WAZA
World Association of Zoos and Aquariums

2023
04

NEWS

WAZA 2023 Animal Welfare Goal

Re-Establishing Scimitar-Horned Oryx in Tunisia

Loro Parque Animal Embassy, at the Forefront of Sustainability

Indigenous Peoples and Local Communities' Perspectives Represented in Exhibits

WAZA

World Association of Zoos and Aquariums

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WAZA Membership

WAZA Members as of 27 October 2023

Affiliates	8
Associations	21
Corporates	32
Institutions	294
Life	102
Honorary	35

Future WAZA Conference

2024 Taronga Zoo, Sydney, Australia, 3-7 November

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President's Letter

Karen Fifield MNZM
WAZA President

Kia ora/Hello WAZA Members,

Welcome to the last edition of the WAZA News Magazine of 2023.

As I look back at 2023, I am delighted by how the WAZA community continues to grow and inspire me. I am writing this as I head back to New Zealand from the 2023 WAZA Annual Conference, where I had the opportunity to meet new colleagues and reconnect with old friends from our community. The Conference received unprecedented interest from both WAZA members and non-members and we had the highest participation in two decades! I am confident that we will surpass this tremendous achievement and welcome many more of you to Sydney for the 2024 WAZA Annual Conference.

As many of you know, we held the Council elections prior to the WAZA Conference, where they were formally proclaimed at the Annual General Assembly. I am excited to work with the new Council members as we, along with the WAZA Executive Office and all of you, work towards breathing life into the ambitious vision we have set for ourselves as WAZA.

The conference highlighted the tremendous work that our community is doing in conservation and environmental sustainability. Some of you were nominated for the WAZA awards and I was amazed, as always, at the exceptional work being done by WAZA members to raise the bar and highlight the importance of this work in zoos and aquariums as we strive to have an impact and make a difference to address the biodiversity crisis.

The implementation of the 2023 Animal Welfare Goal has also been a significant achievement for our WAZA community and I congratulate all the member associations, reviewers and the WAZA Ethics and Animal Welfare Committee that have worked with the WAZA Executive Office to make this into a reality. As more member associations achieve this Goal, we get closer to setting and meeting, as a community, a global benchmark for animal welfare evaluation processes across all regions represented in WAZA. This is an important achievement that should make us all very proud.

I hope you will enjoy reading the articles in the magazine and would like to invite you to get in touch with the WAZA Executive Office to share your news and stories with us. See you in 2024!

Ngā mihi/Thank you

Karen Fifield MNZM
WAZA President

CEO's Letter

Dr Martín Zordan
WAZA Chief Executive Officer

Dear WAZA members and friends,

It is with great pleasure that I share with you the last issue of this year's WAZA magazine.

I would like to start by thanking the wonderful teams at the WAZA office and at the San Diego Zoo Wildlife Alliance for an excellent 78th WAZA Annual Conference. If you are a WAZA member, recordings of several sessions are available on the WAZA's website members' area.

At our 2023 WAZA Annual General Assembly, members approved key decisions for the future of our organisation. Among those are a new WAZA Code of Ethics, the 2027 WAZA Population Management Goal, and a new membership fee structure that enables us to be more equitable and global, as well as pursue key work on the new WAZA strategic priorities. The support of all our members on these decisions is greatly appreciated as they are important steps towards the achievement of WAZA's vision of being a globally recognised and trusted leader advancing Conservation and Animal Welfare.

A very special moment was the acknowledgement of six out of the 21 WAZA Association members achieving the 2023 WAZA Animal Welfare Goal. The members are ALPZA, AZA, EAZA, CAZA, PAAZA, and ZAA. This is a testimony of the global convenor role that WAZA has in setting global benchmarks for our profession. We look forward to more WAZA associations completing this goal.

Our conference concluded with the Annual General Assembly, where the 2023-2025 WAZA Council was proclaimed and our new WAZA President, Karen Fifield (Chief Executive at Wellington Zoo) assumed her new role. I am very confident that with the formation of our new council, we will be able to continue meeting WAZA's goals and I am thankful for all the valuable work that has been completed by our outgoing council.

Following the WAZA conference, I had the pleasure of joining the 2023 International Zoo Educators Association (IZE) Conference hosted by Wellington Zoo, New Zealand. Reflecting on both IZE and WAZA priorities, the result of this meeting was the realisation of the importance of increasing collaboration between both associations.

I include below my three remarks from the conference:

1. What are we achieving in terms of conservation education with the 700 million annual visits we estimate zoos and aquariums receive across the globe? New global data on reach and impact is needed.

2. Capacity building and training remains a priority raised by IZE.

3. Conservation education is core to the mission of zoos and aquariums. Even a single visit to a zoo and/or aquarium should allow us to perceive how essential this role is.

My time in New Zealand also involved a visit to each one of the four WAZA members in the country: Wellington Zoo, Orana Wildlife Park, Hamilton Zoo and Auckland Zoo. I had the pleasure of learning about the high standards of Animal Welfare under which they operate (not surprising considering that the 5 domains model was developed in the country), their committed work on native wildlife conservation (and international as well), and some of the unique and inherent aspects of operating in a geographically distant island country with strict biosecurity measures. For a country with five million inhabitants, New Zealand has been setting trends for our global zoo and aquarium community.

My visit made me much more appreciative of the fact that our 35th WAZA President is not only the fourth woman to take on this role (the third one coming from the Oceanic region) but also the first one from New Zealand. Innovation and determination are to be expected, and we are here to welcome and support these traits.

Dr Martín Zordan
WAZA CEO

Key Highlights from the 78th WAZA Annual Conference

Group picture at the San Diego Zoo Safari Park during the WAZA Annual Conference © WAZA

Tania Kahlon

Communications Coordinator, WAZA

The 78th WAZA Annual Conference was held from 8-12 October 2023 in San Diego, US. Hosted by the San Diego Zoo Wildlife Alliance (SDZWA), the attendees met to discuss seminal issues for the zoo and aquarium community. We welcomed over 300 attendees from more than 40 regions and countries from across the world, highlighting WAZA's global membership and reach. This is the highest number of attendees for any WAZA conference in the last two decades and demonstrates 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 and aquarium community, the prioritisation of conservation education within WAZA and the different Centres for Species Survival.

On the first day of the conference, Dr Clément Lanthier, WAZA President, and Mr 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 of the WAZA conference saw the keynote address by Fanny Cornejo, a Peruvian biologist who has dedicated more than 16 years to working in the research and conservation of endangered fauna in Peru, with an emphasis on the Tropical Andes. She shared her work with Yunkawasi, a Peruvian non-profit, 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, Dr Jackie Ogden and Dr 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 and the challenges that are encountered.

The day also celebrated the associations that have been successful in the implementation of the WAZA 2023 Animal Welfare Goal. The WAZA members associations that have achieved the goal in 2023 are the Zoo and Aquarium Association Australasia (ZAA), the Pan African Association of Zoos and Aquaria (PAAZA), the European Association of Zoos and Aquaria (EAZA), the Latin American Association of Zoos and Aquariums (ALPZA), the Association of Zoos and Aquariums (AZA) and Canada's Accredited Zoos and Aquariums (CAZA).

Perhaps the most significant aspect of the final day of the conference was the Annual General Assembly where the membership met to approve the changes in membership fees and the 2027 Population Management Goal, amongst other discussion items, which will allow WAZA to work towards the achievement of its ambitious new vision.

The conference closed with the Gala Dinner and the awards presentation. Lee Ehmke, President and CEO of Houston Zoo, 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.*

The Heini Hediger Award is the highest award for professional excellence, named in honour of Heini Hediger, the Swiss biologist known as the father of zoo biology. It represents the pioneering success of an individual who is strongly committed to animal welfare, conservation, environmental sustainability and education, and who is actively involved in furthering these causes within their zoo or aquarium and our global community.

Marwell Wildlife, United Kingdom, was awarded the Conservation Award for reintroducing extinct-in-the-wild scimitar-horned oryx. Marwell Wildlife, in collaboration with the Tunisian government, successfully restored the scimitar-horned oryx population and their habitats in Tunisia after an 80-year absence and extinction across its global range. Through reintroductions from various sources since 1987, a metapopulation now spans four protected areas, supported by ongoing post-release monitoring and research since 2000. This initiative aids species recovery in Northern Africa under the UN Convention on Migratory Species and provides a model for large-scale reintroduction efforts, such as those in Chad. Marwell's engagement in managing the WAZA International Studbook and conservation efforts establishes a link between global *ex situ* and *in situ* actions to preserve species.

The two other finalists for the Conservation Award were Dallas World Aquarium's Centro de Rescate Amazónico (CREA) in Iquitos and the Royal Zoological Society of Scotland Edinburgh Zoo's Reintroduction of the Eurasian beaver to Scotland. The WAZA Conservation Award is granted to an institution for an outstanding, comprehensive, specific conservation programme that has clear objectives and excellent conservation outcomes.

Loro Parque 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. Loro Parque stands as the first Zero Emissions zoological facility in their group, generating 26 MWh/year of green energy surpassing consumption.

↑ Clément Lanthier presenting the Heini Hediger Award to Lee Ehmke, Houston Zoo President and CEO, during the Gala Dinner at the WAZA Annual Conference © WAZA

The two other finalists for this prestigious award were Kolmårdens Djurpark and Toronto Zoo.

The WAZA Environmental Sustainability Award is granted to an institution for its outstanding, comprehensive environmental sustainability initiatives that advance its commitment and efforts towards environmental sustainability.

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

↑ From left to right: Martín Zordan, WAZA CEO, Sanna Hellström, Korkeasaari Zoo CEO, Nicola Craddock, ZAA Executive Director, Paula Gonzalez Ciccia, Fundación Temaikèn Deputy Director, Dag Encke, Tiergarten Nürnberg CEO and Cameron Whitnall, Zoo Creative Development Paradise Wildlife Park; during the *Communications Challenges Across Zoos and Aquariums and How to Overcome Them* panel at the WAZA Annual Conference © WAZA

Setting the Bar in Animal Welfare with the WAZA 2023 Animal Welfare Goal

Paula Cerdán[1], Tania Kahlon[2]

[1]Animal Welfare and Conservation Coordinator, [2]Communications Coordinator, WAZA

Polar Bear © Assiniboine Park Zoo

The World Association of Zoos and Aquariums (WAZA), through the WAZA Ethics and Animal Welfare, Membership and Associations Committees, has concluded the first set of reviews of its member national and regional associations' Animal Welfare Evaluation Processes towards the fulfilment of the WAZA 2023 Animal Welfare Goal.

The aim of the WAZA 2023 Animal Welfare Goal is to ensure that the Animal Welfare Evaluation Processes used by the WAZA member national and regional associations adhere to specific principles of animal welfare and that these principles are consistently applied across WAZA's global membership. By working towards this strategic Goal, WAZA has taken a significant step towards positioning itself as a global leader advancing Animal Welfare in zoos and aquariums.

The WAZA 2023 Animal Welfare Goal

By 31 December 2023:

- WAZA National and Regional Associations must have an animal welfare evaluation process in place and such a process must include specific elements approved by WAZA.
- All WAZA institutional members must be compliant with this process.

↑ The six associations that met the WAZA 2023 Animal Welfare Goal received recognition during the 78th WAZA Annual Conference.

The WAZA members associations that have met the goal in 2023 are the:

- Zoo and Aquarium Association Australasia (ZAA)
- Pan African Association of Zoos and Aquaria (PAAZA)
- European Association of Zoos and Aquaria (EAZA)
- Latin American Association of Zoos and Aquariums (ALPZA)
- Association of Zoos and Aquariums (AZA)
- Canada's Accredited Zoos and Aquariums (CAZA)

Animal Welfare Goal journey

The journey towards this landmark achievement began in 2015 with the World Zoo and Aquarium Animal Welfare Strategy, which highlighted the importance of making welfare-based accreditation a priority. In 2016, representatives from WAZA-member national and regional associations met in Singapore to discuss a pathway to implement this within the WAZA community; and in 2019 another meeting was held in Barcelona, which ironed out additional details on this goal for WAZA and moved one step further into the implementation of a global Goal to establish a global benchmark for regional and national animal welfare evaluation processes.

WAZA CEO, Martín Zordan said,

> *"The 2023 Animal Welfare Goal is a tremendous achievement. I am pleased that six member associations (ZAA, PAAZA, EAZA, ALPZA, AZA and CAZA) have already met this Goal and I am confident that other membership associations will meet it in the coming months. This Goal is in keeping with WAZA's strategy to be a globally recognised and trusted leader advancing conservation and animal welfare.*
>
> *The Associations that have been involved in the process, share a joint sense of value of the process and the importance of assessing and positioning their evaluation systems at a global scale."*

Feedback on the achievement of the Goal

ZAA's President, Elaine Bensted, said, "ZAA Australasia's animal welfare accreditation programme has been in operation for nearly nine years, and we are thrilled to have recently received WAZA's confirmation that our ZAA animal welfare evaluation processes meet the criteria for WAZA's Animal Welfare Goal.

The WAZA 2023 Animal Welfare Goal sends a powerful message to the global community, that regional and national zoo and aquarium associations meeting this benchmark present a uniform high standard for animal welfare in their member zoos and aquariums. This can give confidence to any visitor attending an accredited zoo or aquarium."

EAZA's Board Chair, Endre Papp, said, "EAZA is delighted that our EAZA Accreditation Programme (EAP) is amongst the first to meet the World Association of Zoos and Aquariums global benchmark for Animal Welfare Evaluation Processes. 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."

Dr Alejandro Grajal, Chair of the WAZA Ethics and Animal Welfare Committee said, "I am extremely proud of this achievement, not only by the member associations that have achieved this goal, but also of the extraordinary work of the Committee and the support of the WAZA Council. Our vision is to make WAZA a leader in animal welfare and conservation and this is a step in that direction."

Other associations are making progress towards the goal, with self-assessments and peer-reviews underway.

In the future, meeting this Goal will be a prerequisite of WAZA membership.

↑ Malachite butterfly (*Siproeta stelenes*) feeding © Ocean Wise

↑ Craig Hoover, AZA Executive Vice President, accepting a certificate of compliance with the WAZA Animal Welfare Goal from Clément Lanthier at the WAZA Annual Conference © WAZA

Towards Achieving the New WAZA Vision

2024 New Fee Structure

Nicola Craddock, WAZA Membership Committee Chair and ZAA Executive Director, and Janet Ho, WAZA Membership and Events Director, presenting the New Fee Structure model at the WAZA Annual Conference © WAZA

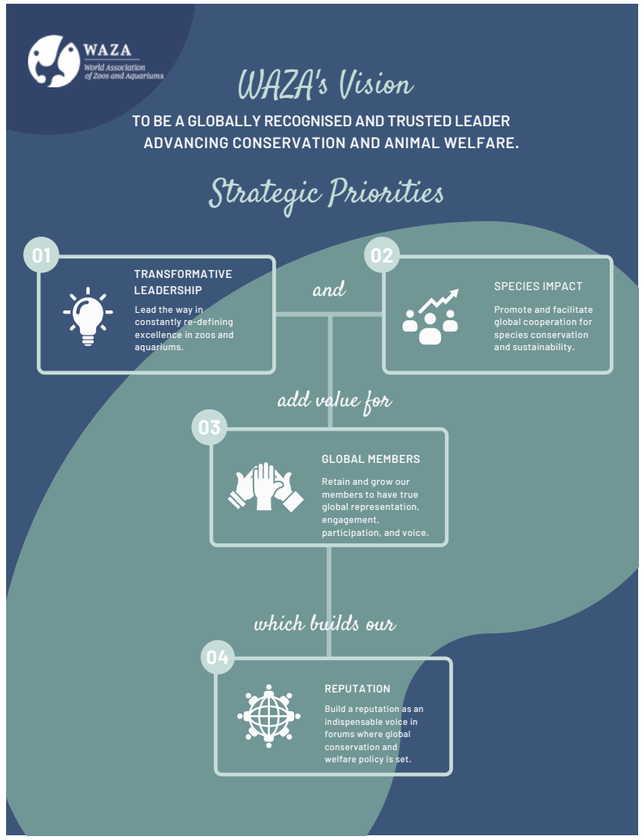
Janet Ho[1], Nicola Craddock[2]

[1]Membership and Events Director, WAZA, [2]Executive Director, ZAA; Chair of the WAZA Membership Committee

Close your eyes and imagine the WAZA Annual Conference in 2034. What is it like? Who do you see there? Where do WAZA members come from? These are the questions that we, the WAZA Council and Executive Office, asked ourselves when we were working through the strategic planning sessions.

Currently, the WAZA membership is composed of around 45% European members, 30% North American members, and the remaining 25% consists of members from Africa, Asia, the Middle East, Australia, New Zealand, Papua New Guinea, the South Pacific Islands, South & Central America and other nations south of the equator. As a global association we seek a balanced and inclusive representation of the world, however, to make this happen a new approach is needed.

Under WAZA's new Vision sits four strategic priorities, one of which is *Global Members*. It highlights the importance and need for WAZA to retain and grow our membership base in all regions to have true global representation, engagement, participation and voice. This increases our resources, capacity and impact potential, allowing WAZA to grow and continue its relevance in this fast-changing world.



→ WAZA's New Vision and Strategic Priorities

WAZA's new equitable fee structure will enable organisations of varying size and economic region, all who meet the 2023 WAZA Animal Welfare Goal, to participate in WAZA membership. The concept of the new fee structure was introduced to members at the 77th WAZA Annual Conference in Tenerife. It was then shared in more detail across the entire membership in September 2023, with the finalised fee model structure being presented during the 78th WAZA Annual Conference and unanimously approved by members at the Annual General Assembly in San Diego. Invoices with the new specific fee value will be distributed to members in the first week of January, 2024.

When we close our eyes and imagine the WAZA Annual Conference ten years from now, we envisage a conference where we have a balanced global membership representation, where delegates from currently underrepresented regions will no longer be a minority at the conference, where fruitful discussion on conserving biodiversity is conducted on a truly global scale.

> ***We are delighted that WAZA members have chosen to adopt WAZA's new Vision, Strategic Priorities, and the new member fee structure, and we are excited to embark on this journey to achieve the new Vision together, as a truly global association.***

The 2024 invoice will be sent out to WAZA members in the first week of January, 2024, with the due date on 31 March 2024.

If members have any questions regarding the new fee structure, please reach out to membership@waza.org.

WAZA MEMBERSHIP FEE STRUCTURE

From January 2024 WAZA membership fees will be based on members' operating expenditure budgets (OPEX).

AFFILIATE MEMBERSHIP

Category	OPEX Budget Range €		Membership Fee €
OPEX ≥1M	1,000,000	/	1,300
OPEX 500,000-999,999	500,000	999,999	1,040
OPEX <500,000	0	499,999	800

ASSOCIATION MEMBERSHIP

Category	OPEX Budget Range €		Membership Fee €
OPEX ≥1M	1,000,000	/	3,200
OPEX 100,000-999,999	100,000	999,999	2,600
OPEX <100,000	0	99,999	1,300

CORPORATE MEMBERSHIP

Category	OPEX Budget Range €		Membership Fee €
CORPORATE	/		2,600

INSTITUTION MEMBERSHIP*

Category	OPEX Budget Range €		Membership Fee €
OPEX 50M+	50,000,000	/	8,000
OPEX 30-50M	30,000,000	49,999,999	4,500
OPEX 10-30M	10,000,000	29,999,999	3,600
OPEX 5-10M	5,000,000	9,999,999	3,000
OPEX 2.5-5M	2,500,000	4,999,999	2,600
OPEX 1-2.5M	1,000,000	2,499,999	2,000
OPEX 500,000-1M	500,000	999,999	1,000
OPEX <500,000	0	499,999	500

*Multiple sites - Fee detemined with aggregated operating budgets of all sites

Embracing a New Goal for WAZA

The WAZA 2027 Population Management Goal

WAZA Members at the 2023 Annual General Assembly © WAZA

Paula Cerdán[1], David Field[2]

[1]Animal Welfare and Conservation Coordinator, WAZA, [2]Vice President and Chair of the Committee for Population Management, WAZA; CEO, RZSS

Just as WAZA members are advancing towards the achievement of the WAZA 2023 Animal Welfare Goal, the WAZA Committee for Population Management (CPM) has raised the bar of our ambition to develop the WAZA 2027 Population Management Goal – or as the team calls it, the 27PMG.

During the 4th Joint TAG Chairs meeting that took place in Long Beach, US, in 2021, delegates discussed the impact that the WAZA 2023 Animal Welfare Goal had across various regions. Excitement filled the room as we envisioned a similar goal that would set global standards for regional population management frameworks and build consensus on what constitutes a professional and effective population management framework.

This initiative aligns with the WAZA Strategy and its four pillars of transformational leadership, species impact, global membership and reputation. The Council nominated the WAZA CPM with the task of exploring this goal and to workshop the specific elements of what professional and effective population management means in the context of national and regional associations.

During their workshop in Amsterdam, the WAZA CPM brought together key population management experts from seven regions to define a potential population management goal based on six key elements:

Engagement and participation by the members

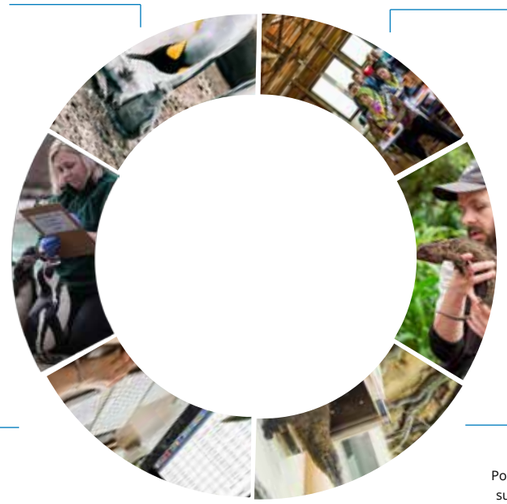
Population management activities are in accordance with rules and procedures set by the Regional Association, that contribute to achieving set goals and that assume cooperation and participation by members and other relevant stakeholders for these activities. These rules and procedures should also define the process for the coordination and collaboration of these activities and how these are implemented and evaluated.

Animal welfare

Population management activities seek to maximise opportunities for positive welfare experiences, and these opportunities must be considered during decision-making processes at both the regional and institutional levels.

Data, tools and science

Population management activities are data-driven, science-based and use appropriate record-keeping and analytical tools to inform decision-making.



Capacity building and staff

Population management activities are appropriately resourced and supported by trained and capable staff.

Goal-driven species selection

Population management activities are prioritised following a robust species assessment and selection process that identifies specific roles and goals for the population, and that considers the needs, feasibilities and risks associated with managing the population.

Sourcing, transfer and destination policy

Population management activities are based on and support legal, sustainable, and ethical sourcing and placement of animals.

The WAZA CPM also established a set of criteria under each of these six elements. These criteria will serve as the requirements for population management frameworks within associations as part of the implementation of the 27PMG.

During the 78th Annual General Assembly, WAZA Members passed *Resolution 78.2. WAZA Population Management Goal*, highlighting the importance of the Goal and the Members' role and responsibility in advancing it.

The WAZA CPM acknowledges the importance of the task that has been entrusted to them in the development and implementation of the 27PMG, and is excited to deliver another ambitious, yet game-changing goal for WAZA and its members.

↑ Joe Barkowski, Vice President of Animal Conservation and Science at Tulsa Zoo, and Chair of AZA's Animal Population Management Committee, presenting at the WAZA Annual Conference © WAZA

↑ WAZA Members at the 2023 Annual General Assembly © WAZA

2024

5TH JOINT TAG CHAIRS MEETING

6-9 May, 2024

RZSS Edinburgh Zoo

Pine hoverfly (*Blera fallax*)
© RZSS

Supported by

WAZA World Association of Zoos and Aquariums

EAZA European Association of Zoos and Aquaria

Association of Zoos & Aquariums

RZSS The Wildlife Conservation Charity

WAZA Launches Reverse the Red Short Guide

Paula Cerdán[1], Tania Kahlon[2]

[1]Animal Welfare and Conservation Coordinator, [2]Communications Coordinator, WAZA

↑ Pages from the Reverse the Red Short Guide © WAZA

WAZA's commitment to the Kunming-Montréal Global Biodiversity Framework has been evident since the development of the Conservation Strategy in 2015.

During the 2022 Annual General Meeting, WAZA members approved the R*esolution 77.2: Changing Outcomes for Biodiversity*. This resolution highlights the urgent need to address the ongoing loss of biodiversity and the failure of the United Nations Decade on Biodiversity 2011–2020 to effectively tackle this issue.

Zoos and aquariums have a vital role to play in addressing the decline of biodiversity and safeguarding endangered species. Recognising the urgency of this issue, the World Association of Zoos and Aquariums (WAZA), the International Union for the Conservation of Nature's Species Survival Commission (IUCN SSC) and other partners jointly launched Reverse the Red (RtR), a movement to inspire action and spread optimism for species conservation.

> ***The WAZA x RtR Short Guide: How your Zoo or Aquarium Can Join Reverse the Red and Halt Biodiversity Decline has been developed to provide clarity on the ways in which zoos and aquariums can join Reverse the Red, contribute to species conservation and optimise the unique skills and reach of our community. We hope you will be inspired to join us.***

The Short Guide establishes the foundation of the movement and its connections to various available conservation tools. It also showcases several success stories highlighting how WAZA members have already taken the initiative to join Reverse the Red. The case studies illustrate their contributions to various actions, such as enhancing the conservation status of species, establishing Centers for Species Survival, collaborating with local communities, and partnering with local governments to align and bolster joint conservation objectives.

We encourage you to avail of this guide, which is available on the WAZA Website, and explore the ways in which your zoo and/or aquarium can support the Reverse the Red movement. By implementing the strategies laid out in this document, WAZA members can inspire action, spread optimism, and make a tangible difference in the conservation of our planet's precious biodiversity.

> ***Together, we can create a brighter future for endangered species.***
>
> ***Together we can Reverse the Red!***

↑ Reverse the Red short Guide © WAZA

Re-establishing Scimitar-horned Oryx in Tunisia

Dr Tania Gilbert

Head of Conservation Science, Marwell Wildlife

Oryx in Dghoumes National Park (2014) © R Cooke and Marwell Zoo

I remember that first glimpse of the gate of Bou Hedma National Park (NP), with images of addax and scimitar-horned oryx emblazoned on the ironwork, and the mountains rising out of the acacia savannah, as clearly as if it were yesterday. We had become somewhat lost at the end of a long drive from the Island of Djerba to Bou Hedma NP but knew we were close when we found a mural of the park on a village wall, resplendent with oryx, ostrich and gazelles. The park itself, however, temporarily eluded us. We finally arrived shortly before nightfall with nearly half our party still on the road due to the unexpected reappearance of luggage that had wandered off in Paris whilst its owner had flown on to Djerba. The remaining three of our party, Bill Houston from St Louis Zoo, Ed Spevak from Cincinnati Zoo, and I, settled into the park's accommodation for the night. As I snuggled down into my four-season sleeping bag and pulled my woolly hat over my ears, I considered whether it was possible to manoeuvre a third pair of socks onto my feet. In the end I decided against it but made a mental note that if I were to travel to Tunisia in January again, I would make sure to bring thermal socks.

The following morning brought Heiner Engel from Erlebnis Zoo Hannover and Terrie Correll from The Living Desert with the errant luggage, and our first glimpse of the object of our mission, a herd of scimitar-horned oryx (*Oryx dammah*) grazing amongst the acacias in the park. It had been 20-years since oryx had been translocated from Marwell and Edinburgh Zoos in the UK in a pioneering project led by the Tunisian government's Direction Générale des Forêts (DGF) and the Zoological Society of London. The project had re-established the species back in its natural habitat 80-years after it had disappeared from Tunisia. It was around this time, in the late 1980s, that the scimitar-horned oryx was completely lost from the wild, making the global *ex situ* population and the newly established reintroduced herd in Bou Hedma NP, the only places in the world where they could be found.

For those unfamiliar with scimitar-horned oryx, they are a white and russet arid-adapted antelope from the Sahel, the 'shore' that surrounds the great Sahara Desert. Their graceful curving metre-long horns gives them their English name, and their ability to survive for months without drinking water enables them to thrive in a challenging arid ecosystem. Once, over a million individuals ranged across the Sahelian grasslands that stretched from the Atlantic to the Nile, but over-exploitation and competition with domestic livestock caused severe population declines making them vulnerable to prolonged droughts and civil war in the region. They eventually became extinct in the wild in the late 20th century (Iyengar at al., 2007; Newby, 1988; Woodfine & Gilbert, 2016).

By the time I first visited Bou Hedma NP in January 2005, the scimitar-horned oryx herd had grown to 130 individuals, too many for a national park surrounded by human-dominated habitats. Since then, the population has reduced to within the park's carrying capacity due to a natural decline and the translocation of oryx to augment other reintroduced populations. Our mission in 2005 aimed to assess past reintroduction efforts for the species and its aridland cousin, the addax (*Addax nasomaculatus*), and evaluate two further national parks for new conservation translocation projects, Dghoumes NP for oryx, and Jbil NP for addax. Over the following two weeks, we reviewed the Marwell and Bratislava Zoo-led project from 1999 in Sidi Toui NP and Oued Dekouk National Reserve (NR) in the South of the country, and then moved on to our final 'oryx destination' of Dghoumes NP close to the oasis town of Tozeur.

Dghoumes NP is set alongside the Chott el Djerid, an endorheic salt lake, and incorporates a mountain range, part of the Chott, and an aridland plain crossed by wadis, the ephemeral river beds characteristic of aridland habitats. The wadis run from the mountains to the Chott and overflow with shrubs, grasses and flowers. A series of reception and acclimatisation pens had been built close to the main entrance, and they needed just a few adjustments to make them ready for the oryx. The habitat was good, the team in Dghoumes NP was highly motivated and skilled, and plans to secure supplies for a soft release were in place. The only missing component were the oryx themselves.

We had already spent some considerable time in assessing and planning the project prior to our visit, and it would take nearly three years more before we brought the oryx and addax from the EEP and Species Survival Plan (SSP) populations to Tunisia. In December 2007, we accomplished this, and in March the following year the oryx were released from the acclimatisation enclosure in Dghoumes NP into the main park. Within a day they had joined the herd that had been translocated from Bou Hedma NP earlier in 2007. Today there are at least 50 oryx in Dghoumes NP.

For over 25-years, Marwell's long-term partnership with Tunisia's DGF has proved resilient in an over-looked and under-resourced region. Our reintroductions of oryx from Marwell, Edinburgh, the EEP and SSP, have re-established a metapopulation across four protected areas. This project further enabled reintroductions of North African ostrich, as well as concerted action for extant threatened species. Rigorous post-release monitoring and research on population performance, animal health, biodiversity, and habitat restoration since 2000 facilitates adaptive management strategies delivering long-term biodiversity gains. In 2011, we established a permanent in-country team, developing the next-generation of Tunisian wildlife veterinarians and conservationists. So far, 26 Tunisian and international students have completed their research with us, and 30 Tunisian veterinary and ecology students have graduated from our internship programme, helping to develop their practical wildlife conservation skills.

The *ex situ* population and support from the global zoo community, particularly the EEP and SSP, has been critical in re-establishing scimitar-horned oryx in Tunisia. Put simply, the species would have gone extinct without them.

It has been 18-years since my first visit to Tunisia and today 200 or so oryx are present in their natural habitats in the country. This conservation programme has achieved much, but in today's rapidly changing world, we know that our conservation work is never truly finished.

Acknowledgements

Conservation is not a solitary endeavour; it is a collaborative effort involving countless individuals, organisations, and communities coming together to protect our planet's biodiversity. Our work on scimitar-horned oryx conservation would not have been possible without the unwavering support of our dedicated team, our friends and colleagues at the Direction Générale des Forêts (Ministry of Agriculture, Fisheries and Water Resources, Tunisia), and the Commissariat Régional au Développement Agricole (CDRA) of Tozeur, Kebili, Medenine, Tataouine, Sidi Bouzid and Gafsa. In the last 30 plus years, over 80 organisations, many of them WAZA members, have supported this project; we are exceedingly grateful to those organisations that have supported us and those that still do, including Artis Amsterdam Royal Zoo, Branféré Parc Animalier et Botanique, Dublin Zoo, Parco Faunistico Le Cornelle, Safari Parc Monde Sauvage & Wroclaw Zoo Foundation DODO.

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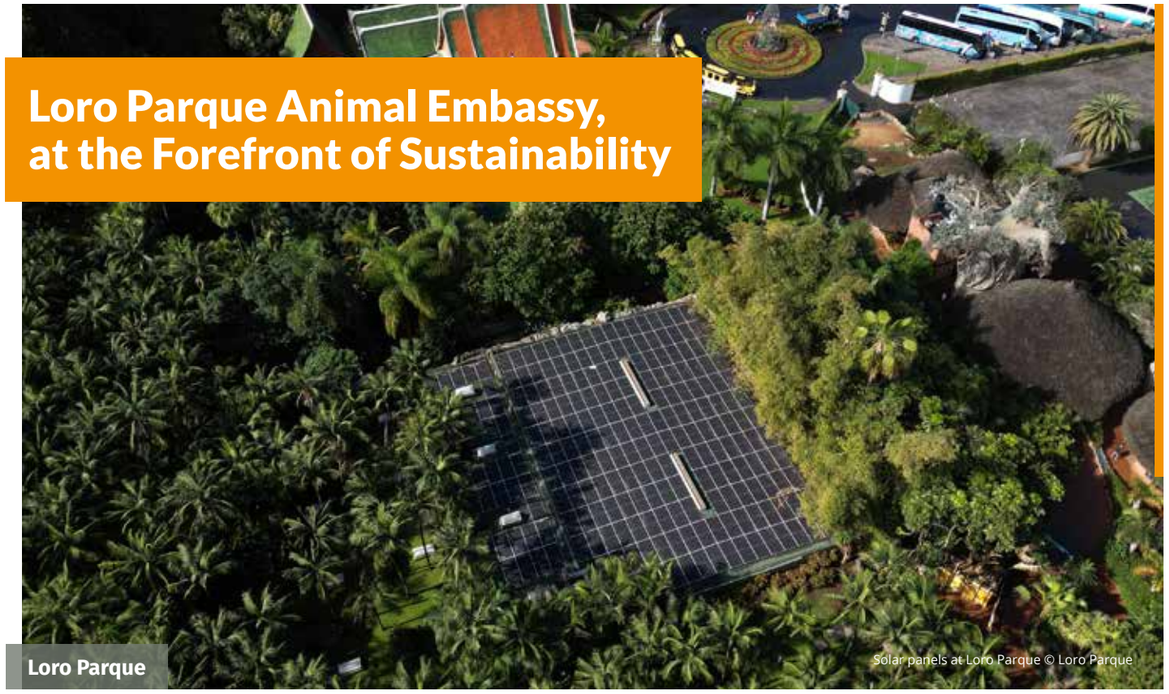
↑ Oryx in Dghoumes National Park (October 2009) © Dr Tim Woodfine and Marwell Zoo

Loro Parque Animal Embassy, at the Forefront of Sustainability



Loro Parque

Solar panels at Loro Parque © Loro Parque

Protecting our planet is the guiding principle that has enabled the company to achieve significant milestones in the preservation of biodiversity

Loro Parque perfectly embodies the role of modern zoos in the fight against our planet's environmental crisis. Today, due to mankind's actions, the sixth mass extinction threatens the lives of more than one million species and their habitats (IPBES, 2019). In this context, the company has adopted a holistic approach to ensure that its daily business is sustainable. Many elements have been incorporated into this approach, including water consumption, use of plastics, energy self-sustainability, environmental education activities and organic production, among others.

Acclaimed work

Throughout its 50-year history, Loro Parque's comprehensive management system has been widely acclaimed and certified. Loro Parque is EMAS certified, the official EU environmental management certification. Furthermore, in recognition of its strong compliance with the SDGs (Sustainable Development Goals), the zoo was awarded the Biosphere Sustainable Lifestyle certificate. It also received the International Environmental Award from TUI, one of the world's largest tour operators.

Leaders in green energy

Loro Parque operates renewable energy facilities, both inside and outside the zoo. In the south of Tenerife, the company has its own solar farm, which provides 2.75 MW of photovoltaic power, preventing the emission of more than 2,000 tonnes of CO_2 into the atmosphere each year.

In addition, the company's Poema del Mar aquarium has a 150 KW solar farm and a 4 MW wind turbine, which allows for considerable energy savings without polluting the environment. This biodiversity conservation centre located on the neighbouring island of Gran Canaria also collaborates with Loro Parque Fundación in many of its marine life conservation projects.

One of the company's upcoming renewable energy projects is the installation of a new 10 MW photovoltaic plant, which would increase the total capacity to 20 MW. Its commissioning would mean that the Loro Parque Group, comprising the zoo, the Poema del Mar aquarium, the Siam Park water park, Brunelli's restaurant, and the Hotel Botánico & The Oriental Spa Garden, would generate enough green energy to offset the impact of its activity on the environment.

→ Water filtration facilities at Loro Parque © Loro Parque

Goodbye plastic!

Loro Parque pioneered the elimination of single-use plastics. In 2018, the entity launched a comprehensive strategy to eradicate the use of this material in its facilities. Plastic was replaced with alternative compostable and biodegradable materials, resulting in a 95% reduction to date. Last year, due to the introduction of this policy, the zoo avoided generating 35 tonnes of plastic.

Under its environmental policy, Loro Parque has implemented a wide network of 5,000 litter bins in the busiest areas of Tenerife, which are installed and cleaned on a daily basis by the company. One of its longest-running environmental responsibility actions, these litter bins have become a feature in Tenerife's landscape.

Hand in hand with the sea

Water plays a fundamental role in the zoo's daily life, and to keep the animals' spaces in optimum condition, a large quantity of water is needed, especially when dealing with marine animals. To meet this demand, Loro Parque has installed its own desalination system with an osmosis plant that produces 600,000 litres of drinking water per day through the desalination of seawater, optimising the park's water resources.

The example of Loro Parque and the other companies in the group, (Poema del Mar, Siam Park, Hotel Botánico & The Oriental Spa Garden and Brunelli's) is an effective way to illustrate the work of modern zoos in the fight against climate change. Such initiatives encourage the zoological community to follow the path of sustainability and environmental protection. The role of modern, sustainable zoos is more vital than ever before, given the dire situation of the world's ecosystems.

Loro Parque Fundación – from Tenerife to every corner of the planet

This environmental commitment is also upheld by Loro Parque Fundación, an NGO founded in 1994 to preserve animal species and their habitats. Since then, their conservation efforts have spread all over the world to fight against the loss of endangered species, especially psittacine birds. The numbers speak for themselves: almost 26 million Euro has been invested in over 220 conservation projects around the world and 12 parrot species have been saved from extinction.

Wolfgang Kiessling, chairman and founder of Loro Parque, donated the ownership of all parrots to Loro Parque Fundación, entrusting them to a non-governmental organisation as a world heritage site. Loro Parque has been its main benefactor, and as a result of the support provided over the last 30 years, the Foundation can cover all its operating expenses so that 100% of all donations received can be devoted to the conservation of biodiversity.

Loro Parque Fundación also plays an important role in the environmental education of new generations. It has a dedicated Education department responsible for holding educational activities at Loro Parque and in schools located in the Canary Islands. These activities promote greater awareness and knowledge about the importance of caring for our planet among future generations.

↑ Student during one of Loro Parque Fundación's educational activities © Loro Parque

Giving Beavers a Bright Future in Scotland

Eurasian beaver (*Castor fiber*) entering water © RZSS

David Field

CEO, RZSS

The Royal Zoological Society of Scotland (RZSS) is a wildlife conservation charity with a bold vision – a vision of a world where nature is protected, valued and loved.

To help achieve this vision, RZSS have pledged to reverse the decline of at least 50 species by 2030 by supporting conservation breeding in our zoos, advancing species recovery science, restoring species and caring for biodiversity on our sites.

Conservation is at the heart of what we do, and RZSS has a long history of conservation action around the world, having contributed husbandry expertise to island species recovery projects – like the Henderson Island rail (2011), Canna mouse (2005-2006) and Gough Island Restoration Programme (2020-2022) – and provided core support to two major *in situ* conservation initiatives for almost two decades – the Budongo Conservation Field Station in Uganda and ICAS the Wild Animal Conservation Institute in Brazil.

Our RZSS WildGenes laboratory, based at Edinburgh Zoo, has forged the way globally in the use of genetic data for conservation management, from combating the illegal trade in elephant ivory in Africa and Asia, to supporting the captive breeding of Siamese crocodiles and managing the reintroduction of scimitar-horned oryx to Chad.

A little closer to home, our wildlife conservation charity has a strong track record in the reintroduction of native species to Scotland including wildcats, pine hoverflies and beavers.

Beavers are ecosystem engineers, which means they have a huge impact on habitats and species through the alterations they make to the environment they inhabit.

Once widespread across Scotland, the Eurasian beaver (*Castor fiber*) is thought to have become extinct in Scotland in the 16th century following over-hunting.

The idea of bringing beavers back to the landscape began in the late 1990s, but it wasn't until 2008, when the Scottish Government approved an application submitted by RZSS, the Scottish Wildlife Trust and the Forestry Commission Scotland (now Forestry and Land Scotland), that a five-year trial reintroduction of the Eurasian beaver to the west coast of Scotland was approved. This work would become the Scottish Beaver Trial.

Together, as part of the Scottish Beaver Trial, the first beavers were released back into Scotland in May 2009. These releases were the first successful licensed release of a mammal species ever to take place in the UK.

↑ Scottish Beavers Reinforcement Action on 19 October 2017 © RZSS

↑ Eurasian beaver (*Castor fiber*) swimming © RZSS

16 beavers were released into three separate freshwater lochs within Knapdale Forest, signalling the first official return of beavers to Scotland in over 400 years. It is estimated that over 10 million people watched, listened to or read about the release in the days that followed. The trial was followed by The Scottish Beavers Reinforcement Project, which ran from 2017-2020. Over the course of a decade of work, RZSS and Scottish Wildlife Trust collaborated together with government partners and a wide variety of stakeholders to achieve a bright future for beavers in Scotland.

The project has seen RZSS take the lead on fieldwork, scientific research, veterinary care and animal handling, stakeholder engagement and political lobbying.

Subsequent to the trial and during the reinforcement project, regular surveys were conducted. This information, along with independent scientific monitoring conducted by government agency Scottish Natural Heritage (now NatureScot), was used to predict the benefits beavers would provide across Scotland. This information contributed to the eventual decision, on 1 May 2019, to grant beavers full European Protected Species Status.

The return of this species has been cited as assisting with Aichi Biodiversity Targets, including habitat loss reduction, sustainable agriculture, aquaculture and forestry, invasive species and ecosystems vulnerable to climate change.

Over the course of the trial, it is estimated that over 2.9 million people were engaged with the work of the project. People from 26 different countries visited the centre constructed at the release site, and the project was featured in numerous television documentaries.

As well as two curriculum linked lessons, which were delivered to 70 primary schools, the Scottish Beaver Trial educational pack was sent to each of the 2,569 primary and secondary schools in Scotland. The journey of the trial was also well documented by the RZSS education team through the work of Wild About Scotland, a bespoke double-decker bus that engaged almost 100,000 learners across Scotland over a four-year period. Today, our charity incorporates learning materials on beavers in our free online educational resources and in our immersive classroom on site at Edinburgh Zoo.

Our charity's involvement with beaver conservation resulted in a high volume of research authored by RZSS staff, including captive management guidelines for Eurasian beavers, over 20 peer-reviewed papers and eight commissioned reports. Additionally, RZSS has contributed to the major Scottish Government outputs *Beavers in Scotland: A report to the Scottish Government* and the beaver management framework.

This research also includes the first ever disease risk assessment for beavers, one of the first projects to use genomic technology to generate Single Nucleotide Polymorphisms (SNPs) to support conservation management decisions in any species, and a novel method for detecting *Echinococcus multilocularis* (also known as fox tapeworm).

Throughout the past decade RZSS, along with project partner the Scottish Wildlife Trust, has been heavily engaged in conservation advocacy. Our charity has played a critical role in maintaining constructive dialogue between conservation organisations, the farming and fishing communities, and government agencies through active participation in the Scottish Beaver Forum. A key output of this forum has been Scotland's Beaver Strategy, which RZSS co-led as a member of the organising team.

RZSS continues to push for stronger welfare measures in beaver management and has a seat on the Scottish Beaver Advisory Group (SBAG). We have also contributed more widely to setting high standards for reintroduction in Scotland through our participation in the Scottish Reintroduction Forum, which produced the Scottish Code for Conservation Translocations – the reinforcement of the Knapdale population was the first project to be granted a translocation license under this world-leading system.

The reintroduction of beavers to Scotland is testament to the commitment of a wide variety of agencies and partners and proves that if we work together, we can create a world where nature is protected, valued and loved.

Amazon Rescue Center

The Dallas World Aquarium

Cristian Vélez

Environmental Education and Ecotourism General Manager, Centro de Rescate Amazónico (CREA)

Environmental Education © Dallas Aquarium

The Peruvian Amazon is renowned for being one of the planet's most biologically diverse regions, hosting thousands of species of plants and animals and serving as the birthplace of the majestic Amazon River. At the heart of this lush landscape stands Iquitos, the world's largest city accessible only by air or waterway. Iquitos is a kaleidoscope of colours, sounds, cheerful inhabitants and enveloping warmth. Unfortunately, throughout its history, the city's development has been intrinsically linked to the exploitation of its natural resources, from the rubber boom in the 19th century to the extraction of animal skins and essential oils like rosewood, to more recent activities such as oil drilling, logging, and the trade in wild fauna. In this region, life for Amazonian residents has been an ongoing struggle for survival, as they depend on the forest's resources to meet their needs. Sadly, our ecosystems are deteriorating at an alarming rate, affecting countless species, including the Amazonian manatee.

In 2007, a group of biologists stumbled upon an Amazonian manatee, a malnourished calf, inside a tray within government offices in the city of Iquitos. This calf had been confiscated by the authorities, but sadly, at that time, Peru lacked an institution dedicated to the conservation of the Amazonian manatee. This, combined with a lack of knowledge about their care, casts a shadow of uncertainty over their long-term survival.

Fortunately, Daryl Richardson arrived in Iquitos the same year, alongside experts from The Dallas World Aquarium, with a profound commitment to Amazonian wildlife and Iquitos. This collaboration soon created the Centro de Rescate Amazónico, (CREA), the Amazon Rescue Center. Iquitos evolved from a society of exploitation into one of conservation, where the local human talent was harnessed and strategically developed. This approach empowered Amazonian professionals by providing them with the skills and support necessary to preserve not only the manatee but also numerous other local and threatened species.

The Dallas World Aquarium, through CREA, conducts comprehensive work for conservation in the Amazon, encompassing rescue, rehabilitation, and the release of animals, as well as research, environmental education, and advocacy in regional and national legislation. The Amazonian manatee became their emblem, symbolising a shift towards sustainable use of the Amazon and inspiring the local population to actively engage in preserving their land and animals.

> *To date, CREA has successfully rescued and rehabilitated forty Amazonian manatees, releasing thirty-one of them into their natural habitat. Additionally, they have released sloths, turtles, birds, and pink dolphins, totalling more than 10,000 animals since their inception.*

In April 2011, with a collaboration of Brazilian professionals, CREA conducted the first manatee release in their natural environment in Peru. This release was conducted alongside the 'Yacutaitas', an organisation formed by local community members with the aim of managing and protecting their natural resources. Mr Lidber Arrué, president of the Yacutaitas, shared his profound excitement at participating in the release. For him, it was the second time in his life that he had the opportunity to see a manatee, the first time was as a child when a dead manatee was brought to his community. However, this time, he and his young son were witnessing a live manatee being returned back to their natural habitat.

Each released manatee is outfitted with a monitoring device on its tail, allowing CREA to track their progress via telemetry and side-scan sonar for several months. This endeavour serves as the foundation for establishing monitoring protocols in Peru and has facilitated collaborative research with organisations and experts from around the world, including Brazil, Colombia, Mexico and Puerto Rico.

In June of this year, CREA conducted their ninth manatee release. Currently, groups of locals navigate the Amazon rivers daily to ensure the manatees' adaptation to their new habitat and to acquire a deeper understanding of the species in its natural environment. In this process, the active involvement of the Indigenous communities plays a crucial role, as they function as local guides and share their ancestral knowledge of the Amazon rainforest and emphasise the importance of the manatees to our ecosystem.

One of the misconceptions about manatees was that they fed on fish and competed with locals for this resource. To dispel this myth and promote a more accurate understanding of the species' biology, The Dallas World Aquarium has implemented an environmental education programme conducted in both urban settings and Indigenous communities in the Amazon. The Amazon comprises approximately 60% of Peru's national territory, and reaching some of its areas is challenging. However, this does not deter educators who travel for several days to convey their message of conservation and inspiration to Amazon communities.

The CREA staff employ an environmental education methodology based on ecological stories inspired by classic tales, myths, and Amazonian legends. The workshops include playful activities, puppet theatre, and hands-on experiences as educational tools. Although the workshops are primarily aimed at children, it is heart-warming to see parents and elders from the community also actively involved. These workshops focus on highlighting the importance of the Amazonian manatee in the ecosystem and its role as an indicator of the river's health. However, the learning process is not one-sided. Community members often share their knowledge of medicinal plants and how they use them in their daily lives, as well as their sustainable and respectful relationship with the natural environment.

> *An impressive indicator of the programme's success is that no single case of manatee trafficking has been reported in Iquitos over the last five years. To date, nearly 200,000 locals have benefited from these conservation and environmental education efforts.*

In the past many outsiders that arrived in the Amazon participated in the exploitation of its natural resources, fortunately today, it is undergoing a profound transformation. Each year, thousands of visitors come to the Amazon with the goal of experiencing wildlife and immersing themselves in its rich culture. These visitors represent a unique opportunity to showcase the tireless efforts aimed at conserving this globally significant region. Thanks to the charisma of the manatee, we can inspire these individuals to become ambassadors of conservation of this invaluable part of the world.

Daryl Richardson, through The Dallas World Aquarium, funds this conservation project and places trust in local professionals who have played a critical role in this transformation.

→ Amazonian manatee © Fabrizzio Hidalgo and Dallas Aquarium

Toronto Zoo's Green Journey

Achieving Net-Zero Sustainability and Conservation Excellence

Energy Retrofit Project © Toronto Zoo

Amy Naylor

Media Relations in Strategic Communications and Guest Experience, Toronto Zoo

Toronto Zoo is thrilled to be one of the finalists for the 2023 World Association of Zoos and Aquariums Environmental Sustainability Award. Our mission is to connect people, animals and conservation to fight extinction, and our sustainability vision is a zoo whose operations produce an overall benefit to our natural environment, allowing wildlife and wild spaces to thrive. The driving force behind this mission and vision is our TZNet0 Environmental Sustainability Plan, and receiving this nomination helps validate the steps we are taking towards becoming a net-zero facility by 2030.

Toronto Zoo has developed a plan that goes beyond the gates and prioritises ecosystem function and social responsibility. We have set more aggressive goals to reduce water consumption and CO_2 emissions, and increase waste diversion. We have added biodiversity goals and assumed a community approach to support the climate resiliency of our community. We will design for resilience, consider the social and environmental impacts of our operations and initiatives, and engage our community and partners in the planning process to ensure we are making the right decisions for the wellbeing of our animals, guests, team and community.

In order to achieve these goals, it was important to look at our resource consumption, and understand how each building, ride and operational practice contributes to the zoo's overall resource consumption. We are currently working on a Strategic Carbon Management Plan, which involves a deep dive investigation of each of our buildings to understand the current energy consumption levels and how they can be improved. The first step in becoming a carbon neutral zoo is to optimise the efficiency of existing systems. We are in the process of installing new LED lighting to replace existing inefficient lighting. We are making life-support systems, mechanical and pump rooms and nature-based infrastructure viewable to our guests by incorporating viewing windows to our Americas Pavilion pump room, a natural water filtration system within the hyena habitat, and the floating wetlands in our stormwater management ponds.

Our most recent step towards net zero has been a $9m Energy Retrofit Project which replaces old boilers with air-sourced heat pumps, and dump and fill pools with filtration recirculation systems. This reduces our annual greenhouse gas emissions by 20%, and water consumption by 11%. We also have the ZooShare biodigester which turns 3,000 tonnes of manure from the zoo and 15,000 tonnes of inedible food waste from our community into renewable power for the Ontario hydro grid – powering over 250 homes each year and providing organic fertiliser to local farms!

↑ Hyena Water Feature at Toronto Zoo © Toronto Zoo

Cleaning and maintaining animal habitats and guest washrooms are the two largest uses of water at the zoo. Implementing behavioural change and installing water reducing options are key to achieving our new 75% reduction target for water consumption by 2024. Using captured stormwater for plant care provides more nutrient rich water and less chemical laden water for their growth. We have a rain harvest system at our Greenhouse, our River hippo and Pigmy hippo habitats are scheduled to receive water filtration systems this year, and as we work our way through renovating our washrooms (four have been completed so far) we are ensuring they have low-flow features.

Our next project, the construction of a new net zero carbon Conservation Centre, will be our first net zero building at the zoo. We currently have 20 staff members who have completed or are in the process of completing the LEED or Leadership in Energy and Environmental Design and Passive House Design training to embolden net zero carbon and resiliency for all new construction. This project will help inspire the community to join us on this green journey, while making it more climate-resilient, as we work towards not only becoming a net-zero facility, but a net-zero community overall.

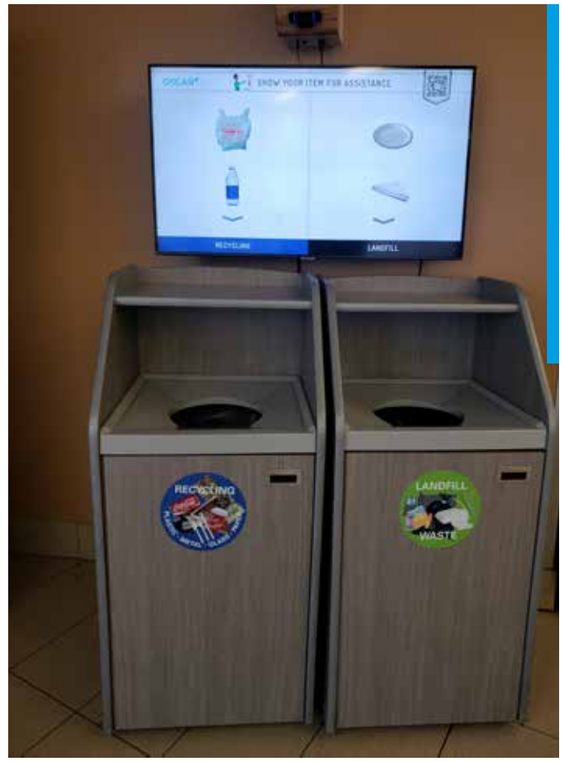
In 2012 Toronto Zoo committed to using only sustainably sourced palm oil by 2023. Since then, we have been performing audits and acquiring products that are either verified to contain sustainable palm oil or contain zero palm oil. The assessment from 2022 found that the zoo had succeeded in its objective. Every aspect of the zoo's activities, including food service and retail, uses only sustainably sourced palm oil. The zoo supports manufacturers who make steady progress towards their own sustainable palm oil commitments and acknowledges that this transition takes time. With over 1.3 million guests visiting our zoo each year, it is vital that we educate our community about the importance of using sustainable palm oil and encourage them to make small but crucial changes to their shopping practices to contribute towards saving the rainforests.

We also educate our community about the 'PhoneApes' programme. Western lowland gorillas are a guest favourite at Toronto Zoo (especially 51-year-old original Toronto Zoo resident, Charles) and it is important that guests are educated about the reasons for much of their habitat loss, which is due to mining for coltan – something they can help solve by recycling their cell phones and old electronics at the zoo. By recycling these devices responsibly, it reduces the need for further mining, and the money Toronto Zoo makes goes directly to gorilla conservation efforts in Western Africa. To date, the programme has raised more than $30,000! Since 2006 we've recycled more than 38,000 old cell phones, and more than 53,000kg of e-waste.

For Canadian insect life, wildlife, and ecological integrity, we must restore native plants and trees. Toronto Zoo teamed up with the Royal Canadian Geographical Society (RCGS) and Dougan & Associates, an ecological consulting and design firm, to plant 700 trees as the first micro forest for the RCGS Network of Nature Program near the main entrance of the zoo. This unique programme engages Canadians in restoring native biodiversity and implementing nature-based climate solutions. The Network of Nature's goal is to create a cross-country network of healthy ecosystems, particularly in urban areas. Over 500 hours were contributed by employees from RCGS, Dougan & Associates, and Pierre Fabre Group for the planting.

The 'Plastics Pathway' is a partnership between Pollution Probe, GREENMANTRA Technologies and Toronto Zoo, and is supported by the Ministry of Environment, Conservation & Parks. Plastic pollution is now one of the most widely known environmental problems in the world due to its effects on animals and aquatic ecosystems.

The Plastics Pathway will take visitors on a journey along the value chain, from point of manufacturing to the point at which the plastic is no longer useful, emphasising how plastic can be a useful resource when used responsibly at each stage. It offers a chance to highlight significant environmental plastic pollution initiatives now under progress and to raise awareness of the need to switch to a more circular method of using plastics.



↑ Recycling containers at Toronto Zoo © Toronto Zoo

↑ Front Entrance of Toronto Zoo © Toronto Zoo

Global Zoo and Aquarium Community Comes Together for Continous Support for Zoos in Ukraine

Since 2022, the war in Ukraine has impacted members of our community, striving to care for the animals under their care. In order to aid their efforts, the European Association of Zoos and Aquaria (EAZA) set up the EAZA Ukraine Zoos Emergency Fund.

Our global community has come together to support the zoos in Ukraine and through this fund, €1,945,011.48 have been raised as of 23 October 2023. The fund has been used to help Ukrainian Zoos provide food and care to their animals as well as provide support for zoo staff during this time of crisis.

WAZA would like to thank members of the 2021-2023 WAZA council (Cheyenne Mountain Zoo, Denver Zoo, Cologne Zoo, Opel Zoo, the Royal Zoological Society of Scotland–Edinburgh Zoo, Wellington Zoo and Calgary Zoo/Wilder Institute) for supporting a collective donation of over €50,000 total earlier this year for the 1 year anniversary since the start of the war.

WAZA contributed to this amount with €10,000. This is WAZA's second contribution adding to the one made in 2022 for to the EAZA Ukraine Zoos Emergency Fund. WAZA joins its members in supporting EAZA's work in ensuring that the zoos Ukraine have access to the funds they need.

For more information on the fund or to make a donation, please visit EAZA's Emergency Appeal page.

Scan the QR code to donate to the fund in

Kolmården Wildlife Park

A Role Model for Sustainability and Animal Conservation in Sweden

Kolmården Wildlife Park

The children's farm at Kolmården Wildlife Park (Barnens lantgård)
© Kolmården Wildlife Park

Sweden has long been known for its beautiful nature and its commitment to environmental issues. An excellent example of this is Kolmården Wildlife Park, which is located at Bråviken outside Norrköping in eastern Sweden. The wildlife park is not only home to a wide variety of animal species, it has also become a role model in sustainability, research, education and species conservation in Sweden.

Kolmården's vision is to achieve a balance between people, animals and nature. This requires a holistic approach to sustainability and not only a focus on species conservation and research.

As Christine Karmfalk, Kolmården's CEO states:

> *"If we are to take our work for species conservation 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."*

Kolmården Wildlife Park was established in 1965 and today it is the largest wildlife park in the Nordic countries. Kolmården hosts about 53 different animal species, participates in 33 *ex situ* conservation programmes and supports 15 *in situ* conservation projects through Kolmården Foundation. The foundation is also a member of The International Union for Conservation of Nature (IUCN).

The park is open during the summer months and during holidays such as Easter, Halloween and Christmas. In 2022, the park welcomed 760,000 visitors, including 25,000 students of all ages, ranging from pre-school to university.

Hundreds of thousands of training hours

A crucial part of Kolmården's sustainability work is to educate the public in order to create commitment and increase knowledge about animals and nature. All employees, including seasonal workers, receive extensive training in the *ex situ* work of the park. This increases the possibility of effectively educating guests, even if they are talking to employees who are general staff, not animal keepers or educators. In 2022, the park had over 380,000 participants on animal tours and more than half of the guests stated that they had a comprehensive understanding of Kolmården's sustainability work. Every year, Kolmården welcomes thousands of students from schools in the local area and works closely with universities, not only at the research level but also by offering internships and opportunities for degree projects.

Knowledge to prioritise

When Kolmården began systematic sustainability work almost ten years ago, energy use was a key priority. Kolmården has over 150 buildings that were constructed at some point during their almost 60 years in existence. In the long term, extensive reconstruction is required to achieve the ambition of halving energy consumption by 2030. The park has therefore invested in a comprehensive control and regulation system. By monitoring energy use, high consumers are identified and resources can be directed where they are most needed. In addition to major maintenance measures, the park has automated the operation of food units, shops and toilets, among other things, so that they consume minimal energy when they are not open. Kolmården continues to develop its working methods to ensure that all new buildings are constructed using sustainable methods from the outset and that purchases of technical equipment are made according to the zoo's environmental practices.

↑ Safari cable car at Kolmården Wildlife Park (Safari linbanan) © Kolmården Wildlife Park

As the park operates in a climate with great need for heating during the winter months, it is challenging to reduce energy consumption overall. Hence, Kolmården has for more than 10 years prioritised running the park on 100% green electricity and one of the largest investments in sustainability is to contribute to the establishment of Sweden's largest solar cell park. The solar park, which was inaugurated in May 2023, generates 20 GWH annually, which is enough to operate both Kolmården and two other parks in the same group.

Big impression with a small footprint
One of Kolmården's most important sustainability issues today is greenhouse gas emissions linked to food and, above all, the consumption of beef. The goal is to reduce emissions from food by 25% in five years, by 2027. To achieve this goal, more climate-smart options have been introduced on all menus and sometimes the park offers a solely vegetarian menu. Kolmården also measures and follows up its food waste. Since 2022, all food waste is weighed and the 'Upcycle Challenge' has been carried out with the aim of increasing knowledge about circular cooking and motivating kitchen staff to reduce food waste.

Another goal is to reduce the amount of combustible waste and increase recycling. To ensure a pleasant, stress-free experience for guests, sorting walls have been created with clearly signposted fractions to indicate the groupings of different waste.

Everyone is involved
Kolmården works broadly with sustainability across all of its operations, based on three aspects – environmental, social and economic sustainability. The park has set long-term goals and links its work to the UN's 17 global goals. Kolmården receives support from a common strategic sustainability function at Group level that drives and shapes the work through subject-specific working groups. Kolmården also has 'sustainability ambassadors', an opportunity for all employees to take a little more responsibility for communicating sustainability to both guests and colleagues and come up with ideas for developing the work. One idea that came from the sustainability ambassadors was to no longer automatically offer straws and lids for cups. By keeping these available behind the counter upon request from the guest, usage of these disposable products was significantly reduced. This idea was effectively shared among colleagues and then spread to other parks in the Group.

Better right than easy
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 very proud but also very humble that we have a lot 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 it one step at a time. The journey we have begun 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 wildlife park'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 continue to be that credible voice."*

Aquarium Drives Change in Sustainable Seafood

Shrimp farm © Seafood Watch

Erin Hudson
Seafood Watch Programme Director, Monterey Bay Aquarium

No matter where you live, the ocean plays an enormous role in your life. It drives weather and climate, produces oxygen, and is the Earth's largest carbon sink. It also provides essential nutrition for three billion people and livelihoods for millions more, along with cultural value. But the ocean is threatened by climate change, plastic pollution, overfishing and a host of other human activities. So, what can you do about it?

Seafood is a living resource – but it's not inexhaustible. Destructive fishing and aquaculture practices, if left unchecked, can harm the ocean. The good news is that environmentally sustainable seafood production helps ensure healthy and resilient ocean ecosystems and supports the wildlife and people who depend on them.

By responsibly choosing what goes on your plate, every person can positively impact and advocate for the ocean. That's why the Monterey Bay Aquarium Seafood Watch programme focuses on educating consumers and businesses about sustainable fisheries and aquaculture – and transforms global seafood production in the process.

An aquarium that saves the ocean by eating sustainable fish
The Aquarium has been inspiring ocean conservation since 1984. In 1997, we created an exhibit to educate visitors about the impacts of seafood production on ocean wildlife. The response was so popular, it inspired us to create a permanent conservation programme, Seafood Watch. The programme celebrates its 25th anniversary in 2024, offering a chance to reflect on where we started, what we've accomplished, and the work that remains.

Seafood Watch's original aim was to help people navigate the complexities of purchasing sustainable seafood by developing ratings and tools like our pocket guides which are designed to identify sustainable seafood options globally. Today, our science-based assessments are a primary resource for understanding sustainable seafood around the world and cover most of the seafood sold on the U.S. and Canadian markets.

As a ratings programme, we assess how fisheries and aquaculture operations perform against our standards for environmental sustainability. We use a three-tiered approach that recognises better and best performers and highlights areas in need of improvement. We then use these recommendations to transform how seafood is fished and farmed worldwide through partnerships with businesses, governments and seafood producers.

Our role is not to act as a management agency and we don't conduct enforcement activities. Instead, to promote change, we use an integrated approach that spans the seafood industry. Our consumer facing ratings and outreach work over the past 25 years have helped build strong consumer awareness and demand for sustainable seafood, which is reflected in today's retail landscape.

Now more than 85 percent of the top U.S., Canadian and European seafood retailers have made commitments to sustainable seafood. These public facing policies for sourcing environmentally sustainable seafood send strong market signals and incentivise improved practices in the seafood industry both domestically and internationally.

Our conservation mission has also expanded over the last 25 years. To encourage better fishing and fish farming practices, the Aquarium works directly with seafood industry stakeholders around the globe to improve the environmental performance of farmed shrimp, farmed salmon, and blue swimming crab – some of the most popular but red-rated (poor environmental sustainability scores) seafood products imported into the U.S. and elsewhere.

Partnering with conservation organisations (you!)
More than ever, solutions to conservation issues require creativity and collaboration. Partnerships with zoos and aquariums are key to the Seafood Watch mission. Our conservation partners help educate people about the links between sustainable seafood and healthy populations of ocean wildlife – which is where you come in!

Our theory of change is rooted in market demand, so educating the public on seafood is imperative – and not a task we can do alone. Zoos, aquariums, museums, and other public education institutions can deeply connect with visitors and are powerful allies in making progress toward a better, more resilient ocean.

They do so in many ways: by talking about sustainable seafood and incorporating Seafood Watch signage into their exhibits; offering pocket guides to the public; and 'walking the walk' by serving sustainable seafood in their concessions. Many also pledge to only feed sustainable seafood to their exhibit animals wherever possible.

Conservation partners make a commitment to spread the word about sustainable seafood. In return, Seafood Watch provides free materials and resources to help them get started, stay engaged, and increase their impact.

> *In 2023 and 2024, we're revitalising our conservation partners programme after the COVID-19 pandemic forced us to scale back. We'd love to work with you.*

If you're interested in making a difference by joining the sustainable seafood movement, here are some easy steps to get started:

- Learn about sustainable seafood and access our recommendations at SeafoodWatch.org.
- Incorporate sustainable seafood messaging into your exhibits and educational materials. We provide our partnering zoos and aquariums with regional and species-specific guides, which help you quickly identify sustainable seafood options wherever you live or travel. These materials are updated every six months to reflect our latest recommendations.
- Incorporate sustainable seafood messaging into your exhibits and educational materials. We provide our partners with complimentary pocket guides, which help you quickly identify sustainable seafood options wherever you live or travel. We have 10 different versions available, covering distinct regions across the U.S. We also offer a digital version of our National Pocket Guide as well as Spanish-language versions of the national guide and the West Coast guide. These materials are updated every six months to reflect our latest recommendations.
- Since 90 percent of the seafood sold on the U.S. market is imported, we assess many of the highest priority fisheries and aquaculture sources worldwide. Conservation partners can avail of our recommendations globally by using our search tool to filter by country or region.
- Become an official conservation partner. Email seafoodwatch@mbayaq.org to join today.

We can't wait to see what the next 25 years bring, and we're excited to have you on this journey with us! Becoming a conservation partner costs nothing but a commitment to making the world a better place. The more people we can inform about global seafood challenges and how to make responsible choices, the healthier our oceans will become.

↓ Monterey Bay Aquarium Seafood Watch National Consumer Guide 2023-2024 © Monterey Bay Aquarium

New Center for Species Survival Dives into Freshwater Biodiversity of Central America

Dr Yasmín Quintana

Scientists from Shedd Aquarium and the El Salvador Ministry of Environment and Natural Resources join efforts to study native freshwater mussels in El Salvador. © Shedd Aquarium

Manager of the Center for Species Survival: Freshwater, Shedd Aquarium

On a bright, warm day in March 2023, scientists from Chicago's Shedd Aquarium and the El Salvador Ministry of Environment and Natural Resources (MARN) arrived at the banks of the Rio Titihuapa. They waded into the water, and with the help of in-country partners (and some local children), began sifting the river floor looking for nearly invisible inhabitants – freshwater mussels.

Often called 'the livers of the river,' these powerhouse invertebrates filter out and feed on microorganisms in the water around them, improving the overall water quality. Despite their critical ecological function, freshwater mussels are the most endangered group of animals in the world.

This collective visited nine sites across El Salvador from the borders of Guatemala to Honduras, documenting seemingly four unique mussel species – three native species to Central America, like the mushroom foot mussel, as well as one non-native species, the Chinese pond mussel.

But this expedition represented much broader ambitions than a simple aquatic census. It was the inaugural trip for the newly launched Center for Species Survival: Freshwater – hosted by Shedd Aquarium in partnership with the International Union for the Conservation of Nature's Species Survival Commission (IUCN SSC).

There are fewer than 20 Centers for Species Survival across the globe, and Shedd's is the world's first to focus exclusively on freshwater environments. Despite covering just 0.8 percent of the Earth's surface, these environments support a disproportionately large amount of unique aquatic life. More than 10 percent of all known animals and half of all fish species on the planet rely on these fragile watersheds. And yet the planet is losing vital freshwater ecosystems at an alarming rate at the hands of fragmentation, pollution, climate change and overexploitation.

> *"Now, more than ever, we cannot fall behind the curve on how we look at addressing threats to freshwater",*

said Ian Harrison, co-chair of the IUCN SSC Freshwater Conservation Committee.

> *"This requires collaboration and resources, focused where we know we can have the best effect. The addition of Shedd Aquarium to IUCN SSC's global network of partners will be extremely important in addressing these most urgent needs and will help us conserve ecologically and culturally iconic species."*

The work of Shedd's Center for Species Survival is aimed initially at freshwater environments in Central America, where much less is known about the conservation status of these biodiversity-rich watersheds and their inhabitants. Indeed, in the case of freshwater mussels, the extent of their true biodiversity in Central America is unknown because the current taxonomy is based primarily on one monograph published almost 100 years ago. In fact, molecular analyses at Shedd from samples taken from the March survey revealed that scientists may have been wrong about the species they thought they found.

Leveraging the networks and knowledge products of the IUCN SSC, the Center will advance freshwater conservation through the IUCN model of Assess-Plan-Act. Shedd will work with local collaborators to **assess** potential extinction threats and identify key biodiversity areas; engage a core group of stakeholders to **plan** conservation strategies; and **act** by training local partners to implement the conservation strategies, while at the same time building capacity for this work so that it can be sustained within the region.

↑ Inoue teaches local collaborators how to take a sample from a freshwater mussel © Shedd Aquarium

Shedd and partners will begin building capacity in Central America through the creation of an aquatic conservation and research training programme. University students and the next generation of conservation scientists from El Salvador, Costa Rica and Guatemala will hone their skills in field research, animal husbandry, museum curation, conservation planning and more by collaborating directly with experts from Chicago-based institutions like Shedd Aquarium, Field Museum and The Morton Arboretum. This commitment to build capacity helps to ensure that conservation is done equitably and that the work is built to last.

Another unique aspect of the work of the Center for Species Survival: Freshwater is a burgeoning partnership with the Center for Species Survival: Trees – hosted by The Morton Arboretum. While Shedd and partners will be performing assessments of aquatic environments in Costa Rica, the Arboretum will be conducting similar assessments of endemic trees and plants.

By sharing information, the two Centers can investigate important linkages between aquatic and terrestrial environments. Over time, they can also discover how conservation actions taken to safeguard one ecosystem may impact or benefit the other.

The IUCN SSC is increasingly collaborating with zoos, botanic gardens and aquariums like Shedd to advance global species conservation goals. This is because accredited aquariums like Shedd are in an incredibly unique position where they can blend a diverse conservation science portfolio with the ability to reach people authentically and effectively to understand, appreciate and act on behalf of freshwater ecosystems.

This rationale from the IUCN SSC was recently highlighted at the WAZA Annual Conference in San Diego, alongside a call for an increased amount of government agencies and conservation organisations to follow suit and work with more conservation-minded zoos, aquariums and botanic gardens to help curb the dramatic decline in biodiversity facing our planet.

Shedd Aquarium is honoured and exhilarated by the opportunity to work directly with the IUCN SSC to host the Center for Species Survival: Freshwater and broaden freshwater conservation beyond the Great Lakes to magnify its global impact. By elevating awareness of threats to these vulnerable habitats across the globe, the aquarium and its partners can advance conservation that benefits animals, plants and humans alike.

> *"The Center for Species Survival: Freshwater comes at the perfect time, and I see it as becoming a beacon for global freshwater biodiversity conservation"*
>
> Topiltzin Contreras, co-chair of the IUCN SSC Freshwater Conservation Committee.

Beetle-mania in Denmark

Signe Ellegaard[1], Simon Bruslund[2], Martin Schwarz[3]

[1]Zoologist, [2]Head of Conservation, [3]Zookeeper, Copenhagen Zoo

Male stag beetle (*Lucanus cervus*) © Copenhagen Zoo

On a warm Tuesday night in June 2023 many years of anticipation culminated when beetle experts from Copenhagen Zoo found the first stag beetles (*Lucanus cervus)* of 2023 after the Danish Nature Agency reintroduced the species in Jægersborg Dyrehave north of Copenhagen, Denmark.

More than 10 years ago, a political decision was made to reintroduce the stag beetle in Denmark from where it has been considered extinct since the 1970s. The Danish Nature Agency's areas in Jægersborg Dyrehave north of Copenhagen were chosen as the most suitable location for the reintroduction of this forest-dwelling, deadwood dependent beetle. The areas were restored and beetle experts collected stag beetle larvae and imagoes (the last stage an insect attains during its process of growth and development) from wild populations in Sweden, Germany and Poland, whereafter the first releases took place in 2013. The hope was that the larvae would thrive and develop into adult beetles that could reproduce and disperse so that Denmark once again would have a stable population of this amazing species.

This year, the Danish Nature Agency has asked Copenhagen Zoo to conduct a first thorough post-release survey to assess if a population had been established. Transects around the original release sites were walked upon once a week for six weeks during June and July, to observe where adults of this species are most likely to be active. During the survey, if it was possible, all beetles found were captured, registered, measured, and gently tagged in the field with a very small number plate and were then released back where they were found. For various reasons, including unsuitable weather conditions for a long period of time, not many adult beetles or imagoes were found and thus it was not possible to conduct an accurate estimate of the total populations size and dispersal abilities, which would have been important knowledge for future management of the population and its habitat. However, the results with multiple sightings at all surveyed locations indicated that the habitats created through dedicated management of the areas by the Danish Nature Agency are sufficient to house a population of the iconic beetle and furthermore, the results prove to us that not only have the animals survived in Jægersborg Dyrehave, but they have also successfully reproduced in at least two generations since their release a decade ago.

As Europe's largest beetle, the stag beetle serves as an ambassador species creating understanding, curiosity and attention about the rare and threatened species in Denmark. It may remind us of a time where large beetles flying around at dusk were not a rarity and thus make us think about how we perceive and exploit our vulnerable nature. Furthermore, it may serve as an umbrella species for other species dependent on dead wood and/or light open forest – a habitat type which houses a high diversity of fauna and flora but is unfortunately in short supply in the Danish forest landscape.

Facts about the stag beetle (*Lucanus cervus*)

- Classified as globally NT (near threatened) on the IUCN Red List.
- Widespread around Europe but considered extinct in Denmark since the 1970s.
- Reintroduced in Jægersborg Dyrehave, Denmark, in 2013-2018.
- Europe's largest beetle. The male is up to 9 cm long, while the female is slightly smaller.
- The males' large mandibles (jaws) are not used for eating, but rather to fight other males for the females.
- The adult beetles emerge in June-August on warm evenings around sunset.
- Larvae feed on deadwood which is found on the ground and develop over three to six years.

Conservation breeding of saproxylic beetles at Copenhagen Zoo

In Copenhagen Zoo, we have a long history of working with saproxylic (i.e., deadwood dependent) beetle species. These species are under tremendous pressure in the wild, primarily due to a lack of deadwood due to the intensive methods used in modern forestry. Three species of native beetles which are severely threatened in Denmark, are currently being held in the breeding centre of Copenhagen Zoo for the purpose of conservation breeding and subsequent release in restored habitats, as well as for research purposes. All three beetle species lay their eggs in more or less decomposed tree hollows where the larvae, depending on the species and abiotic factors, such as ambient temperature and nutritional value of the deadwood, spend one to three years developing until the imagoes emerge during summer.

The noble chafer (*Gnorimus nobilis*) is a metallic green scarab beetle which is only found at two locations in Denmark. It is classified as LC (least concern) on the IUCN Red List, but as EN (endangered) on the Danish Red List. Imagoes from one of these populations were first captured in 2016 and now, seven years later more than 4500 captive-bred larvae have been released back to the forest in big wooden artificial nest boxes or suitable natural tree cavities. More than 400 new cavities have been created in living trees by means of 'tree-veteranisation' in the project area to ensure that enough suitable tree hollows are available for the beetles and other species with similar ecological needs in the future. Monitoring of the population has shown an increasing number of imagoes observed over the years.

The variable chafer (*Gnorimus variabilis*) is a black scarab beetle which resembles the noble chafer in both morphology and ecology. However, where the noble chafer forage primarily on blooming elderflower in Denmark, this black beetle forage on sap runs. This species is also found in only two locations in Denmark where it is classified as CR (critically endangered) and globally as NT (near threatened) on the IUCN Red List. Individuals from one of the Danish populations have been bred at the zoo since 2022 and recently released as larvae in nest boxes. During the next couple of years more larvae will be released, and future monitoring will determine if the efforts successfully increased the vulnerable population.

The hermit beetle (*Osmoderma eremita*) is a black scarab beetle, slightly larger than the other two. On the IUCN Red List it is classified as NT (near threatened) while it is EN (endangered) on the Danish Red List. All the few remaining populations in Denmark are very local (with some populations only found in a single tree) and all being highly fragmented. In 2023, the first imagoes hatched at the breeding centre, and we have now, after (un) patiently waiting, observed the first successful captive breeding of the species in Denmark with more than 100 new larvae. We hope to be able to release larvae of this species for the first time in 2024.

Our long term experience with conservation breeding of these saproxylic species has inspired us to suggest the creation of a subgroup of the EAZA Terrestrial Invertebrate Taxon Advisory Group concerning "European Invertebrate Conservation". The aim is to have all EAZA institutions working on such conservation projects sharing experiences, inspiring new collaborations, and supporting each other in the process. With the approval and support of the TAG chair and members, the subgroup will hopefully soon become a reality.

↗ Surveying © Copenhagen Zoo

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Family photo at Auckland Zoo © Auckland Zoo

Zoos and Aquariums are Changing their Exhibits to Represent Indigenous Peoples and Local Communities' Perspectives

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Zoos and aquariums aim to inspire and engage people visiting their institutions to get involved. Through its Social Change for Conservation Strategy, WAZA encourages zoos to develop and deliver clear messaging, engaging content and innovative programming.[1]

Global calls for increased and meaningful engagement with Indigenous peoples and local communities, represented through exhibitions and signage in zoos, provoke a rethinking and redefinition of the mandate of conservation education. Dr Judy Mann-Lang's (Executive for Strategic Projects at Two Oceans Aquarium Education Foundation, South Africa and WAZA Council Member) doctoral research highlights that "little work has been done to explore the impact that culture (and in the case of multicultural audiences, cultural diversity) has on visitors' conservation learning experiences in zoos and aquariums". Notably, this call for purposeful action challenges the existing audience engagement structures and strategies for zoos. For example, zoo structures, landscapes and educational information such as signage and images. Dr Alejandro Grajal, the President and CEO of the Woodland Park Zoo in Seattle, termed it "Reimagining Exhibits", a process that starts with an act of humility. Bartlett et al. (2012) describes this process as 'two-eyed seeing'. Two-eyed seeing is an educational process proposed by elders of the Mi'kmaw First Nation (Canada) that combines two knowledge systems, such as traditional and modern, to improve conservation outcomes.[2]

How the complex undertaking of catering to multicultural audiences and cultural diversity is undertaken by zoos depends on each zoo's environment and surrounding socio-cultural contexts, the solutions that they find are therefore unique to each zoo. To understand how zoos from different regions of the world have changed and adapted their exhibits and signage to be more inclusive and representative, from February 2023 to June 2023, we interviewed senior conservation scientists and chief executive officers from five zoos.

Zoos are valuable assets for change in conservation culture

In an effort to reimagine their exhibits, zoo staff highlighted that they endeavour to be representative of the local and Indigenous contexts and to serve those communities through their zoo landscape. The team from Woodland Park Zoo stated that zoos have the unique opportunity to change behaviour in people because they represent knowledge through conservation education. By acknowledging their controversial history, zoos can also be catalysts for social change. Zoos Victoria has also embarked on a journey of transformation by confronting the past, changing how colonial history was previously taught. Dr Sally Sherwen, the Director of Wildlife and Conservation Science, explained that to start the critical conversation process and establish a strong foundation to build upon, cultural safety training should be the first priority. An experienced contractor facilitated training and awareness on the impacts of colonisation for executives and initiated important, yet challenging, conversations. Included were discussions on how zoo exhibitions can make visitors from different backgrounds experience what is being represented.

Auckland Zoo is starting to weave together immersive landscape design and Māori design principles to strengthen how it develops all visitor spaces within the zoo that reflect the unique cultural context of modern Aotearoa New Zealand. Encompassing one fifth of the zoo, Te Wao Nui is the Aotearoa New Zealand track which offers both locals and tourists a truly unique experience of Aotearoa animals, plants and culture in a way that has never been done before, and all in one location at Auckland Zoo. Visitors can explore six different regions of Aotearoa, from picturesque alpine areas to dense night forests. Multimodal interpretation celebrates and interweaves Indigenous thought into physical features of the habitats, conservation learning programmes, volunteer engagement, keeper talks, and calls to conservation action.

Dr Sarah Thomas, the Head of Conservation Advocacy and Engagement, emphasised how the zoo is committed to a long-term journey of strengthening its relationship with Te Ao Māori (Māori Worldview), and the zoo's habitats are just one piece of the puzzle within a larger organisational system change around Te Ao Māori and delivering better outcomes for Māori.

Similarly, the team at Toronto Zoo aims to address social justice in conservation through the culture of the zoo. Jennifer Franks, the Director of Indigenous Relations, stated that the zoo will "move at the speed of trust" as their ethos is grounded in building relationships and creating a space to best serve the community. The zoo and communities co-design projects and habitats by employing collaborative strategies. These include advisory circles, engaging Indigenous architects to incorporate Indigenous design principles and creating spaces within the zoo landscape. Specifically, they have set aside 41 acres of land within their project Master Plan to provide communities with a space to practice their ceremonies. Likewise, the Woodland Park Zoo is transforming its practices by establishing a team culture which recognises how the zoo should transition. Within 37 exhibits, the Woodland Park team seeks to reset their values and strategic vision by utilising the Theory of Change. For instance, the zoo brought in local voices to design their Tibet and Papua New Guinea exhibits. They conducted 14 design workshops with local people, an approach that the exhibit architects found to be "revolutionary".

"Reimagining Exhibits"
Exhibits are conservation education platforms that have the power to inform the visiting public on biodiversity protection, endangered species conservation, as well as socio-cultural aspects that are interwoven in these issues. The gradual journey to achieving the mission of the zoo whilst incorporating transformative strategies can be challenging. However, the zoos interviewed have begun to sensitise their practices in response to socio-cultural concerns raised by society. The "two-eyed seeing" educational process could provide practical steps to "reimagining exhibits" (Bartlett et al, 2012). The examples from the various zoos above, incorporate some of these collaborative strategies to combine Indigenous and mainstream science and knowledge. The process includes acknowledging co-dependency of knowledge systems, viewing science in an inclusive way, going beyond discussing issues to actioning them, viewing knowledge, actions and values as an object to be addressed, and developing advisory councils of willing, knowledgeable stakeholders from various knowledge backgrounds (Bartlett et al, 2012).

"How do we become a zoo distinct of modern Aotearoa New Zealand?" This is an important and timely question posed by the Auckland Zoo team as they established a roadmap of cultural inclusivity as part of their mission to 'bring people together to build a future for wildlife'. To be as inclusive and representative as possible, Auckland Zoo acknowledges the country's difficult past whilst preparing for the future. The zoo continues to build relationships with Mana Whenua (Māori with ancestral rights and authority of the land, native species and natural resources) of Tāmaki Makaurau Auckland, and is committed to listening to the voices and needs of the Māori communities that the zoo serves. Te Reo Māori (Māori language) is now seen, heard, spoken and learnt throughout Auckland Zoo and Indigenous thoughts are being assimilated into all parts of the zoo's landscape. Additionally, they have embedded Te Ao Māori (Māori worldview) principles, practices and values of looking after the earth for future generations by weaving this into the organisation's commitment to conservation, education and social outcomes.

In the same breath, Cali Zoo in Colombia communicates ongoing work with surrounding communities in their exhibits. Similarly, through context-specific engagement, Zoos Victoria have incorporated training activities that inform guidelines representing local communities on the physical property of the zoo.

Conclusion
Zoos will continue to educate the public on conservation related matters through captivating and thought-provoking exhibits, images and signage. The delicate process of fostering Indigenous and local community perspectives is a response to the call for inclusivity and the recognition of existing communities within the landscapes being represented in exhibits. The zoos that were interviewed illustrated that community involvement is a crucial step towards reimagining exhibits. Furthermore, the use of language, creating access to land and/or culturally sensitive elements within the zoo, enriches the educational experience whilst acknowledging the contribution these communities have made to conservation and in shaping the biodiversity of their landscapes." However, due to cultural diversity, these journeys can be unique and not transferable to other zoos and aquariums due to differences in the local context. As WAZA seeks to further their Social Change for Conservation Strategy, the examples highlighted here can serve as a point of departure for other zoos to consider when and how deciding to embark on this journey.

Acknowledgements
We wish to thank all the participants for giving their time to enable this article to be written, and Martín Zordan (CEO of WAZA) for facilitating the correspondence between the authors and the zoos interviewed. In particular, we would like to extend our gratitude to Sarah Thomas (Head of Conservation Advocacy and Engagement) of Auckland Zoo, Sally Sherwen (Director of Wildlife Conservation and Science) of Zoos Victoria, Dolf DeJong (CEO) and Jennifer Franks (Director of Indigenous Relations) of Toronto Zoo, Sara Basque (Executive Assistant to the CEO and Board Coordinator), Alejandro Grajal (President and CEO) of Woodland Park Zoo and Carlos Calvis (Head of Populations Department) of the Cali Zoo.


Bird forestry keeper at Auckland Zoo © Auckland Zoo

[1]https://www.waza.org/wp-content/uploads/2020/10/10.06_WZACES_spreads_20mbFINAL.pdf

[2]Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. Journal of Environmental Studies and Sciences, 2, 331-340

Reverse the Red Announces World Species Congress

Mike Clifford, Reverse the Red Strategy Director, during the Plenary Session on Day 1 at the WAZA Annual Conference © WAZA

Megan Joyce
Communications Officer, Reverse the Red

Reverse the Red, in partnership with co-chairs WAZA, The International Union for Conservation of Nature Species Survival Commission (IUCN SSC) and the executive committee organisations, have announced that the first World Species Congress will take place on May 15, 2024.

Bold headlines in the media such as "one million species at risk of extinction," require an equally bold response. With 196 countries signing up to the Kunming-Montreal Global Biodiversity Framework (GBF) in 2022, we are on the path to protecting biodiversity. The zoo and aquarium community have a diversity of success stories, showing that we can save species. Now, we need to align the efforts of governments, NGOs, zoos and aquariums, botanic gardens, species experts and more. We must recognise and commit to direct actions that will recover species to meet Target 4 of the GBF by 2030. Threatened species are recovering, genetic diversity is being maintained and human-wildlife conflict is being managed.

The World Species Congress will amplify our collective conservation efforts and facilitate critical connections and commitments that accelerate our impact for species. We need to celebrate and reinforce our successful strategies to recover species, learn from and replicate these efforts, and ultimately accelerate our actions to recover species ten-fold. This forum for collaboration will help us learn from each other and lay out roadmaps to success.

A unique feature of this Congress is its 24-hour and virtual construction, with registration fees subsidised by sponsors, which make it accessible to the whole of the conservation community. This virtual 24-hour gathering will have something of interest for everyone, from director level through to all departments of your institutions. From uniting biodiversity, climate and protected area action to financing species conservation, community engagement and behaviour change to tools and datasets that inform best practice, and the power of networks to GBF target implementation, the World Species Congress will tackle key themes and invite you to engage and apply innovative ideas to your own work. Attendees from across diverse sectors working towards species conservation, including zoos and aquariums, botanic gardens, NGOs, government agencies, IUCN SSC members and Centers for Species Survival, biology and conservation students and academics, and more will participate together, learning alongside one another and collaboratively thinking about solutions and strategies.

The World Species Congress will also highlight and model impact-driven commitments that pair needs and assets in order to set achievable targets that move the needle for conservation. The Royal Zoological Society of Scotland and Edinburgh Zoo made a commitment to downlist 50 species by 2030 and are well on their way. The Indianapolis Zoo launched their Saving Species Challenge, committing $1 million to a project that would downlist a species within five years. And Zoos Victoria has pledged that no terrestrial vertebrate species will go extinct in Victoria on their watch.

These are just a few of the ways zoos and aquariums are making a difference – evidence to the IUCN SSC position statement released in October about the role of botanic gardens, aquariums and zoos in conservation. Reverse the Red is asking WAZA members to start considering their own commitments so that we can present a collective Species Pledge to governments and the Convention on Biological Diversity.

How your institution can be involved in the World Species Congress:

- Host an in-person Congress viewing party for staff and support staff participation.
- Host a satellite event for your visitors, membership and community.
- Sponsor through the WAZA Collective Gift.
- Make a commitment to saving a specific species.

Follow Reverse the Red on social media and express interest by registering on the website to keep informed about the various programmes and to connect with the Reverse the Red team on all the numerous ways to get involved.

Kiitos Korkeasaari

An Overview of EAZA's Annual Conference

Communications Plenary Panel at the 2023 EAZA Annual Conference
© Annika Sorjonen and EAZA

Sandrine Camus

Communications Officer, EAZA

From 12 to 16 September 2023, 887 delegates from 842 institutions and 70 countries met in Helsinki for the EAZA Annual Conference!

Despite Helsinki Zoo Director Sanna Hellström's opening joke about Finnish coffee for which "quantity overrules quality", we can all testify that the saying does not apply to the hosts' organisational skills. From the icebreaker event held in the beautiful City Hall to the frenzied rhythm of the band's songs at the farewell dinner, everything was meticulously 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 important, 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. This message was strengthened by keynote speaker Kira Mileham who presented examples of crucial partnerships between EAZA and the IUCN Species Survival Commission over the past decade.

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 and discuss with Gavrielle Kirk-Cohen (Species360, formerly WAZA), Tomasz Rusek (EAZA) and Lotta Kivalo (Helsinki Zoo) how this approach will help EAZA Members to be prepared in the event of a crisis. This coincided well with the approval of the EAZA Communication Guidelines. These guidelines are intended to help all Members convey cohesive messaging and strengthen long-term understanding of what EAZA zoos and aquariums represent and the types of activities they are engaged in.

In the wrap-up of the EAZA21+ Campaign during the conservation plenary, the audience was reminded of our continued role in the story of the post-2020 Global Biodiversity Framework, especially in the areas of conservation education, wildlife trade and species conservation. Related to the latter, the next EAZA Campaign, 'Vietnamazing' (https://vietnamazing.eu) was launched, aiming to build a powerful network to highlight and help to conserve the biodiversity hotspots of Vietnam through an applied One Plan Approach.

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 from Arador Innovations. With the help of a brave delegate volunteer from the audience, practical videos and a theatrical performance by members of the EAZA Animal Training and Animal Welfare Working Groups, some myths and misconceptions about reinforcement, both positive and negative, were illustrated.

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

> ***We thank all the participants, presenters, sponsors and the welcoming organising team for making another EAZA Annual Conference so productive! We are looking forward to seeing everyone again for the 2024 event, hosted by Leipzig Zoo on 8-12 October.***

Positive Impact via Partnership & Community

An Overview of ZAA's 2023 Annual Conference

ZAA Conference MC, Shaun Horan – Community & Conservation Engagement Manager, Willowbank Wildlife Reserve opening the conference © WAZA

Georgie Mitchell

Communications Manager, ZAA

The Zoo and Aquarium Association (ZAA) annual member conferences are highly regarded within the Australasian region as a great opportunity to connect, learn and grow. Examples of best practice and innovation are shared amongst community colleagues, aligned to the Association's strategic pillars: Resilient Organisations, Connected Communities and Progressive Practices for threatened species conservation, species population management and positive animal welfare.

The 2023 ZAA conference was hosted by Willowbank Wildlife Reserve in Christchurch, Aotearoa New Zealand, from 8-11 of August. The theme of this year's conference was Positive Impact via Partnership and Community, bringing to life ZAA's recently updated vision of Positive Outcomes for Wildlife and People which is aligned closely with the United Nations' Sustainable Development Goals. The conference witnessed a gathering of over 160 people, both in-person and online, joining from four continents.

The programme boasted a range of over 40 speakers from across the region and the globe, where delegates explored topics such as:

- Developing meaningful partnerships with First Nations People of both Aotearoa New Zealand and Australia.
- Sustainable practices and habitat development at a small and large scale.
- Developing impactful engagement with communities and evaluating behaviour change campaigns.
- The value of partnerships to drive positive conservation outcomes.
- Evidence based conservation action for positive impacts on regional species populations.
- The future of animal welfare in zoos and aquariums from the perspective of the animals and the public.

Keynote speeches were delivered by Arapata Reuben who represented Te Rūnanga o Ngāi Tahu, the local iwi (Indigenous tribe) in the Christchurch region and Professor Ngaio Beausoleil, who along with David Mellor, both from Massey University, developed the 5 Domains model for animal welfare assessment. Arapata discussed the relationship of Taonga (treasured species) to Māori people and explained how ZAA members can work together with their local iwi representatives to build meaningful relationships for the betterment of our unique wildlife.

Professor Ngaio explored the application of the 5 Domains animal welfare model and its practical use in day-to-day operations in zoos, aquariums and wildlife parks.

> ***Workshops allowed delegates to discuss and explore ideas around regionalising our efforts in relation to advocacy, conservation, and animal welfare, to deliver greater impact.***

The week was then wrapped up with an immersive day of learning whilst exploring on site at Willowbank Wildlife Reserve, where delegates put their knowledge into practice across various workshop stations, all while networking and building relationships with peers.

Pekka Haavisto, Member of the Finnish Parliament, at the Opening Plenary at the 2023 EAZA Annual Conference © Annika Sorjonen and EAZA

While the days were filled with plenty of learning and information, the nights were filled with enjoyable events for networking, strengthening relationships and sharing wins. The gala evening hosted ZAA's biennial awards presentations with worthy winners across each category:

Engagement Award

- Zoos Victoria, Totes for Wildlife (Large institution)
- Aussie Ark, Small Macropod Engagement Programme (Small institution)

Environmental Sustainability Award

- Territory Wildlife Park, Community Arts Programme

Conservation Award

- Zoos Victoria, Saving the Mainland Eastern Barred Bandicoot (Large institution)
- Hidden Vale Research Station, Koala Conservation Project (Small institution)

Exhibit Award

- Taronga Western Plains Zoo, Wildlife Hospital (Large institution)
- David Fleay Wildlife Park, Crocodile Enclosure Full Redevelopment (Small institution)

ZAA Employee of the Year Award

- Nic Dunn, Animal Care Manager – Wellington Zoo

ZAA Meritorious Awards

- **Cameron Kerr, CEO – Taronga Conservation Society**
  For his valuable contribution to the Association and its future via ZAA Board, ZAA Committees and ZAA President tenures
- **Simon Eyre, Animal Science Manager – Wellington Zoo**
  For his long-standing commitment and contribution to the ZAA Animal Management Committee and the ZAA Standards and Accreditation Committee, including as SAC Chair.
- **Androo Kelly, Managing Director – Trowunna Wildlife Sanctuary**
  For his valuable contribution and respected leadership in the Association's development and knowledge share of Tasmanian Devil husbandry.

Please join us in congratulating the winners of the 2023 ZAA Awards.

↑ Karen Fifield, WAZA Vice President & Wellington Zoo CEO – presenting on "*Harnessing the power of partnership for positive impact*" during the ZAA Conference © Copenhagen Zoo

Zoo and Aquarium Education
Where We Are in the SDGs and Post-COVID Society

Hiroyuki "Hiro" TAKAHASHI, Chiba Zoological Park, Japan

Published in 2023 in Japanese

A new book by Professor Dr Yukihiko Asaoka, entitled "Zoo and Aquarium Education: Where We Are in the SDGs and Post-COVID Society" is the first book in Japan to discuss both zoo and aquarium education.

The book examines the philosophy and activities of zoos and aquariums, which have environmental education as one of their key functions. It was developed with a variety of authors, including researchers, zoo and aquarium staff, and staff from non-profit environmental organisations, and proposes the unique educational value and opportunities that zoos and aquariums have. Zoos and aquariums are adapting in response to social changes caused by the pandemic and changing values due to the impact of the Sustainable Development Goals, etc. The book also compares the position of zoos and aquariums as being akin to museums, and views their future as educational centres of biodiversity learning, rooted within local communities where solutions can be explored collaboratively.

The first part of the book examines the role of zoos and aquariums as sites for environmental education. It summarises the relationship with school education (science, life, integrated studies, etc.) from a theoretical perspective, and also discusses environmental education in zoos and aquariums from multiple perspectives, including practical examples in zoos and aquariums, their legal position, and their relationship with ecotourism.

The second part includes practical reports and recommendations from zoo and aquarium staff from the field in order to gain perspectives on changes in zoo and aquarium education in a post-COVID society. The practical reports include online transmission of information on animal exhibits, providing guidance on observing living creatures via online classes which allow participants to connect with zoos, transcending the spatial and temporal hurdles of the past.

The reports focus on the efforts during the pandemic, in particular, they reflect upon the trials and errors of reconstructing connections online and creating online 'learning places'. They also introduce the World Zoo and Aquarium Conservation Education Strategy (WZACES), a collaboration between WAZA and IZE, and provide hints for the near future of zoo and aquarium education in a post-COVID society.

We encourage you to pick up a copy of this book.

*Hiro is one of the authors of the book.

Update on International Studbooks (ISBs)

Changes between 28 April and 18 October 2023.

ISBs Published

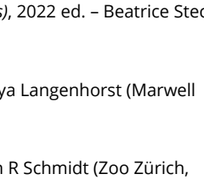
- **Somali wild ass** *(Equus africanus somaliensis)*, 2022 ed. – Beatrice Steck (Zoo Basel, Switzerland)
- **Grévy's zebra** (*Equus grevyi*), 2022 ed. – Tanya Langenhorst (Marwell Wildlife, UK)
- **Vicugna** (*Lama vicugna*), 2022 ed. – Christian R Schmidt (Zoo Zürich, Switzerland)
- **Cheetah** (*Acinonyx jubatus*), 2022 ed. – Laurie Marker and Becky Johnston (Cheetah Conservation Fund, Namibia)
- **Persian leopard** (*Panthera pardus saxicolor*), 2022 ed. – Susana Nolasco (Jardim Zoológico de Lisboa, Portugal)

ISB Transfers

- **Indochinese sika deer** *(Cervus nippon)*. Interinstitutional transfer from Zoo Ostrava to Olomouc Zoo. The ISB keeper, Jan Pluhaček, moved institutions.
- **Vicugna** *(Lama vicugna)*. Interinstitutional transfer from Christian R Schmidt at Zoo Zürich (Switzerland) to Lena Bockreiss at Münchener Tierpark Hellabrunn AG (Germany)
- **Aruba island rattlesnake** *(Crotalus durissus unicolor)*. Intrainstitutional transfer from Stan Mays to Jonathan Rold at Houston Zoo, US.

Vacant Studbooks

- **Buff-crested Bustard** *(Lophotis gindiana)*
- **Edward's pheasant** *(Lophura edwardsi)*
- **Andean Bear** *(Tremarctos ornatus)*



WAZA Shares its Deepest Condolences on the Passing of Dr Jennifer Mickelberg

It is with great sadness that we share that Dr Jennifer Mickelberg, Vice President of Collections and Conservation at Zoo Atlanta, passed away in late October 2023.

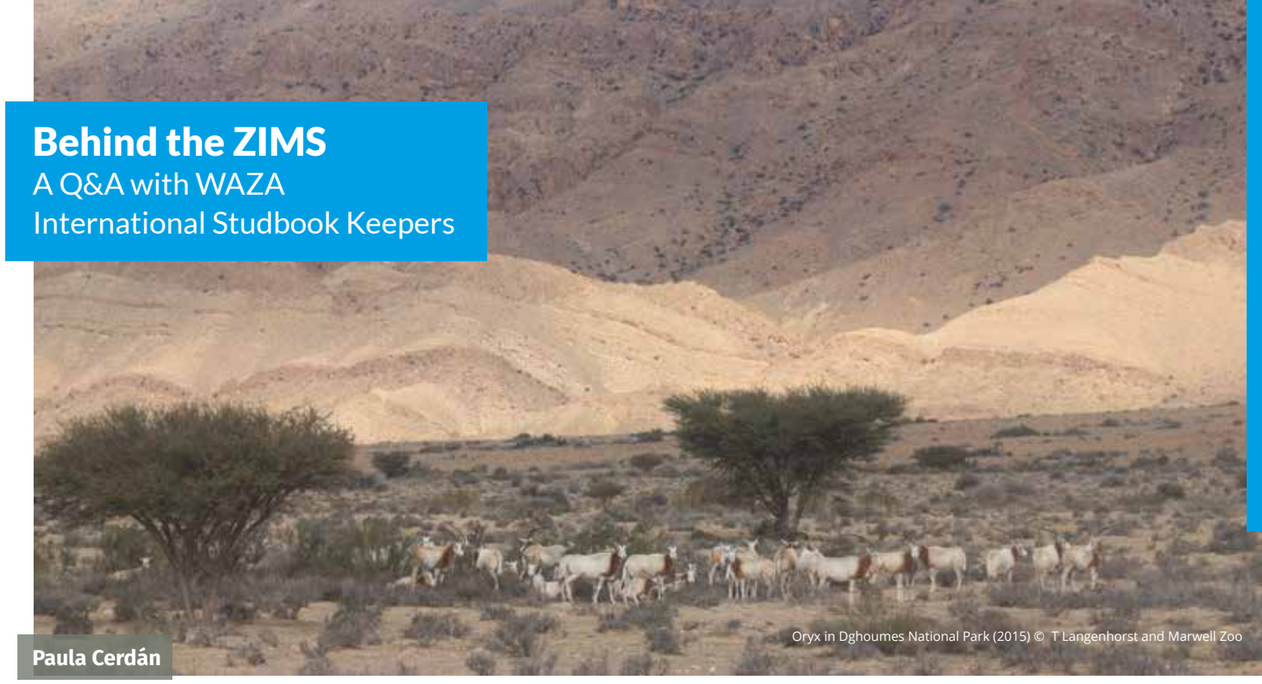
Dr Mickelberg had been Golden Lion Tamarin International Studbook Keeper and had worked with Zoo Atlanta since 2012. Prior to that, she worked at the Smithsonian Conservation Biology Institute - Center for Conservation and Evolutionary Genetics while also holding several teaching positions.

Dr Mickelberg's commitment, efforts and contributions have left a legacy for wildlife conservation, especially for the conservation of the Golden Lion Tamarin. Her loss has been a shock to the zoo and aquarium community. WAZA shares its deepest condolences with her family, as well as with her friends and colleagues across the globe.

Spectacled bear Bernie © Chester Zoo

Would you or someone in your team like to become an International Studbook Keeper? Are you interested in any of these vacancies? Would you like to know more about Global Species Management Plans?

Get in touch with the WAZA Executive Office at conservation@waza.org or visit www.waza.org to learn more about these programmes and how to get involved.



Oryx in Dghoumes National Park (2015) © T Langenhorst and Marwell Zoo

Behind the ZIMS
A Q&A with WAZA International Studbook Keepers

Paula Cerdán

Animal Welfare and Conservation Coordinator, WAZA
WAZA Office liaison to the Committee for Population Management

Behind the ZIMS aims to showcase the behind the scenes work of International Studbook Keepers and their management using Species360's Zoological Information Management System (ZIMS), to show the relevance and contributions of WAZA International Studbooks in the work we do in wildlife conservation and professional population management.

Q&A with Tania Gilbert

Tania Gilbert
Head of Conservation Science
Marwell Wildlife
Scimitar-horned oryx
International Studbook Keeper

EW

ISB kept: *Scimitar-horned oryx (Oryx dammah)* – Extinct in the Wild
ISB Host Organisation: Marwell Wildlife
Year Started as ISBk: 2005

For how many years have you been acting as the species' International Studbook Keeper (ISBk) and why did you become an ISBk?
I first took on responsibility for the scimitar-horned oryx International Studbook in 2005 (18-years ago). Marwell was developing plans to reintroduce scimitar-horned oryx and addax to new protected areas in Tunisia with colleagues from Hannover Zoo, St Louis Zoo, The Living Desert and Cincinnati Zoo. Together we comprised the studbook keepers and EEP and SSP coordinators for the two species. However, the dataset for scimitar-horned oryx was not current enough for us to select the animals for release. The data were in two studbooks, the European one and the International one that mostly recorded the North American population, but we needed the information in one compiled dataset to select the best genetic and demographic mix of animals for release. As a rather young and enthusiastic conservation biologist, I volunteered to take on the role of bringing the data together in one place in an updated International Studbook, and I have been the International Studbook keeper ever since.

How has the International Studbook (ISB) contributed to the species' conservation? What do you see as the value of your ISB?
The International Studbook, and the global *ex situ* population that it represents, is integral to the conservation of scimitar-horned oryx. As an extinct-in-the-wild species, it is entirely reliant on a strategy of *ex situ* management and reintroduction for its continued survival.

> ***"Regionally coordinated ex situ management programmes use the International Studbook as the basis for population management, and it was the data source used to select individual animals for reintroduction projects in Tunisia, where there are now around 200 scimitar-horned oryx in four protected areas."***

We also used the International Studbook to choose which animals to send to the Environment Agency-Abu Dhabi to genetically augment the source population for their large-scale reintroduction of scimitar-horned oryx to the Ouadi Rimé-Ouadi Achim Faunal Reserve in Chad. This project is a joint initiative between the Chad Government, the Environment Agency-Abu Dhabi, and implemented on the ground by Sahara Conservation. Over 500 oryx are now free-ranging in Chad.

We also used life-history data from the International Studbook to build the population viability analysis models to help inform the release strategy for reintroductions in Tunisia and Chad.

How has the ISB contributed to *ex situ* conservation in practical terms?
The International Studbook holds the data used to manage regional *ex situ* population management programmes, a critical function for any species that is threatened with extinction in the wild. It also provides an absolutely fantastic resource to answer questions on management and husbandry issues, genetics, and One Health. Data from the studbook have contributed to, or been the basis of, a number of research projects including ongoing work on changing horn morphology in *ex situ* care. It has provided fundamental information to determine where to collect samples from for genetic projects and has elucidated relationships between individuals to enable interpretation of the results. Below, is an example of some of the research that has utilised scimitar-horned oryx studbook data:

Harwood, D.G., Griffiths, W.H., Bradshaw, J.M. & Gilbert, T. (2009) Uterine endometrial carcinoma associated with dystocia in a captive scimitar-horned oryx (Oryx dammah). The Veterinary Record 164: 661-662. https://doi.org/10.1136/vr.164.21.661

Iyengar, A., Gilbert, T., Woodfine, T., Knowles, J.M., Diniz, F.M., Brenneman, R.A., Louis Jr., E.E. & Maclean, N. (2007) Remnants of ancient genetic diversity preserved within captive groups of scimitar-horned oryx (Oryx dammah). Molecular Ecology 16: 2436-2449. https://doi.org/10.1111/j.1365-294X.2007.03291.x

Little, L.A., Gilbert, T.C., Athorn, M.L. & Marshall, A.R. (2016) Evaluating Conservation Breeding Success for an Extinct-in-the-Wild Antelope. PLOS One 11(12): e0166912. https://doi.org/10.1371/journal.pone.0166912

Ogden, R., Chuven, J., Gilbert, T., Hosking, C., Gharbi, K., Craig, M., Salem Al Dhaheri, S. & Senn, H. (2020) Benefits and pitfalls of captive conservation genetic management: Evaluating diversity in scimitar-horned oryx to support reintroduction planning. Biological Conservation 241: 108244. https://doi.org/10.1016/j.biocon.2019.108244

What do you see as the next chapter or role for International Studbooks?
International Studbooks have so much potential and have so many stories hidden in their archives. An apparent data anomaly can yield new insights into species biology or reveal a tale of transatlantic travel by oryx in the age of steam. Putting my fascination with history to one side, studbooks are a phenomenal research resource, and I would like us to unlock their potential for cross-species research to tackle some of the fundamental issues of our age.
We are currently in a biodiversity crisis and mass extinction event caused by humans, but we have the knowledge and means to reverse this. Studbooks have a role to play by helping to answer fundamental questions on how best to manage some of the most threatened species on earth and can shine a light on gaps in understanding and conservation action to improve outcomes.

> ***"We are currently in a biodiversity crisis and mass extinction event caused by humans, but we have the knowledge and means to reverse this."***

This is illustrated in recent work by the IUCN SSC Conservation Translocation Specialist Group Taskforce for Extinct in the Wild Species who utilised ZIMS data and other sources to understand the perilous state of those species entirely reliant on *ex situ* care. This work highlighted real opportunities to prevent their complete extinction and return them to the wild. This work is continuing.

Dalrymple, S.E., Abeli, T., Ewen, J.G., Gilbert, T.C., Hogg, C.J., Lloyd, N.A., Moehrenschlager, A., Rodríguez, J.P. & Smith, D. (2023) Addressing Threats and Ecosystem Intactness to Enable Action for Extinct in the Wild Species. Diversity 15: 268. https://doi.org/10.3390/d15020268.

Smith, D., Abeli, T., Beckman Bruns, E., Dalrymple, S.E., Foster, J., Gilbert, T.C., Hogg, C.J., Lloyd, N.A., Meyer, A., Moehrenschlager, A., Rodriguez, J.P., Smith, P.P., Terry, A. & Ewen, J.G. (2023) Extinct in the wild: The precarious state of Earth's most threatened group of species. Science 379: eadd2889. DOI: 10.1126/science.add2889.

How do you see your work as an ISBk supporting conservation action for the species in the wild?
The International Studbook, as the largest compiled dataset for scimitar-horned oryx, is an important component of *ex situ* management and reintroduction efforts. It is an invaluable resource for research and provides crucial information for advancing husbandry and animal welfare. Being an International Studbook keeper is like being the engineer that keeps the machinery in good working order. If the studbook runs smoothly, it enables all the conservation, research, and population management work that relies upon it to move forward and make a real difference in the world.


Oryx in Dghoumes National Park (2018) © Camera trap


© Wild immersion

WAZA Welcomes New Members

© SSA Group ↑

Wild Immersion

WAZA welcomed Wild Immersion as a new Corporate Member to the global zoo and aquarium community! The company creates immersive and educational experiences focused on biodiversity. Wild Immersion produces 360° documentaries on wildlife and has the world's largest library of animals, with over 250 species. Additionally, Wild Immersion has developed interactive and educational workshops using new technologies.

Wild Immersion is committed to developing new narratives to raise awareness among as many people as possible about the challenges of biodiversity, fostering collective and global action and aims to stimulate the curiosity of a family audience through exciting and unifying experiences that inspire respect for nature through contemplation, emotion, and education.

SSA Group

WAZA also welcomed SSA Group as a new Corporate Member! For over 50 years, SSA Group has adopted a strategic plan and framework for driving growth and partner success. They focus on three pillars: Sustainability, Digital Innovation, and Diversity. SSA partners with approximately 86 cultural attractions, 63 of which are Zoos and Aquariums. SSA Group is also a member of Association of Zoos and Aquariums (AZA), Zoo and Aquarium Association (ZAA), and International Association of Amusement Parks and Attractions (IAAPA).

Edmonton Valley Zoo

WAZA welcomed Edmonton Valley Zoo as a new Institution Member to the global zoo and aquarium community.

The Zoo team is passionate about working to preserve the natural world and promoting environmental responsibility. Zoo staff work with international organisations on ethical and strategic conservation projects, either actively raising animals in species survival programmes or raising funds and awareness to support initiatives in other parts of the world. The zoo also models green strategies in all it does here at home to promote environmental responsibility.

↑ Northern Leopard Frog (*Lithobates pipiens*) © Edmonton Valley Zoo

WAZA

World Association of Zoos and Aquariums

www.waza.org