2022
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WAZA
World Association of Zoos and Aquariums

NEWS

The One Health Approach in Zoos and Aquariums

Saving Hoverflies from Extinction

WAZA 2023 Animal Welfare Goal

WAZA

World Association of Zoos and Aquariums

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WAZA Membership

WAZA Members as of 10 March 2022

Affiliates	**10**
Associations	**23**
Corporates	**22**
Institutions	**281**
Life/Honorary	**124**

Future WAZA Conferences

2022: Loro Parque, Tenerife, Spain, 23-27 October
waza2022.org

2023: San Diego Zoo Global, San Diego, United States

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President's Letter

Dear WAZA Members,

Welcome to the first edition of the WAZA News Magazine of 2022. I hope you will enjoy the reading the articles and would like to invite you to please get in touch with the WAZA Executive Office to share your news and stories with us, so that we can distribute them to our wider community.

There are several things to look forward to this year, and for me personally, I think I am most excited about our upcoming WAZA Strategic session. The WAZA Council has decided to focus on the development of a new strategy for WAZA to inform our future direction and strategic goals. A lot has changed since we held our last strategic planning session in 2018, most notably the impact Covid has had on the world and our sector. We will look at WAZA's 87-year history – focusing on what we have done, what we have achieved, and what we should be working towards for the future.

The Council held an in-person strategic session in April, where we dedicated a couple of days to this process. This will be followed by work throughout the year to further develop the strategy and will also involve input from the WAZA Executive Office. Input from you, our valued WAZA members, will be crucial to this entire process. We will host several sessions and workshops at the upcoming 77th WAZA Annual Conference, where WAZA members will be able to provide input into the strategy.

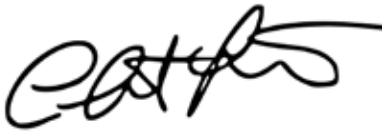
We also look forward to the second part of the Convention on Biological Diversity (CBD) 15th meeting of the Conference of the Parties (COP 15) in Kunming, China later this year, which will see the adoption of the post-2020 global biodiversity framework. The framework will hopefully galvanize action to halt biodiversity loss. As progressive zoos and aquariums we have a significant role to play in furthering the goals and targets set by the framework. Through the Reverse the Red movement, of which WAZA is a founding partner, alongside the IUCN Species Survival Commission and other partners, we aim to highlight the role of our members in conservation and conservation awareness at the CBD COP.

We continue to make progress on the WAZA 2023 Animal Welfare Goal, which you can read more about in this issue. If you have any questions about the process, please do not hesitate to contact the WAZA Executive Office.

And I hope that we can meet in person again later this year, at the 77th WAZA Annual Conference in Tenerife, Canary Islands from 23-27 October. It has certainly been a very challenging few years and I look forward to being able to meet with friends and colleagues in-person again.

Sadly, on a final note, as I write this letter, war has broken out in Ukraine. And by the time you read this magazine it is impossible to know what the situation will be, but it is with heavy hearts that we watch the news unfold. WAZA stands with the people and zoos of Ukraine.

Yours sincerely,



Dr Clément Lanthier
WAZA President

CEO's Letter

Martín Zordan

WAZA Chief Executive Officer

Our world is constantly changing, and while perhaps nature and those in our societies that are in a more vulnerable position have perceived those changes long before most of us, we are now starting to face some of these challenges with more intensity. WAZA intends to face these challenges in the coming months by developing a new strategy.

The last time the WAZA Council worked on our Association's strategy was in April 2018. At that time coronavirus was merely a strange, unfamiliar word for the majority of us, #FridaysForFuture had not yet begun, and the threat of a war with global repercussions was not in our radar. The past few years has seen significant changes globally. In order for WAZA and its members to evolve and face the challenges which affect the natural world, we will embark on a strategic planning process to develop guidance on how to respond to the societal challenges we face. This will be a collaborative process with input from members, the WAZA Executive Office, our partners and others.

As I write this letter, we are days away from the 74th Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Standing Committee meeting. I am convinced that we will be heading into this meeting in a better position than ever before. This is because we are working closely with the regional associations involved in the convention – the Association of Zoos and Aquariums (AZA) and the European Association of Zoos and Aquaria (EAZA). I am certain that what brings us together is a deep sense of the value of collaboration and respect for the different nations and regions represented through WAZA, and a shared goal that unites our endeavours. Yet, it is for this same reason that we struggle when we see that these principles are under attack, it touches our core identity.

As WAZA's President has mentioned in his letter, we are shocked with the current situation in Ukraine. We have been so heartened by the outpouring of support coordinated by the European Association of Zoos and Aquaria (EAZA) for the zoos in Ukraine, which has included fellow WAZA members in nearby countries and from around the world.

Expanding on this cooperative spirit, there are currently two lines of work we are pushing forward. One of them is Reverse the Red.

After the successful representation of this global movement for conservation at the IUCN World Conservation Congress, we are progressing with the subsequent phases. The newly created WAZA Reverse the Red Committee will help members find opportunities to get involved in this initiative.

The second is the launch of the WAZA Animal Welfare Assessment Tool to implement the WAZA 2023 Animal Welfare Goal, which is the result of many meetings to convene the view of what a national or regional association's animal welfare evaluation process should cover.

I must also use this letter to thank Gavrielle Kirk-Cohen, our Communications Director. This is the last issue of the WAZA Magazine she will be working on as she moves on in her professional path. Gav, as we know her at the Office, is absolutely amazing, committed and willing to help anyone in her team, even when she is already swamped with her own work. She will be missed, and we wish her all the best in her new role.

Finally, we are excited to start working on the preparations for the 77th WAZA Annual Conference in Tenerife, Spain, hosted by Loro Parque. We trust this will be a fantastic reunion after two long and challenging years for our community.

Sincerely,

Dr Martín Zordan

The One Health Approach in Zoos and Aquariums of the World

Dr Koichi Murata

Director of ZOORASIA Yokohama Zoological Gardens, Japan

The definition of One Health is similar to the definition of Conservation Medicine. Dr Gary Tabor, the American environmentalist with over 30 years' experience working on behalf of large-scale conservation internationally, wrote: "One Health is at the nexus of the fields of human health, animal health, and ecosystem health". The Centers for Disease Control and Prevention (CDC) explains the concept of One Health as a collaborative, multisectoral, and transdisciplinary approach, working at the local, regional, national, and global levels. In fact, as many people already understand, One Health is not only applicable to human or domestic animal health, but also for ecological health. Conservation of biodiversity is the most important factor of this concept. However, this often tends to be misunderstood or ignored among the medical experts who focus only on their specialised fields.

The concept of One Health grew traction following the international conference of Conservation Medicine held in Florida in 1999 and the 'One World, One Health' symposium held in 2004 at the Rockefeller University. However, some researchers say the idea stems from as far back as the ancient Greek physician, Hippocrates.

The concept of One Health has been accepted broadly throughout the continuous outbreak of Emerging Infectious Diseases (EIDs) such as HIV, Ebola, Hendra virus infection, avian influenza, SARS, MERS. But it has recently gained attention again due to the Covid-19 pandemic.

Main photo: Visitors at the Yokohama Zoological Gardens "ZOORASIA". © Koichi Murata

To tackle the problem of EIDs from a One Health perspective, there are five main issues which require international responses and national policy:

1. Deforestation and other land use changes
2. Illegal and poorly regulated wildlife trade
3. Antimicrobial resistance
4. Intensified agriculture and livestock production
5. The climate crisis.

The climate crisis is the largest issue, but there are also several related issues. It is vital to consider that each do not exist separately but are all interconnected.

Last year, the Intergovernmental Panel on Climate Change (IPCC) released the latest report on climate change. The report, prepared by more than 200 scientists from 60 countries, highlights the irrefutable evidence of human influence on climate.

> **"One Health is at the nexus of the fields of human health, animal health, and ecosystem health"**
>
> **Dr Gary Tabor**

Global surface temperature has increased more rapidly since the 1970s than in any other 50-year period over at least the past 2,000 years. Global mean sea levels have risen more quickly since the 1900s, than over any preceding century in at least the last 3,000 years. Overall, global temperature is expected to reach or exceed 1.5°C.

The Stern Review, published for the UK Government in 2007, indicates the catastrophic effect climate change will have on world economies. The Review concluded that the benefits of strong and early action on the climate crisis far outweighs the economic costs of not acting. According to research from 2020, the cost of preventing future pandemics over the next decade by protecting wildlife and forests would equate to just 2% of the estimated financial damage caused by Covid-19. As progressive zoos and aquariums we are already playing a significant role in protecting wildlife and wild places and can aim to do more in the future. WAZA recently published a *Short Guide on Sourcing Sustainable Forest Products*, which can assist zoos and aquariums in changing their sourcing methods and encouraging their visitors to make changes in their own lives for the benefit of forest preservation. It may only be one element in the grand scheme of things, but ultimately plays a role in following a One Health Approach for people, wildlife and the planet.

Recently, research has found that marine vertebrates contribute to carbon storage through a range of natural processes.

To date, nine different mechanisms have been identified through which marine vertebrates have an impact on the oceanic carbon cycle. For example, whale faeces are used as nutrition by phytoplankton which plays an important role of carbon neutrality in the ocean. So, whale faeces can protect our health and planet! While there is still much more to be learnt about marine vertebrate carbon, we, as zoo and aquarium representatives, should consider wildlife health from a broader perspective. This approach could be integrated into educational conservation programmes at zoos and aquariums to advocate public awareness and understanding of the importance of the One Health concept.

Looking at One Health from a regional perspective

In Japan, there has been an increasing awareness of the traditional rural landscape. The Japanese term of Satoyama is observed to provide a "backyard" for rice paddies, to accommodate biodiversity hotspots, acting as a model of sustainable ecosystem management, which represents Japan's beautiful ancestral homeland. A Satoyama is an environment where people have co-existed with nature over time. The Satoyama Initiative is an effort to realise "societies in harmony with nature" through landscape approaches to biodiversity conservation and human well-being.

A young visitor interacts with Humboldt penguins at the Yokohama Zoological Gardens "ZOORASIA". © Koichi Murata

I personally feel the word “harmony” is a little misplaced, but it is clear that we should learn more from these traditional societies maintaining ecosystems and biodiversity. As an Asian I believe that we should not only fight against the loss of biodiversity and adopt the western One Health approach, but we should also act locally to honour our own cultures based on traditional, indigenous, and native ways of being. We should take pride in and cherish our own cultures without relying solely on global standards by establishing an Asian standard of lifestyle which operates in harmony with the rest of the world.

Social change and protecting our planet

In 2020, WAZA released two strategies. The first, *Protecting our Planet* is a strategy to guide WAZA members in achieving sustainability outcomes crucial to progressive conservation organisations. This strategy asks WAZA members to demonstrate behavioural leadership. The other strategy, *Social Change for Conservation*, was created in collaboration with the International Zoo Educators Association and is the first unified global strategy on conservation education. It aims to guide zoos and aquariums in achieving educational and social outcomes crucial to their organisational mission. Put simply, zoos and aquariums should play an important role in changing the world. To follow the WAZA mission and strategies, our zoos in the city of Yokohama, Japan erected a sign at the entrance which says, “Social change from zoos” and informative information is provided for visitors.

If we consider the most appropriate way of taking an educational approach towards the One Health concept, we need to adopt a more multifaceted, wider view on the conservation of biodiversity. I hope that the members of WAZA develop and cultivate the One Health approach by promoting it to the younger generations. Zoos and aquariums have the potential and capability to change the outdated social system and enhance their visitor’s relationship with nature.

Top photo: Zoo visitors
© Koichi Murata

MIddle photo: A sign at the entrance of Yokohama Zoos says “Social change from Zoos”
© Koichi Murata

Bottom photo: Young visitors engage in a card game as part of a conservation education programme at the Zoo
© Koichi Murata

A young visitor photographs an otter
© Koichi Murata

Visitors and Zoo staff during a cnservation education session in front of the polar bear's habitat. © Koichi Murata

A family enjoys the penguin view
© Koichi Murata

Unfortunately, many people are not convinced as to why they should conserve biodiversity and they do not see the link to their own life. However, I am very impressed by Sir David Attenborough's statement saying that the planet is not only here for humans but the other numerous wildlife. Damaged ecosystems will recover without humans much more quickly. The real reason to protect or conserve ecosystem and biodiversity is to protect ourselves and the sustainable development of the human world.

It would serve us well to recognise that we are only one part of numerous living organisms and the ecosystem. It is imperative that we change our behaviours and lifestyles or we may continue to face EIDs such as Covid-19, and encounter socio-economic problems. The role of zoos and aquariums globally is becoming increasingly more vital to protect our planet which is currently in indifferent health. In the words of Dr Rachel Carson, we can better protect the environment and the biodiversity under our feet by retaining and sharing the innate "sense of wonder" that children are born with.

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RZSS Takes Huge Step Forward in Saving Pine Hoverflies from Extinction in Britain

Dr Helen Senn, Head of Conservation and Science at RZSS carries larvae and moss towards their new home © RZSS

Dr Helen Taylor

RZSS Conservation Programme Manager

Dr Helen Taylor has a strong background in field-based conservation research and is a keen science communicator. Her role includes managing the pine hoverfly conservation breeding programme, coordinating onsite biodiversity conservation and the Royal Zoological Society of Scotland's (RZSS) partnership with the Institute for the Conservation of Wild Animals in Brazil.

Despite making up around 77% of the species known to science and playing vital roles in ecosystems and human food production, invertebrates are frequently overlooked by conservation programmes. Invertebrates are also in peril, with significant population crashes recorded around the world.

From an *ex situ* breeding perspective, invertebrates offer amazing opportunities to make real differences to species conservation on relatively modest budgets. Invertebrate conservation breeding for release programmes also enable zoo-based organisations to take a more holistic approach to species conservation and make a meaningful impact on improving ecosystem function.

Here at the Royal Zoological Society of Scotland (RZSS), we are taking this holistic approach to species conservation to heart. Alongside our work reintroducing large mammals, like wildcats and Eurasian beavers, we are using the expertise at both our zoos, Edinburgh Zoo and Highland Wildlife Park, to pull several invertebrate species back from the brink of extinction.

One of these species, the pine hoverfly (*Blera fallax*), has become one of our most recent success stories, and 2021/22 saw the release of 6,000 individuals into the wild.

Pine hoverflies are thought to be in decline in Britain, with the population restricted to a tiny forest patch in the Cairngorms National Park in Scotland. An adult pine hoverfly has not been observed in the wild for over eight years, and all information regarding the population comes from surveying larvae. The species is currently listed as critically endangered on the United Kingdom Red List, with frighteningly low larval numbers recorded in recent years.

Habitat loss is the main threat facing pine hoverflies in Britain. The species relies on complex, old-growth pine forests, a habitat that has all but disappeared. Pine hoverfly larvae grow up in rot holes that typically appear in older Scots pine trees and are created by heart-rot fungus. Adult flies feed on pollen and nectar from flowering trees like rowan. All these elements need to be present for pine hoverflies to survive, but there is little habitat like this left.

The Rare Invertebrates in the Cairngorms (RIC) project, a partnership between the Royal Society for the Protection of Birds (RSPB), Cairngorms National Park Authority, Buglife, Butterfly Conservation, NatureScot, British Dragonfly Society and RZSS, has been working in tandem with Forestry and Land Scotland (FLS) and RSPB Scotland within the Cairngorms' forests to create artificial rot holes for pine hoverflies to lay their eggs.

These holes fill with rainwater, which mixes with pine mulch, to create the microbial soup larvae feed on. Larval habitat creation is conducted as close as possible to good rowan tree locations so when adults emerge, they have a decent food source. The hard work of RIC, RSPB Scotland, FLS, local contractor Alban Tree Care, and other local landowners has paid off, and there are now several suitable sites for pine hoverflies in the Cairngorms. What's missing are the flies themselves.

The RZSS pine hoverfly breeding programme started in 2015 and was initially based at Edinburgh Zoo, using pine hoverflies from Sweden to try and perfect animal husbandry techniques. Despite the zoo's hard work, taking the flies through a full breeding season proved to be impossible. In 2018, the project was moved up to Highland Wildlife Park in the hope that the climate and its proximity to the species' natural habitat would be more conducive to success. Following the move, the stakes were raised even higher. After a bumper larval survey season in the wild, it was decided to move some Scottish pine hoverfly larvae into the breeding programme. With the Scottish population of pine hoverfly sitting at such seemingly low numbers, this was a calculated risk, but the team at the park rose to the challenge and, in 2019, took the species through its first successful breeding season at RZSS.

Invertebrates may be reasonably cheap to keep, but the requirements for their different life stages are far from straightforward. Larvae are kept in large jam jars filled with pine sawdust and rainwater to replicate the pine tree rot holes found in the wild. Jars are topped with small bits of wood that act as a ramp up to a moss plug, where larvae can escape the freezing water in winter and eventually retreat to for pupation. Moss plugs with pupae are then transferred to empty hummus pots, and when adults emerge, they are transferred into special flight enclosures.

Adults live for just four to six weeks, so the team has a very small window to facilitate mating and egg-laying for the following season. Flies require fresh flowers from plants like rowan and bird cherry every day, supplemented with cotton wool balls soaked in honey. All flight enclosures are fitted with fluorescent lighting for light and heat, and a mister is installed to stop the enclosure and flowers inside from drying out. Temperature is controlled using a combination of heaters and fans, and moisture is kept in check using dehumidifiers. Flies are individually marked with tiny dots of non-toxic paint, and flight enclosures contain jars filled with pine mulch so females can lay eggs. The setup is designed to encourage natural behaviours and produce the maximum number of eggs possible.

Photo top right: Adult pine hoverfly © RZSS

Photo bottom right: Dr Helen Taylor preparing to release the first larvae of day into Glemore Forest (land managed by Forestry and Land Scotland) © RZSS

RZSS Team during a larvae release © RZSS

It may sound like a well-oiled machine, but there have been many improvements over the past four years to reach this stage and it is a constant learning process. Starting with 25 larvae brought in from the wild in 2018 and working in a tiny shed, we produced 16 larvae in 2019. This may sound disappointing, but the big breakthrough was getting through that breeding cycle. These 16 larvae went on to produce 170 larvae in 2020, at which point we realised that one tiny shed would not be sufficient. Thanks to generous support from the National Geographic Society, computer games company Marvelous Europe Ltd, the Cairngorms National Park Authority, FLS, NatureScot and the Scottish Government, a larger, more modern breeding facility for the rapidly growing *ex situ* pine hoverfly population was constructed and not a moment too soon. In 2021 we welcomed over 8,000 pine hoverfly larvae!

The aim had always been to breed enough larvae to establish new populations within the Cairngorms, and with 8,000 larvae, this became a possibility. So in October 2021, before the cold weather set in, and in March 2022, just ahead of pupation, we worked with RIC to release two lots of 3,000 larvae into newly created artificial rot holes across three specially selected sites owned by the RSPB and FLS. This leaves another 300 or so larvae in the breeding facility, with planning underway for the 2022 breeding season and a follow-up release of adults in late spring.

Although 2021 has been an incredible year for pine hoverfly conservation in Scotland, with a record-breaking breeding season and the first releases from the RZSS breeding programme, there's still more to do.

Unfortunately, many conservation reintroductions fail. Small organisms like invertebrates are particularly vulnerable to random extreme weather events, but it is hoped that by having several release sites and releases at multiple time points, the risk will be spread, increasing the chance of success, but only time will tell if this approach has worked.

In September 2022, we will join the RIC team in looking for pine hoverfly larvae across the release sites. If larvae are found, this will mean at least some of the individuals released have bred successfully, and pine hoverflies might be one step closer to survival in Britain. Obviously, one successful season is not enough, and long-term monitoring is key to ensuring accurate assessment of success and determining the appropriate conservation actions. In the meantime, we will maintain an *ex situ* population of pine hoverflies at Highland Wildlife Park to safeguard as much as possible against a complete population collapse.

The conservation work with pine hoverflies in Scotland illustrates the many kinds of zoo staff required to make a project like this successful and the importance of solid external partnerships. RZSS keepers, conservation team members and vets have all played key roles. A close partnership with RIC and membership of the pine hoverfly steering group has also allowed us to draw on a wealth of wild expertise, without which this project would not be possible.

Crucially, the pine hoverfly project is one step closer to preventing this tiny pollinator from disappearing from Britain. By looking after the little guys, we hope to aid whole ecosystem restoration and give species big and small a safe, functional space to thrive in the wild.

Amphibian Conservation Needs Assessments

Amphibian Ark, Joint SIS and CNA assessment in Honduras © Amphibian Ark

Kevin Johnson[1] and Luis Carrillo[2]

[1]Communications and Development Officer, [2]Training Officer, Amphibian Ark

Conservation Needs Assessments (CNAs) use current knowledge of species in the wild to determine those with the most pressing conservation needs and provide a foundation for the development of holistic conservation action plans that combine *in situ* and *ex situ* actions as appropriate.

These assessments allow us to maximise the impact of conservation resources by identifying which measures could best serve those species requiring help. In conjunction with data from recent International Union for the Conservation of Nature (IUCN) Red List Assessments (RLAs) and other amphibian databases, the CNAs are a valuable resource for directing and prioritising amphibian conservation planning and action at the national level, especially for the zoo and aquarium, and the wider *ex situ* conservation community.

Conservation resources are limited, especially for amphibians, and the global zoo and aquarium community, along with the wider *ex situ* conservation community lacks the resources required to effectively manage the number of amphibian programmes which will likely be required to prevent species extinctions. With 41% of amphibian species assessed by the IUCN Red List of Threatened Species currently threatened with extinction (IUCN 2021) the CNA process seeks to objectively and consistently identify priority species and their immediate conservation needs, so resources can be most appropriately allocated.

Background

The Amphibian Ark (AArk) was formed in 2006 as a joint effort of the IUCN Species Survival Commission Conservation Breeding Specialist Group (CBSG), now known as the Conservation Planning Specialist Group (CPSG), the Amphibian Specialist Group (ASG), and WAZA, in response to the Amphibian Conservation Action Plan (ACAP, Gascon et al., 2007). The AArk is an international NGO which supports a global network of captive breeding programmes that are explicitly linked to conservation and research programmes, and our role is to implement the *ex situ* component of the ACAP. We work closely with the Amphibian Specialist Group (ASG) and the Amphibian Survival Alliance (ASA), to achieve a shared Vision: *Amphibians thriving in nature*. Our mission is "*Ensuring the survival and diversity of amphibian species focusing on those that cannot currently be safe-guarded in their natural environments*".

Among other activities, AArk assists its partners in evaluating the needs of amphibian species and regions for conservation work.

The assessment process

In 2006, CBSG, now CPSG, and WAZA held an Amphibian *Ex Situ* Conservation Planning workshop during which a species selection working group developed a decision tree to provide high-level guidance to the *ex situ* conservation community, providing a means to identify and prioritise which amphibian species were most in need of *ex situ* intervention to prevent extinction (Zippel at al. 2006). In many countries the *ex situ* conservation community lacks sufficient expertise on the status of wild populations, and assessments based on the most current field knowledge encourage more appropriate decisions to be made.

At the time the original process was developed, there was no established methodology for evaluating the suitability and need for a given amphibian species to be included in an *ex situ* programme, and which of those species should have *ex situ* programmes established ahead of others. Where Amphibian Red List Authority assessment priorities overlap with those of the AArk, our two organisations have worked together during the past four years to hold joint RLA/CNA assessment workshops.

The decision tree has subsequently been further reviewed and refined and has now evolved into the AArk Conservation Needs Assessment process, and while the primary focus is still to identify and prioritise species for *ex situ* conservation actions, the current version includes recommendations for both *in situ* and *ex situ* conservation actions (Johnson et al. 2020). It is available online (www.ConservationNeeds.org), in English, Spanish and French versions, and all completed assessments and recommended conservation actions are available on the website.

The assessment process is usually coordinated by ASG Chairs who assemble appropriate experts in their country to collaborate on the assessments. Scientists, field biologists and researchers, animal husbandry experts, government representatives, and other stakeholders are vital to the success of the CNAs. Sharing expertise and experiences enhances the assessments, ensuring that appropriate recommendations for national conservation actions are delivered where they are most needed. Participation in the process, along with networking opportunities encourages stronger stakeholder buy-in. Assessments can be undertaken in a physical workshop-based situation, or online.

Unlike RLAs, which assess the risk of species becoming globally extinct, CNAs are developed at the national level, since typically, conservation actions are also planned and implemented at the national level. Multiple assessments for the same species, in different countries within its distribution, and with differing recommendations might be available.

A complete CNA for each species includes:

- current information on the status of the species
- in the wild
- suitable protected habitat
- details of the threats facing each species and the likelihood of them being mitigated in time to prevent further decline
- cultural, scientific, socio-economic and phylogenetic significance
- past *ex situ* experience with the species
- information about potential authorisation for any proposed *ex situ* conservation programmes, and the availability of founder animals.

Once assessments have been completed and saved, each species is assigned to one or more of ten different conservation actions, based on the data in the assessments, with none, one, or multiple actions being recommended for each species. These high-level actions, in combination with the data and extensive supporting comments recorded during the assessment process, can subsequently be used by amphibian conservation groups as a guide to develop new, or update existing amphibian action plans or as a prioritised guide to inform future conservation programme development. Species are listed according to their priority for the particular conservation action.

The current version of the CNA process has been used to generate almost 4,200 assessments for 3,544 species of amphibians (31% of the 8,384 currently known species (Amphibiaweb 2021)), in 47 countries (Amphibian Ark 2001a) (Figure 1). Anurans account for 3,582 assessments, with 528 assessments for caudates and 87 for caecilians.

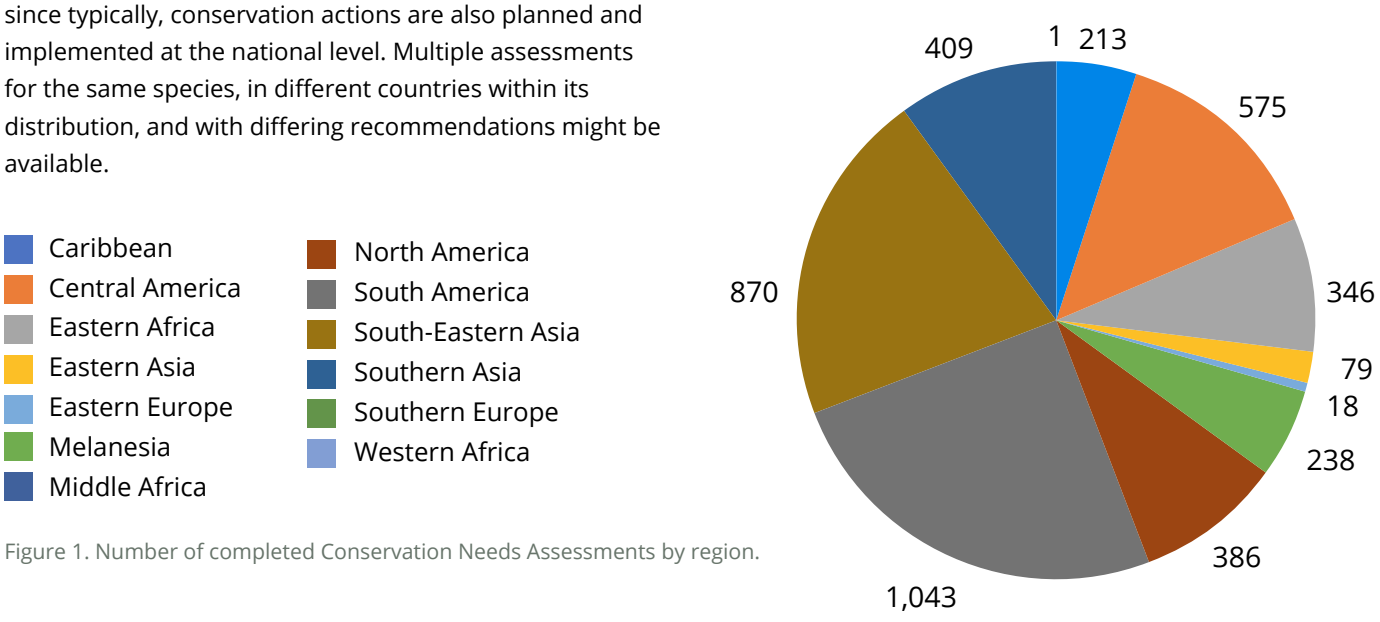


Figure 1. Number of completed Conservation Needs Assessments by region.

Of the assessments completed to date, 398 of them recommend *ex situ* conservation-assurance programmes for 382 different species, to prevent their imminent extinction, and 561 species have been recommended as potential husbandry analogue species (Figure 2). If all known amphibian species were assessed, we can extrapolate that 934 species will potentially require *ex situ* management to prevent their extinction.

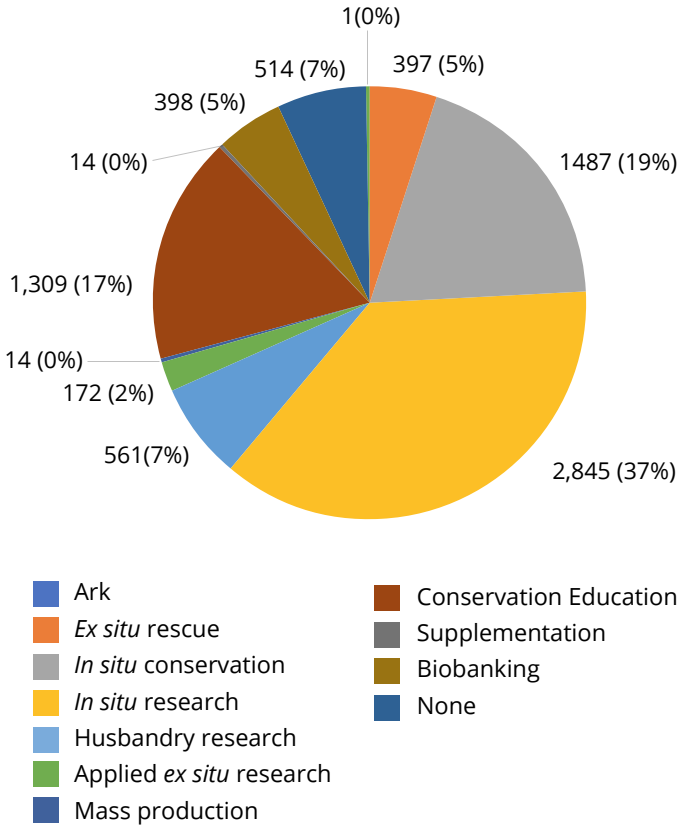
Unfortunately, to date only about 12% of the 398 species recommended for *ex situ* rescue have ever been managed in captive conservation programmes, with just 37 (9.5%) of these species currently in *ex situ* programmes, according to AArk's programme progress database (Amphibian Ark 2021b). Of the 195 active *ex situ* programmes in that database, 95 of these programmes are managed by zoos and aquariums, with the remainder based in universities, museums and private facilities (Amphibian Ark 2021b). Although there are an additional 49 species currently in *ex situ* survival-assurance programmes, for which CNAs have not yet been completed (Amphibian Ark 2021b), it is evident that many more resources are required to effectively manage the number of *ex situ* programmes required. While AArk endeavours to monitor and evaluate the progress of each programme to determine its success or failure, as tasked in the ACAP (Gascon et al., 2007; Wren et al., 2015), there are almost certainly additional *ex situ* survival-assurance programmes for threatened amphibian species which are not yet included in the progress database.

Red List and Conservation Needs Assessments

We are often asked if there is overlap with RLAs. Approximately 40% of the data contained within a RLA is also required within CNAs. The CNAs amplify conservation actions in RLAs, with the Conservation Needs section in many older RLAs lacking consistency and not providing guidance, although recommendations are now required in RLAs for threatened species. The CNAs complement RLAs, and when used together, they provide a more holistic guide to conservation priorities and actions.

The group of experts required to compile both RLAs and CNAs is similar and bringing them together for a single workshop is a much better use of our respective resources. Since early 2018, joint assessment workshops have been held for species in Costa Rica, Ghana, Honduras, India, Malaysia and Papua New Guinea, with a joint methodology being developed to integrate both sets of questions into a single process.

Figure 2. Number of recommended conservation actions generated by Conservation Needs Assessments.



The False Malabar Gliding Frog (*Rhacophorus pseudomalabaricus)* was recommended as a high priority species for *ex situ* rescue, and other conservation actions during the 2020 Conservation Needs Assessments for Indian amphibians © Dr. Benjamin Tapley, ZSL

Using the assessments

Many *ex situ* rescue programmes have been implemented as a result of recommendations from CNAs (e.g. for *Telmatobius culeus* in Bolivia, *Lithobates vibicarius* in Costa Rica, *Telmatobius pisanoi* and *T. stephani* in Argentina, *Alsodes vanzolinii* in Chile, *Eleutherodactylus portoricensis* in Puerto Rico and *Scinax alcatraz* in Brazil). Using the recommendations generated by the CNAs when considering the establishment of new conservation programmes for threatened amphibians will help to ensure that our collective conservation resources are used wisely.

Additional tools are currently being developed which will further prioritise species recommended for *ex situ* conservation action, in an effort to reduce the list of species requiring *ex situ* management to those that are most suitable for a captive breeding programme, and therefore most likely to succeed. It is not feasible, nor practical, for the *ex situ* community to manage the 900+ species which could potentially require *ex situ* rescue. One of the new tools assesses a number of variables for each species (biology; geographic, socio-cultural and political issues; and biosecurity risks), with recommendations being made for species which are most suitable for *ex situ* care, and those which are not, or face potential risks. Species which are recommended for *ex situ* management via a CNA, and deemed to be potentially suitable for captive management, should be considered highest priorities for *ex situ* programmes. Institutions wishing to embark on a programme for those species can use the recently-expanded Program Implementation Tool on the AArk web site (www.amphibianark.org/program-implementation-tool) to determine their potential to host a programme for the species.

The CNA process has changed over time. The criteria and their rankings have been adjusted as experience with the process was gained, and we continue to work with the broader conservation community to identify goals, threats, and conservation options. This evolution is ongoing, with regular reviews of the type of information being collected in the assessments, and the methodologies used to generate priorities and recommended conservation actions. Assessments and prioritisation of individual species are reviewed and updated as we gain knowledge and as the threats to each species change. While the process was originally designed to be used with amphibians, it is now designed so that it can be applied to any group of taxa, and its use with species other than amphibians is currently being tested. The questions in the assessments, possible responses, and the text used within the interface are all customisable and can readily be modified if needed, to better suit different taxonomic groups.

Aparasphenodon pomba is a Critically Endangered tree-frog from Brazil - due to the threats facing the species, *ex situ* management, as well as other conservation actions, is highly recommended and urgent until the threats in nature can be solved. © Cybele Sabino Lisboa, São Paulo Zoo.

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The WAZA 2023 Animal Welfare Goal: Becoming a Reality

Paula Cerdán Codina
WAZA Animal Welfare and Conservation Coordinator

In its 'World Zoo and Aquarium Animal Welfare Strategy', WAZA states that:

> **"Zoos and Aquariums have a responsibility to achieve high standards of animal welfare in support of their goals as modern conservation organisations."**

Animal Welfare is at the core of everything WAZA and our members do, and as such, WAZA's collective mission is to ensure the best conditions for all animals under our care, using the latest scientific knowledge. In support of this approach, WAZA, in consultation with its member national and regional associations, its members, and the WAZA Council, set the WAZA 2023 Animal Welfare Goal.

At this point you may have read about the WAZA 2023 Animal Welfare Goal on different occasions, heard of it or even attended presentations where it has been discussed. The WAZA 2023 Animal Welfare Goal is an ambitious goal for WAZA, and for the past few years it has been the focus of most of the work done by the various committees that are involved in it, that is, the Associations, Membership, and Ethics and Animal Welfare Committees, supported by the WAZA Executive Office.

What exactly is the purpose of the WAZA 2023 Animal Welfare Goal? How does WAZA plan to implement it? And what does it mean for WAZA members? In this article, we plan to address these questions and others that may have arisen since the introduction of the Goal.

The WAZA 2023 Animal Welfare Goal

In 2019, the WAZA Council set the goal that by 31 December 2023:

1. 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.

2. All WAZA institutional members must be compliant with this process.

WAZA Members later voted on and passed resolution 74.3 at the 2019 WAZA Annual General Meeting, which supported the adoption of the WAZA 2023 Animal Welfare Goal.

While the goal seems ambitious, for the past few years we have been working on the development of the specifics of this goal, not only in terms of the elements and requirements that will be requested to meet the Goal, but also in terms of the process to follow to confirm compliance with the different Animal Welfare Evaluation Processes.

Frequently Asked Questions (FAQs)

What is an Animal Welfare Evaluation Process?

After two meetings in Singapore and in Barcelona, it became apparent that the word "accreditation", which was originally used within the framework of the WAZA 2023 Animal Welfare Goal, does not translate into all languages equally. There was a need to establish another term to unify our goals and the different regional approaches taken to meeting them.

An Animal Welfare Evaluation Process is a national or regional association's process that is intended to evaluate and review animal welfare within a member zoo and aquarium, and propose, where necessary, ways to enhance animal welfare within the institution. An animal welfare evaluation process is based on several factors with a potential ultimate impact on the well-being of the animals housed in human care. The process provides a holistic approach to animal welfare by not only looking at the well-being of the animals housed, but also taking into consideration further practices that may happen at an institutional level.

Is this 2023 Animal Welfare Goal an accreditation issued by WAZA?

No. First and foremost, the WAZA 2023 Animal Welfare Goal is about confirming that the Animal Welfare Evaluation Processes utilised by the WAZA member national and regional associations, include specific high-level principles of animal welfare, and these principles will be seen consistently across the world, through their implementation by our member associations. The Goal intends to ensure that all regions represented within WAZA, adopt a holistic and compelling approach to animal welfare.

Will each WAZA-member association need to develop an Animal Welfare Evaluation Process?

No, WAZA-member associations may choose to delegate another association to evaluate their non-mutual members after joint-agreement by both associations.

What are these high-level principles of animal welfare? Who has set them?

In 2019, WAZA hosted the 2nd WAZA Animal Welfare Evaluation Summit in Barcelona. Representatives from 18 of the 23 WAZA member associations attended the meeting, and described the following elements, which should be included in the Animal Welfare Evaluation Process:

1. Welfare Model
2. Animal Welfare Standards
3. Verification
4. Capacity
5. Training
6. Disciplinary process
7. Complaints procedure


© Assiniboine Park Zoo

How will WAZA confirm that these high-level principles of animal welfare are integrated in an association's Animal Welfare Evaluation Process?

A tool for the implementation of the 2023 Animal Welfare Goal has been developed. This tool, called the WAZA Assessment Tool for Confirmation of the Associations' Animal Welfare Evaluation Processes – or the WAZA Assessment Tool for short – allows each association to identify their gaps and address them. It translates each of the above-mentioned seven operational elements into requirements.

How will WAZA confirm compliance with the goal?

The process to confirm each association's Animal Welfare Evaluation Process will be peer-reviewed, as such, it involves the following steps:

1 A WAZA national or regional association member carries out a self-assessment of their association's Animal Welfare Evaluation Process (AWEP) and prepares for a Peer-Review.

2 The review is carried out by a peer association which prepares a recommendation for the Animal Welfare Evaluation Process Expert Panel.

3 The outcomes and recommendation of the peer-review process are presented to the WAZA Animal Welfare Evaluation Process Expert Panel for consideration.

4 The recommendation of the Expert Panel is shared with the WAZA Executive Committee, who will decide whether to endorse the recommendation.

Who is the Expert Panel?

The Expert Panel is tasked with the final determination and endorsement of the Peer Reviewer's recommendation that an association has, or has not, met the WAZA requirements of the WAZA Animal Welfare Evaluation Process. The Expert Panel will:
a) guarantee the consistency of the WAZA process for confirmation of all associations being reviewed
b) confirm/deny the reviewer's recommendation
c) manage any disagreement between reviewer and reviewee.

What kind of support can I get as a WAZA member regional or national association?

The whole process has been designed to offer opportunities for WAZA member associations to be supported by others, exchanging ideas and resources to meet the goal while strengthening the Animal Welfare

In addition, as part of the Memorandum of Understanding (MoU) that WAZA signed with Wild Welfare in August 2020, Wild Welfare will support WAZA member national and regional associations who may need assistance in delivering certain components of the WAZA 2023 Animal Welfare Goal. Different associations have already worked with Wild Welfare, and you can read their testimonials in past issues of the WAZA Magazine.

We encourage you to visit our website and take a look at the WAZA Assessment Tool and the rest of resources that are already available there: https://www.waza.org/priorities/animal-welfare/2023-animal-welfare-goal/

Building up the Goal– recent work and progress

The collaborative work between the WAZA Executive Office and the WAZA Associations, Membership, and Ethics and Animal Welfare Committees has led to making great strides on the development of the WAZA Assessment Tool for implementation of the 2023 Animal Welfare Goal. The tool is used to assess compliance and provide support for members to meet the Goal, based on the seven operational elements required for the different Animal Welfare Evaluation Processes.

Before rolling out this tool to all WAZA member associations, two pilot reviews were conducted. The main aim of the pilot review was to test the process, the definitions, and clarity of the requirements within the WAZA Assessment Tool. Considering the diversity within WAZA, we considered it important to test this tool in a sample of the various contexts we embody, taking into account different capacity, staffing, and regional approaches and perspectives. Three associations have been involved in these pilot reviews, the Pan-African Association of Zoos & Aquaria (PAAZA), the Zoo and Aquarium Association Australasia (ZAA) and the European Association of Zoos and Aquaria (EAZA). The two pilot processes have led to very valuable findings and have helped to inform the best approach to take in the assessment of each association's programme, considering the capacity of WAZA members, as well as the knowledge of other associations' programmes. All the feedback received throughout the pilot reviews process has been extremely useful as confirmation that the tool is ready to be distributed to all the 23 WAZA member associations and start the peer-reviews this year.

In early February, this Tool was sent to WAZA member associations to start reviewing and assessing their potential gaps. Other WAZA-Member associations have already come forward to request an early review. After many years of tireless work, the WAZA 2023 Animal Welfare Goal is becoming a reality.

Brazilian Programme of *Ex situ* Management of Threatened Species – Achievements So Far and Plans for the Future

The Jaguar (*Panthera onca*) is one of the species targetted by the Brazilian Programme of *Ex situ* Management of Threatened Species. © Ivan Mattos

Ana Raquel Gomes Faria, Clarissa Machado de Carvalho and Mara Marques

Association of Zoos and Aquariums of Brazil (AZAB)

Due to the anthropic impact on wildlife and their biomes, *ex situ* management is needed for several species to ensure their survival. In order to succeed, an *ex situ* management programme has to be carefully planned and implemented to ensure tangible benefits for species conservation.

Since 2018, the Association of Zoos and Aquariums of Brazil (AZAB has partnered with Chico Mendes Institute for Biodiversity Conservation (ICMBio) and the Brazilian Ministry of Environment's administrative arm to implement population management for threatened species in Brazilian zoos and aquariums. The agreement aims to elaborate, maintain, and analyse studbooks for selected species, assuring their demographic and genetic viability. The agreement follows the goals established by national action plans for these species. In addition, all meetings and decision-making processes follow the IUCN Species Survival Commission's Conservation Planning Specialist Group's (CPSG) guidelines for species conservation planning.

The programme began in 2018 by targeting 25 species, with an initial time frame of five years. So far, we have made significant progress. We gathered information on the 25 species from zoos and aquariums, created working groups for each species with the professionals and institutions involved, obtained Zoological Information Management System (ZIMS) for studbooks licenses, and started working on the studbooks, some of which have already been implemented. With the help of zoos and aquariums across Brazil, we were able to count on excellent professionals that volunteered to be part of the programme as studbook keepers. They work hard to implement studbooks and ensure they are well kept, the pairing recommendations are followed, and annual reports are sent to ICMBio.

In 2020, we held training sessions in São Paulo for the studbook keepers on the use of the demographic and genetic analysis tools ZIMs and PMx, and held a best practices course in partnership with the Zoo Conservation Outreach Group (ZCOG). We were also able to hold live online events during 2020 and 2021, which allowed us to collaborate with international studbook keepers to bring our conservation programmes closer, and develop manuals on the species of the programme regarding nutrition, animal welfare, and environmental education.

Our current challenges are reaching out to more Brazilian institutions to join the programme, improving communications during the pairing recommendations and movement processes, both nationally and internationally, and integrating our programme with international programmes.

Plans for the future include the release of the 25 manuals to Brazilian zoos and aquariums to help improve the level of care and to perform a genetic evaluation of selected individuals to improve reproductive groups and pairing recommendations. We also hope to expand the number of species in the programme with the addition of 14 more.

You can learn more about AZAB, our committees, our events, and our members at https://www.azab.org.br/ *(in Portuguese).*

Participants blowing bubbles at the 2018 Guinness World Record attempt
© Cormac Hanrahan

Bubbles, Not Balloons

How a Community Conservation Campaign Influenced State-wide Policy Change

Helen Johnston

Community Conservation Campaigner, Zoos Victoria

Balloons are one of the most disproportionately lethal items ingested by marine fauna (Roman et al., 2021), especially for seabirds (Roman et al., 2019). Balloon latex and accompanying hard plastic clips can cause gastrointestinal obstructions, and balloon ribbon may pose an entanglement risk to wildlife (Wilcox et al., 2016).

To address the risk posed by balloons, two leading Australian conservation organisations, Zoos Victoria and Phillip Island Nature Parks, joined forces to create the *When Balloons Fly, Seabirds Die* campaign. Established in 2017, this campaign motivates the community to use bubbles, not balloons, at outdoor events.

The When Balloons Fly campaign employs best practice behaviour change methods (McKenzie-Mohr, 2011) and Zoos Victoria's successful Connect-Understand-Act model (Squires, Lowry & Banks, 2016), to encourage positive social change by replacing an environmentally harmful behaviour, with an enjoyable and less harmful alternative.

To encourage the community to blow bubbles rather than balloons, the When Balloons Fly campaign has been promoted in a variety of interactive ways. For example, in 2018 Zoos Victoria gathered thousands of people in a Guinness World Record attempt to simultaneously blow the largest number of bubbles. Held at Australia's largest sporting stadium, this event piqued significant media interest, engaged a unique audience, and led to a commitment from several sporting clubs to cease using balloons outdoors.

Onsite, engaging When Balloons Fly installations were assembled at two of Zoos Victoria's sites (Melbourne Zoo and Healesville Sanctuary), to connect visitors with wildlife, and inspire conservation action. One such installation allows visitors to make a public pledge to blow bubbles not balloons outdoors. This cost-effective behaviour change tool not only builds a social norm towards the desired behaviour, but may also promote long-term conservation action.

Mellish and colleagues (2019) revealed that exposure to the When Balloons Fly campaign at Melbourne Zoo significantly increased visitor likelihood to use bubbles, and reduced visitor likelihood to use balloons. Furthermore, six months after exposure to the campaign, two-thirds of the follow-up sample reported changing their behaviour at an event they hosted or attended, as a result of their zoo experience.

In an extraordinary demonstration of how effective zoo-based community conservation can be, since the launch of the When Balloons Fly campaign over 230,000 people, and 60 schools, have pledged to blow bubbles rather than balloons at outdoor events. Further to this, hundreds of organisations, including businesses, councils, and community groups, have committed to stop using balloons outdoors.

What Goes Up, Must Come Down

In early 2021, the Zoos Victoria Community Conservation Team began assessing the biological impact of the When Balloons Fly social movement. We analysed a suite of litter data, including data provided by our campaign partner, Phillip Island Nature Parks, to evaluate the prevalence of balloon waste on Victorian shorelines. While further research is required, preliminary data (2016-2021) suggests that balloon debris is decreasing along Victorian beaches.

Despite this potential decline in balloon litter, Zoos Victoria was informed that various businesses, such as funeral companies, were still regularly releasing helium balloons. Consequently, in April 2021, we investigated the rate of balloon release by Victorian funeral companies (N = 77) at their services. We found that 84% facilitated balloon release, either by sourcing balloons for clients, or by allowing clients to source and release their own balloons. Anecdotally, funeral company staff reported that balloon release requests ranged from a few times a year, to several times a month, and the estimated number of balloons released ranged from approximately 10 to 150 balloons per service. Of the funeral companies surveyed, 48% of staff who facilitated balloon release mentioned that they are aware of the negative impact balloons can have on wildlife, and many believed that community awareness about the impact of balloons has led to a decline in release requests.

WBF campaign banner © Zoos Victoria

Interestingly, 18% of funeral company staff claimed to only release 'biodegradable' balloons. This belief is likely due to the misleading claims of latex balloon biodegradability being made by balloon manufacturers and suppliers around Australia. Contrary to this claim, a Zoos Victoria and City of Hobart funded study carried out by the University of Tasmania, demonstrated that latex balloons do not meaningfully degrade in freshwater, saltwater or compost (Gilmour & Lavers, 2021).

Excitement Flies High with Balloon Release Ban

Recently, Zoos Victoria galvanised community support for the When Balloons Fly campaign by collaborating with state Government agencies to advocate for a Victoria-wide ban on balloon release. Consequently, on 1 July 2021, as part of a new Environmental Protection Act, the release of balloons outdoors is regarded as littering, and is therefore illegal in Victoria. Zoos Victoria communicated the news of this significant win for wildlife via social and mainstream media, while at the same time directly informing the Victorian businesses who were known to release balloons of the newly introduced legislation.

> **The When Balloons Fly campaign showcases how community conservation can influence real-world policy change.**

The campaign has played a crucial role in launching discussion about the impact of pollution on marine wildlife, and has demonstrated how harmful behaviours can be replaced with fun and accessible alternatives. Zoos Victoria will continue to fight extinction via engaging community conservation initiatives, which inspire the public to adopt wildlife-friendly behaviours.

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Footprints™ Developing Lifelong Values and Attitudes

Building Awareness, Behaviour Nurturing, and Inspiring a Balanced Environment

Ray Hole

Founder and Managing Director, Ray Hole Architects

Behaviour Change – a primary strategy in wildlife conservation – requires awareness building across all social structures, but particularly in the young where lifelong beliefs and values are initially established. We call this 'behaviour nurturing'. It is recognised that awareness building is most successful when emotional connections are created and then reinforced through transformational experiences.

Footprints™ is one of Ray Hole Architects' primary "awareness building" tools. Through the installation of artwork-based representations of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species in all 21,000+ primary schools in the United Kingdom – we aim to engage in total some 5,498,000 children between 5 and 11 years of age – all of whom will eventually grow into more "ecologically aware" citizens and the democratic electorate.

As the founder and managing director of Ray Hole Architects, I know all too well how human habitat development impacts the environment. And as architects we are sometimes inadvertently complicit (because of the authorised sustainability benchmarks we work to) even though we are technically compliant. As innovative architects we attempt to negate (or at least mitigate) such impacts through adopting imaginative; Reduce, Reuse, Recycle, Generate, Harvest and Waste Management practices.

However, as consultants we are limited in our influence to effect a sea-change in human habitat development and social behaviour to achieve such a profound paradigm shift, because, although we are often depicted as independent agents of change, in reality, we are still servants to our social, economic and political masters.

So, Ray Hole architects decided to instigate change in a different way, by establishing our own awareness building and behaviour nurturing platform and align ourselves with the IUCN Species Survival Commission/WAZA Reverse the Red initiative.

Footprints™ has been specifically developed to deliver such experiences.

Each year the IUCN publishes updates to the Red List of Threatened Species which catalogues the categories and status of the world's threatened species of flora and fauna. The categories include: extinct; extinct in the wild; critically endangered; endangered; vulnerable; near threatened; least concern.

> **Footprints™ is aimed at expressing this authoritative Red List of Species in a tangible, educational and experiential way through the performance of a simple graphic art installation ceremony in every Primary School in the UK.**

These fun and engaging events bring attention, awareness and knowledge not only for the children actively participating – but also the rest of a participant's class, school, staff, parents, governors and local community.

Ray Hole architects with the Governor of Gibraltar, Edward Davis, the Environment Minister, John Cortes; and Jessica Leaper (Gibraltar Wildlife) © Ray Hole architects

Each ceremony comprises a short introductory presentation relating to the plight of endangered species, followed by a "footprinting" event, ideally located on the playground surface.

A range of "footprints" selected from species with varying degrees of endangerment are represented through a unique stencil of that species' footprint.

Each participating student stencils their adopted endangered species' footprint graphic onto the playground surface. Collectively, the artwork creates an array of footprints in a colourfully sequenced display segueing from black – showing the species is extinct – to green – showing the species is not highly threatened with extinction.

Importantly, the artwork installation is carried out by the school children themselves. Arundel Primary School created their Footprints™ endangered species ground art installation, then the following senior year group returned to refresh the original stencilled representations.

The children enquired about the current status of each species through the IUCN Red List and adapted the colour code accordingly.

Of the species chosen one had declined further but all the others had maintained their status, albeit still in various stages of endangerment.

Obviously, a decline in any species status emphasises the reality of that species vulnerability, but conversely an improvement is a reason for celebration, either emotion generated is potentially transformative.

Beyond schools, Gibraltar's Alameda Botanic Gardens and Wildlife Centre played host to a Habits for Habitats Campaign event providing the local children, their parents, teachers and other citizens the opportunity to learn about the many endangered species around the planet, but also those that live on the famous rock itself – barbary macaques. This event was made all the more poignant by the attendance and participation of His Excellency Governor of Gibraltar (Edward Davis) and The Honourable Minister for the Environment (John Cortes) – who both actively engaged with the Footprints™ artwork installation by applying their signatures next to each of their chosen endangered species' footprints.

We see this engaging and inexpensive method to universally develop behaviour nurturing in our young as part of the IUCN/WAZA collaborative Reverse the Red initiative. For further information please contact rh@rh-architects.com

The Okapi of Al Bustan Zoological Centre

Okapis at Al Bustan Zoological Centre, in the United Arab Emirates © Al Bustan Zoological Centre

Kate Burns

General Manager, Al Bustan Zoological Centre

The okapi, also known as the forest giraffe, is an endangered, elusive, forest dwelling species endemic to the Democratic Republic of Congo. It has long been thought of as a very special species by the zoological community. They are still only found in relatively few zoos worldwide, but often appear on the wish list of many zoo CEOs and curators when looking at revisions of collection plans or zoo development projects.

Regarded as a delicate and tricky species, its husbandry and management, like all species being managed in human care, is being continually refined and improved.

Given where it is found in the wild and the way that the species is managed in zoos, it is counter intuitive to find that an important *ex situ* population of this species is found in the Sharjah Emirate in the United Arab Emirates (UAE), at Al Bustan Zoological Centre – where we have been caring for this species for 10 years now.

Upon receiving our first related pair through the Association of Zoos and Aquariums (AZA) Species Survival Plan (SSP) 2012, we set about keeping these animals in the best way we possibly could. A year later, we received our second, unrelated pair, and then our first calf was born in 2015, a female named Zuri. Fast forward to today and we now look after 10 okapi, five of which were born in Al Bustan.
So, what do we owe our success to and what do we hope for the future of our okapi breeding programme?

Animal Management
Year round the animals have access to a climate-controlled barn with inside temperatures maintained between 19°C and 28°C, thus offering the animals the respite and break they need from the extremes of the heat found in the UAE in the summer months.

The animals have daily access to outside enclosures on a rotational basis. The 2000m^2 outside area is densely planted with specially selected trees, which in addition to providing shade and shelter, similar to the dense, dark surroundings of their native rainforests, also acts as an extra food source for them.

The entire enclosure is surrounded by wooden fences and a dry moat with gentle slopes on the animal side, thus giving easy access to the bottom of the moat.

M'Bura, one of the Okapis at Al Bustan Zoological Centre, lays with her second calf Mzimu. © Al Bustan Zoological Centre

Farida and Johari exploring the mother/calf outside area in Al Bustan Zoological Centre.
© Al Bustan Zoological Centre

Adea being habituated to her keeper
© Al Bustan Zoological Centre

All of the male okapi have their own indoor stall within the temperature controlled building, with the younger males housed next to each other, giving them visual, olfactory and physical contact through the common barrier. Unrelated females also have their own stall with common barriers dividing them from older females and males on either side, while related females are kept together in a herd. The inside stalls are 10m x 12m with sand-based bio-floors.

Mothers with calves are kept separate from others in a stall with a built-in creep area for the calf and mother to have access to their own outside area. Their stall size is the standard 10m x 12m with the calf creep area being 4m x 3m, with a wood shavings floor.

We manufacture the composite pellet offered to the okapi in our own feed mill and import alfalfa hay from the USA. Animals that are inside the barn are offered freshly cut browse from trees on the zoo site.

Breeding

For breeding purposes, the males are introduced into the female's stall daily and these introductions are monitored for signs of oestrus, which usually happen in cycles of between 13-15 days. After this is known, the male is only introduced daily from day 10 until her cycle is complete when he is then moved back to his stall after copulation is witnessed. These introductions are always monitored very closely.

This process of introductions will continue to be undertaken until the female does not appear to cycle, or the male shows no interest in any of the subsequent introduction attempts. The female is then kept separate from the male for approximately six months. At this time, the female will have a trans-abdominal ultrasound to diagnose pregnancy. If she is pregnant, she is moved to the mother/calf stall in preparation for birth. If she is deemed not pregnant, the introduction cycle begins again.

Staff Management of Okapi

They are managed in a very hands-on style with calves starting the habituation process three to four weeks after being born, after the mother calf bond is well established.
For Al Bustan, we find that this process is best done by mimicking the natural process by removing the mother to the outside area for two to three hours twice a day while the calf stays in the stall. Keepers can then clean the stall and work with the calf during this time, before allowing the mother back inside. Calves are only allowed access to the outside area from the age of three months onwards, initially being closely monitored by staff, but after a short time of daily monitoring, are allowed to move freely between the indoor and outdoor areas, with their mother and at times of their own choosing.

Of course, generally speaking, no single collection can successfully manage an *ex situ* population of a species sustainably and it is important to Al Bustan's owner and management that we play our part and role in both *in situ* and *ex situ* okapi conservation work.

The False Malabar Gliding Frog (*Rhacophorus pseudomalabaricus)* was recommended as a high priority species for *ex situ* rescue.
© Dr. Benjamin Tapley, ZSL

A couple of transfers have recently taken place between our collection and the European Association of Zoos and Aquariums *Ex Situ* Programme (EEP). A male from Wuppertal Zoo, Germany has arrived, and we will also be receiving a female from Rotterdam Zoo, Netherlands.

We will then send a pair of our okapi into the EEP – a female to Copenhagen Zoo and a male to Dvůr Králové Zoo, thus providing the European population of okapi with much needed input of new genetic material.

Hopefully with new animals being brought into the Al Bustan okapi population from the EEP, we will be able to expand our breeding programme.

The current facility for the okapi will need additional development as with more calves on the way, the existing okapi barn will need to be expanded to ensure more mother/calf stalls are available with separate access to the outside area.

Given our location and easy access to all parts of the globe, we are looking at how Al Bustan can be used as a stopover destination for okapi being transferred from one part of the globe to another. The UAE is able to bring in okapi from anywhere in the world and send animals into a quarantine station based elsewhere. This reaffirms the fact that Al Bustan is in a unique position to facilitate the international movement of okapi for the benefit of the species.

And finally

As all zoo managers and curators know, there are always surprises and unexpected moments when managing any species.

> **Mzimu, our fifth calf, was born on boxing day 2021.**

His name, meaning Ghost in Swahili, was chosen as he is the first-known leucistic okapi born in human care.
It has been 120 years since this wonderful species was formally recognised in science and just over 100 years since the first okapi came into human care. Its gentle, quiet nature coupled with its stunning coloration and markings, ensures that the species has an endearing, almost mysterious quality which beguiles visitors and zoo staff.

Our understanding of the biology of this elusive species is still being unlocked and of course the *ex situ* population has an important role in helping us do this, with the obvious benefits this has for both the *in situ* and *ex situ* populations of the species.

This endangered species needs the holistic, One Plan approach to help safeguard its future. Al Bustan, while relatively new to okapi management compared to some other zoos, has, in its ten years with the species, learnt much, and intends to play its full part in the task of protecting this species for future generations.

Zoo Basel Primate House

A Diverse Environment for Animals and Visitors

Jakob Rope Systems

The modern zoo has many additional priorities other than simply accommodating a diversity of rare animals. One such priority lies in the quality of the outdoor fixtures and enclosures: ensuring that they are species-appropriate, offer unrestricted viewing and are visually and architectonically attractive. The objective is to provide a diverse environment for the animals and also to offer the visitors a quality viewing experience.

To that end, WAZA member Zoo Basel, in Switzerland, sought an appropriate solution for their enclosures that is durable, nearly invisible and yet also sufficiently robust to withstand any possible aggressive behaviour from the animals. The enclosure material was supplied by Jakob Rope Systems. Its Webnet system is woven out of flexible wire ropes and offers an architectonically highly attractive alternative to conventional structural barriers such as ditches, bars or glass plates. Zoo Basel worked in collaboration with landscape planners Schweingruber Zulauf (Zurich), architects Peter Stirner (Basel), engineers Conzett Bronzini Gartmann (Chur) as well as Pfeifer Ingenieure (Konstanz) and fellow WAZA member Jakob Rope Systems to create an outdoor enclosure for primates and thereby set new standards.

Interaction between architecture and species-appropriate enclosures

Five neighbouring, but spatially separated net tents were constructed on a surface of about 8,000 square metres. The unique properties of Webnet in this application are ideal for animals and visitors: the primary supporting structure for the nets is formed in each case by three-armed, heavily cantilevered, steel-reinforced concrete pylons called tri-digits, which reach a height of nearly 20 metres. They are securely anchored into the ground with a concrete foundation and underground bored piles reaching a depth of up to 17 metres. Depending on the size, two or three of these bundled supports are located in each enclosure and they are fully integrated in the enclosure design. This space-saving style of construction gives the animals a much larger living space and the supports and nets are used avidly by the monkeys for climbing. Another unique aspect is the double-layer design of the project. While the inner, fine-meshed net structure surrounds the actual animal enclosure, the outer shell serves as a support for creepers and climbing plants. The resulting vertical green surfaces attaining a height of up to 20 metres not only provide a visual highlight, but also serve as a source of shade for the primates and imitate their natural, tropical habitat. Specific areas were set aside to give zoo visitors viewing access of the enclosure from different perspectives in between the lush green covering.

Rapid implementation thanks to precision dimensioning

A noteworthy aspect of the primate enclosure in Basel is also the manner in which it was implemented. After a precise analysis of the net's spatial geometry, the rope lengths and net sizes required for the realisation were calculated – including consideration of snow and wind loading. The ropes and nets were created in the Jakob Rope Systems factory to the exact dimensions. Thanks to this professional production approach, cost-intensive and complex cutting to size, fitting and readjusting of the nets on site was unnecessary. The assembly of the ropes and nets at the construction site was carried out by four employees of Jakob Rope Systems over a six-month period. The new primate enclosure in Zoo Basel highlights the advantages of using the Webnet system in the construction of modern and attractive animal enclosures. It offers a space-saving, secure design, with the highest level of transparency and visual airiness, guaranteeing safety for people and animals. It is also attractive due to its longevity and low maintenance costs.

To learn more, please visit www.jakob.com
Jakob Rope Systems works closely with zoo experts from around the world, to learn more about the needs of animals and how to build better habitats for them. As a WAZA member, they support research into new animal-friendly zoos that benefit animals and people.

Update on International Studbooks (ISBs) and Global Species Management plans (GSMPs)

Changes between 19 November 2021 to 23 February 2022

GSMP Convenor Change

Blue-crowned laughingthrush GSMP – From Mark Myers (Woodland Park Zoo, USA) to Laura Gardner (Wildwood Trust, UK) and Colleen Lynch (Riverbanks Zoo and Garden, USA) as Co-convenors for the GSMP.

ISBs published

- **Indochinese sika deer** (*Cervus nippon*), 2021 ed. – Jan Pluháček (Zoo Ostrava, Czech Republic)
- **Red ruffed lemur** (*Varecia rubra*), 2021 ed. – Mylisa Whipple (Saint Louis Zoo, USA)
- **Tiger** (*Panthera tigris ssp.*), 2021 ed. – Peter Müller (Leipzig Zoo, Germany)
- **Greater bamboo lemur** (*Prolemur simus*), 2021 ed. – Delphine Roullet (Cotswold Wildlife Park, UK)
- **Cheetah** (*Acinonyx jubatus*), 2020 ed. – Laurie Marker (Cheetah Conservation Fund, Namibia)
- **Malayan tapir** (*Tapirus indicus*), 2021 ed. – Sharmy Prastiti (Taman Safari Indonesia, Indonesia)

ISB Transfers

- **Asian small-clawed otter** (*Aonyx cinereus*) – Inter-institutional transfer from Sara Duncan (Tulsa Zoo, USA) to Jason Palmer (New Forest Wildlife Park, UK)
- **Sumatran rhino** (*Dicerorhinus sumatrensis*) – Intra-institutional transfer from Frank Oberwemmer to Michael Meyerhoff (Zoo Leipzig, Germany)
- **Vietnam's pheasant** (*Lophura edwardsi*) – Inter-institutional transfer from Berlin Zoo to Sarah K Patterson (St. Augustine Alligator Farm
Zoological Park, USA)
- **Sloth bear** (*Melursus ursinus*) – Inter-institutional transfer from José Kox (Ouwehands Dierenpark, the Netherlands) to Anand Kumar (Mandai Wildlife Group, Singapore)
- **Banteng** (*Bos javanicus*) – Inter-institutional transfer from San Diego Zoo Wildlife Alliance to Dallas Zoo. Steve Metzler remains as the International Studbook Keeper.

Vacant studbooks

- **Buff-crested bustard** (*Lophotis gindiana*)

Photo: Blue-crowned laughingthrush *(Garrulax courtoisi)* © Wade Tregaskis

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

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

New Member
Indira Gandhi Zoological Park

WAZA is pleased to welcome a new WAZA Institutional member to the global zoo and aquarium community – the Indira Gandhi Zoological Park, Visakhapatnam, India.

Based in India, in the Visakhapatnam district, Indira Gandhi Zoological Park (IGZP), also called Vizag Zoo, is located in an area of 625 acres in Seethakonda Reserve Forest, which is part of the beautiful hills of the Eastern Ghats. Construction of the zoo began in 1972 and was opened to the public in 1977. The zoo is home to more than 840 animals from 85 species and also welcomes many free ranging animals from the surrounding forest.

Indira Gandhi Zoological Park is committed to conservation and sustainability, and has a long-term vision for *ex situ* conservation. The Zoo primarily focuses its conservation efforts on the *ex situ* conservation of critically endangered fauna endemic to the Eastern Ghats, including wildlife rescue and rehabilitation. IGZP is recognised by Central Zoo Authority, India as the "Coordinating zoo for the conservation breeding of Asiatic Wild Dogs" in India, and the breeding programme has been very successful.

Another of the zoo's core objectives is conservation education, as such it has created an environmental education centre called the Bioscope. This knowledge centre is composed of several educational programmes which provides a truly informative and educational experience for thousands of zoos visitors every year.

Main photo: Visitors at Indira Gandhi Zoological Park.
© Indira Gandhi Zoological Park

A group of blackbucks, also known as Indian antelopes, at Indira Gandhi Zoological Park. © Indira Gandhi Zoological Park

The IGZP's vision is to become a national leader in saving wildlife by fighting species extinction. The aim is to ensure the future of next generations where human values are protected, and biodiversity is preserved.

Indira Gandhi Zoological Park is a member of the Central Zoo Authority, India.

To learn more about the Indira Gandhi Zoological Park, visit the website at: https://vizagzoo.com/

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