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WAZA
World Association of Zoos and Aquariums

news

04
Transforming the Global Zoo and Aquarium Community for 2050

07
23AWG: Setting a Global Standard

10
27PMG: A Vision for the Future of Species Conservation

13
The WAZA 2030 Conservation Goal – The Time Is Now

Editors:
Marion Karam and
Tania Kahlon

Reviewer:
Thalia Pelegrin

Proofreader:
Laurie Clinton

Layout and design:
Ink Design
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WAZA Executive Office

Postal Address:
WAZA Executive Office
Carrer Roger de Llúria 2, 2–2
08010 Barcelona
Spain

+34 936638811

secretariat@waza.org

www.waza.org

@officialWAZA

@wazaglobal

@world-association-of-zoos-and-aquariums

@waza

WAZA
World Association of Zoos and Aquariums

WAZA Executive Office Staff

Chief Executive Officer:
Martín Zordan (ceo@waza.org)

Director of Membership and Events:
Janet Ho (membership@waza.org)

Membership and Events Assistant:
Emma Burke (membership@waza.org)

Head of Conservation and Animal Welfare:
Paula Cerdán (animalwelfare@waza.org, conservation@waza.org)

Conservation and Animal Welfare Intern:
Thalia Pelegrin (conservation@waza.org)

Head of Partnerships and Advocacy:
Loïs Lelanchon (advocacy@waza.org)

Head of Communications:
Tania Kahlon (communications@waza.org)

Communications Assistant:
Marion Karam (communications@waza.org)

Finance and Office Manager:
María Jesús Sanz (administration@waza.org)

WAZA Membership as of 30 November 2024

Affiliate:	9
Association:	21
Corporate:	38
Institution:	297
Life:	101
Honorary:	35

Future WAZA Conference

2025: Zoológico de Cali, Colombia, 26 to 30 October 2025

Contents

02
President's Letter

03
CEO's Letter

04
Transforming the Global Zoo and Aquarium Community for 2050

07
Meeting WAZA's 2023 Animal Welfare Goal

10
The WAZA 2027 Population Management Goal

13
The WAZA 2030 Conservation Goal – The Time Is Now

16
A Bright Future For Beavers

19
Darjeeling Zoo Red Panda Recovery Programme

22
Brookfield Zoo Chicago, Conserving Bottlenose Dolphin Populations

24
Protecting Wildlife and Supporting a Low-carbon Future

27
Columbus Zoo and Aquarium: Leading the Charge in Sustainability

30
Environmental Sustainability Plan at Toronto Zoo

34
Shedd Aquarium's Collaborative Effort to Save the Bowmouth Guitarfish

37
Opportunities to Contribute to the Extinct in the Wild Alliance

40
Take-aways from EAZA Annual Conference 2024

42
Update on International Studbooks (ISBs)

43
Behind the ZIMS

45
Expanding WAZA Executive Office

46
WAZA at CBD COP16

47
WAZA Welcomes New Members

PRESIDENT'S LETTER

Kia ora WAZA community. As I reflect on an extraordinary year for our global zoo and aquarium community, I am filled with optimism about the path ahead. Our recent Annual Conference in Sydney, hosted by Taronga Zoo, embodied our theme '*Zoos and Aquariums 3.0: Transforming Zoos and Aquariums for 2050*' by showcasing how our community is actively shaping the future of conservation, sustainability, animal welfare and conservation learning to achieve WAZA's vision to be a trusted and respected leader in conservation and animal welfare.

A key milestone was the inclusion of five more member associations that have met the 2023 Animal Welfare Goal, along with the resolution to work towards the 2027 Population Management Goal; a Goal that aims to ensure that WAZA members are not only maintaining sustainable and healthy populations in human care but are also contributing meaningfully to global conservation efforts.

Looking ahead, I am delighted to invite you to join us for the 2025 WAZA Annual Conference in Cali, Colombia. As we celebrate WAZA's 80th Annual Conference and WAZA's 90th anniversary in 2025, we reflect on the progress made in advancing conservation and animal welfare efforts over the years. We will also reflect on the steps we need to take as a community in order to achieve the WAZA vision. We extend our warmest invitation to our members to join us in Cali for the 2025 WAZA Annual Conference as the ideal opportunity to bring leaders in the zoo, aquarium and conservation communities together to discuss pertinent issues for our community and examine how WAZA members can act on global issues. This will be the first ever WAZA conference to be held in Colombia, which is aligned with our strategic efforts of global representation, engagement, participation and voice.

As we embark upon our new mission, WAZA is taking an increasingly active role in international conservation forums. In 2025, we will be participating in key international meetings including the CITES COP as well as the IUCN Congress. Our voice in these forums is crucial as we represent institutions that connect millions of visitors annually with wildlife and conservation messages – a role unique to zoo and aquariums as many other conservation agencies do not have this trusted voice in our communities.

As we look to the future, I am confident that WAZA will continue to evolve and adapt to meet the challenges facing wildlife, wild places and our communities. Our strength lies in our shared commitment to conservation and animal welfare. Together, we can make a meaningful and impactful difference in protecting Earth's biodiversity for future generations. I thank you all for your commitment to the work we all do and for your support of WAZA. My special thanks to the Council, Committees and the Executive Office, led by Martín, for their dedication to our work. All the very best as we bid farewell to 2024 and move towards your 2025 ambitions.

I look forward to seeing many of you in Cali next year and continuing our vital work together.

Warm regards,

Karen Fifield MNZM
WAZA President

CEO'S LETTER

Dear WAZA members and friends,

This is our final issue of the WAZA Magazine for the year. As I write this, it has only been two weeks since our 79th WAZA Conference in Sydney, graciously hosted by Taronga Zoo (Taronga Conservation Society Australia).

The conference theme invited us to envisage how aquariums and zoos will have evolved by 2050. Discussions centred on transformative forces shaping our profession: advancements in artificial intelligence, evolving institutional identities and the challenges of emerging diseases, among others. This issue offers a glimpse into those conversations, and members can explore the recordings in greater depth via the conference archive in the members' area of our website.

Following the conference, members of the WAZA Executive Office, myself included, had the privilege of visiting all our five institutional members in Australia, as well as our regional association member, the Zoo and Aquarium Association (ZAA) Australasia. This trip followed visits to our four zoo members in New Zealand earlier in 2023.

There is something inspiring about engaging with colleagues in this region. In many ways, visiting them felt like stepping into the future.

At the time of our visit, the region was actively preparing for the Highly Pathogenic Avian Influenza (HPIA), an emerging disease on its doorstep. Meanwhile, significant transitions were underway: some of the last elephants in urban zoos were being relocated to open-range zoos – a symbolic milestone, particularly with the departure of the final elephant from New Zealand to join a herd in Australia. Simultaneously, many zoos were reimagining how to better communicate the importance of their conservation breeding programmes for native species, reaffirming their vital conservation role and looking at enhancing regional cooperation to maximise conservation outcomes and stories of success for their native species.

Allow me to challenge you for the next few paragraphs, so please indulge me here.

Of all the regions I've had the opportunity to visit, the concept of 'social license' resonates most strongly here, in the sense of local societies granting their institutions with a justification –a license– to operate and fulfil their mission and social role. Progressive aquariums and zoos in the Australasian region appear to be transforming their identity at a pace unmatched in many other parts of the world. It is no surprise – Australia embodies a cultural ethos of reconciliation, fostering a forward-thinking approach.

In an unexpected full-circle moment, as our conference explored the future of aquariums and zoos, many of the answers we seek and have discussed in previous conferences in other parts of the world, are already becoming visible in the Australasian region.

I often reflect on whether our profession is ready to meet the scale of change required to tackle the biodiversity crisis. After this visit to Australia, I left with renewed hope. Yet, I am also left wondering: how quickly can we implement the necessary changes to establish aquariums and zoos as globally trusted leaders in conservation and animal welfare? And, perhaps more importantly, what are we willing to sacrifice in order to succeed?

Warm regards,

Dr Martín Zordan
WAZA Chief Executive Officer

Group photo from 79th WAZA Annual Conference © *WAZA*

TRANSFORMING THE GLOBAL ZOO AND AQUARIUM COMMUNITY FOR 2050

Tania Kahlon, *Head of Commmunications, WAZA*

Over 250 global conservation leaders joined the 79th WAZA Annual Conference at Taronga Zoo Sydney, held from 3–7 November, 2024. The theme for this year's conference was '*Transforming Zoos and Aquariums for 2050*'. This theme was the catalyst for generating insightful conversations with colleagues from across the globe, addressing urgent issues like habitat destruction, biosecurity, and species conservation especially against the background of the recently concluded CBD COP16 in Cali, Colombia.

On the first day of the conference, WAZA President, Karen Fifield and Taronga Zoo CEO Cameron Kerr shared their opening remarks, welcoming the attendees to the conference and highlighting the need to adopt change in light of technological advancements especially with artificial intelligence (AI) influencing various aspects of operations, as well as addressing urgent issues like habitat destruction, biosecurity, and species conservation. The keynote address by Nardi Simpson, shed light on the need for new approaches to conservation as well as better engagement with First Nations and how we can work with traditional custodians to learn from and protect our environments.

Highlighting the pivotal role of zoos and aquariums in addressing the decline of biodiversity, safeguarding endangered species and as crucial partners in achieving international goals for conservation, the Reverse the Red presentation showcased WAZA members who have signed the WAZA Declaration, reaffirming their commitment to advancing global conservation through collaborative, strategic, coordinated, and measurable actions aimed at halting extinctions, reversing declines, and restoring populations.

The second day of the WAZA conference saw the keynote address by Adam Spencer, who continued the theme of AI and the potential ramifications of these cutting-edge technologies

for zoos and aquariums. WAZA also signed an MOU with Wild Welfare, to foster and promote a shared commitment to improving welfare for animals in human care. WAZA and Wild Welfare have a long history of working together, and going forward, will focus on developing and implementing comprehensive animal welfare standards across WAZA's membership and beyond.

The keynote speaker for day three was Nesha Ichida, an Indonesian marine conservation scientist, whose expertise includes the taxonomy of reef fish, research on elasmobranchs, marine protected areas (MPAs), and community-led conservation programmes in Eastern Indonesia. Ichida manages the StAR Project, a multinational collaborative initiative to restore Indo-Pacific leopard shark populations by translocating egg cases bred at accredited aquariums worldwide. During her keynote, Ichida discussed participation opportunities for zoos and aquariums and the past, present, and future of the ReShark initiative.

The day also saw the recognition of WAZA member associations that met the 2023 Animal Welfare Goal: Associação de Zoológicos e a Aquários do Brasil (AZAB), the British and Irish Association of Zoos and Aquariums (BIAZA), the Southeast Asian Zoos and Aquariums Association (SEAZA) and the Japanese Association of Zoos and Aquariums (JAZA). The WAZA 2023 Animal Welfare Goal aims towards confirming that the Animal Welfare Evaluation Processes used by the WAZA member national and regional associations include specific principles of animal welfare, and thus, to see these principles consistently across WAZA's global membership. By working towards this strategic Goal, WAZA has taken a significant step towards positioning itself as the global leader advancing Animal Welfare in zoos and aquariums.

On the final day of the conference, science communicator Tegan Taylor presented her keynote address which discussed zoonotic disease biosecurity and how aquariums and zoos can prepare for future challenges.

The conference closed with the Gala Dinner and the awards presentation. Dr Jenny Gray, CEO of Zoos Victoria, was awarded the prestigious Heini Hediger Award. Jenny has a background in management, transportation, engineering and ethics which provides a unique set of skills to tackle the challenges of transforming the three zoos that comprise Zoos Victoria: Melbourne Zoo, Healesville Sanctuary and Werribee Open Range Zoo. Prior to her role at Zoos Victoria, Jenny was the CEO of Johannesburg Zoo.

Jenny served as WAZA President from 2016–2019. She has pioneered change in animal ethics, welfare and conservation, played a crucial role in initiating Reverse the Red and is a strong advocate of the role that zoos and aquariums can play in empowering visitors to take actions that help wildlife.

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, education, and is actively involved in furthering these causes within their zoo or aquarium and our global community.

Nardi Simpson at the 79th WAZA Annual Conference
© *WAZA*

Adam Spencer at the 79th WAZA Annual Conference
© *WAZA*

Tegan Taylor at the 79th WAZA Annual Conference
© *WAZA*

Karen Fifield presenting the 2024 Heini Hediger Award to Sally Sherwen on behalf of Dr Jenny Gray © *WAZA*

Nesha Ichida at the 79th WAZA Annual Conference © *WAZA*

The Royal Zoological Society of Scotland was awarded the 2024 WAZA Conservation Award for Reintroduction of the Eurasian Beaver to Scotland (read more on page 14).

The Programme's scientific rigour, local conservation focus, and positive impact on legislation, research, education, and policy, make it an example of effective conservation. During their decade of work, RZSS and the Scottish Wildlife Trust have laboured together with government partners and a wide variety of stakeholders to achieve this milestone. This has seen RZSS take the lead on fieldwork, scientific research, veterinary care and animal handling, stakeholder engagement, and political lobbying. RZSS led the return of this species which is now successfully established across Britain.

The two other finalists for the Conservation Award were Brookfield Zoo Chicago's Sarasota Dolphin Research Program (SDRP) and Padmaja Naidu Himalayan Zoological Park's Red Panda Conservation Breeding and Augmentation Programme in Singalila National Park and Neora Valley National Park in West Bengal.

The WAZA Conservation Award is granted to an institution for an outstanding, comprehensive, specific conservation programme that has clear objectives and excellent conservation outcomes.

The 2024 WAZA Environmental Sustainability Award was awarded to Mandai Wildlife Group.

In addition to being the first zoological organisation to have its Net-Zero science-based targets validated by the Science Based Targets Initiative (SBTi), Mandai also focuses on showcasing best sustainable solutions to influence Singapore's general public and business community.

The institution is committed to sourcing products sustainably with established criteria for over 20 product categories like RSPO (palm oil) and MSC/ASC (seafood). They also work with their supply chain to secure sustainable products, source locally, and reduce packaging used in deliveries. As a founding member of the Singapore Alliance on Sustainable Palm Oil (SASPO), the institution advocates for national and industry-wide transition towards sustainable palm oil (see more on page 21).

The two other finalists for this prestigious award were Columbus Zoo and Aquarium 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.

We would like to thank everyone who contributed to the success of the conference – the host, Taronga Zoo, and all attendees, and we look forward to the 80th WAZA Annual Conference in Cali, Colombia.

MEETING WAZA'S 2023 ANIMAL WELFARE GOAL

Thalia Pelegrin, *Animal Welfare and Conservation Intern* and Paula Cerdán, *Head of Conservation and Animal Welfare*

Over the course of 2024, more WAZA member national and regional associations have met the WAZA 2023 Animal Welfare Goal (23AWG). A total of five more regional associations were recognised and celebrated following a session on the 23AWG during the WAZA Annual Conference, which reflected, just weeks before the deadline for implementation, on the learnings and opportunities that WAZA's pioneering Goal has brought.

The Association of Zoos and Aquariums of Brazil (AZAB), the British and Irish Association of Zoos and Aquariums (BIAZA), the Eurasian Regional Association of Zoos and Aquariums (EARAZA), the Japanese Association of Zoos and Aquariums (JAZA), and the Southeast Asian Zoos and Aquariums Association (SEAZA), were recognised as having achieved this major milestone, meeting the WAZA 2023 Animal Welfare Goal, and they join the rest of Associations that met the Goal throughout 2022 and 2023. This brings the total number of 11 associations to have achieved this Goal through the peer review process, elevating and advancing WAZA's vision to be a globally recognised leader in animal welfare and conservation.

The Goal and Its Impact

WAZA's journey towards this milestone began in 2015 with the publication of the Animal Welfare Strategy, which included the recommendation that animal welfare-based accreditation should be made a priority. This ambition gained momentum through summits in Singapore and Barcelona, culminating in the development of the WAZA 2023 Animal Welfare Goal framework.

Delayed by the global COVID-19 pandemic, the 23AWG was finally launched in 2022. It establishes a global benchmark for animal welfare evaluation.

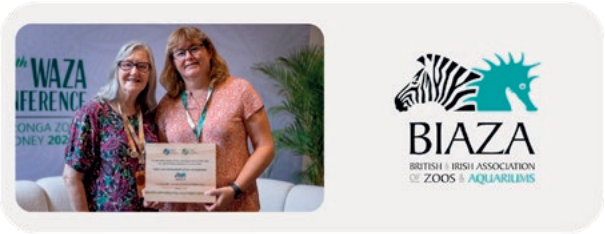
This goal sets a global benchmark in animal welfare evaluation processes, building common ground on what these processes should include globally, provide knowledge and expertise exchange (opportunities) for WAZA member national and regional associations, as well as an opportunity to strengthen their existing processes with guidance, and enhance our collective reputation.

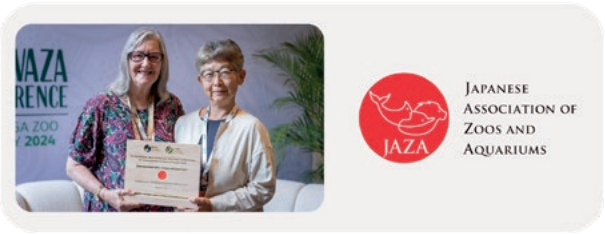
Chinese Big-headed Turtle (*Platysternon megacephalum*) © *Tennessee Aquarium*

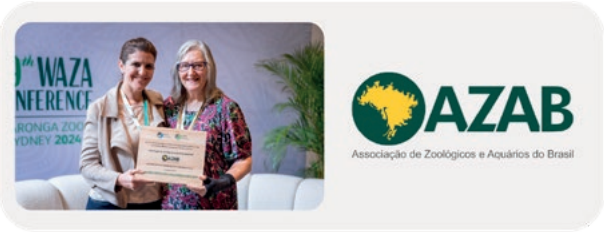
At the 79th WAZA Annual General Meeting, members approved amendments to the 23AWG timeline and clarified requirements for institutional members to undergo welfare evaluation within five years of a process being confirmed by WAZA. The final statement reads:

By 30 November 2024

- By November 2024, 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 comply with the appropriate WAZA approved National and Regional Associations animal welfare evaluation process within 5 years (or less) of the process being approved. This is because under the framework of the WAZA Animal Welfare Goal, there is a requirement for the members of these Associations to undergo this process within a five-year (or less) cycle.







Recognising Achievements

In 2023, six associations—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), and Canada's Accredited Zoos and Aquariums (CAZA)—were celebrated for meeting the 23AWG.

In 2024, they were joined by AZAB, BIAZA, EARAZA, JAZA, and SEAZA.

Dr Cheng Wen Haur, Chair of SEAZA remarked:

> *"SEAZA's achievement in meeting WAZA's 2023 Animal Welfare Goal is a testament to our commitment to the well-being of the animals under our care. We will continue to work closely with WAZA to ensure the animals thrive in the care of our members."*

Meeting WAZA's criteria required most of these associations to adapt or develop animal welfare evaluation processes to align with the elements and requirements set by WAZA through the work with its national and regional association members. In some cases, the peer review process and opportunity to exchange knowledge was an integral part to the process and a key element to a successful outcome.

Jo Judge, CEO of BIAZA, emphasised:

> *"I am delighted that WAZA has confirmed our welfare requirements are consistent with their global animal welfare principles. This reflects the work that has gone into developing robust welfare assessment requirements for zoos and aquariums in the UK and Ireland and our commitment to continuous improvement."*

The recent achievement of this goal by AZAB, BIAZA, EARAZA, JAZA, and SEAZA marks a significant step forward, not only for them and their own member institutions, but also for WAZA as an association, solidifying its vision to be a globally trusted leader advancing conservation and animal welfare.

Learnings and Opportunities

As we achieve the deadline for implementation of the 23AWG and WAZA shifts focus to the implementation of the WAZA 2027 Population Management (27PMG) and the development of the WAZA 2030 Conservation Goal (30CG), key learnings and opportunities have emerged to streamline and optimise future goals that WAZA will focus on as part of its strategy:

Framework Development and Engagement Strategies

- **Clarifying objectives and stakeholders early:** Challenges during the 23AWG's development highlighted the importance of defining outcomes, timelines, and stakeholders from the outset. Early engagement with regional champions ensures frameworks are both regionally relevant and technically robust.
- **Balance ambition with feasibility:** The first cycle of any WAZA goal should establish a baseline, building common ground and setting a foundation for future iterations to drive greater ambition. This phased approach worked well for the 23AWG and can serve as a model for subsequent goals.
- **Addressing challenges:** Limited financial and staff resources, as well as language barriers, were recurring issues. Early identification of these challenges and collaborative strategies to address them will be essential for the success of future goals.

Goal Implementation and Confirmation Process

- **Complex, multi-layered and resource demanding process**: Considering that welfare is a highly scrutinised area of focus, the multi-step confirmation process, with 4 steps and assessment groups involved, provided a complex process but thorough outcome and review. Future goals on less scrutinised topics could benefit from a simplified confirmation process, reducing the workload without necessarily compromising the robustness of the evaluation.

African Wild Dog (*Lycaon pictus*) © *Wroclaw zoo*

Leveraging Achievements

- **Strengthening internal understanding of the 23AWG's significance:** Building a stronger understanding among members about the Goals' significance and operational framework is crucial. Clearer communication and broader engagement can help foster ownership and pride in WAZA's collective achievements.
- **Building external recognition and engagement:** Communicating the relevance of these goals beyond the zoo and aquarium community can attract new perspectives, strengthen partnerships, and reinforce WAZA's role as a global leader in ethical animal care.

The achievement of the WAZA 2023 Animal Welfare Goal is a testament to the commitment of WAZA and its member associations to prioritising the welfare of animals in our care. This milestone not only strengthens the global reputation of WAZA member zoos and aquariums, but also sets a precedent for future goals, including the WAZA 2027 Population Management and the, yet to be developed, 2030 Conservation Goal. By embracing collaboration and a shared vision, WAZA continues to lead the way in driving progress, fostering a culture of knowledge sharing and continuously raising the bar, and inspiring trust as a globally recognised leader in animal welfare and conservation.

THE WAZA 2027 POPULATION MANAGEMENT GOAL: A VISION FOR THE FUTURE OF SPECIES CONSERVATION

Thalia Pelegrin, *Conservation and Animal Welfare Intern*; Paula Cerdán, *Head of Conservation and Animal Welfare* and David Field, *Chair of the WAZA Committee for Population Management*

On November 6 2024 at the 79th WAZA Annual Conference hosted by Taronga Zoo in Sydney, the presentation by David Field, WAZA's Vice President and Chair of the WAZA Committee for Population Management (CPM), was interrupted by some (fake) breaking news: A well-known zoo had been exposed as no longer having penguins, the zoo visitors had been waiting for hours to see the *wee waddle* and were dismayed to hear the news. "This would not have happened if WAZA had a Population Management Goal". While clearly a joke from the CPM Chair, this brief exaggerated video set the stage on the importance of the presentation that would come later, the official launch of the 2027 Population Management Goal (27PMG).

This goal, developed by the WAZA Committee for Population Management (CPM), is designed to establish a science-based framework for effective population management in WAZA member associations worldwide. Its ultimate purpose is to ensure that institutions are not only maintaining sustainable and healthy populations in human care but are also contributing meaningfully to global conservation efforts.

Paula Cerdán, WAZA's Head of Conservation and Animal Welfare summed up the ambition behind this goal: "*Through the WAZA 27PMG, we will work with regions to establish a goal that strengthens and collectively advances global zoo and aquarium practices in the way we manage species and populations, setting the stage for easier and more efficient global collaboration.*"

What is the 2027 Population Management Goal?

The WAZA 2027 Population Management Goal commits to setting a global benchmark for effective and professional population management across WAZA's regional and national association members.

By December 31 2027

- WAZA Regional* associations must have a science-based population management framework that reflects the specific professional and effective elements of population management as approved by WAZA.
- WAZA Regional associations must require participation of its institutional members in their population management framework, such that there is institutional responsibility for effective and impactful population management.

* *Without the oversight of a Regional association, this responsibility will be that of the operating National association.*

Horned Puffin (*Fratercula corniculata*) © *Georgia Aquarium*

Why Is It Important?

The 27PMG is a natural progression for WAZA after the implementation of the WAZA 2023 Animal Welfare Goal. These goals will help solidify WAZA's vision to be a globally trusted and recognised leader advancing conservation and animal welfare.

As biodiversity loss accelerates, zoos and aquariums are increasingly called upon to play a critical role in preventing the extinction of species. The Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework has the vision of living in harmony with nature by 2050 and has established a set of 23 targets and 4 Goals that will support this vision. WAZA is well positioned to develop frameworks, like the 27PMG as well as other strategic priorities, to support meeting these Targets and Goals. Target 4 of the Kunming Montreal Global Biodiversity framework aims to *halt species extinction, protect genetic diversity, and Manage Human-Wildlife Conflicts*. The WAZA 27PMG will support this by ensuring that WAZA members contribute effectively to their regional and national professional, science-driven, and effective population management frameworks.

This initiative also aligns with WAZA's commitment to transformative leadership in the zoo and aquarium community. By establishing a global standard for population management, WAZA is setting its members up as leaders not just in animal welfare but also in population management.

"*The WAZA 27PMG is about more than just effective population management of animals in human care, it is about ensuring that zoos and aquariums are part of the solution to the global biodiversity crisis.*"

Developing the 2027 Population Management Goal: A Collaborative Effort

The 27PMG is the result of an extensive collaborative effort across WAZA's global network. The first step towards the Goal began in March 2023, when the WAZA Committee for Population Management (CPM) convened in Amsterdam to develop the framework that would guide its implementation. The workshop brought together representatives from regional associations such as the Latin American Association of Zoos and Aquariums (ALPZA), Association of Zoos and Aquariums (AZA), European Association of Zoos and Aquaria (EAZA), Pan African Association of Zoos and Aquaria (PAAZA), Southeast Asian Zoos and Aquariums Association (SEAZA) and Zoo and Aquarium Association Australasia (ZAA). This global gathering ensured that the framework would be comprehensive, inclusive, and adaptable to the unique needs of different regions.

During the workshop, the CPM defined the key elements that are essential for professional and effective population management. These include:

- **Goal-Driven Species Selection:** Population management must be strategic, with species chosen based on robust assessments of conservation needs, feasibility, and risk. The 27PMG calls for regional species plans that outline clear roles and goals for each species.
- **Sourcing, Transfer and Destination Policy:** The 27PMG requires associations' population management activities to be based on and support legal, sustainable, and ethical sourcing and placement of animals.
- **Data, Tools, and Science:** Emphasis is placed on the importance of using high-quality science-based data and tools to manage populations effectively, including rigorous record keeping and analytical tools to inform decision-making.
- **Animal Welfare:** WAZA prioritises animal welfare and regards it as central to population management. This element of the framework ensures that maximising positive animal welfare experiences is a key factor in decision-making both at a regional and institutional level.

Clown Triggerfish (*Balistoides conspicillum*)
© *Oceanario de Lisboa*

- **Engagement and Participation by Members:** This element acknowledges that the successes of population management activities depends on strong collaborative efforts and participation from members and various stakeholders.
- **Capacity Building:** Effective population management requires skilled professionals. The 27PMG framework includes provisions to ensure that associations' population management activities are appropriately resourced and supported by trained and capable staff.

Once the framework was approved by the WAZA Council, supporting documents as well as an assessment tool were developed by the WAZA CPM and WAZA Executive Office. During a meeting in July 2024, where the executive members of the WAZA CPM met in Barcelona to review all documents, the three regional associations that sit on the WAZA CPM: AZA, EAZA, ZAA, went through a pilot review to ensure the effectiveness of the framework and its assessment tool.

This pilot programme was critical in refining the framework, informing the development of the confirmation process, and ensuring that it can be successfully implemented across all regions.

The Next Steps: Implementation of the Goal

With the official launch of the WAZA 2027 Population Management Goal during WAZA's 79th Annual Conference, the next phase of this initiative will begin. Regional associations will be required to complete a self-assessment process, gathering evidence to demonstrate that their population management frameworks meet the requirements. This process will involve a thorough review of their policies and population management activities relating to the six elements described above.

Associations that successfully meet the 27PMG will be acknowledged for their leadership and commitment to effective population management. This process will not only help to ensure accountability but will also provide opportunities for regions to learn from one another, share best practices, and continually improve their population management strategies.

As we look towards the 2027 deadline, there is a clear path ahead for WAZA's member associations: embrace the challenge of effective population management, demonstrate leadership in conservation, and work together with our colleagues to address gaps and strengthen our processes, securing a future for the species that our community manages around the world. The work begins now, and with the WAZA 27PMG, we are taking a significant step forward in ensuring that zoos and aquariums remain at the forefront of global conservation efforts.

THE WAZA 2030 CONSERVATION GOAL – THE TIME IS NOW

Paula Cerdán, *Head of Conservation and Animal Welfare*; James Biggs, *Director, Conservation and Population Management, ZAA, WAZA Conservation Subcommittee Co-chair*; Helen Lockhart, *Conservation & Sustainability Manager, Two Oceans Aquarium, WAZA Conservation Subcommittee Co-chair;* Thalia Pelegrin, *Conservation and Animal Welfare Intern*

Under increasing pressure from climate change, pollution and growing demands on natural resources due to an expanding human population, our planet needs urgent and decisive action. In response to the ongoing global biodiversity crisis and the unprecedented rate of species extinction, the WAZA Council, during its July 2024 meeting, endorsed and recommended the development and implementation of the WAZA 2030 Conservation Goal. Building on the foundation of WAZA's Strategy, this ambitious initiative highlights the critical role and shared responsibility of the global zoo and aquarium community in conserving biodiversity. It also emphasises the importance of aligning our efforts with international frameworks, including the Kunming-Montreal Global Biodiversity Framework (GBF) and global biodiversity-related treaties.

From Crisis to Action:

Following the Council's recommendation, the WAZA Conservation and Environmental Sustainability Committee (CESC) drafted a resolution for the WAZA 2030 Conservation Goal. This resolution was unanimously approved by WAZA members during the 79th Annual General Assembly, held in Sydney, Australia. The unanimous support from member organisations represents a new commitment to halting extinctions, reversing species declines and restoring threatened wild populations and their ecosystems. It also reflects the unique opportunity for zoos and aquariums to contribute meaningfully and measurably to global biodiversity targets.

Red-backed Poison Frog (*Ranitomeya reticulata*) © *Zurich Zoo*

The WAZA 2030 Conservation Goal focuses on two key objectives: active contributions to conservation and standardised reporting.

The general objectives of this goal are:

By 2030

- WAZA Member Regional Associations* have a process in place that requires institutional members to actively contribute to halting extinctions, reversing declines, restoring populations and securing a future for threatened species. This process will be expected to include specific, WAZA-approved elements that align with global biodiversity targets and frameworks.
- WAZA Member Regional Associations* will have a system in place for their zoo and aquarium members to document and report their conservation efforts. This system will be used to report on these activities to WAZA in a standardised manner.

* *Without the oversight of a Regional association, this responsibility will be that of the operating National association.*

Next Steps

To bring this ambitious goal to life, the WAZA CESC, in collaboration with representatives from various national and regional associations, will convene in 2025 to develop the framework and requirements for the 2030 Conservation Goal. This process will include multiple rounds of consultation with WAZA members to integrate the diverse perspectives of the global zoo and aquarium community.

As part of the framework discussions, lessons learnt from the other two WAZA Goals – the 2023 Animal Welfare Goal and the 2027 Population Management Goal – will be carefully considered. Parallel efforts will focus on identifying challenges and developing solutions to overcome them, ensuring that all regions represented within WAZA are adequately supported with the resources and mechanisms needed to achieve the goal.

The challenge lies ahead, as we aim to finalise these pieces of work in 2025, intending to share them with members and launch during the 80th WAZA Annual Conference, that will take place in Cali, Colombia from the 26-30 of October 2025.

By committing to scaling up conservation efforts and adopting a standardised, transparent system for measuring and reporting contributions aligned with global conservation frameworks, WAZA members are positioning themselves as key players in addressing the biodiversity crisis.

Scimitar-horned Oryx (*Oryx dammah*) reintroduced to the wild in January 2017 © *ZSL*

WAZA
World Association of Zoos and Aquariums

Download the Short Guide
Visit www.waza.org
or scan the QR Code

Beavers are now a protected species in Scotland © *RZSS*

THE ROYAL ZOOLOGICAL SOCIETY OF SCOTLAND, A BRIGHT FUTURE FOR BEAVERS

David Field, *RZSS CEO*

The Royal Zoological Society of Scotland (RZSS) is dedicated to wildlife conservation, with a bold vision of a world where nature is protected, valued and loved. To achieve this, RZSS has committed to reversing the decline of at least 50 species by 2030 through conservation breeding, advancing species recovery science, restoring native species, and preserving biodiversity across our sites – Edinburgh Zoo and Highland Wildlife Park.

Conservation has long been central to RZSS's mission, and our charity has played a vital role in recovery projects for species around the globe. RZSS has lent its expertise to species conservation projects such as the **Henderson Island rail (2011)**, the **Canna mouse (2005–2006)**, and the **Gough Island Restoration Programme (2020–2022)**. Additionally, RZSS has supported two major conservation initiatives for nearly two decades: the Budongo Conservation Field Station in Uganda and ICAS, the Wild Animal Conservation Institute in Brazil.

The RZSS WildGenes laboratory at Edinburgh Zoo has made global strides in using genetic data for conservation efforts. From fighting illegal elephant ivory trade in Africa and Asia to supporting the reintroduction of Siamese crocodiles and managing the return of the Scimitar-horned oryx to Chad, their efforts are far-reaching. Closer to home, RZSS has a solid record of reintroducing native species like wildcats, pine hoverflies and beavers to Scotland.

Beavers, known as 'ecosystem engineers', significantly influence their habitats through the environmental changes they create. Once widespread across Scotland, the Eurasian beaver *(Castor fiber)* was hunted to extinction in the 16th century. Efforts to reintroduce beavers to Scotland began in the late 1990s, and in 2008, the Scottish Government approved an application by RZSS, the Scottish Wildlife Trust, and the Forestry Commission Scotland for a five-year trial reintroduction of beavers on the West Coast of Scotland. Thus, the Scottish Beaver Trial was born.

In May 2009, as part of the Scottish Beaver Trial, beavers were successfully reintroduced into Scotland's Knapdale Forest, marking the UK's first licensed release of a mammal species. A total of 16 beavers were released into three freshwater lochs, signalling the return of beavers to Scotland after over 400 years of absence. The trial garnered global attention, with over 10 million people following the news.

The trial was followed by the Scottish Beavers Reinforcement Project (2017–2020), during which RZSS took a leading role in fieldwork, research, veterinary care, stakeholder engagement and political advocacy. Regular surveys were conducted, and data from these, along with independent monitoring by Scottish Natural Heritage (now NatureScot), helped assess the positive impacts beavers could have on Scotland's environment. On 1 May 2019, beavers were granted full European Protected Species status, a decision informed by the wealth of data collected during the trial and the reinforcement.

Beavers have played a significant role in contributing to the reduction of habitat loss, promoting sustainable agriculture and forestry, managing invasive species and aiding ecosystems vulnerable to climate change. The project engaged approximately 2.9 million people, with visitors from 26 countries attending the project's release site. It was also featured in several documentaries and provided educational content to Scottish schools.

The RZSS education team has been integral in spreading awareness about the beaver reintroduction through initiatives like the 'Wild About Scotland' bus, which reached almost 100,000 learners. Today, beavers remain a part of RZSS's educational efforts, with resources available online and on-site at Edinburgh Zoo and Highland Wildlife Park.

RZSS's work on beaver conservation has generated a wealth of research, including over 20 peer-reviewed papers, eight commissioned reports, and the first disease risk assessment for beavers. The team's research also marked the first use of genomic technology to support conservation management decisions for any species, contributing to the understanding of genetic diversity and species adaptability.

Throughout the past decade RZSS, along with project partner the Scottish Wildlife Trust, has been heavily engaged in conservation advocacy. We have 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 widely to setting high standards for reintroduction in Scotland through our participation in the Scottish Reintroduction Forum, which produced the *Scottish Code for Conservation Translocation* – the reinforcement of the Knapdale population was the first project to be granted a translocation license under this world-leading system.

Scottish Beavers reinforcement © *Steve Gardner*

Earlier this year, RZSS and the Scottish Wildlife Trust published a study about the importance of genetic research when reintroducing species. The study confirmed a concerning lack of genetic diversity in the original beaver population in Knapdale, but that bringing additional animals with different genetics during the reinforcement project has improved the gene pool – which should increase adaptability to environmental challenges. Our previous report on beaver genetics in England demonstrated that the animals there have similar genetics to those in Scotland. Essentially, the vast majority of Britain's beavers come from a small number of founders with a limited gene pool. As a closed population, Britain's beavers are at risk of losing genetic diversity. This would further reduce adaptability to change and suggests a need to bring in beavers from Europe to boost genetic diversity and ensure a long-term future for beavers in Scotland and beyond.

The successful reintroduction of beavers to Scotland, and further research, is a testament to the collaboration of numerous organisations and highlights that through collective effort, a future where nature is protected, valued and loved is within reach.

Judy Mann-Lang presenting the 2024 WAZA Conservation Award to David Field © *WAZA*

Scottish Beavers reinforcement © *RZSS*

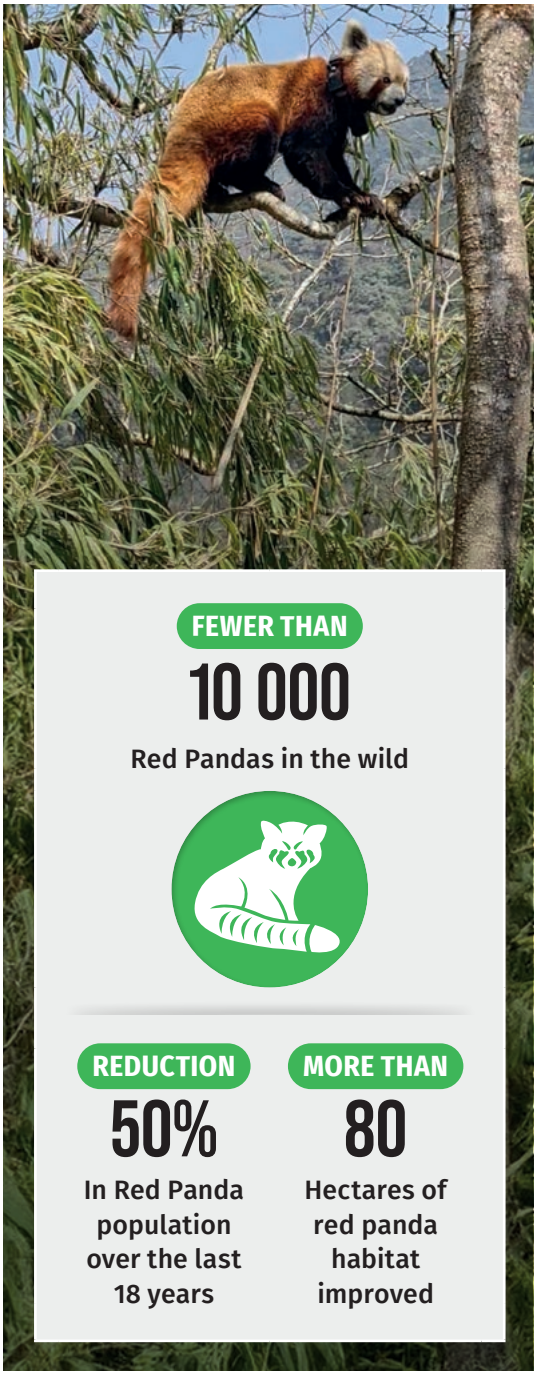
Release group © *PNHZP*

DARJEELING ZOO RED PANDA RECOVERY PROGRAMME

Basvaraj Holeyachi, *Director Himalayan Zoological Park*

The red panda (*Ailurus fulgens*), is a charismatic yet elusive species native to the Eastern Himalayas. The species has been listed as Endangered on the IUCN Red List since 2015 due to its rapid population decline, leaving fewer than 10,000 individuals in the wild (two subspecies together). As an indicator species for the health of the Eastern Himalayan broadleaf and conifer forests (Roka *et al.*, 2020), red panda conservation is not just about protecting a single species but preserving an entire ecosystem that supports a diverse range of flora and fauna, including snow leopards. Red pandas face a survival crisis due to anthropogenic factors such as habitat destruction, habitat fragmentation leading to isolation of populations thereby reducing genetic diversity, poaching, feral dogs and climate change. Their population is estimated to have decreased by 50% over the last three generations (approximately 18 years), with the decline expected to continue and potentially worsen in the next three generations (Glatston *et al.*, 2015). Conservation efforts have become critical to ensure the survival of this species.

With the wild population continuing to shrink, conservation breeding programmes have emerged as a vital strategy in red panda conservation. The goal of such programmes is to maintain genetically diverse captive populations and release them into the wild to enhance population numbers and genetic diversity. Conservation programmes like the Red Panda Conservation Breeding and Augmentation Program, initiated by the Padmaja Naidu Himalayan Zoological Park (PNHZP), are crucial in reversing the decline of red panda population in the wild. This comprehensive initiative combines breeding, research, habitat restoration and community engagement to secure the red panda's future.



Collared Red Panda (*Ailurus fulgens*) © *PNHZP*

Augmentation © *PNHZP*

Launched in the 1990s, the Red Panda Conservation Breeding Program of PNHZP aims to counter the shrinking population of red pandas by maintaining a healthy, genetically diverse captive population that can act as a buffer for the dwindling wild populations and, eventually, be used for reintroduction back into the wild. Since 2007, PNHZP has served as the coordinating zoo for this national programme under the Central Zoo Authority (CZA) of India.

Between 2022 and 2024, nine captive-bred red pandas (seven females and two males) were released into the Soft Release Facility inside Singalila National Park (SNP). They underwent genetic analysis, including DNA heterozygosity and pedigree assessments, health assessment and behavioural evaluation before release to ensure their positive contribution to the wild gene pool. Out of the nine individuals, seven were successfully acclimatised and released into the wilderness of SNP.

The augmentation programme has already yielded positive results. Of the seven released red pandas, three females successfully mated with wild males, resulting in the birth of five cubs in the wild. This milestone demonstrates that captive-bred red pandas can integrate into wild populations and reproduce, boosting both population numbers and genetic diversity, essential for the long-term survival of the species.

However, breeding and augmentation efforts alone are insufficient without protecting and restoring natural habitats. The Wildlife Wing of the Government of West Bengal, has undertaken several habitat restoration initiatives. More than 80 hectares of bamboo forest in Singalila National Park and adjoining forests have been improved to create suitable habitat and maintain corridors for red pandas to move freely between habitat patches. These efforts benefit not only red pandas but also other species that rely on these ecosystems. As part of the broader habitat restoration efforts, 40 hectares of forest have been restored through bamboo thinning and the planting of indigenous tree species such as *Taxus wallichiana*, *Quercus lamellosa*, and *Rhododendron arboreum*. Nine water retention systems were constructed to ensure consistent water supply for red pandas and other wildlife during the dry season. To protect these restored habitats, 17 kilometres of patrolling paths were maintained, along with two protection camps, nine watchtowers and the security and monitoring

were also enhanced. These measures have improved red panda monitoring, protection, and surveillance, thus creating a safer environment for red pandas and other wildlife.

PNHZP is collaborating with institutions like the Centre for Cellular and Molecular Biology at the Indian Institute of Science Education and Research, and the Wildlife Institute of India to support conservation efforts with scientific studies. In the last two years, PNHZP has generated useful data on red panda habitat, home range, vegetation preference, etc. Research on reproductive and stress hormone profiles of red pandas in captivity and the wild is underway. One key study involves analysing red panda scat using Next-Generation Sequencing (NGS) to determine their wild diet. This research will offer valuable insights into the nutritional needs of both wild and captive red pandas.

Another area of focus is the gut microbiome of both wild and captive red pandas. Gut health is essential for maintaining overall health, particularly in captivity, where stress and artificial diets can lead to digestive issues. Research into the microbiome aims to improve health outcomes for red pandas by tailoring dietary practices to optimise gut health, which is vital for successful breeding and longevity.

PNHZP has partnered with the Indian Veterinary Research Institute (IVRI) and Rotterdam Zoo, Netherlands to study Amdoparvovirus and its impacts, both in captive and wild populations.

PNHZP's conservation efforts are further strengthened by its Biobanking and Genetic Resource Facility, wherein gametes, tissues and the DNA of red pandas and other endangered species will be preserved for future use. This facility offers a long-term strategy for preserving genetic diversity of endangered species like the red panda, despite several challenges.

For any conservation programme, involving local communities is crucial for habitat protection, preventing poaching and supporting reintroduction efforts. This makes conservation plans become more culturally sensitive, economically sustainable and practically effective. Collaborations with Joint Forest Management Committees and Eco-Development Committees ensures the engagement of local communities through education and outreach programmes, empowering them to actively participate in protecting these vital ecosystems.

Red panda conservation extends beyond local efforts to global initiatives. Campaigns like International Red Panda Day and social media outreach raise awareness and educate the public about the threats faced by red pandas and need for their conservation.

Despite significant progress, challenges remain and there is a need for long-term strategies that include habitat restoration, continued research and the expansion of breeding programmes to secure the future of the species. In line with this goal, PNHZP has developed Phase II of the Red Panda Augmentation Program along with the Wildlife Wing. Building on the successes of the first phase, this initiative aims to release 20–30 captive-bred red pandas over the next decade into natural habitats to augment wild population.

In conclusion, conserving red pandas requires a multifaceted approach that combines scientific research, habitat restoration, conservation breeding and community engagement. Through these comprehensive efforts, PNHZP and its collaborators are making strides toward reversing the decline of this endangered species. While challenges persist, with continued commitment and innovative strategies, the future of the red panda in the wild remains hopeful.

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BROOKFIELD ZOO CHICAGO, CONSERVING BOTTLENOSE DOLPHIN POPULATIONS

Brookfield Zoo Chicago

In Sarasota Bay, Florida, USA, generations of bottlenose dolphins carry out their lives in inshore coastal habitats, foraging for prey fish, dodging predatory sharks, and interacting with one another in their own unique social structure. Dolphins must contend with a variety of natural threats, and in addition, they face numerous threats locally and world-wide from anthropogenic – human induced – causes.

For the past 54 years, researchers from the Sarasota Dolphin Research Program (SDRP) have poured their time, energy and hearts into conserving and studying this species, along with the ecosystem they share in the region, giving them an unparalleled window into the world of wild dolphins. It is the longest-running wild dolphin conservation research programme in the world.

Operated by Brookfield Zoo Chicago since 1989, the SDRP was founded in 1970 by Dr Randall Wells, now Vice President of Marine Mammal Conservation at Brookfield Zoo Chicago, and Dr Blair Irvine. Based in Sarasota, Florida, the programme aims to better understand the structure and dynamics of dolphin, whale, and porpoise populations, as well as the natural and human-induced factors that impact them.

From the outset of the programme, Wells and Irvine began the first study of wild dolphin ranging patterns by monitoring the movements of dolphins they had tagged in the coastal area of Sarasota Bay. Later, they were among the pioneers in the implementation of systematic photo-identification surveys to monitor the dolphins, which were individually identifiable by a unique set of markings, scars and nicks and notches on their dorsal fin.

Over time, data from tracking and dolphin-monitoring surveys led to the discovery of long-term residency: multiple generations of related dolphins lived within the same community home range of Sarasota Bay and vicinity year-round, across decades. At any given time, the resident Sarasota dolphin community of about 170 individuals can include related members spanning as many as five generations, and including individuals up to 67 years of age. The SDRP has identified similar communities up and down the west coast of Florida.

These groundbreaking findings established the area as a unique natural laboratory for learning about wild dolphin biology, behaviour, ecology, social structure, health and communication, as well as the impacts of human activities on the animals and their ecosystem.

The SDRP researchers recognised early-on the importance of providing an ecosystem perspective to facilitate understanding the dolphins. To this end, the team engages in seasonal prey fish surveys, samples, tags and tracks prey fish and predatory sharks, and maintains a network of underwater acoustic listening stations to help monitor ecosystem health.

Since the SDRP first began its research on the Sarasota Bay dolphin community, the team has recorded data from more than 59,000 dolphin group sightings and amassed more than a million photographs during photo-identification efforts. More than 182,000 individual dolphin identifications have been made from these photos, based on more than 5,000 distinctive individual dolphins from the central west coast of Florida.

Sarasota Dolphin Research Program team member conducting photographic identification survey *© Sarasota Dolphin Research Program, taken under NMFS/MMPA Scientific Research Permit No. 26622*

Sarasota Dolphin Research Program staff and volunteer prepare to release a dolphin after disentangling it's flukes from a fishing line *© Sarasota Dolphin Research Program, taken under NMFS/MMPA Scientific Research Permit No. 26622*

Starting in the 1980s, the SDRP staff, along with biologists and veterinarians, have conducted periodic catch-and-release health assessments of individual dolphins in Sarasota Bay. The data and samples collected fuel more than 40 research projects during each session, enabling researchers to monitor the health of the population as a whole, learn about life-history, and assess the effects of environmental contaminants.

Today, the SDRP team consists of 10 full-time and three part-time researchers conducting research under Scientific Research Permits issued by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries service. The team has published more than 370 peer-reviewed publications, been a resource for 51 doctoral dissertations and 50 master's theses, and provided opportunities for more than 510 interns. Indeed, the programme's contributions are numerous and far-reaching.

Along the west coast of Florida, the SDRP leads and participates in rescues of entangled and out-of-habitat dolphins; these rescues support future generations of dolphins and help to maintain populations. The SDRP also established a Gulf of Mexico-wide collaborative photographic identification catalogue for bottlenose dolphins to help track individually identifiable dolphins throughout the Gulf.

In the United States, NOAA has used the programme's findings to improve protective measures for bottlenose dolphins throughout the Southeastern United States. They also use the Sarasota dolphins as a reference population for comparisons with more at-risk populations to identify and define impacts of natural and human-induced phenomena, such as the *Deepwater Horizon* oil spill and red tide harmful algal blooms.

Globally, the SDRP team has contributed its expertise to conservation programmes for a variety of species, including the highly endangered vaquita in the Gulf of California; spinner dolphins in Hawaii; Guiana dolphins in Brazil; blue, grey, bowhead, and humpback whales; manatees in Florida and Belize; Mekong River dolphins in Cambodia; and franciscana dolphins off the coasts of Argentina and Brazil. Techniques, approaches, and tools developed, tested, and refined with Sarasota dolphins have greatly enhanced research capabilities locally, nationally and internationally. As a result, training and education opportunities afforded by the SDRP have increased conservation capacity in the U.S. and in many countries around the world, benefitting more than 200 researchers and budding scientists globally.

The SDRP serves as a global model for conservation, with its efforts benefiting both local ecosystems and endangered species worldwide. The programme's groundbreaking research has informed policies, shaped best practices for marine animal care, and inspired international conservation efforts. Through collaboration, innovation, and education, the SDRP has made an indelible mark on the field, working toward the long-term health of dolphin populations and contributing to the future of marine wildlife conservation on a global scale.

PROTECTING WILDLIFE AND SUPPORTING A LOW-CARBON FUTURE

Mandai Wildlife Group

At Mandai Wildlife Group, we are committed to protecting wildlife and supporting a low-carbon future. We recognise that biodiversity protection and sustainability are intricately linked and critical in mitigating threats to climate change. We strive to promote a world where people and wildlife thrive together, contributing to a healthier planet for future generations.

We are committed to ambitious environmental sustainability targets that influence nearly every aspect of our work, including operations, development, and advocacy. From the energy we use, our waste management practices, or to the coffee we serve, we continuously strive to embrace the best practices in environmental sustainability.

Our Net-Zero targets, validated by the Science-Based Targets Initiative (SBTi), are set with the goal of achieving Net-Zero across our value chain by 2050, in line with climate science. This is especially challenging in a small city-state like Singapore, where about 95% of electricity is generated from natural gas. We believe that pursuing these goals will drive meaningful progress and innovation and real change and we are dedicated to making a positive impact.

Our Environmental Sustainability Strategy

Guiding us towards our Net-Zero targets is our Environmental Sustainability Strategy, underpinned by three pillars: **Sustainable Operations, Biodiversity Protection, and Sustainability Advocacy**. Each pillar is vital to our goal of protecting nature and supporting a low-carbon future:

1. **Sustainable Operations:** Driving efficient use of resources to minimise carbon footprint and championing a sustainable value chain for green living.
2. **Biodiversity Protection:** Protecting and enhancing biodiversity within and around our parks, ensuring that animals and plants have safe, healthy habitats in which to thrive.
3. **Sustainability Advocacy:** Using our platform to educate and inspire our guests and community to adopt sustainable choices in their own lives.

Mandai Wildlife Group's eco-friendly architecture incorporates green roofs, enhancing biodiversity and energy efficiency in line with sustainable operations © *Mandai Wildlife Group*

Our Approach to Operating Sustainably

As the steward of Singapore's four zoological parks, operating sustainably is a key focus, encompassing responsible procurement, resource stewardship, and sustainable design. Under resource stewardship, there are roadmaps for energy, water, waste and transport. We have pledged to attain 100 per cent of our energy from renewable sources, reduce the intensity of potable water use in our precinct by 25 per cent, and divert 60 per cent of our waste from incineration by 2030.

Key initiatives include:

- **Energy:** Solar panels are being implemented on all available rooftops across the precinct in phases, contributing to further reduction in our carbon footprint. To further reduce our energy needs and carbon footprint, the wheels are in motion for a sustainable transport system across the precinct. All our trams and buggies are now electric, cutting our greenhouse gas emissions by 70 tons of CO_2 each year. We have installed EV chargers at our car parks and earlier this year, we worked with our transport vendor to transition all our shuttle buses from petrol to electric.
- **Water:** To reduce water consumption, we began an initiative in 2017 to capture and treat rainwater across our 126-hectare precinct which includes upgrading our catchment drains and detention tanks. We also constructed two wastewater recycling plants which are expected to support 21 per cent of our water needs. These plants will treat wastewater into high-quality recycled water for non-potable use such as irrigation, replenishing moats and cleaning. Other initiatives include installation of a bio-bed filter at our manatee exhibit to recycle 29,200m3 of water annually by channelling wastewater through specially selected plants and using meters and sensors to monitor usage and detect leaks.
- **Waste:** In 2023, we eliminated all single-use fossil-based plastics from our guest operations. To address food waste, we use Black Soldier Flies and Madagascar Hissing Cockroaches to turn raw food waste from our F&B kitchens and animal food waste into compost. The invertebrates are in turn used as animal feed, creating a closed-loop waste management system. A food waste digester has also been set up on-site, that has the capacity to convert up to two tonnes of food waste per day into liquid fertiliser that can be used for fertigation.

To better inform our waste management strategy to achieve a 60 per cent waste diversion rate by 2030, we adopted a data driven approach by conducting a Waste Profiling and Waste Service Journey Mapping exercise in 2023. The exercise was designed to assess the disposal habits of key stakeholders and understand barriers and challenges in waste minimisation and recycling. Staff and guests were interviewed as part of the stakeholder engagement process to improve the Group's understanding of visitor behaviour and perceptions.

Judy Mann-Lang presenting the 2024 Environmental Sustainability Award to Mandai Wildife Group's Rohaya Saharom, Vice President, Sustainable Solutions and Mike Barclay, Group CEO © *WAZA*

Electric trams transport guests within our wildlife parks at the Mandai Wildlife Reserve, reducing greenhouse gas emissions as part of our green transportation initiatives © *Mandai Wildlife Group*

Sourcing Responsibly

Our commitment to sustainability extends to our purchasing practices. We have established strict standards for the products we procure, from wood and paper to seafood, tea, and palm oil.

For example, we serve OWA coffee, a wildlife-friendly option sourced from a conservation project we support. Our partners in the field work with local communities in the Central Javan highlands to grow coffee under shade. This approach reduces deforestation and helps protect the habitat of wildlife like the endangered Javan gibbon. By offering such choices, we demonstrate to our guests how even small decisions—like the coffee they drink—can make a significant impact on the world.

Additionally, we are committed to using 100 percent-certified sustainable palm oil. We have transitioned to certified sustainable cooking oil in all our food outlets and are working to ensure that all the palm oil used across our operations meets these standards.

We ceased selling beef products in the F&B outlets operated by the Group to lower its carbon footprint and ensure that our menus feature at least 20 per cent plant-based options, encouraging guests to opt for more sustainable food choices.

Enhancing Ecological Connectivity: The Mandai Wildlife Bridge

One of the projects that best encapsulates our commitment to protecting biodiversity in and around our wildlife parks is the Mandai Wildlife Bridge. This dedicated crossing connects forest fragments on either side of a road, allowing wildlife to move safely between habitats and reducing the risk of road accidents for our animal neighbours. Our efforts reached a new milestone in July 2023 when wildlife cameras captured our first record of the Sunda Pangolin using the bridge. Moreover, the cameras also recorded 51 detections of lesser mousedeer, a record high for us! With two threatened, forest-dependent, and typically elusive species using the bridge, we are encouraged that the bridge is fulfilling its intended purpose as a wildlife corridor.

Advocates for Sustainability and Conservation

Recognising the vital connection between conservation and sustainability in addressing climate change, we encourage our employees, guests and the wider community to adopt green lifestyles. We achieve this by raising awareness and offering educational programmes, and resources about sustainability.

Our outreach starts with clear and impactful messaging. In January 2024, we introduced a new icon and tagline, “Choose Sustainable”, to create a cohesive sustainability message across our precinct. Sustainability themes are integrated into various touchpoints including exhibit signage, animal presentations and our Food & Beverage and retail outlets.

Promoting a World Where People and Wildlife Thrive Together

As a conservation-minded organisation, it is fundamental to our mission that we are intentional about reducing our impact on the environment and doing our bit to secure a future that is sustainable. We see it as our responsibility to ensure we optimise our operations, in line with our commitment to adopt sustainable best practices.

An aerial view of The Mandai Wildlife Bridge © *Mandai Wildlife Group*

COLUMBUS ZOO AND AQUARIUM: LEADING THE CHARGE IN SUSTAINABILITY

Kristeena Blaser, *Director of Sustainability*

Sustainability has always been a priority for the Columbus Zoo and Aquarium, and our commitment is demonstrated through a robust history of initiatives that support our organisation's mission which is 'Empowering People. Saving Wildlife'. In 2023, the Columbus Zoo and Aquarium embarked on our most ambitious master planning initiative to date: the 2040 Framework. This comprehensive 16-year plan encompasses all four of our parks and properties (the Columbus Zoo, The Wilds, Zoombezi Bay and Safari Golf Club), with sustainability as a core tenet alongside conservation. Our vision is to become one of the most impactful wildlife conservation institutions globally, with sustainability at the foundation of our success.

Energy Conservation

As we continue our sustainability journey, energy conservation remains a cornerstone of our operational strategy. In 2020, the Suzie Edwards Conservation Education Classrooms building was unveiled at the Columbus Zoo, featuring a rooftop solar array with 165 panels. This array generates approximately 74.16 MWh of electricity annually.

As part of ongoing efforts since 2009, the Zoo completed the transition from traditional holiday lights to LED bulbs for the Wildlights event by 2012, switching over 3 million lights. This shift for Wildlights, efficiently powered by AEP Ohio, resulted in an 85% reduction in electricity consumption during the event. Non-working light strands are collected and donated for recycling.

Pollinator Habitat (Powell Road) © *Grahm S. Jones, Columbus Zoo and Aquarium*

In 2023, the Zoo replaced its older compressed natural gas and gasoline train engines with a fully electric model. The Zoo acquired its first fully electric vehicle in 2022, followed by three more in 2023, and added another three to its fleet in 2024, along with an existing EV plug-in hybrid. In 2024, the Zoo also started converting its carts and all-terrain vehicles to electric options, phasing out gasoline and diesel-powered models.

A grant awarded in 2019 helped cover the costs of installing six electric vehicle chargers for guest use in the parking lot. That same year, five additional chargers were installed for fleet and employee EV charging.

Waste Management

Building on our commitment to sustainability, waste management and diversion are also central to many of our operational practices. Over the past five years, we have improved our diversion rate by 16.15%. Currently, our waste stream consists of 72% compostable materials, 8% recyclable materials and 20% landfill-bound waste, supported by several successful waste management programmes.

All our parks provide single-stream recycling options for both guests and employees, accepting materials such as glass, aluminium, plastic, paper, cardboard and metal. We have contributed more than 2,400 devices to the **Gorillas on the Line** cell phone recycling programme, raising awareness about the threats gorillas face due to coltan mining. Since 2019, we have also recycled 25.7 tons of additional electronics, along with over 1,000 pounds of alkaline batteries, since launching our **Batt Patrol** programme in 2021.

Through a partnership with a local drainage company, a leading manufacturer of stormwater and onsite septic wastewater solutions, we have diverted nearly 20,000 pounds of High Density Polyethylene (HDPE) plastic from landfills. This plastic is sorted, washed and turned into pellets that are used to make pipes designed to last over 100 years. Our Animal Care team also repurposes event signage into hammocks for orangutans, and once the hammocks are no longer in use, the remaining materials are transformed into reusable bags sold at the Columbus Zoo Marketplace gift shop.

The Zoo has partnered with Price Farms Organics, a local Environmental Protection Agency (EPA) certified composting facility, since 2009. Together, the Zoo, Zoombezi Bay and Safari Golf Club send approximately 1,600 tons of animal bedding, yard clippings, food waste and manure annually to be composted. These organic materials are processed over two years, resulting in Zoo Brew compost and nutrient-rich Zoo Brew Tea. Both are used as topsoil across the Zoo's properties, and Zoo Brew is available for purchase in the Zoo Marketplace.

Many of our large catered events, including the Rwandan Fête, Wine for Wildlife and Zoofari, are zero-waste, meaning less than 10% of the waste generated goes to landfills. For this year's Zoofari, we partnered with Columbus Food Rescue to donate over 480 pounds of rescued food to those in need.

During our annual **Boo at the Zoo** event in October, we distribute approximately 250,000 pieces of candy. In 2023, we introduced a candy wrapper recycling program, collecting nearly 120,000 wrappers.

Waste audits were conducted across our organisations in 2023, with all 42 departments completing and submitting their results. The outcome of this effort is helping us better understand and improve waste management across our organisation.

Water Conservation

In addition to our waste management efforts, water conservation is another critical component of our sustainability strategy. The Life Support Systems (LSS) at the Zoo reclaim water in several areas, including 4,000 gallons per week at Discovery Reef Aquarium, 8,000 gallons daily at our Manatee Rescue and Rehabilitation Center and 3,000 gallons during each backwash cycle for the polar bear habitat, which is essential for animal well-being.

Additionally, of the 400,000 gallons of salt water in the sea lion habitat, about 16,000 gallons are used daily for backwashing, a process where water is pumped backwards through filters to flush out debris and particles, with LSS reclaiming nearly all of that water to minimise waste.

Non-potable water is utilised for tasks like toilet flushing, animal area cleaning and irrigation. Most restrooms feature water-saving fixtures, including waterless urinals and low-flow faucets.

Purchasing, Procuring and Producing Sustainably

As we strive to create a comprehensive approach to sustainability, our dining options also reflect our commitment to eco-friendly practices. The Columbus Zoo is home to three **Green Restaurant Association Certified** locations: Mapori Restaurant, WildBurger and Shores Park Cafe.

Mapori was intentionally designed to be the Zoo's first Leadership in Energy and Environmental Design (LEED) certified building and to earn a 4-star rating from the Green Restaurant Association. At the time of its certification, it was the only 4-star rated restaurant in the central Columbus area.

Community and Staff Engagement

Recognising the importance of community involvement, we engage both our guests and staff in sustainability initiatives. The **Teen Eco Summit** (TES) is held annually at the Columbus Zoo, bringing together over 300 students to develop Conservation Action Plans for their schools and communities.

Since its inception in 2018, the **Plastic Free Ecochallenge**, a month-long initiative open to all, has focused on promoting zero-waste living. With over 42,000 participants from all 50 states, we have successfully diverted over 1.2 million pieces of single-use plastic from landfills.

In 2023, all year-round staff from the Zoo's four parks took part in a sustainability course, which reviewed the organisation's ongoing green initiatives. With all 419 staff members from the Columbus Zoo and Aquarium, Zoombezi Bay, Safari Golf Club and The Wilds completing the course, we achieved a 100% participation rate across all parks.

Sustainability is not just a choice but a responsibility for modern zoos. By adopting eco-friendly practices, reducing waste, conserving resources and educating visitors about environmental stewardship, zoos can become powerful advocates for the planet. These efforts not only ensure the well-being of the animals in their care but also contribute to global conservation initiatives. Ultimately, a commitment to sustainability helps zoos inspire future generations to protect wildlife, preserve natural habitats, and create a more harmonious relationship between humans and our planet.

3 million

LED BULBS

Resulted in an 85% reduction in electricity consumption

16.15%

WASTE DIVERSION RATE

Improved over the past five years

1.2 million

SINGLE-USE PLASTIC

Diverted from landfills

Pollinator Habitat (Zoombezi)
© Grahm S. Jones, Columbus Zoo and Aquarium

ENVIRONMENTAL SUSTAINABILITY PLAN AT TORONTO ZOO

Kyla Greenham, *Manager of Conservation and Environment, Toronto Zoo*

At Toronto Zoo, the mission is to connect people, animals and conservation to fight extinction. The TZNet0 Environmental Sustainability Plan supports a sustainability vision for the Zoo, whose operations produce an overall benefit to the natural environment, allowing wildlife and wild spaces to thrive. In 2023, the Zoo made significant strides in environmental sustainability, showcasing its commitment to achieving net-zero by 2030.

Progress Toward Net Zero Emissions

In 2023, Toronto Zoo reduced its greenhouse gas (GHG) emissions by 53% compared to 1990 levels, despite increased activities, including longer visitor hours and ongoing construction projects. This reduction highlights the Zoo's long-term commitment to carbon reduction.

A key contributor to this success was the implementation of energy efficiency upgrades across the Zoo, particularly in the Americas Pavilion. This vibrant indoor exhibit, which showcases the biodiversity of the Americas, achieved a 95% reduction in natural gas consumption after its heating system was converted from steam to a heat pump. Initially targeting a 50% reduction, this pilot project exceeded expectations, demonstrating the potential for further GHG emission reductions as the Zoo undergoes critical infrastructure renewal during its 50th anniversary.

Water Conservation Efforts

Water conservation is a central focus of Toronto Zoo as they work toward achieving net-zero water usage. In 2023, the Zoo reduced potable water consumption by 8,000 cubic meters, reaching 45% of its net-zero water target. This success was driven by upgrades such as the penguin habitat filtration system, which significantly reduced the need for water-intensive backwashes and pool changes.

Toronto Zoo also transitioned from sand to recycled glass beads in its filtration systems, improving efficiency. One standout project was the Beaver/Otter filtration system renovation, where the plumbing team used glass media to enhance performance. To engage guests, glass doors were installed in the filter room, offering a behind-the-scenes look at the system, complemented by educational signage explaining how these upgrades support the Zoo's sustainability goals.

Mini Forest © *Toronto Zoo*

Another innovative water conservation project is the hyena habitat's new waterfall feature, designed using biomimicry principles. This self-filtering, recirculating system mimics natural wetland processes, using beneficial bacteria and algae to filter and oxygenate the water. This design ensures the hyenas have access to clean drinking water without the need for chemical treatments or frequent draining, significantly reducing water consumption. The feature also supports local wildlife, attracting dragonflies, birds and butterflies.

Beyond animal habitats, Toronto Zoo's renovated greenhouses, now equipped with rainwater harvesting systems, have further reduced reliance on municipal water, saving over 80,000 litres annually. These greenhouses feature energy-efficient LED lighting, modern Heating, Ventilation and Air Conditioning (HVAC) systems and automated climate control, cutting energy use by 40% and reducing GHG emissions by 64 tonnes. For the first time, the greenhouses are open to guests, offering hands-on experiences with sustainable plant growth, living walls, sensory plant tables and hydroponic systems.

Advancing Zero-Waste Operations

In 2023, Toronto Zoo made major advancements towards zero-waste operations through the launch of the 'Close the Loop' Program. This initiative, supported by third-party consultants, aims to achieve net-zero waste by 2027. A key component of the programme is the installation of 18 bin sensors across high-traffic areas, which monitor waste levels in real-time and optimise waste disposal practices. The installation of two OSCAR Sort units at the Peacock and Caribou Cafés gamify waste diversion, helping guests to sort waste accurately while making the process engaging and fun. The Zoo aims for more than 90% accuracy in guest waste sorting, while OSCAR Sort collects valuable data for waste audits and Environmental, Social and Governance (ESG) reporting, further improving waste management efficiency.

The Zoo's 'PhoneApes' cell phone recycling program, launched in 2006, is another vital part of its waste reduction efforts. The programme encourages guests and the community to donate old cell phones for recycling, reducing the demand for coltan, a mineral used in electronics that is mined in areas home to endangered species like gorillas. To date, PhoneApes has successfully recycled over 60,000 cell phones and 65 tonnes of electronic waste, raising over $38,000 for great ape conservation in Africa. This initiative fosters greater understanding of how everyday actions can impact the environment and wildlife.

The 'Plastics Pathway' is another innovative project that highlights the Zoo's commitment to reducing plastic waste. This educational pathway takes visitors through the lifecycle of plastic, emphasising responsible use and circular economy practices which involve recycling, refurbishing and using products for as long as possible. A groundbreaking part of this initiative involved paving a 475-square-metre section of the Tundra Trek pathway using recycled plastic, diverting 76,000 plastic bottles from landfills. Along the pathway, interpretive signage educates guests on the importance of reducing plastic waste, providing a tangible example of how repurposing materials can contribute to sustainable infrastructure.

53%

GHG EMISSIONS

Reduced in 2023

45%

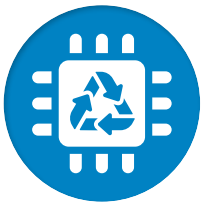
NET-ZERO

Water target reached

65 tonnes

RECYCLED

Electronic waste



76,000

PLASTIC BOTTLES

Diverted from landfills

Floating Wetlands © *Toronto Zoo*

SARIT vehicle © *Toronto Zoo*

Electrification of the Zoo's Fleet

Transitioning the Zoo's diverse vehicle fleet to electric is a challenge due to limited vehicle availability, but the Zoo is actively working to develop solutions. A key initiative in this effort is the SARIT vehicle pilot program, developed in partnership with York University and Elvy Inc. This electric vehicle is designed to improve operational efficiency by providing eco-friendly transportation for staff and supplies across the Zoo. The programme is also exploring ways to enhance the guest experience, particularly for guests with special needs. The Zoo's leadership in electrifying its fleet not only reduces its carbon footprint but also promotes broader adoption of electric vehicles in the community by driving progress in sustainable transportation.

Biodiversity and Habitat Restoration

Toronto Zoo became the first location for the Royal Canadian Geographic Society's Network of Nature Mini Forest Program, marking a significant milestone in urban reforestation and biodiversity conservation. Over the years, the Zoo has planted 32,000 trees to create thriving mini forests on its grounds, enhancing local biodiversity and providing critical habitats for native wildlife. These mini forests also contribute to improved air quality, reduced carbon dioxide levels, and help mitigate the effects of urban heat islands, aligning with the Zoo's broader sustainability goals.

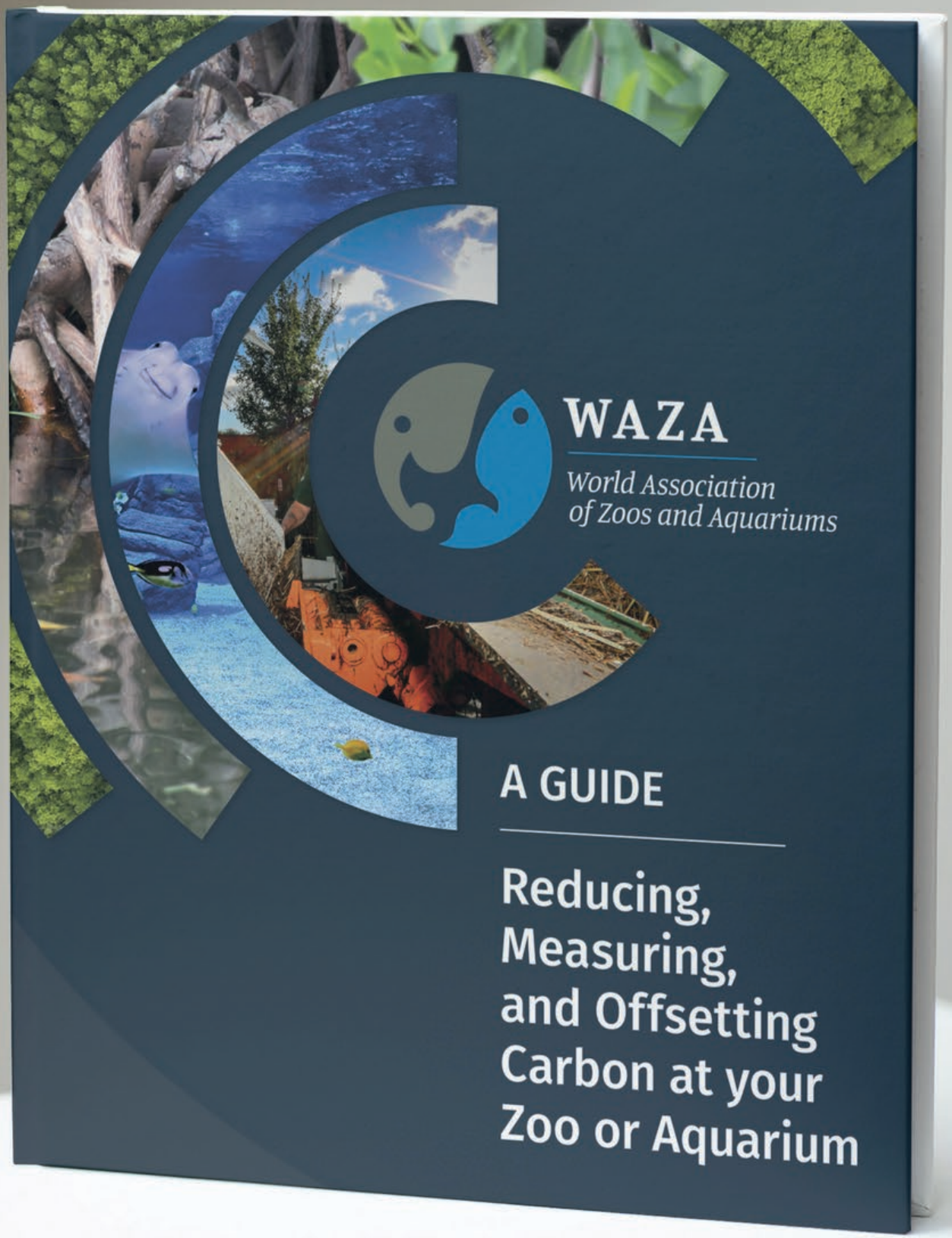
The Zoo also made strides in water quality improvement and biodiversity support by installing floating wetlands in its stormwater management ponds. These wetlands use specially planted vegetation to naturally filter the water, absorbing excess nutrients and pollutants while increasing oxygen levels. This innovative approach not only enhances the health of the ponds but also provides vital habitats for birds, amphibians and insects. The floating wetlands play a key role in managing stormwater runoff, preventing erosion and contributing to the Zoo's overall sustainability objectives.

Conclusion

Achieving net-zero emissions, waste to landfill and water usage by 2030 is a complex challenge, but Toronto Zoo is fully committed to leading the way. By embedding sustainability within corporate culture and fostering environmental responsibility across all operations, the Zoo is transforming its practices and positioning itself as a leader in conservation and sustainability. Through continued innovation, strategic partnerships, and public engagement, Toronto Zoo is setting an inspiring example for other organisations, paving the way for a greener future, and empowering future generations to protect the planet.

WAZA
World Association of Zoos and Aquariums

Visit **www.waza.org** and download the WAZA Carbon Guide or scan the QR Code



SHEDD AQUARIUM'S COLLABORATIVE EFFORT TO SAVE THE BOWMOUTH GUITARFISH

Peggy Sloan, *Chair for Shark Ray 360*
Grant Abel, *Coordinator of Shark Ray 360*

The Bowmouth Guitarfish (*Rhina ancylostomus*) is a critically endangered elasmobranch species with a unique appearance, native to coastal waters stretching from East Africa to the Red and Arabian Seas, Indian Ocean rim to Southeast Asia, north to Japan and south to Australia. This remarkable species belongs to a group of rays of the order *Rhinopristiformes*, commonly referred to as 'shark rays'.

Recent scientific discoveries have added urgency to the need for conservation action for this species.

This dire situation has captured the attention of conservationists worldwide, prompting a growing interest in developing integrated *ex situ* and *in situ* solutions to protect the species from extinction.

An ***ex situ* conservation assessment** published in 2024 identified the Bowmouth Guitarfish as the most evolutionarily distinct, critically endangered jawed vertebrate in existence (Gumbs et al., 2024).

The Role of Aquariums in Conservation

One key turning point in the conversation around Bowmouth Guitarfish conservation occurred in 2022. Twelve individual animals, legally caught by commercial fishing centres in Taiwan, were purchased by Fred Fan Aquatics (FFA) – a live fish supplier in Taiwan. FFA purchased the fish with the explicit intention of donating the animals to aquariums and zoos for a global *ex situ* conservation action plan. The donations not only saved the animals from commercial exploitation but also sparked an international conversation about the role aquariums can play in conserving species like the Bowmouth Guitarfish.

In November 2023, a global workshop on Bowmouth Guitarfish conservation was held in Chicago, bringing together experts from diverse fields including conservation, fisheries and elasmobranch husbandry. Hosted by Shedd Aquarium and facilitated by the IUCN's Species Survival Commission (SSC) Conservation Planning Specialist Group (CPSG), the workshop aimed to explore how *ex situ* (in human care) management can complement efforts to conserve the species in the wild.

The workshop had strong international attendance and support from several organisations including Seattle Aquarium, Georgia Aquarium, Newport Aquarium, Resorts World Sentosa Singapore, Ocean Park Corporation Hong Kong, Oceanographic Valencia Spain, the Association of Zoos and Aquariums (AZA), the AZA Shark and Ray program and FFA.

Bowmouth Guitarfish (*Rhina ancylostomus*) © *Shedd Aquarium*

Bowmouth Guitarfish (*Rhina ancylostomus*) © *Shedd Aquarium*

Ex situ Management: A Potential Lifeline

The *ex situ* conservation approach focuses on managing genetically appropriate metapopulations of a species to ensure their survival and, if feasible, to breed and return pups to protected areas within the species range in the wild. For the Bowmouth Guitarfish, this strategy could serve as an *ex situ* 'insurance population', offering a safety net against further population declines in the wild.

One of the key outcomes of the Chicago workshop was a formal *ex situ* conservation assessment, outlining specific activities and recommendations. Managing a genetically diverse and sustainable population of Bowmouth Guitarfish in aquariums could serve several important functions:

1. **Preventing Extinction** By establishing a healthy and genetically appropriate breeding population, aquariums can help to augment the extant population or repopulate wild areas if natural populations continue to decline.
2. **Rescue and Rehabilitation** Aquariums that have space and expertise can assist in rescuing and rehabilitating Bowmouth Guitarfish that are caught incidentally (bycatch), or seized from illegal trade. These facilities are equipped to provide care and potentially release rehabilitated individuals back into the wild.
3. **Filling Knowledge Gaps** Many aspects of Bowmouth Guitarfish biology and ecology, including their genetics reproductive habits, dietary needs, and behaviour, remain poorly understood. Keeping and studying these animals in managed care allows researchers to gather valuable data that can inform future conservation efforts.

Preparing for the Future: Breeding and Release Initiatives

One of the most exciting possibilities discussed at the workshop was the potential to breed Bowmouth Guitarfish in aquariums and release offspring into designated protected areas. While this concept is still in the early stages, similar initiatives with other species have provided valuable lessons.

The StAR (*Stegostoma tigrinum* Augmentation & Recovery) project, which focuses on releasing Indo-Pacific leopard sharks (also known as zebra sharks) into marine protected areas in Indonesia, offers a promising precedent. Such efforts, while complex, demonstrate that augmenting wild areas with aquarium bred individuals is feasible if key conditions are able to be met. These include identifying suitable release sites, genetic compatibility with conspecifics in the release areas, ensuring genetic diversity, and establishing robust tracking mechanisms to monitor the released animals, together with the appropriate funding for such activities.

Overcoming Challenges: What It Will Take

Successfully implementing a breeding and release programme for Bowmouth Guitarfish requires careful planning, collaboration and substantial resources. Several key prerequisites must be in place:

- **Genetic Management** Careful selection of breeding individuals (brood stock) to ensure appropriate genetic diversity is crucial to maintaining a healthy population.
- **Protected Environments** Identifying and securing safe habitats where reintroduced individuals can thrive is essential. These areas must have minimal human interference and sufficient resources to support the species and population needs.
- **Logistical Support** Releasing animals into the wild involves intricate logistics, including tagging, and monitoring the survival of released individuals.
- **Local Partnerships** Collaboration with local communities and governments in the species' natural range is critical. These indispensable partners provide the legal approvals and infrastructure needed to manage releases and track the animals after reintroduction.

Building Conservation Knowledge

One of the most significant advantages of *ex situ* management is the opportunity to learn more about the species. By studying Bowmouth Guitarfish in aquariums, researchers can develop husbandry protocols that may improve their care both in aquariums and in the wild. Additionally, aquariums can share their findings with local communities and fishing industries, helping to raise awareness about the importance of conservation actions for this unique species.

In fact, partnerships with fishing communities have already begun to yield positive results. In a recent example, FFA worked with local fishers in Taiwan to recover two live Bowmouth Guitarfish. Researchers led by Kevin Weng from the Virginia Institute of Marine Science were able to tag and release these individuals back into the wild, where their movements will be tracked to gain insights into their behaviour and habitat use.

Moving Forward: The Formation of Shark Ray 360

As a direct outcome of the Chicago workshop, the conservation community recommended the formation of a new organisation – Shark Ray 360. This coalition of experts will work together to implement the conservation strategies discussed at the workshop, advancing both *ex situ* and *in situ* efforts to save the Bowmouth Guitarfish.

We also invite anyone in the conservation community who is interested in learning more and contributing to our work to please reach out to us at SharkRay360@sheddaquarium.org.

The collaborative efforts of zoos, aquariums, conservation groups and local communities hold immense potential for securing a future for the Bowmouth Guitarfish. While challenges remain, the groundwork laid by the Chicago workshop provides a roadmap for future conservation action. By working together, we can help ensure that this remarkable species does not vanish from our oceans.

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OPPORTUNITIES TO CONTRIBUTE TO THE EXTINCT IN THE WILD ALLIANCE

Fiona Sach, Malcolm Fitzpatrick and John Ewen, *Zoological Society of London*

The world is facing an unprecedented crisis of species extinction, with international commitments to prevent extinction and improve the status of threatened species repeatedly being unmet. Zoos, aquariums and botanic gardens have a unique and critical role to play in contributing to the Kunming-Montreal Global Biodiversity Framework (GBF) Target 4, which focuses on ensuring that by 2030, species that are threatened by extinction are recovered and conserved, and the genetic diversity of wild species is maintained. One exciting way that zoos, aquariums, and botanical gardens can support Target 4 of the GBF is through joining the Extinct in the Wild Alliance (EWA).

Extinct in the Wild (EW) species are the most threatened species globally and their survival depends on specialist human care provided largely by conservation zoos, aquariums and botanic gardens. They are usually found in tiny populations, in a small number of institutions, with small founder populations. There are 36 animal species and 45 plant species currently registered as EW on the IUCN Red List of Threatened Species, and many more are either already extinct in nature and not recognised as EW or could urgently be rescued into human care to prevent their extinction. The long-term fate of these species depends upon the investments and choices of WAZA member zoos and aquariums.

A species can become Extinct in the Wild for several reasons. In some cases, threats in the wild cause populations to decline toward extinction which is prevented by bold rescue operations that secure the species under human care. For example, Guam's sihek (kingfisher) were rescued from the brink of extinction due to the accidental introduction of brown tree snakes to their native island Guam.

In other cases, long maintained *ex situ* populations may become the sole representation of a species after its wild populations are lost to threats arising in their wild habits. This was the case for another bird, the Socorro Dove where 17 birds were taken from Socorro Island, Mexico, by collectors in 1925 and subsequently the wild population abruptly declined sometime after 1958 with the last birds seen in the wild in 1972. In either case their continued conservation and existence relies completely on human care.

There are several common conservation issues facing EW species as captured fully in the *IUCN SSC Guidelines on the Use of Ex situ Management for Species Conservation* and the *IUCN Guidelines for Reintroductions and Other Conservation Translocations*. These include biological challenges such as the need to maintain genetic diversity within the population, the intense dependency on *ex situ* management, practical challenges such as considering the geographic distribution of *ex situ* facilities and geographic areas of safe wild habitat for species release, and how to go about undertaking responsible releases that take all biological (genetic, demographic, health), welfare and socioeconomic factors into account.

Partula surturalis vexillum
© Paul Pearce Kelly, ZSL

Male Guam's Sihek (*Todiramphus cinnamominus*)
© John Ewen, ZSL

Conservation translocation of an EW species is made increasingly challenging the longer the time elapsed since extinction in the wild both due to changes in the EW species and available release habitats. In some cases there is little precedent to work from (for example when an EW species has existed *ex situ* for many generations and where the best available release site is outside indigenous range). Alongside all this is a general lack of awareness and funding for EW species.

The IUCN Species Survival Commission (SSC) acknowledges the significant contributions that botanic gardens, aquariums and zoos can, and do, bring to conserving wild animals (IUCN SSC 2023). The EWA builds off the endorsed IUCN World Conservation Congress Motion 119 'Improving process and action to identify and recover 'Extinct in the Wild' species' (IUCN 2020). The EWA views extinction threats to EW species starting from their *ex situ* viability through release and successful establishment, the later steps encompassing status downlisting against IUCN Red List criteria.

The Extinct in the Wild Alliance (EWA) is a global initiative significantly contributing towards rescuing species on the brink of extinction, revitalizing *ex situ* populations of EW species and recovering wild populations of these species via first release and subsequent reinforcement of established wild populations (collectively known as the 4Rs). The EWA strives to let no further EW species slip into total extinction, drawing a line in the sand to halt human induced species extinction. The EWA recognises that a healthy planet is a diverse planet and every single species is important for global biodiversity. The survival of EW species is in our hands, no species will be left behind. For animals, the EWA will draw on the unique strengths of the conservation and science work of participating zoos and aquariums to solve these uniquely challenging biological and social scenarios.

The EWA will achieve this by:

- Creating a focussed global movement that motivates governments, zoos, aquariums, botanic gardens, IUCN Specialist Groups, conservation NGOs and academic institutions to catalyse action for EW species.
- Providing strategic thinking and connection between EWA partners to shape best practice in delivering the 4Rs for EW species.
- Monitoring the status of all EW species to catalyse action where it is most needed and track conservation progress and impact.
- Fundraising and driving action for EW species within strategic EWA partnerships.
- Creating and curating a list of EW species (past and present), including species requiring urgent conservation attention (rescue) to prevent them becoming extinct.

What Can Zoos and Aquariums Do?

1. Species Planning and Conservation Breeding

Zoos and aquariums have long played a pivotal role in rescuing and then maintaining populations of EW species. Species like the Arabian oryx, Przewalski's horse and the Scimitar-horned oryx are success stories where zoos' breeding programmes have directly contributed to their wild recovery and successful IUCN Red List downlisting. Through well thought out species planning, prioritising

holding space and working with the relevant regional association breeding programmes for EW species, we can continue contributing towards species recovery and reversing extinction. Most EW animal species are held in a very low number of zoos globally, with over 80% of EW animal species being cared for in fewer than five zoos or aquariums per species, making them very vulnerable to catastrophe and their state perilous.

2. Release and Habitat Restoration

Release into safe wild habitat is at the heart of the EWA's strategy for species recovery. Zoos and aquariums, working with partners including other conservation organisations and governments, play a key role in releasing individuals into safe wild habitat. Before animals can be released, habitats often need to be identified and sometimes restored, either because they have been degraded or because the factors that contributed to the species' extinction in the wild – such as poaching, habitat destruction, or invasive species – must be mitigated. We can contribute to habitat restoration by funding and supporting local and international efforts to rehabilitate ecosystems and by providing expertise on the needs of the species they care for.

3. Research and Innovation

Zoos and aquariums are research hubs for species recovery. Through scientific research, we can develop new techniques for breeding difficult species, improving animal welfare and preparing and then supporting animals through successful releases.

4. Public Engagement and Education

Finally, zoos and aquariums can contribute to GBF Target 4 through their educational role. By raising awareness about extinction, biodiversity loss and the role of conservation breeding, we can inspire visitors to take action to support conservation efforts. This public engagement is essential for securing long-term funding and political support for EW species recovery programmes. We can create new, vibrant and impassioned visitor experiences, engaging our audiences and enhancing our social license to exist.

Conclusion

Zoos and aquariums are already contributing to achieving the GBF Target 4 but this can be greatly enhanced through participation in the EWA. Our combined expertise in conservation breeding, conservation translocations, research and public engagement makes us uniquely positioned to play a major role preventing species extinction and restoring biodiversity. As the world moves toward the 2030 target, we will continue to play a vital role in preserving species that have been lost to the wild but not to the world. We, as WAZA member zoos and aquariums have a moral responsibility to use our science and actions to unleash our global potential for EW species recovery, thereby reversing species extinction, and writing a future that yields hope for both nature and humanity.

If you would like to find out more about the EWA and discuss ways in which your organisation could contribute, please visit www.zsl.org/extinctinthewild.

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TAKE-AWAYS FROM EAZA ANNUAL CONFERENCE 2024

Sandrine Camus, *EAZA Communications Coordinator*

What a week! On 9–12 October, 1,072 delegates from 52 countries and 283 institutions gathered in Leipzig Zoo, Germany, for the EAZA Annual Conference 2024. They participated in two Academy courses, five thematic sessions, five plenaries, 12 workshops, 18 social breaks and over 100 meetings.

The conference participants were welcomed by Steffi Lemke, Federal Minister for Environment, nature conservation, nuclear safety and consumer protection, Michael Kretschmer, Prime Minister of Saxony and Skadi Jennicke, Chair of Board and Deputy Mayor for Cultural Affairs. They all thanked EAZA zoos and aquariums for their conservation efforts and referred to the peaceful revolution taking place in Germany 35 years ago to encourage us to continue advocating together for our common goal, thriving species on a healthy planet. Jörg Junhold, Leipzig Zoo Director, announced that one tree per delegate will be planted in Saxony to counter the carbon footprint of our conference.

Keynote speaker, Svante Pääbo, Nobel Prize winner and Director of the Max Planck Institute for Evolutionary Anthropology, talked about our closest evolutionary relatives and how they impact the lives of present-day people, with chunks of Neanderthal genes linked to sensitivity or resistance to certain viruses, e.g. Covid-19 or HIV.

Delegates heard updates from the EAZA conservation campaign by the 'Vietnamazing' team, the Director of the Viet Nature Conservation Center Pham Tuan Anh and HE Vu Quang Minh, Ambassador in Germany for the Socialist Republic of Vietnam. The campaign plenary ended with a live fundraising session and the generous audience donated €55,000!

The Biotech plenary touched on the ethics of cryopreservation. Franck Meijboom, Professor of Sustainable Animal Stewardship at Utrecht University, discussed people's evolving perception of animals and zoos and some of the concerns around cryopreservation.

Congratulations to the EAZA Biobank Working Group for the approval of the EAZA Position Statement on the use of cryopreserved materials and biotechnology. It was introduced to the delegates followed by a presentation on the Cryopreservation Interest Group and the new Cryopreservation Network.

Renowned photographer and regular contributor to the National Geographic magazine, Joel Sartore wowed the delegates with his stunning pictures from The Photo Ark, a project dedicated to reconnecting people with nature and raising awareness of the species living around us before they disappear. EAZA is grateful to have such an affable and passionate ambassador to highlight the integral role zoos and aquariums can play in contributing to species conservation.

The EAZA Nutrition Group celebrated their 25th anniversary with an interactive plenary. Members of the group dismantled the common misconceptions around animal diets and the keynote by Marcin Przybylo, Assistant Professor at the University of Agriculture in Krakow, highlighted the crucial component of natural behaviours when designing optimal diets for wild animals in human care.

After acknowledging our Ukrainian colleagues who need our help to survive the coming winter*, Endre Papp concluded the week by honouring key figures for their significant contribution to our association and to safeguarding species. Congratulations to the 2024 Lifetime Achievement Awardees Stewart Muir (Shaldon Wildlife Trust), Achim Johann (NaturZoo Rheine) and former EAZA Chair Thomas Kauffels (Opel-Zoo)! Visit www.eaza.net/news to read more about them and view the full Conference summary.

Thanks to Leipzig Zoo for their warm welcome and impeccable hosting.
See you next year in Orientarium Zoo Łódź on 9–13 September!

* Visit www.eaza.net/emergency-fund to help.

EAZA ANNUAL CONFERENCE

Paula Cerdán, Head of Conservation and Animal Welfare at WAZA, presented the vision for the potential WAZA 2030 Conservation Goal at the closed session of the EAZA Conservation Committee and received valuable feedback from EAZA colleagues, which helped strengthen the proposal.

Joel Sartore on his journey to capturing the beauty of all animal species in The PhotoArk
© *EAZA*

Endre Papp opening the conference in the beautiful Kongress Halle
© *EAZA*

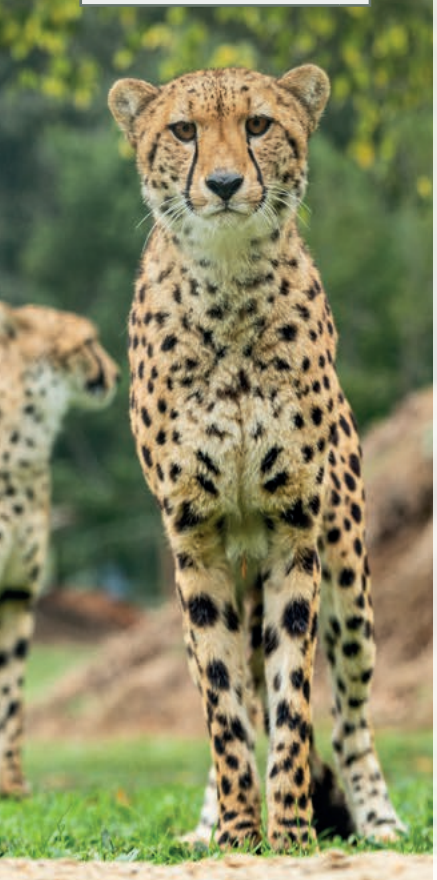
UPDATE ON INTERNATIONAL STUDBOOKS (ISBS)

Changes between 4 April 2024 and 26 November 2024

Would you or someone in your team like to keep an International Studbook? 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



Cheetah (*Acinonyx jubatus*) ©*Hamilton Zoo*

International Studbooks

Published International Studbooks

- **Black Crested Mangabey** (*Lophocebus aterrimus*), 2020–2023 ed. – Tjerk ter Muelen and Kees Groot (ARTIS Amsterdam Royal Zoo, The Netherlands)
- **Grévy's Zebra** (*Equus grevyi*), 2023 ed. – Tanya Langenhorst (Marwell Wildlife, United Kingdom)
- **Hartmann's Mountain Zebra** (*Equus zebra hartmannae*), 2023 ed. Tanya Langenhorst (Marwell Wildlife, United Kingdom)
- **Polar Bear** (*Ursus maritimus*), 2020–2023 ed. – Antje Angeli and Dorothea Rieck (Zoologischer Garten Rostock, Germany)
- **Visayan Spotted Deer** (*Rusa alfredi*), 2023 ed. – Christina Schubert (Zoo Landau in der Pfalz, Germany)
- **Vicuña** (*Lama vicugna*), 2023 ed. – Lena Bockreiss (Münchner Tierpark Hellabrunn, Germany)
- **Western Lowland Gorilla** (*Gorilla gorilla gorilla*), 2023 ed. – Sabrina Linn and Undine Bender (Frankfurt Zoo, Germany)
- **Scimitar-Horned Oryx** (*Oryx dammah*), 2023 ed. – Sophie Whitemore (Marwell Wildlife, United Kingdom)
- **Cheetah** (*Acinonyx jubatus*), 2023 ed. – Laurie Marker and Becky Johnston (Cheetah Conservation Fund, Namibia)
- **Blue-eyed Black Lemur** (*Eulemur flavifrons*), 2023 ed. – Peggy Hoppe (Loveland Living Planet Aquarium, United States)
- **Red-ruffed Lemur** (*Varecia rubra*), 2023 ed. – Mylisa Whipple (Saint Louis Zoo, United States)
- **Black and White Ruffed Lemur** (*Varecia variegata*), 2023 ed. – Mylisa Whipple Saint Louis Zoo, United States)

ISB Transfers

- **Scimitar-Horned Oryx** (*Oryx dammah*), from Tania Gilbert to Sophie Whitemore (Marwell Wildlife, United Kingdom)

Vacant International Studbooks

- **Buff-crested Bustard** *(Lophotis gindiana)*
- **Aruba Island Rattlesnake** *(Crotalus durissus unicolor)*
- **Chinese Alligator** *(Alligator sinensis)*

BEHIND THE ZIMS
A Q&A with WAZA International Studbook Keepers

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 Amy Humphreys

Amy Humphreys

Animal Technical Support Officer, Chester Zoo
Banteng (*Bos javanicus*) EEP coordinator for Banteng and Colombian spider monkey, acting vice chair of EAZA Population Management Advisory Group.

LC RED LIST

ISB kept and featured:	*Bos javanicus*
ISB Host Organisation:	Chester Zoo
Year Started as ISBk:	2023

For how many years have you been acting as the species' International Studbook Keeper (ISBk) and why did you become an ISBk?

I have been the ISBk for Banteng (*Bos javanicus*) since April 2023 so I am still relatively new to it! However, my work with this species started back in 2017 when I began assisting with the EAZA *Ex-situ* Programme (EEP) and later took on the role of coordinator in 2020. Chester Zoo are also one of the partners of the Action Indonesia Global Species Management Plans (GSMP) for Banteng, Babirusa and Anoa and I have been lucky enough to have been involved with this initiative for the last seven years. Through the work I have done with the Action Indonesia GSMPs I have really come to understand the value of the one plan approach and the many benefits working as part of a global network can bring to species conservation.

Taking on the ISB seemed like a great way to use the knowledge and skills I have gained to further support the conservation efforts for this underrated species.

Over the years I have become very passionate about the conservation of Banteng; they are a lesser known and often overlooked species, so I am proud to be advocating for them on a global scale!

How has the International Studbook (ISB) contributed to the species' conservation? What do you see as the value of your ISB?

One of the main goals of the Banteng GSMP is to reach a demographically and genetically healthy global *ex situ* population. This can only be achieved by knowing and understanding our *ex situ* populations, not just the animals that are alive today but also the generations that came before right back to the founders. It is the ISB that holds this valuable information, a comprehensive database that helps us make informed decisions regarding breeding and transfer recommendations, ensuring genetic diversity and long-term viability of the population to support the GSMPs goal of creating a robust, sustainable global *ex situ* population.

Banteng (*Bos javanicus*) © *Rachel Cartwright Chester Zoo*

The value of the ISB also lies in its capacity to facilitate collaboration and data sharing among zoos and conservation organisations worldwide. It serves as a central resource that enhances the coordination of conservation strategies and breeding programmes. The Banteng ISB is not only a record of the animals but also of the institutions and people that have cared for the species over years and even decades. Being able to tap into this collective knowledge fosters a greater understanding of species biology, husbandry practices and behaviour, contributing to both *in situ* and *ex situ* conservation efforts. Through these efforts, the ISB not only supports the survival of Banteng in captivity but also strengthens the overall conservation framework.

How has the ISB contributed to ex situ conservation in practical terms?

One of the most significant long-term threats to the survival of Banteng, like many other large mammal species, comes from a potential lack of genetic diversity. The Action Indonesia GSMPs highlight that the upkeep of a comprehensive, current international studbook is the first step towards establishing a global population management strategy. Genetic analysis of the global Banteng population has been possible for the first time due to the International Studbook being fully updated with regional data from Indonesia, Europe and North America. Previously each region had been looked at in isolation meaning there were gaps in pedigree and any pedigree assumptions that had been made were done without looking at the full picture. However, with the ISB updated these have been re-evaluated leading to more accurate records, and after assumptions and exclusions, the potential breeding population globally has a nearly completely known pedigree. Having access to the ISB data means that both regional and global population targets can be set with breeding being carefully managed at regional levels to meet these targets. It also means that international transfers could be looked at in the future as a way of increasing demographic robustness or genetic variability of the regional populations where required.

How do you see your work as an ISBk supporting conservation action for the species in the wild?

The ISB plays a vital role in contributing to the goal of creating a demographically and genetically healthy global *ex situ* population, which has the potential to act as an insurance population for its wild counterparts as their numbers continue to decline. This cannot be done effectively without up-to-date information and accurate records. In recent years, data from the Banteng ISB has been used to support a genetic study which aims to better understand the genetic makeup of both *in situ and ex situ* populations. Information from the ISB has helped to identify which animals needed to be sampled in the *ex situ* population to ensure full representation of all founder lines. The results of this study will enable understanding of the genetic variation in the various zoo populations which is important in supporting conservation actions for the species in the wild, as these populations in human care represent a potential source of important genetic diversity to help improve future conservation efforts for the species.

What do you see as the next chapter or role for International Studbooks?

I believe the next chapter for International Studbooks could be shaped by advances in genetics. As genetic technologies become increasingly sophisticated and accessible, ISBs will be able to incorporate detailed genetic data into their breeding programmes. This will enhance the ability to better maintain genetic diversity, resulting in healthier and more resilient populations, which is now more important than ever with increasing pressures on wild populations largely due to human activity. ISBs could also expand their role in creating and nurturing extensive international collaborations. By connecting zoos, conservation and research organisations across the globe, ISBs will enable a more cohesive and coordinated approach to species management. This global network will facilitate the sharing of data, resources and expertise, ultimately strengthening conservation efforts and ensuring the survival of diverse species.

EXPANDING WAZA EXECUTIVE OFFICE

WAZA welcomed Loïs Lelanchon as the Head of Partnerships and Advocacy. Loïs has an extensive background as a lawyer with a Master's degree in International and Comparative Environmental Law, and Animal Law and Society. His experience as EU Policy Officer for Humane Society International (HSI) and Head of Programme, Wildlife Rescue for the International Fund for Animal Welfare (IFAW), underscores his capacity to drive impactful change at WAZA.

WAZA also welcomed Marion Karam as the new Communications Assistant. Marion has been working in sustainability since 2019, collaborating with European organisations and NGOs to raise awareness on climate issues in the Mediterranean region. With a background in communications, she has contributed to creating engaging content supporting projects that address key environmental and social challenges.

Black and White Ruffed Lemur (*Varecia variegata*) © *Perth Zoo*

WAZA at the CBD COP16 in Cali, Colombia © *WAZA*

WAZA AT CBD COP16

WAZA along with the European Association of Zoos and Aquaria (EAZA), the Zoo and Aquarium Association Australasia (ZAA), the Association of Zoos and Aquariums (AZA), the Association Française des Parcs Zoologiques (AFdPZ), the San Diego Zoo Wildlife Alliance and Species360 hosted an event at the IUCN Pavilion during the UN Convention on Biological Diversity (CBD) COP16 highlighting the role of our community in meeting the targets set under the Kunming-Montreal Global Biodiversity Framework.

The event focused on Achieving the Targets: The Role of Zoos, Aquariums, and Botanic Gardens for Conservation. It featured speakers from the various organisations co-hosting the event, as well as representatives from IUCN SSC, Botanic Gardens Conservation International, the Fundación Zoológica de Cali, Reverse the Red, and the Zoological Society of London (ZSL).

WAZA also presented the WAZA Members' Commitment to Biodiversity Conservation, our commitment to strengthening the role of zoos and aquariums in global biodiversity conservation. WAZA and the 109 signatories of this declaration support Reverse the Red, promoting targeted species recovery actions and the establishment of civil society networks to enhance conservation efforts.

Signatories of the WAZA Declaration as of 17 December 2024

WAZA WELCOMES NEW MEMBERS

WAZA is pleased to welcome four new Institution Members; The National Aquarium, Jimmy's Farm and Wildlife Park, SEA LIFE Sydney Aquarium, and SEA LIFE Aquarium at LEGOLAND.

The National Aquarium, US

Founded in 1981, the National Aquarium's compelling exhibits, science-based education programmes and hands-on field initiatives engage more than 1.2 million people annually. One of the top three aquariums in the United States, the National Aquarium features thousands of fishes, birds, amphibians, reptiles and mammals living in award-winning habitats.

Jimmy's Farm & Wildlife Park, UK

Founded in 2002, Jimmy's Farm & Wildlife Park is home to 34 species of invertebrates, 29 species of mammals, 14 species of birds and 11 species of reptiles. Jimmy's Farm & Wildlife Park is a member of the British and Irish Association of Zoos and Aquariums (BIAZA), the International Union for Conservation of Nature (IUCN) as well as Species360.

SEA LIFE Sydney Aquarium, Australia

SEA LIFE Sydney Aquarium's mission focuses on marine conservation and education. Through engaging and immersive experiences, SEA LIFE Sydney Aquarium inspire visitors to care for the oceans and marine life. The aquarium showcases the rich diversity of Australia's underwater habitats, featuring over 300 species and 4,000 individual marine creatures.

SEA LIFE Aquarium at LEGOLAND California Resort, US

SEA LIFE Aquarium California is part of SEA LIFE, the world's largest aquarium group, and is committed to inspiring the protection of marine life through engaging programmes and exhibits that connect visitors with the ocean.

WAZA is pleased to welcome 7 new Corporate Members:

Apple Industries Inc., US

Apple Industries Inc. is known for their innovative photo booths and offers them to venues on a revenue share basis (no cost to venue), creating a new revenue stream for zoos and aquariums. They design and manufacture unique photo booths for zoos, aquariums, and theme parks, amongst others.

CS the Critter Saver, US

Founded in 2017, CS the Critter Saver works in partnership with zoos, aquariums, wildlife conservation centres, and more, to inspire the next generation of conservation leaders with online and in-person Courses, Coaching, and Conservation Clubs.

Crossborder Animal Services, The Netherlands

Formed in 2013, CAS is renowned for its innovative approaches in animal welfare and rehabilitation, as well as its commitment to enhancing the lives of animals in both domestic and wild settings. With a strong track record in providing specialised animal care, logistics, and rescue operations, they align with WAZA's mission to promote global conservation efforts.

Stantec, US

Stantec is a recognised innovator and industry design leader, offering a multidisciplinary team of experienced professionals that provide creative, integrated and sustainable solutions for their clients with expertise in a diverse range of project types.

Verdis, US

Verdis Group is a leading facilitator of transformational climate strategies, dedicated to helping organisations achieve their sustainability and climate goals. They have supported various zoos, aquariums, and cultural institutions in improving their sustainability efforts and reducing their environmental impact.

Mobaro, Denmark

Mobaro provides a digital tool designed specifically for managing safety, maintenance, and operations within the leisure and attractions industry. Their platform helps organisations optimise maintenance tasks through digital checklists and mobile task management and is utilised daily by over 300 institutions worldwide, including several zoos and aquariums.

Instone Air, UK

Instone Air specialises in the air transport of animals. With extensive experience in transporting horses, livestock, and a wide variety of zoo animals, Instone Air has worked with zoos, wildlife parks, and aquariums worldwide.

WAZA also welcomed Fondation MAKWA as Affiliate Member

Located at Parc Oméga in Canada, the Makwa Foundation provides shelter and care for injured or orphaned wild animals, focusing on the conservation of species at risk both within the park and throughout Quebec and Canada. The Foundation prioritises education and research in its mission.

Tél. : +33 (0)5 49 72 09 20
Email : commercial@st-laurent.fr

ZA du BOUILLON - 3, rue du Bouillon
79430 LA CHAPELLE SAINT LAURENT (FRANCE)

www.st-laurent.fr

WAZA
World Association
of Zoos and Aquariums

www.waza.org