and through different educational programmes, there are certain standards in terms of defined minimum learning outcomes and individual needs to acquire in order to obtain a specific qualification.

Apart from the qualifications standards, the CROQF introduces

occupational standards as well. These contain information about key work tasks related to a particular occupation and competences required to perform those tasks. They are developed in line with a specific methodology by working groups composed of different stakeholders.

Once the proposal of standards is positively assessed by relevant committees and finally approved by the competent body, they enter the national database called the CROQF Register and become national standards and the basis for development or redesign of educational programmes and curricula.

The process of updating and revising VET curricula is managed by the AVETAЕ. In November 2017 they started a project called 'Modernisation of the Vocational Education and Training System'. The purpose of the project was to develop vocational education and training that is attractive, innovative, relevant and related to the labour market and to enable participants to acquire competences for personal and professional development, continuing education and lifelong learning.

Zagreb Zoo was recognised as a compatible and experienced partner in this project. As the employer representative, the zoo was selected to join the professional standards development working group, along with different stakeholders: employers and VET teachers. In November 2019, the working group started developing proposals for occupational standards

in the Sector of Agriculture, Food and Veterinary Medicine.

OCCUPATIONAL STANDARD

Our working group developed a proposal of two occupational standards, related to the EPZQF competences, for enrolment in the CROQF Register. The first is for Veterinary Technician (EQF level 4.2), and the second is for a new occupation, Veterinary Technician Specialist (EQF level 5). The proposed new occupation is designed as post-secondary level of education (EQF VET Level 5 – VET specialist development programmes), which includes shorter educational programmes that will offer a higher level of competence to participants, for whom the labour market has expressed such needs, and for whom higher education is not required.

The proposed occupational standards were approved by the sector council of CROQF and they were registered in the national database.

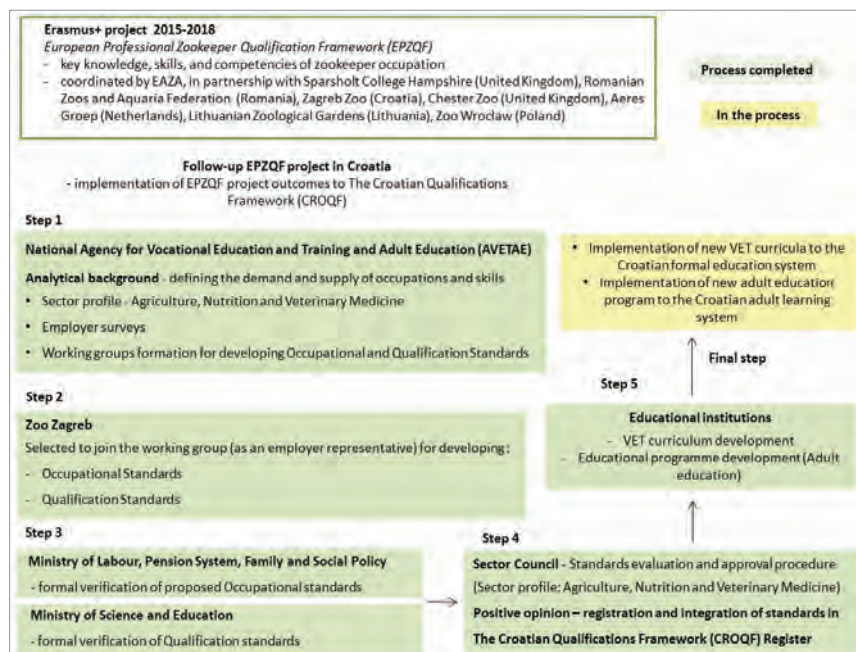
QUALIFICATION STANDARD

Occupational standards serve as the basis for development of qualifications standards. After the formal verification of proposed occupational standards, the working group started to develop the qualification standards. For a registered new occupation of Veterinary Technician Specialist we proposed a qualification standard named Veterinary Specialist for the Care of Wild and Exotic Animals. In the summer of 2023, the standards were approved, entered into the national database of the CROQF Register, and became national standards.

VOCATIONAL CURRICULUM FOR VETERINARY TECHNICIAN

Standards aim to ensure that VET curricula are demand-driven and informed by labour market needs for qualifications and competences. The VET curriculum enables achieving a specific VET qualification and both key and professional competences.

The new vocational curriculum for Veterinary Technician was developed in early 2023 by the vocational school that implements the programme,



based on the registered standard and the national curriculum for vocational education and relevant sectoral curricula. The new curriculum will be introduced in all relevant institutions in Croatia.

VETERINARY SPECIALIST ADULT EDUCATION

In adult education, AVETAE has developed a methodology for adult education programmes for the acquisition of micro-qualifications, partial qualifications and complete qualifications, which opens many possibilities of horizontal and vertical mobility through the educational system. The methodology for creating adult education programmes is also based on the occupational and qualification standards from the CROQF Register.

Zagreb Zoo worked on a proposal of complete qualification for a Veterinary Specialist for the Care of Wild and Exotic Animals, in accordance with qualification standard and sets of learning outcomes. At this moment, the proposal is in the verification process at AVETAE.

ERASMUS+ PROGRAMME 2021–2027

Zagreb Zoo recognises the opportunity to participate in the new Erasmus+ programme for 2021–2027, under the Key Action 1 that supports vocational education and training providers and other organisations active in the VET field to organise

learning mobility activities for individuals.

We applied for the Erasmus+ Accreditation in the field of VET and in 2022 we received an award that recognises that we have set up an Erasmus Plan to implement high-quality mobility activities as part of a wider effort to develop organisation. During this period of accreditation, our main goal is to improve the key competences of zoo employees in animal care and husbandry, to ensure the quality of practical teaching for our VET learners.

At this moment, we are looking for partners both among zoos and among providers of professional education and training, who would like to participate in the mobility as a host organisation to provide job-shadowing activities or courses and training for our employees.

The focus areas of job-shadowing experience and courses are developing the professional knowledge, skills and competences needed to be successful in animal care and husbandry, investigating how each partner trains their VET learners in this sector, and understanding each other's VET curriculum and approach to education methods.

It is expected that these activities will have a positive and long-term impact on the participants and the organisations involved. If you are interested in this opportunity, please do not hesitate to embark on this Erasmus+ journey together with us!



Best practice for zoo construction

PENGUIN ENCLOSURE AT KRAKÓW ZOO

ArtSystemDeco, a company specialising in building arrangements with artificial rocks and artificial trees, explains the difficulties of zoo construction projects and good practice, based on their years of experience in working for zoos.

The mission of zoos is, first and foremost, to protect endangered animal species. But at the same time, in order to carry out their statutory activities, they must generate and complete complex and unusual construction projects, which are much more difficult to carry out on zoo grounds than in more typical construction locations.

A BESPOKE SOLUTION

The project, which is central to the ongoing investment, often insufficiently addresses all the zoo's requirements. Even in the case of very elaborate and solidly prepared projects, we often find that they

focus mainly on typical elements such as structures, installations or facade designs while overlooking a fundamental aspect – the welfare of the animals they are intended to serve.

Even at the stage of creating project documentation, it is necessary to work closely with the zookeepers. Information about the lifestyles and preferences of particular species is crucial for the proper design of living spaces for each animal.

It is very good practice to seek advice and opinions from zoos that have previously made similar investments and from keepers caring for the chosen species.

TENDERING

We have often seen the time allowed for the bidding process reduced to the minimum, which makes it significantly more difficult for bidders to analyse the bidding documentation in

depth, formulate relevant questions and price specialised work from subcontractors who deal with very narrow fields. Once set, the price and deadline for the task are very rarely negotiable and binding, and any underestimation reflects negatively on the final result of the work and, consequently, on the new home for our charges.

PUTTING THE ANIMALS FIRST

Due to the negligible number of investments in construction made by zoos, there is a lack of building companies in Europe that specialise in such projects. Lack of experience working in zoos, in close proximity to animals, means that companies often overlook the impact of the ongoing project on the animals living at the zoo. In order to minimise this impact, and in particular to minimise stress to the animals, any noise created by work being carried out on the zoo grounds should be reduced as much as possible. This can be achieved, among other things, by partial prefabrication and, if possible, carrying out some of the work outside the zoo. Early specification of such requirements on the part of the investor helps the work to be planned in an optimal way.

Are you planning a new enclosure or aquarium? Check out our website: artssystemdeco.com and contact the team on office@artssystemdeco.com



ORIENTARIUM AT ZOO ŁÓDŹ

Instone AIR

100
YEARS IN AVIATION
Instone Air Line flew the first racehorse to travel by air in 1919

Experts in zoo animal transport



World leaders in animal air transport

Instone Air has been flying animals throughout the world for many years. We have vast experience, working with zoos and wildlife parks, providing both charter and scheduled service flights. Our team will handle all the logistics required to make absolutely sure the animals travel in the best possible way – aircraft – attendants – pens – road transport – documentation.

Licensed, approved members of:



Federal Aviation
Administration



T +44 (0) 1903 740101 E sales@instoneair.com W www.instoneair.com



CORBIER  iconic materials

Reynolds Polymer Technology Inc, The original acrylic window specialist.
Over 35 years of experience in Zoo and Aquarium windows.

Corbier Iconic Materials is the local distributor for Europe Reynolds, based in the Netherlands.
Support, repairs or new windows,
Corbier Iconic Materials keeps stock of a large range of standard size acrylic sheet.
We can custom make your window small or large
in time for the new 2024 season.