

QUARTERLY PUBLICATION OF THE EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

ZOOQUARIA

SPRING 2021

ISSUE 111

OPERATION JAGUAR

TRACKING DOWN THE
ILLEGAL TRADERS



NEW BEGINNINGS

PLANNING A BETTER FUTURE FOR CAPRINES

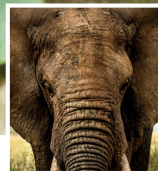
MOVING DAY

HOW TO MOVE AN ELEPHANT – SAFELY





Primates



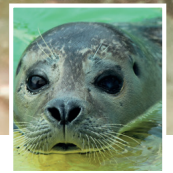
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4 From the Director's chair

How EAZA learned to adapt and survive during the pandemic – and how it will continue to do so

5 Noticeboard

Council and conference news from EAZA

6 Births & hatchings

The latest arrivals at EAZA's zoos and aquariums

8 Global warning

How a global coalition is working to unite efforts across the world in the battle for biodiversity

10 Rewild Carbon

Introducing Durrell's ground-breaking carbon offsetting programme

12 Sustainable solutions

How Marineland converted to a sustainable seafood diet for the animals in its care

14 A bright future for caprines

A new strategy is underway for this overlooked species

16 A race against time

Tackling the extinction threat to freshwater teleosts

18 Primate priorities

A new long-term plan addresses the threat to three species of mangabey

20 Virus management for parrots

New protocols to reduce the spread of parrot viruses

21 New laws for new standards

A new Animal Health Law will transform the movement of animals within the EU

22 Operation Jaguar

How joining forces could help to crush the devastating illegal trade in jaguar parts

24 Together for Forests

How EAZA has joined the fight against deforestation

26 Life support

Covid-19 has wreaked havoc on callitrichid field projects – so how can EAZA Members help?

28 How to move an elephant

How protected contact crate-training made a jumbo-sized job a little easier

30 On the record

Why global zoological data is so vital to our conservation efforts

KEY: a quick guide to frequently used acronyms

EETP: EAZA Ex-situ Programme

LTMP: Long-term Management Plan

RCP: Regional Collection Plan

TAG: Taxon Advisory Group

ZIMS: Zoological Information Management System

Zooquaria

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



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Email: info@eaza.net ISSN 2210-3392 .

For information on print subscriptions to Zooquaria visit:

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

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

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

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



FROM THE DIRECTOR'S CHAIR

We had aimed to publish this edition of *Zooquaria* at the start of May; however, as with many things at the start of 2021, there were some unwanted delays. We were pleased to see restrictions lifted in many countries, and zoos and aquariums able to reopen. Unfortunately, for around 20% of our Members, this opportunity was delayed past the popular Easter holiday time, when we usually see a peak in visitor numbers. Of course, it is important to be safe and to control the spread of Covid-19; however, this doesn't negate the frustrations experienced by Members when certain businesses and outdoor areas were able to open while zoos and aquariums had to remain closed. What does offer some hope is the full attendance that we are seeing for those that are able to open. This is a clear sign that people value their local zoo or aquarium and the opportunity they provide to connect with nature.

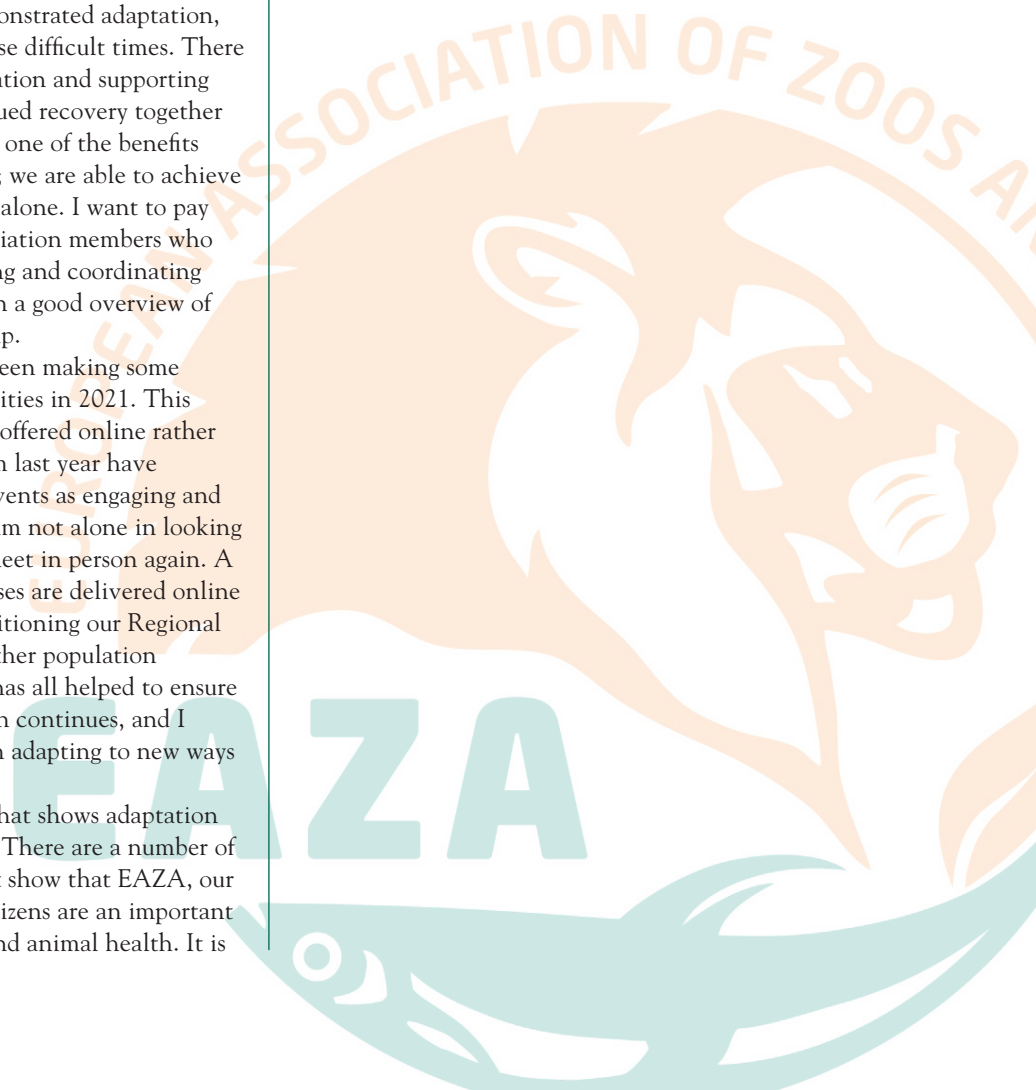
Continuing with the topic of attendance, analysis of visitor numbers for EAZA Members in 2020 show that the average decrease in visitor numbers between 2019 and 2020 was 35%. There was a vast range in such decreases, from 1% to 93%, showing the diversity of impacts faced by our Members. I applaud all who demonstrated adaptation, innovation and resilience during these difficult times. There was a great deal of sharing of information and supporting one another, and I anticipate continued recovery together as a community. Working together is one of the benefits and strengths of being part of EAZA; we are able to achieve much more together than we can do alone. I want to pay special thanks to our National Association members who have been a vital link in collaborating and coordinating activities so that we were able to gain a good overview of how and where EAZA could best help.

As the restrictions ease, we have been making some decisions about planned EAZA activities in 2021. This resulted in all our conferences being offered online rather than in person. The experiences from last year have taught us a lot about making these events as engaging and interactive as possible, yet I know I am not alone in looking forward to when we will be able to meet in person again. A number of our EAZA Academy courses are delivered online and we have been successful in transitioning our Regional Collection Planning meetings and other population management meetings online. This has all helped to ensure that the vital work of the Association continues, and I thank everyone for their flexibility in adapting to new ways of working.

Another area of EAZA activities that shows adaptation and continuation is our policy work. There are a number of articles in this issue of *Zooquaria* that show that EAZA, our Members, and our connections to citizens are an important voice in biodiversity, conservation and animal health. It is

really pleasing to see that our capacity to engage and enact change in these areas has been growing. This has been part of our 2017–2020 Strategy and will continue into our new 2021–2025 Strategy. And, on that topic, I will finish on a teaser. The Strategy was recently approved by EAZA Council and you will be hearing more about the ambitions, activities and how it connects to you in future issues of *Zooquaria* and wider communications. I very much look forward to working with everyone to deliver on our vision: 'Progressive zoos and aquariums saving species together with you'.

Myfanwy Griffith
Executive Director, EAZA



NOTICEBOARD

EAZA COUNCIL

EAZA Council's spring meeting took place online on Tuesday 20 April, and resulted in the following decisions:

- The EAZA Strategy 2021–2025 was approved.
- The Committees propose that from 2023 onwards, annual conservation input (financial and/or staff time support) from all EAZA Full, Temporary and Associate Zoo and Aquarium Members should be included in the EAZA Conservation Database by 1 May, for the previous calendar year. Not doing so could lead to the Member being in violation of the EAZA Code of Ethics and may lead to Sanctions.
- Council urges all Members to contribute their data to the Socio-Economic Impact Assessment via the survey provided.
- The following membership decisions were made and unanimously approved:

NEW MEMBERS

- Parc d'Isle, France (Temporary Member Under Construction)

FULL MEMBERSHIP (FROM TEMPORARY)

- Tallinn Zoo, Estonia

TEMPORARY MEMBERSHIP (FROM FULL)

- Parque de la Naturaleza de Cabárceno, Spain

NEW CORPORATE MEMBERS

- Imagine Exhibition
- Eurogames
- Convivous

WITHDRAWING CORPORATE MEMBERS

- BLV Licht

EAZA AGM

The EAZA Annual General Meeting took place online on Thursday 22 April with the following outcomes:

- A new membership fee category for Members with fewer than 50,000 visitors was approved.
- Updates to the EAZA Membership and Accreditation Manual were approved: chapters on Technical

Assistance, Corporate Membership and interaction between National Associations and EAZA on joint member complaints will be added to the Manual.

- New members of EAZA Council were approved: Linda Elsacker (Antwerp Zoo, Belgium), Kirsten Pullen (Paignton Zoo, UK), Rembrandt Sutorius (Artis Zoo, the Netherlands), Jānis Rudzītis (Riga Zoo, Latvia) and Carlos Agrela Pinheiro (Lisbon Zoo, Portugal).

THE VIRTUAL EAZA ZOO NUTRITION CONFERENCE 2021

Due to Covid-19 restrictions, the biennial European Zoo Nutrition Conference was hosted virtually on 28-29 January 2021. It was the first time that this conference has been held online, and it allowed around 570 delegates from over 40 countries worldwide to take part.

Talks ranged from bats, bird seed, and the primate microbiome to human behaviour change science and sustainability in zoo nutrition. There was also a range of short talk sessions covering mineral deficiency, body condition scoring, underwater feeding and diet change and behaviour, along with three workshops.

The first workshop was *Behaviour Change Science in the World of Zoo Animal Nutrition*, which provided background theory on behaviour change and how this links to making zoo staff support diet changes. The second workshop, *Covid-19 and Zoo Animal Nutrition*, offered examples of practical solutions that nutritionists had employed during the pandemic to save money and operate in new ways. The final workshop was *Bear Nutrition*, which gave us new insights into the dietary management of polar and brown bears.

The conference received excellent feedback, and allowed a greater audience reach than is often possible at live events. The recorded talks from EZNC2021 can be viewed here: www.eaza.net/events/european-zoo-nutrition-conference-2021-online/. We thank all the speakers who contributed and delegates that attended, and EAZA for their excellent support.

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Worldwide Zoo Consultants
Zoological Adviser
Zoologistics
Zooprofit

EAZA ANNUAL CONFERENCE 2021

The EAZA Executive Committee has decided to hold the EAZA Annual Conference 2021 online. This is due to continued uncertainty about the pandemic, and the risks inherent in gathering 800 or more delegates from more than 50 countries. A full programme is in development and details regarding registration will be circulated in good time.

NEW ARRIVALS

A PROGRESSIVE YEAR FOR THE SPOTTED EAGLE RAY

SPOTTED EAGLE RAY (*Aetobatus ocellatus*) is currently classified as a species that is Vulnerable to extinction (IUCN, 2020) writes *Jakub Kordas of ZOO Wrocław, Poland*. It is, of course, always better to secure a self-sustaining population rather than rely on acquiring animals from the wild. Therefore, the spotted eagle ray was one of the first pelagic ray species included in the European Studbook (ESB) programme. It started under the name of the white-spotted eagle ray programme in March 2010. The beginning was quite a challenge, as there were just eight participants and 21 wild-caught animals registered in European collections.

It needs to be mentioned that the Fish and Aquatic Invertebrate TAG (FAITAG) was established in 1999 (it has since split into different TAGs), and 10 years later under this TAG we had around eight fish species in ESB programmes and few proposals for the future. At that time only one institution in Europe was able to breed the eagle rays, and there were a lot of husbandry challenges to overcome for this species. There was simply not much data on how to work with these large animals in human care, and the data from the wild on the growth rate, age of sexual maturity and number of offspring as well as inter-birth period was insufficient.

A decade later, due to hard work, husbandry improvements, collecting data and the considerable interest shown by curators and aquarists, we are in a totally different situation. These past years also saw a big demand from large public aquariums, where eagle rays became popular residents.

Today more than 90 animals are housed in 14 participating institutions. Four of them (Atlantis, The Palm in Dubai, Royal Burgers' Zoo in the Netherlands, the National Marine Aquarium in the UK and ZOO Wrocław in Poland) breed this species on a regular basis. Nowadays 60% of these animals in human care are bred *ex situ* from still-alive wild-caught founders.

Due to the improvements in health management, feeding protocols, compatibility issues and shipping



procedures, institutions are increasingly successful in keeping eagle rays. Genetic research has been carried out within the studbook with a focus on paternity tests based on eight specific microsatellites. This tool is used successfully, and without it, it would be extremely hard to manage the breeding programme, as the eagle ray world is full of phenomena such as parthenogenesis or multiple paternity.

The second benefit of applying genetic research is the use of the DNA barcoding method for species identification. For quite a long time spotted eagle rays were defined as belonging to widely ranging circumtropical species *Aetobatus narinari*. After more research, this changed into three different species, of which *Aetobatus ocellatus* was the Indo-Pacific example. Genetic research showed that all founder animals within the studbook belong to this species. For

the RCP it was decided that *Aetobatus narinari* was not to be kept in the European region. Many things still need to be improved, but this past decade has seen a great step forward and shown how much has already been achieved. Last year's breeding success only confirmed this. Thanks to the efforts of three institutions (Royal Burgers' Zoo, National Marine Aquarium and ZOO Wrocław) there are now 10 offspring. At Christmas last year there was fantastic news when triplets were born in ZOO Wrocław.

The fact that this species is becoming a sustainably bred ray within a genetically healthy population is very important to our community. Each year aquarium-bred eagle rays' surplus are transported to other zoos and aquariums, and this animal is hugely appreciated by young visitors, not least because it is a character in the children's film, *Finding Nemo*.



LESSONS IN BREEDING LESSER FLAMINGOS

LEIPZIG ZOO, GERMANY, HAS BEEN KEEPING lesser flamingos (*Phoeniconaias minor*) since 2004 writes *Ruben Holland*. The enclosure is part of the big Africa Savannah exhibit and is divided into an outdoor area of around 610m², and an indoor area of about 40m² with 10m² of water. Initial breeding of the birds was in summer on an island in the outdoor enclosure.

Over the first decade, some eggs were laid, but only four chicks hatched of which only one survived and that was hand-reared. In 2014, we decided to breed the birds in the stable (indoor enclosure) in wintertime, as we observed that they were in courtship plumage towards the end of autumn. After some construction work the birds were provided with a perfect breeding surface. Mud was added to the indoor enclosure, and we separated the water and feeding area from the breeding area with a wall with two sliding doors. From that time on

during the whole breeding season no one entered the breeding part of the enclosure, and only the water and feeding area were cleaned daily. In addition, the temperature was always at a minimum of 20°C and the windows were at first covered in mirror foil to preserve heat. However, the foil became dirty after only a few days and the effect was lost.

In October the birds were housed inside and the breeding area prepared. At this point we changed the food from regular flamingo pellets to breeding pellets, together with 500g of Artemia per day. In the first year we had more than 40 eggs, but only one chick hatched and survived. Also, our keepers observed a lot of aggression in the group, especially amongst males without a female partner. These birds normally pair with other males and try to occupy other birds' nest hills, and eggs often fall out of the nest during this period. In the next breeding season, some changes were

made before the birds came in. We mixed salt with the mud and extended the light period to 16 hours a day. Also, all surplus males were excluded from the group during the breeding season and we used artificial nest hills as stimulation. That year eight chicks hatched and were reared by their parents. Since then, between seven and 11 chicks have hatched every year. In late March, breeding season is stopped so that the whole group can go out one month later. If the breeding season continues for longer, the bodyweight of the egg-laying females becomes very low and they need a longer time to regain their condition.

In summary, lesser flamingos breed best in wintertime in a big group of equal sex ratio and without any human disturbance. The temperature of the enclosure should be 20°C or more and salt should be mixed with the mud. With luck, these conditions will improve breeding success.

POLAR BEAR CUB BORN AT MULHOUSE ZOO

ON 22 NOVEMBER 2020 AT 5AM, the video surveillance from the maternity den at Mulhouse Zoo, France, confirmed that a polar bear cub had been born, writes *Brice Lefaux, CEO, Mulhouse Zoo*. After the birth of Nanuq at the end of 2016, this was the second polar bear cub for the Mulhouse community (M2A). Kara's birth is only the sixth birth of a viable polar bear in France in more than 20 years, so her arrival is rare and quite exceptional.

Kara's arrival was, of course, due not only to luck, but also to the expertise of the animal team at the zoo, which is an Arctic Ambassador Centre for Polar Bears International (PBI). First, the polar bear facilities were completely renewed in 2014. A maternity den in a separate building was built and cameras installed, and two welfare-based enclosures were designed to separate the mother from conspecifics and allow the lactating female to be at some distance from human activity. The community of Mulhouse invested more than €3 million for these improvements. Environmental factors were considered and created specifically to encourage and allow the bears to breed.

Secondly, all the keepers and veterinarians improved their skills in enrichment and medical training with a specialised training course. In 2018, keepers benefited from PBI training in North American zoos, and, in return, Mulhouse Zoo shared its experience by hosting a French-speaking research and welfare workshop. As Mulhouse Zoo's Welfare Policy states, individual



welfare and its assessment are a priority for the zoo team, and this influences breeding success in their polar bears.

The third and certainly one of the key elements of this breeding success is the animals themselves. The male and female always got along well and the previous birth showed how proficient the mother was at producing and caring for her cub.

Polar bear births remain rare even if the EEP records more and more successes – in the last season there were 10 viable cubs. But so far this winter there have been only three viable cubs.

These births are important for the dynamic of the population, as the LTMP mentioned. Encompassing almost 140 polar bears, the roles of the EEP are to ensure a future for this threatened species and to raise visitors' awareness of the need to mitigate climate change and to support research needs.

For Mulhouse Zoo, Kara is a very attractive animal and a wonderful ambassador for the need to tackle global warming. Changing behaviour in order to reduce our carbon footprint is a priority that the Mulhouse community shares with PBI, and we run scholar and visitor education programmes to that end. As an example, in a poll to choose Kara's name, each participant had to engage in ways of reducing their carbon footprint in order to cast their vote. The campaign attracted 7,500 voters and 31,600 such engagements, creating a four-tonne reduction in CO² emissions.

Global warning

ZOOQUARIA'S DAVID WILLIAMS-MITCHELL TALKS TO GILLES DOIGNON, COMMUNICATIONS UNIT, DG FOR ENVIRONMENT AT THE EUROPEAN COMMISSION AND COORDINATOR OF THE GLOBAL COALITION 'UNITED FOR BIODIVERSITY'



DWM: Gilles, can you remind readers about the Global Coalition "United for Biodiversity" and its aims?

GD: It is one of the main communication actions coordinated by the European Commission (EC), ahead of the 15th Conference of the Parties (CoP15) to the UN Convention on Biological Diversity (UN CBD) taking place in China this year.

Over the last year, our lives have been disrupted by the Covid-19 crisis, with its terrible consequences. Yet there is a worse crisis facing our generation and generations to come – the nature crisis.

In report after report, the science is clear: one million species are at risk of extinction within decades as a result of human activities. We are not talking just about polar bears and tigers, but about all organisms and ecosystems, from bacteria to pollinators, soil to ocean, forests to mangroves, which form our life-support system, providing us with food, oxygen and clean water. Half of the world's economy depends on healthy nature. And nature is our best ally in solving the climate crisis, or at least mitigating its effects. By destroying nature, we are jeopardising the future of our own species on Earth. We must take action urgently, and this is why the CoP15 is crucial: 196 Parties are expected to adopt a new global framework to protect and restore nature.

On 3 March 2020, World Wildlife Day, Virginijus Sinkevičius, EU Commissioner for Environment, Oceans and Fisheries, launched the Global Coalition 'United for Biodiversity'¹. The Coalition calls on all zoos, aquariums, national parks, botanic gardens, science and natural history museums to join forces and speak up for nature. Since then, the Coalition has been extended to all museums and to all research centres, universities and natural reserves or protected areas, including Natura 2000 in Europe.

The idea is to ensure that every citizen in the world understands the concept of biodiversity and its importance for humanity, as well as learning about this crisis and the actions each of us can take to solve it. The members and supporters also promote the Coalition pledge²

urging all municipalities, companies and governments to take measures. Each institution or organisation joining the Coalition is invited to display the pledge, to use social media to inform its followers about biodiversity and to activate its media network via press releases, as one of the main aims this year is to attract hundreds of journalists worldwide so they also communicate more about the crisis and the importance of the CoP15.

The good news is that the political momentum is growing. Under the Leaders' Pledge for Nature³ already 84 countries and the EU are committed to reversing biodiversity loss by 2030 for sustainable development. The EU and currently 58 countries also support a second political coalition, the High Ambition Coalition for Nature and People⁴. This intergovernmental group co-chaired by Costa Rica and France and by the UK as Ocean Co-Chair, is committed to protecting at least 30% of the world's land and oceans by 2030.

'United for Biodiversity' supports this process and we hope that our actions will convince more countries to join the initiatives, and will encourage national delegations to be ambitious at the CoP15.

DWM: How can EAZA Members, and zoos and aquariums more widely, help most effectively? Can you give an example of best practice so far?

GD: By the first anniversary of the Coalition, 205 institutions from 47 countries had joined us. Zoos and aquariums were the most represented partners, with more than 90 from Europe, and I would like to warmly thank EAZA and the national associations of zoos and aquariums in Europe for their support.

The Coalition is a great opportunity for zoos and aquariums to explain their role in nature and society. Very few people know that dozens of species would already have gone extinct without your *ex situ* and *in situ* research and conservation programmes. The same is true for the budgets allocated globally to projects on the ground: zoos and aquariums are the third largest donors after governments and

NGOs. Your pedagogical role is also key. Many young people fall in love with nature when they have the chance to observe animals. Some of them will be the conservationists, biologists and politicians of tomorrow.

We have seen how zoos and aquariums have a strong relationship with their visitors and followers, and they can put that to good use. After we asked everyone to use the hashtag #CoP15 on social media, we were impressed to see that, in just two months, the three most influential tweets and Instagram posts globally were from two European zoos. Each press release generates four or five articles, in local and international outlets. Several directors became ambassadors for nature on television programmes.

Our reach is expanding fast, but it is just the beginning. As we encourage all initiatives, more and more people are organising debates, exhibitions, projects with schools. We will develop joint communication actions after the CoP15, and my role as coordinator is to gather and share all good practices and ideas. As the spirit of the Coalition is that we are stronger together, we are also very pleased to see more and more members alerting their partners so they join the movement too, and we would be happy to welcome even more EAZA Members.

DWM: EAZA has worked with Botanic Gardens Conservation International (BGCI) and the European Network of Science Centres and Museums (Ecsite), who are both in the Coalition. Can you tell us who else is taking part, and about innovative joint activities between different types of institution?

GD: There are now 37 organisations and associations endorsing the Coalition pledge, including 16 zoo and aquarium associations. Other supporters represent many categories and interests, from protected areas (Eurosites, Europarc) to municipalities (Local Governments for Sustainability/ICLEI), Cities with Nature, botanic gardens (BGCI) to conservation societies or NGOs such as African Parks and Traffic. Each brings its own expertise

and regional angle.

We were very happy to be approached by the research community and are honoured to collaborate with the Global Biodiversity Information Facility (GBIF) and specialised scientific groups such as the Global Soil Biodiversity Initiative (GSBI). This is very important, as we need to ensure we communicate using the most up-to-date and reliable scientific facts. More and more research centres are confirmed, and the University of Bergen in Norway is officially the first to join the Coalition, and its call urging all to join was disseminated by the International Association of Universities.

Natural history and science museums are the second largest category in the Coalition, thanks to the support of Ecsite and the Consortium of European Taxonomic Facilities (CETAF). These institutions bring invaluable knowledge to the Coalition: in their collections, CETAF members host over 1.5 billion specimens that represent nearly 80% of all described species worldwide. Most of their members, such as the Natural History Museums of Berlin, London, Paris, Vienna and Madrid, have already joined us and we expect all will be confirmed for the World Biodiversity Day on 22 May.

Our most recent supporter is the International Council of Museums (ICOM), which, on Earth Day (22 April), invited all its 40,000 members worldwide to speak up for nature. It means art, history, maritime and architecture museums will show why nature is so important for humanity, how it inspired so many artists, engineers, philosophers. This is exactly the spirit of the Coalition: we want to build bridges among all organisations and institutions that share a passion for nature. Just imagine zoos, research centres and museums providing scientific comments to be displayed by art museums, explaining why the birds in a 17th-century painting of an Italian landscape have disappeared because of pollution or climate change, and what can be done to protect them.

DWM: If the new framework for biodiversity meets expectations, what will happen to the Coalition then? It seems to have a lot of potential.

GD: The potential is indeed huge. The CoP15 is a very important step but is not the end of the fight. Regardless of its outcome, we need actions on the ground, we need transformative change

of our societies, to redefine the way we consume and use natural resources. The Coalition is the perfect platform to inform and inspire millions, not only citizens but also business leaders, mayors and politicians, on a global scale.

There is still time to act, but the time is now. The next 10 years will be crucial, which is why we are brainstorming with several partners to maximise synergies. The secretariat of the CBD is preparing a major communication strategy around the post-2020 framework. Similarly, the Coalition would be a strong ally for the UN Decade of Ocean Science for Sustainable Development as well as for the UN Decade of Ecosystem Restoration which will be launched on World Environment Day on 5 June.

In terms of communication actions to be developed after the CoP15, more and more ideas are already flying around, based on best practices. A great example is the exhibition 'Extinction Voices' (Bristol Museum, UK), mourning the species on the IUCN Red List, each specimen covered by a black veil. Another potential project is to collaborate with airports to explain to all tourists how they can respect nature, and contribute to the fight against wildlife trafficking. Last but not least, each Coalition member could become the ambassador for one species. For zoos and aquariums, the ideal choice would be species in their conservation, education or research programmes.

It is clear that we should also link these actions with climate change campaigns: the nature crisis and the climate crisis are two sides of the same coin.

DWM: How optimistic are you that society will act in time to save the majority of animal and plant species, and restore degraded ecosystems?

GD: For many species, it is already too late: extinction is for ever. And we humans are responsible for the sixth mass extinction. We all know about iconic species such as the dodo from Mauritius. What is less well known is that our impact can have long-term consequences: for example, because so many cheetahs were killed by the Romans during the circus games, the genetic pool of existing populations is now very low. What is unpredictable is the evolution of life on Earth, particularly when so many species disappear: each is a piece of the puzzle, connected to

many others. This is what we show on the two visuals for the Coalition: it is time to reconnect with nature.

Yet there is still hope. Nature is resilient. Many animal populations increased in 2020 because they were less disturbed by humans. But we should not need a pandemic to protect nature. When we implement the right policies, with adequate funding and monitoring, we can restore nature, sometimes very quickly. For example, many fish stocks in the north-east Atlantic were close to collapse 20 years ago and most are at sustainable levels now thanks to the collaboration between scientists, policy-makers, conservationists and fishermen. The same is true for many wild species once close to extinction such as the lynx, thanks to projects funded under the LIFE programme. We need to do more and this is the core of the EU Biodiversity Strategy for 2030. Yet Europe alone cannot solve the nature crisis, which is why the CoP15 is so important. We need everyone on board.

I would like to end with individual involvement. Every action, however small, is important. In Belgium, campaigns encouraged citizens to create one square metre of biodiversity on their balconies, or to keep gardens wild until May, oases for insects and flowers to have time to reproduce. In India, the action of one man, Afroz Shah, who started collecting trash on a beach every day, inspired so many that a real national movement was born. And guess what? For the first time in decades, baby turtles hatched on that beach: nature came back.

For more information about the Global Coalition 'United for Biodiversity' go to:

<https://ec.europa.eu/environment/nature/biodiversity/coalition>

Join the movement on social media:

#UnitedforBiodiversity (also in all languages) and #CoP15

Zoos and aquariums can contact the coordinator, Gilles Doignon, on:

gilles.doignon@ec.europa.eu

<https://twitter.com/gillesdoignon>

References

¹ https://ec.europa.eu/commission/presscorner/detail/en/ip_21_891

² <https://ec.europa.eu/environment/nature/biodiversity/coalition/images/poster.jpg>

³ www.leaderspledgefornature.org

⁴ www.hacfornatureandpeople.org



THE STARK CONTRAST BETWEEN FARMLAND AND THE ATLANTIC FOREST OF BRAZIL

Rewild Carbon

HOW A NEW PROJECT AT DURRELL IS NOT JUST PUTTING NATURE AT THE HEART OF CARBON OFFSETTING, BUT ALSO OVERHAULING THE WHOLE OFFSETTING CONCEPT TO DELIVER REAL IMPACT

Rachel Hughes, Durrell Wildlife Conservation Trust, Jersey

At Durrell, our mission is to save species from extinction, but we have also been, almost unnoticed, sequestering carbon across the world. The voluntary carbon market is expanding and becoming more vibrant, so we have looked into how to develop our conservation projects as carbon projects, but in a way that is wild, effective and has nature at its heart. We are very proud to be launching Rewild Carbon, our carbon offsetting programme, which not only makes carbon savings, but also benefits biodiversity and local communities.

We want now to share the journey of how we developed it, why it is such a compelling investment for nature, climate and local communities, and how partnering with us could contribute to your own conservation goals.

Our understanding of the overexploitation of the planet has advanced with grim, sharp clarity in recent years. Climate change and biodiversity loss are two sides of the same coin and we solve both or neither. The world is now facing another major crisis, the pandemic. Biodiversity, climate change and the pandemic have overlapping root

causes, and therefore natural climate solutions are a powerful means of addressing these issues holistically.

Rewild Carbon is a carbon offsetting programme like no other. It's reviving ecosystems, recovering species, reducing carbon and rebuilding livelihoods. By offsetting your carbon with Durrell, you are not merely investing in a 'stick of carbon', but in a living, breathing ecosystem and the many animals and communities that flourish there. This avoids the pitfalls of inferior products where carbon offsetting, if done improperly, can cause more harm than good. Forest restoration that is not well designed can mean rows of fast-growing non-native monocultures, sometimes planted in the wrong place entirely. These may have quick wins for carbon in the short term but are a disaster for wildlife and, as we increasingly understand, escalate pandemic risk. Even worse, they ultimately don't meet their carbon goals.

EFFECTIVE OFFSETTING

We knew that if we were going to offer carbon offsetting, it needed to have a real impact. Here is why you can feel confident that offsetting through

Rewild Carbon is profoundly beneficial for nature:

- We've been capturing and storing atmospheric carbon for over 60 years, although we have not exchanged it as such until now.
- Our ecosystems, although rich in biodiversity, are highly threatened with endangered species living amongst the last fragments. Species-rich forests can sequester up to 40 times more carbon than monocultures.
- 95% of the money you invest in Rewild Carbon will go straight to nature.
- We will translate tonnes of carbon into wild commodities, such as the number of species moving through your trees.
- Our projects are designed with local communities and benefit sustainable livelihoods.
- We work with local partners with whom we have long-standing relationships. Together we can better understand the wildlife, the land and the threats they face.
- Our approach is transparent and science-driven.

IMPROVING THE SYSTEM

The carbon offsetting market is a complicated area, and has had a troubled history, so we've spent a year doing our homework and researching what makes a highly credible and effective offset. One of our most surprising findings was in the area of certification. Most carbon schemes are certified to one of many standards; however, the deeper we looked into certification, the more we realised that by keeping the scheme in-house we could deliver so much more impact for nature.

For example, we were surprised to learn that in many cases 40–80% of the money invested by an offset buyer in a certified scheme does not go to the carbon project itself, but to certification fees, shareholder profit, intermediaries and resellers, and project administration. The schemes were also very complicated, requiring investment in outside expertise and took two years to become certified. To us, this was too much lost time, and a loss of critical funds that could otherwise be restoring ecosystems. In addition, at some point

a carbon investor has to show trust in the delivery on the ground from institutions with meaningful track records. No one questions if they need to certify the certifier, yet there are poor-quality projects on the market that are fully certified.

So instead of certification, we have focused our efforts on designing a carbon-offsetting programme that puts nature, not profit, first, and has a transparent process that stands up to scrutiny. Here are some of the steps we have taken to ensure high integrity:

- We have written a detailed, publicly available Project Design Document, which sets out the science and theory behind the project – it follows the guidance of one of the certification standards but does not go to the expense of being certified by it.
- We've built an in-house carbon registry database where each tonne of carbon is carefully tracked to ensure we can't sell it twice.
- We have reduced our carbon estimates by 20% to ensure they are conservative. And we've built a 20% 'insurance buffer' into our ecosystems, meaning that we do not sell 20% of the carbon there in the event of a natural or man-made disaster.
- And finally, we are placing significant emphasis on vigorous monitoring and reporting, a long-held expertise of Durrell. We don't want investors to just walk away with a transaction for carbon and a stamp to show for it, we want to truly engage them in the project, with the sounds and sights from the precious ecosystem they are restoring, annual reports and bi-annual newsletters. We want to be partners in this endeavour.

THE BRAZIL PROJECT

We are launching the first Rewild Carbon project in the Atlantic Forest of Brazil alongside our local partner Instituto de Pesquisas Ecológicas (IPÊ), with whom we have collaborated for more than 20 years. This extraordinarily lush forest in Brazil is one of the richest, most biodiverse and threatened habitats on the planet. Tragically, only 6% of it remains today, in isolated fragments; the remainder has been replaced by

THE ENDANGERED BLACK LION TAMARIN
(*LEONTOPITHECUS CHRYSOPYGUS*)



pastures and intensive farmland.

The project aims to restore 4,500 hectares of vital forest corridors by 2030, linking these isolated fragments and thereby creating lifelines for the wildlife, including highly threatened populations of black lion tamarins, jaguars, tapirs and giant anteaters.

These tactically situated corridors are established by planting 100 different species of native tree, which will sequester nearly 2 million tonnes of CO₂ equivalent over the trees' lifetime. The trees are planted in a carefully considered way to maximise success and are nurtured for the three years it takes until they can survive on their own. If a tree dies, another is planted in its place. This is very different to many planting schemes that are heralded in the media, which promote millions of trees planted but rarely follow up to see the survival rates, which can be extremely poor, especially in seed-scattering schemes.

Local people are at the heart of this project. The areas to be planted are designed in collaboration with communities, and the trees are grown and planted by them. The project also involves agroforestry, thereby providing sustainable livelihoods for the true guardians of this rich landscape.

The key species on which the project focuses is the endangered black lion tamarin (*Leontopithecus chrysopygus*), which Sir David Attenborough has named as the number one species he would like to save from extinction. There are thought to be 1,000 of these tamarins left in the wild in the project area.

Jersey Zoo is the only place where they are held outside Brazil, with nine individuals. Existing forest remnants are probably at carrying capacity, therefore the connectivity and expansion of the forest, and therefore Rewild Carbon, is key to their conservation. The project also funds the design and deployment of 100 nest boxes in the newly planted forest corridors, as successfully trialled in Jersey Zoo's free-ranging tamarin forest, to ensure they have safe sleeping sites as they move through the forest corridors.

Launching Rewild Carbon was also the perfect opportunity to better understand our own emissions as a zoo. This year we have worked with an expert to calculate Jersey Zoo's emissions for the past three years, meaning we can identify where we are doing well and where we can do better. Starting from 2019, we will be offsetting all those emissions that we cannot yet reduce to become a carbon-positive zoo. We are already putting this into action. For example, in 2020 we chartered an emergency mission to rescue 66 Mauritian reptiles on the brink of extinction from the impacts of the Wakashio oil spill and ensured that the flights were carbon positive by investing in planting trees through our own carbon-offsetting project.

Our Rewild Carbon programme is being launched to organisations this summer. If you are interested in hearing more about how your zoo could offset in a way that has biodiversity at its heart, we would love to hear from you: please contact us at Rachel.Hughes@durrell.org.



Sustainable solutions

HOW MARINELAND ADOPTED A SUSTAINABLE SEAFOOD DIET FOR THE ANIMALS IN ITS CARE

Christopher Scala, Head Veterinarian, Marineland, France

Marineland Côte d'Azur is home to a large collection of marine animals, including two species of cetaceans – killer whales (*Orcinus orca*) and Atlantic bottlenose dolphins (*Tursiops truncatus*) – five species of pinnipeds, polar bears (*Ursus maritimus*), three species of penguin, loggerhead sea turtles (*Caretta caretta*) and a hundred species of shark, ray and coral reef fish. Seafood is the main item we use to feed our animals; all of these animals consume about 600kg of seafood each day, or 210 tonnes per year.

As an institution concerned about the preservation of natural habitats and wildlife conservation, it is important for us to ensure the sustainability of these food sources and to continue to have access to these

resources for our animals, especially when large quantities are being used daily.

SUSTAINABLE SEAFOOD

We started to pay attention to sustainability four years ago, and at that point we chose to work with one major seafood supplier, Seafoodia, as it already had a policy of sustainability. Seafoodia provides us with the majority of our seafood, so using sustainable seafood has been relatively easy since then. We also have other suppliers for certain items that are bought in small quantities, such as the zooplankton that is used to rear the larvae of coral reef fish.

Our main supplier ensures that seafood is from selective and non-

destructive fishing practices; that overfishing of some species is avoided to aid the preservation of wild stocks and marine biodiversity; that criteria are met in terms of minimum legal catch size and location and seasons of fishing, to allow fish to reproduce at least once in their lives; and it ensures compliance with the regulations in terms of international quotas of each species to avoid massive irreversible losses in the future. The IUCN classification status, the fishing areas of the Food and Agriculture Organisation (FAO) of the UN, and the fishing methods preserving marine environments are important criteria that are taken into consideration by our supplier when they choose which fish they buy. Certifications exist,

created by such bodies as the Marine Stewardship Council (MSC), the Aquamarine Stewardship Council (ASC), or the Friend of the Sea (FOS), but they are not the most important criteria. These certifications are chargeable and granted by non-governmental organisations; thus, many fisheries choose not to be certified, although their practices are sustainable because they meet the other criteria set out above. As a zoological park, we cannot at our level verify all the sustainability criteria of all fisheries. Therefore, having trust in and a good relationship with our supplier is essential.

Marineland is located on the Mediterranean coast of France, and a majority of our sustainable seafood comes from the north-east Atlantic Ocean and from the Mediterranean Sea. In addition, our supplier's storage warehouses are located close to our park. All this reduces the carbon footprint associated with transport. New constraints have arisen with the use of sustainable species. One important constraint was the size of the prey. Fishing must involve only adult fish, if they are to have the opportunity to reproduce and maintain wild stocks. A very clear example concerns dolphins. In some parts of the world, bottlenose dolphins eat common pandora (*Pagellus erythrinus*) or red porgy (*Pagrus pagrus*). At the sizes available in the markets, these fish have highly developed dorsal spines, which can be dangerous for animals when swallowing. Smaller fish have shorter and soft dorsal spines, which could allow them to be fed

to the animals, but these juvenile stages should not be fished as they have not had the opportunity to reproduce to maintain the wild stocks. Therefore, common pandora and red porgy are not incorporated into diets. Another important constraint created by the use of sustainable species is the conservation status in the wild. Recently we were looking at incorporating law croaker (*Pseudotolithus senegallus*) into our animals' diets, but because its status is Vulnerable on the IUCN Red List, we decided not to use this species.

We are also committed to reducing all waste related to seafood. Seafood is prepared in the park's Nutrition Centre for all our fish-eating species. Only phytoplankton and zooplankton are cultured in the Aquarium. All seafood is thawed during the night and is offered to the animals on the following day, but no later; at the end of the day, 100% of leftover food is recycled by a dehydrator and the waste is used at the park as fertiliser for the plants.

SEAFOOD DIVERSIFICATION

Historically, the prey species fed to animals were few. In 2018, we decided to initiate an important process of food diversification to improve the health and the nutritional welfare of all the animals we care for. We reviewed our feeding plan with the objectives of increasing the number of items, providing more naturally consumed items, and using more sustainable species. It was initially applied to dolphins, to manage some metabolic syndromes of nutritional origin described in some individuals

in human care. But the diversification of diets was very quickly extended to all the other marine mammals at the park. This seafood diversification was a great opportunity to incorporate into our criteria the use of as many sustainable species as possible.

During the process of creating new diets, we try to incorporate prey items for each of our species from the habitats where their wild counterparts come from, to be as close to wild diets as possible. And for marine mammals that eat a large diversity of prey in the wild, we try to have at least five different food items in their diets every day, which is also the case in the wild. Indeed, for example, Atlantic bottlenose dolphins can eat about 30 species of prey in the wild, but they consume only about three to five preferential preys, and we try to reproduce that with our animals.

Currently we have at our disposal 18 different species of fish, five species of mollusk and crustacean, and phyto- and zooplankton that can be used in our animals' diets. To achieve this diversification of food, in 2018 we made a chart with clear specifications of the needs of our animals, in terms of, for example, new prey species, size or maximum frozen storage time. With this document, our seafood supplier was able to work on finding many other species for us. It took two years for this process to start showing interesting results, and it continues to this day.

Our animals sometimes needed a period of adaptation in terms of the size and taste of fish when we introduced certain new seafood species. Marine mammals have a clear taste preference and they choose to eat certain species over others, and this is not necessarily related to the fat content of the items. But with patience and training, the vast majority of new seafood has been accepted by all our animals.

To care about sustainability is an obvious choice for us if we want to continue to provide our animals with high-quality diets. The EAZA Which Fish? campaign was a great opportunity for us to communicate our seafood sustainability policy to our visitors, through public interactions in the park and with messaging on our website and in our social media.





WESTERN TUR (*CAPRA CAUCASICA CAUCASICA*)

A bright future for caprines

A NEW RCP AND A TIMELY WORKSHOP HAS CLARIFIED THE WAY FORWARD FOR THIS OVERLOOKED SPECIES

Marco Penello, EAZA Caprinae TAG Vice-Chair, Parco Faunistico Valcorba, Italy; Pascal Damois, EAZA Caprinae TAG Chair, Parc Animalier d'Auvergne, France; Dennis Müller, EAZA Caprinae TAG Vice-Chair, Zoologischer Garten Halle, Germany

Caprines have always been, and are still, a rather unpopular taxonomic group within the zoo community, often limited to a few specialised collections. As a result, the Caprinae TAG has experienced difficulties in finding new holders for the majority of the species under its remit. Modern zoo philosophy aims to create more space for all species within our zoo community and to provide the best possible conditions for the animals under our care. Many zoos are therefore reducing the number of species in their collections to provide more space and

create better enclosures. Although this development is welcomed, it does mean that when institutions are considering which species to have in their collection, they often choose the more popular 'crowd-pullers' to meet the preferences and expectations of visitors. This creates challenges for the future management of less popular species such as caprines, even though they offer great opportunities to contribute to conservation, showcase interesting exhibits and spread important conservation and non-conservation messages.

Caprines play an important role in human history, as our progress owes a great deal to the domestication of goats and sheep. Furthermore, caprine species are an essential part of the ecosystems they live in as they are the favourite prey of many endangered predators such as snow leopards (*Panthera uncia*), some subspecies of leopard (*Panthera pardus*) and even tiger (*Panthera tigris*) in certain habitats, and are therefore crucial for the conservation of those predators. Additionally, their browsing behaviour has an enormous effect on the plant societies of their ecosystems.

The subfamily caprinae is one of the most threatened among mammals; approximately 23% of species are endangered, and many more have experienced an alarming rate of decrease in their wild populations (and sometimes also the *ex situ* populations) for several years. The greatest threat to wild caprines is unregulated hunting and poaching. This has affected almost all caprine species, driving several towards extinction, wiping out many small populations and reducing ranges; because they have high fidelity to their home ranges and use open habitats most of the time, this makes them more vulnerable to hunters. Other negative factors include increasing competition with livestock and the accompanying transmission of diseases, loss of habitat, fragmentation of isolated populations and road building that improves access to remote mountain areas. Many people are unaware of these conservation issues, even in the EAZA community.

Therefore, it is time for proactive management for the Caprinae TAG; it is our firm intention to ensure a new and brighter future for caprines within our collections and in their natural ranges. To this end, the new-style EAZA RCP of the Caprinae TAG was approved and published last November and is now available to download from the EAZA Member Area. In preparation for the RCP, a very productive and interesting workshop was held at the EAZA Executive Office in Amsterdam, the Netherlands, from 3–5 February 2020 just before the Covid-19 pandemic rolled across Europe. The workshop was attended by TAG past and current members and by Stefan Michel as representative of the IUCN Species Survival Commission (SSC) Caprinae Specialist Group. A total of

30 taxa were assessed. Among these, 22 species are currently kept within EAZA zoos, while eight species – red goral (*Naemorhedus baileyi*), long-tailed goral (*Naemorhedus caudatus*), Nilgiri tahr (*Nilgiritragus hylocrius*), Walia ibex (*Capra walie*), chiru (*Pantholops hodgsonii*), Japanese serow (*Capricornis crispus*), Formosan serow (*Capricornis swinhoei*) and Sumatran serow (*Capricornis sumatraensis*) – are not kept in our collections. Within the new RCP the TAG proposes 12 new-style EEPs, including five totally new programmes:

- Takin (*Budorcas taxicolor*) – EEP
- Markhor (*Capra falconeri*) – EEP
- Musk ox (*Ovibos moschatus*) – EEP
- Western tur (*Capra caucasica caucasica*) – EEP
- Urial (*Ovis vignei arkal*, *Ovis vignei bochariensis*) – EEP
- Chinese goral (*Naemorhedus griseus*) – EEP
- Alpine ibex (*Capra ibex*) – EEP
- Chamois (*Rupicapra rupicapra*, *Rupicapra pyrenaica*) – EEP
- Nubian ibex (*Capra nubiana*) – EEP
- Barbary sheep (*Ammotragus lervia*) – EEP
- Blue sheep (*Pseudois nayaur*) – EEP
- Wild goat (*Capra aegagrus*) – EEP phase out

HIGHLIGHTS OF THE RCP

The Wild goat EEP is particularly innovative and interesting because it is the first ‘phase out’ EEP within the Caprinae TAG; its aim is gradually to phase out the species from EAZA collections (150 wild goats > 10 EAZA Members) and create space for other species that urgently need new holders. This decision was taken because the

pedigree of the specimens kept in our zoos is completely unknown (very probably all hybrids) and have little conservation value. We encourage all holders of wild goats to think about replacing them and to contact the new coordinator for support in finding an alternative. Why not consider priority species such as the beautiful and endangered Western tur or the markhor with its unique appearance and insurance and research roles?

There are other species not managed as a programme but always assessed and monitored by the TAG, which the TAG recommends should be gradually decreased in number or even phased out or replaced by priority EEP species. For example, it is recommended that the Eastern tur (*Capra caucasica cylindricornis*) be replaced with the more endangered Western tur.

The greatest challenge will be a reduction of the huge population of European mouflon/feral sheep (*Ovis aries musimon*) of which there is an enormous number – more than 700 animals – in our zoos. These herds should be replaced wherever possible with recommended wild species, not necessarily only from the Caprinae TAG. Many endangered deer species might also be a good option for former European mouflon enclosures. Nevertheless, we strongly recommend one of the Caprinae TAG’s priority species as the perfect match for such a replacement. For instance, why not help us build an insurance population for the two subspecies of urial that are on the brink of extinction and have similar husbandry needs as the mouflon? Other species for which

we need to reduce the population in a coordinated manner are the blue sheep and even more the Barbary sheep, which numbers more than 500 specimens. We are happy to help anyone who would like advice on how to plan such important replacements.

The flagship species of the TAG are undoubtedly the two largest and most charismatic caprinae species, namely the musk ox and the takins. In particular, the Takin EEP needs more holders to increase the number of animals in the insurance population within our zoos. The TAG has decided to focus on the Mishmi takin (*Budorcas taxicolor taxicolor*) and the golden takin (*B. t. bedfordi*) to develop into insurance populations, while the Sichuan subspecies will preferably be phased out to create space for these subspecies.

Last but not least, if you like mixed enclosures for herbivores you should strongly consider caprines. Takin, markhor, Nubian ibex, Chinese goral and urials are excellent solutions for very interesting mixed exhibits; you could create a completely new enclosure, or you could add a caprine species to an already existing one.

Of course, we are aware that it is impossible to reach all our aims in the short term – our RCP is a long-term plan. However, ‘well begun is half done’. Now is the moment for you to make a difference and ensure a brighter future for these marvellous creatures. We are looking forward to actively supporting you, so check out the new RCP for more details on our decisions for these magnificent species. Feel free to contact us with any questions!



BLUE SHEEP RAM AND GOLDEN TAKIN © HALLE



WESTERN TUR IN WINTER © HALLE

A race against time



THE NEW FRESHWATER TELEOST RCP IS COMMITTED TO ADDRESSING THE EXTINCTION THREAT TO THESE CAPTIVATING FISH

David Aparici Plaza, EAZA Coordinator Animal Programmes and Conservation; Brian Zimmerman, EAZA Freshwater teleost TAG Chair, Bristol Zoo, UK; Anton Weissenbacher, EAZA Freshwater teleost TAG Vice-Chair, Zoo Vienna, Austria.

In November 2019, the EAZA RCP workshop for freshwater teleosts took place at the EAZA Executive Office in Amsterdam, the Netherlands. The workshop required months of preparations and planning, including a session during the 2019 EAZA Annual Conference in Valencia, Spain, to develop the TAG's mission statement:

'To achieve conservation by managing freshwater teleost populations that mainly function as ark or rescue populations. A large number of freshwater fishes are threatened with extinction and several are already extinct in the wild. For many of these species, *ex situ* populations can be maintained with relatively few resources and high chances of a successful reintroduction to the wild in the future. The EAZA community has the ability in many cases to respond rapidly to a changing situation in the wild and prevent extinction.'

It is important to realise that 51% of fish species are found in fresh water but only 1% of aquatic habitats are fresh water. Out of all the freshwater fishes, 56% have been assessed by IUCN, and of those 30% are at risk of extinction. The threats that freshwater teleosts face include habitat destruction, invasive species, human disturbance, pollution, pesticides, damming, overfishing and climate change.

The Freshwater teleost TAG may face challenges that other TAGs do not, requiring tailor-made solutions. Rapid ecosystem alteration in the Anthropocene poses significant and immediate threats to freshwater habitats due to their small size, which makes them particularly vulnerable. A rapid

change that occurs in a small ecosystem leaves little opportunity for the species living there to adapt. Many freshwater springs, streams and other wetlands are essentially aquatic islands that trap their inhabitants and leave them at the mercy of human development. With nowhere to escape to, many species suffer a rapid demise. There are still many undiscovered and undescribed freshwater fish species surviving undetected and unprotected in these habitats and they will need help in the future.

LONG-TERM PLAN

It cannot be emphasised strongly enough to EAZA Members that the efforts to prevent the complete extinction of these species requires a strong commitment to this RCP and that they should expect a long-term commitment to the species they agree to hold. The TAG sees the commitment to species as a long-term strategy in order to achieve a result for conservation.

The EAZA Freshwater teleost TAG is overseeing more than 21,600 species from more than 200 families. Given the high number of species under the TAG's remit, it was decided that the most efficient way would be to manage programmes at family level. After reviewing all 200 families, the TAG shortlisted 84 families to discuss in more detail. A number of selection criteria were established in order to prioritise families with species in greatest need of TAG support. These included:

- avoiding families that contained only species from countries with sufficient resources in place to develop their own plans, including USA, Canada, Australia, New Zealand, Japan,

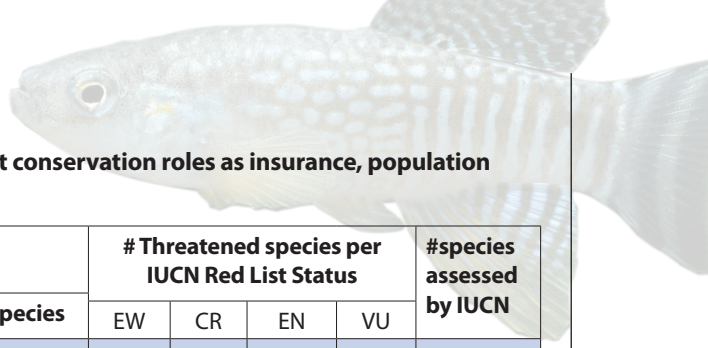
- China, Russia and South Korea;
- ensuring that at least one species within the selected families would be likely to benefit from *ex situ* management, preferably species/families with an aquarium husbandry history, to ensure that it is possible to breed them and to provide them with good welfare; and
- eliminating families that already have significant conservation efforts being applied due to, for example, their commercial importance.

As a result of the RCP process, 30 families were selected for an EEP management level, as shown in the table opposite. From these 30 families, there are currently 1,431 species assessed as threatened by IUCN. It is important to note that this number is constantly changing, most often with the number of threatened species increasing in each family, as more information is gathered and assessed and data-deficient species are evaluated in greater detail.

CONSERVATION PRIORITIES

It is clear that until now the global zoo and aquarium community has been slow to act for freshwater fish conservation. Proportionally, litre per litre, public aquariums devote far more space and resource to marine systems. It could be argued that for many marine fish species the direct conservation benefit of having them in an aquarium is limited; awareness-raising and research roles are easier to demonstrate than frontline extinction prevention. This has undoubtedly led to a direct limitation on space provided to freshwater species on the doorstep of extinction.

This argument is substantiated when reviewing the global species-holding data on ZIMS and the consolidated records of the zoo and aquarium community. For example, the global commitment to the extinct-in-the-wild Monterrey platyfish (*Xiphophorus couchianus*) rests on only two institutions, tasked with safeguarding the loss of this species. Yet in comparison, 165 institutions keep the common clownfish 'Nemo' which is now commercially produced in vast quantities for the ornamental aquarium industry. Although the keeping of 'popular' species may help aquariums to satisfy visitor expectations, the proportionally greater space, cost and time dedicated to keeping 'Nemo'



reduces the ability of an institution with limited resources to contribute to meaningful frontline conservation efforts for species on the verge of extinction.

The Freshwater teleost TAG is looking to the European zoo and aquarium community to step up and seriously commit to species conservation by supporting our efforts to act as a frontline barrier to species extinction. We are looking for EEP Family Coordinators and for institutions who are seriously committed to demonstrating their conservation credentials by dedicating some of their footprint and staff time to managing populations of threatened freshwater fish species. The TAG is ready to provide support, information and guidance on how to make a lasting impact and prevent extinction.

EEP Family Coordinators are asked to be the contact point for their fish family for EAZA and the European Union of Aquarium Curators (EUAC) and the wider zoo and aquarium community in Europe. They will need to keep an inventory of the numbers of individuals being kept by zoos and aquariums for each species in the family. They should stay updated on the species' status, *in situ* conservation efforts, breeding and husbandry information and seek new institutional holders when necessary. They also will sit on the TAG Steering Committee and be prepared to attend at least two (virtual) TAG meetings each year.

Institutions that want to support the TAG's efforts should be prepared to commit space and time for managing a population of at least one of the species in the RCP for an indefinite period. Conservation (especially reintroductions) takes time to achieve. Committing to keep and maintain a species is therefore not a short-term task. We expect this commitment to include providing simple inventory data on an annual basis, reporting issues such as disease to the EEP coordinator promptly, and following management advice such as scheduled transfers between institutions and maintaining agreed population demographics as set by the coordinator.

If you and your institution are interested in taking part, please do get in touch.

30 EEPs with a focus on direct conservation roles as insurance, population restoration or research

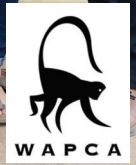
RCP Category: EEP		# Threatened species per IUCN Red List Status				#species assessed by IUCN
Family	#species	EW	CR	EN	VU	
Adrianichthyidae - Ricefishes	37	-	5	4	1	36
Alestidae - African tetras	119	-	1	4	9	108
Aplocheilidae - Killifishes	14	-	-	5	2	14
Atherinopsidae - Neotropical silversides	112	-	7	8	3	73
Bedotiidae - Madagascar rainbowfishes	16	-	6	9	8	28*
Callichthyidae - Armoured catfishes	206	-	-	1	1	44
Characidae - Characins	1135	-	3	3	13	244
Cichlidae - Cichlids	1713	-	118	62	94	1190
Cobitidae - Loaches	262	-	9	18	14	149
Cyprinidae - Minnows or carps	3163	1	124	204	234	2158
Cyprinodontidae (inc. Aphaniidae) - Pupfishes	137	3	9	17	18	78
Distichodontidae - Distichodus	102	-	2	3	4	90
Fundulidae - Topminnows and killifishes	44	-	2	3	3	41
Gasterosteidae - Sticklebacks and tubenouts	18	-	1	1	1	17
Goodeidae - Splitfins	51	2	14	14	6	41
Lebiasinidae - Pencilfishes	77	-	1	-	-	13
Melanotaeniidae - Rainbowfishes	95	-	2	1	9	36
Nemacheilidae -	696	-	17	29	44	298
Nothobranchiidae - African rivulines	273	-	5	31	36	206
Osphronemidae - Gouramies	133	-	16	30	20	123
Percidae - Perches	239	-	10	18	30	225
Phallostethidae - Priapiumfishes	23	-	-	1	1	4
Poeciliidae - Poeciliids	349	2	4	12	16	176
Profundulidae - Middle American killifishes	9	-	-	1	1	7
Pseudomugilidae - Blue eyes	18	-	2	1	2	8
Telmatherinidae - Sailfin silversides	18	-	-	2	1	11
Tetraodontidae - Puffers	200	-	-	-	2	176
Umbridae - Mudminnows	7	-	-	-	1	5
Valenciidae - Toothcarps	3	-	2	-	-	2
Zenarchopteridae - Halfbeaks	63	-	-	1	4	39

EW = Extinct in the Wild; CR = Critically Endangered; EN = Endangered; VU = Vulnerable.
*IUCN has assessed species not yet officially described and named.



Primate priorities

LEFT: WHITE-NAPED MANGABEY AT EEP PARTICIPANT KUMASI, GHANA; BELOW: THE WAPCA TEAM



THE RECENT PUBLICATION OF THE NEW LTMP FOR MANGABEYS SETS OUT THE LONG-TERM STRATEGY FOR THREE SPECIES UNDER THREAT

M. Teresa Abello and Taide Pérez, Barcelona Zoo, Spain; Tjerk ter Meulen, Artis Zoo, the Netherlands; Andrea Dempsey, West African Primate Conservation Action (WAPCA); Elmar Fienieg and Maaike Voorham, EAZA Executive Office

The **LTMP for Mangabeys in EAZA** was published on 5 June 2020, after an intensive meeting on 4–5 March 2020 at the EAZA Executive Office in Amsterdam, the Netherlands, just before Europe closed its borders. The advisors and species committees provided input and reviewed the plan before and after the meeting. We thank them for their collaboration. Populations of three species of mangabey are managed as EEPs under the Afro-Eurasian Monkey TAG, which have various direct and indirect conservation roles. All three species (see table below) can be used to convey conservation optimism using the success story of the White-naped mangabey, which in many ways follows the philosophy of the One Plan Approach. For a full list of roles, please see the Mangabey EEPs LTMP

on the EAZA website. Each mangabey has its challenges, and in particular the Cherry-crowned and the Black-crested mangabey EEPs have a need for significant change.

The White-naped mangabey EEP is a conservation success story in the making thank to its Ghanaian EEP participants, Accra Zoo and Kumasi Zoo, and WAPCA support. This allows the EEP to mitigate threats to the species through education inside the species' range and to potentially function as a source for reintroduction, if suitable release sites can be identified by the Ghanaian Wildlife service and WAPCA. To prepare for this, the EEP will gradually build up a robust population at Accra and Kumasi to supply the necessary animals if and when these will be needed. The EEP's

positive demographic and genetic status can to a significant extent be contributed to this collaboration as well. Accra, Kumasi and WAPCA have facilitated the addition of new genes and keep around a third of the total EEP population.

Within Europe, breeding has been quite successful in the last few years, and as a result, animals are available to form new breeding groups in Europe as well. Therefore, more institutions willing to participate in this programme are welcome.

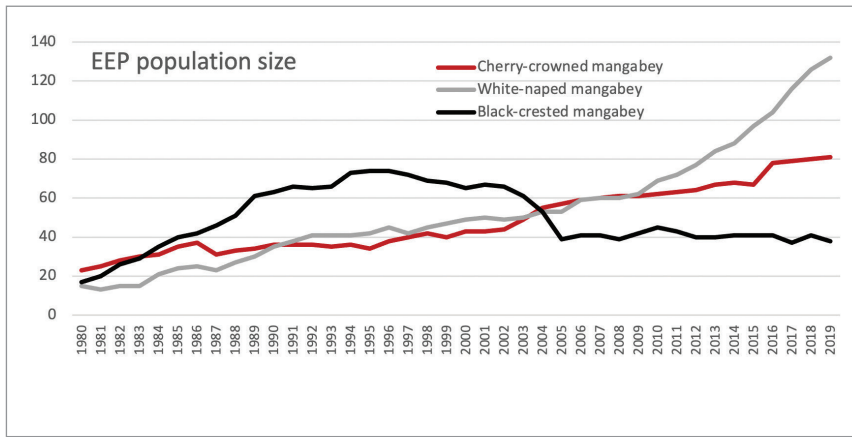
The Cherry-crowned mangabey EEP population status on the other hand, is not so good. The population is vulnerable from both a demographic and a genetic perspective, and this is compromising its insurance role. The best way to overcome this and to maximise the conservation impact of the EEP seems to be to follow the model of the White-naped mangabey EEP. Therefore, the programme will work towards the establishment of an *ex situ* population inside the species range (Nigeria, Cameroon and Gabon).

The Black-crested mangabey EEP population is currently at a pivotal moment, with a high risk of a

EEP	White-naped mangabey	Cherry-crowned mangabey	Black-crested mangabey
Scientific name	<i>Cercocebus lunulatus</i>	<i>Cercocebus torquatus</i>	<i>Lophocebus aterrimus</i>
IUCN status	Endangered (EN)	Endangered (EN)	Vulnerable (VU)
EEP pop. size ¹	57.69.2 (128)	40.38.1 (79)	13.26.1 (40)
Institutions ²	18	13	12

¹Current population size shown as Males.Females.Unknown Sex (Total)

²Institutions currently holding individuals



population crash. The main reason for this is the low birth rate in the last 15 years. Fortunately, the reasons for this low birth are understood, and related species show that the species can thrive in zoos under the right circumstances. In the short-term, focus is needed from all holders to maximise the birth rate and minimise juvenile mortality. EEP participants are asked to realise this and to consider hand-rearing with early reintroduction in the group if there is any doubt about their survival chances. The EEP coordinator can be contacted at any time to discuss this, in case quick decisions need to be taken.

In the long term, structural husbandry changes are needed, namely larger groups and sufficient options for individuals to avoid each other visually, physically and psychologically. If this can be achieved, the outlook of the EEP is positive, because the genetic status of this population is actually reasonably good, especially when considering the potential to exchange with the North American Species Survival Plan (SSP) population in the long term.

MANGABEY AWARENESS DAY AND WAPCA



All mangabey holders are encouraged to continue to contribute to WAPCA, which is an

association supported by a number of EAZA zoos and led by Heidelberg Zoo, Germany, with the mission to 'safeguard the future of endangered primates and their habitat in West Africa following a One Plan Approach to species conservation'. Furthermore, all holders are encouraged to take part in Mangabey Awareness Day on 1

August every year. This is meant to raise awareness of the existence of mangabeys and the threats to the species and their ecosystems, and more generally the need for sustainable agriculture, logging and mining. Additional efforts happen throughout the year. Already many educational activities and materials have been created by WAPCA and are available to download via their website: www.wapca.org.

What do we ask from you as a (future) holder of mangabeys?

In addition to supporting WAPCA, participating in Mangabey Awareness Day and of course, following the (non-) breeding and transfer recommendations by the relevant EEP coordinator, holders of all mangabey species are encouraged to:

- arrange keeper exchanges with Accra and Kumasi (after the Covid-19 crisis, of course) – because this experience is valuable for both Ghanaian as well as EAZA keepers, this ideally would involve exchanges back and forth;
- report effectiveness and reversibility data to the EEP and EAZA Reproduction Management Group (contraception@chesterzoo.org); and
- take blood samples opportunistically (e.g. during veterinary checks) and send these to the relevant EAZA Biobank (contact ania.brown@eaza.net for any questions).

THANK YOU WAPCA MEMBERS!

WAPCA membership provide the crucial funding for all WAPCA Ghana core operating expenses and also provide significant funding for rainforest protection activities in Côte d'Ivoire. It is the support of WAPCA membership that has allowed WAPCA to implement vital *in situ* and *ex situ* conservation efforts throughout the years. Zoo Heidelberg serves as the managing body for WAPCA. Funds for specific projects are acquired through major sponsor donations.

Virus management for parrots

NEW PROTOCOLS ON LIMITING THE SPREAD OF PARROT VIRUSES WILL HELP TO PROTECT THESE SPECIES

Sandra Molloy, Parrot TAG Vice-Chair, and Simon Bruslund, Parrot TAG Chair

In February 2021, the Parrot TAG released a comprehensive reference document on how to limit the spread of five major parrot viruses (see table), which could severely impact *ex situ* and *in situ* parrot populations. As parrots are one of the most threatened bird orders, it is vital that we minimise the risks posed by these viruses to all parrots in EAZA institutions, in particular so that the EAZA populations can better play a direct role in future conservation efforts.

Another reason for fighting these viral infections is the birds' welfare. If we can prevent infections that may impact the health and welfare of birds housed in zoos, then we must do so. Healthy, sustainable populations are a shared good in which it is worth investing.

The Parrot TAG is fortunate to have three veterinary advisors, whose expertise was incorporated into this document: Michael Lierz, who is based at Justus Liebig University of Giessen, Germany, and is at the forefront of veterinary research into avian infectious diseases; Helena Vaidlová, who works in private practice specialising in avian veterinary care and provides services to Prague Zoo, Czech Republic; and Katharina Reitel, a vet at Zoo Vienna, Austria, specialising in avian medicine. In addition, Mads Bertelsen, veterinarian and zoological director from Copenhagen Zoo, Denmark, and the EAZA Veterinary Committee representative, provided his expertise. The Parrot TAG also ran two workshops (Athens, September 2018 and Berlin, May 2019) to integrate the Member institutions' experiences and knowledge into the document. The Parrot TAG would like to acknowledge the contribution of all those who attended these workshops and provided insights.

KEY MESSAGES

- There are no known treatments for these viruses, so testing is vital for reducing their spread. Institutions holding or wishing to hold these parrot species must include the cost of sampling and testing in their budgets.
- These viruses need to be screened for before any new parrot enters your

Virus	Mortality Rate	Infection Rate
Avian Bornavirus = Avian Ganglioneuritis = Proventricular Dilatation Disease	Moderate	Low
Avian Polyomavirus	Moderate High in chicks	High
Psittacine Beak and Feather Disease = Avian Circovirus	Moderate High in chicks	High
Psittacine Adenovirus	Moderate but can be high in some species	Moderate
Psittacine Herpesvirus = Pacheco's Disease	High	High

collection or leaves your quarantine. Seemingly healthy parrots may be silent carriers of one or more viruses.

- Anaesthesia is not required to take samples for the recommended tests.
- Occasionally tests may result in false positives or negatives. This can happen for many reasons, such as incorrect sampling method, sample contamination or degradation, or lab error. It is vital to choose a lab that is accredited for the tests you request; not all labs use the same standards.
- Institutions holding parrots that are part of a managed programme and that test positive for one of these viruses need to consult with the programme manager regarding the future management of these parrots. Holders and coordinators are asked to seek inclusive and sensible solutions to achieve the best interests of the overall parrot populations and their ongoing sustainability.
- Accurate record-keeping is essential to understand the prevalence of these viruses in EAZA institutions.

The Parrot TAG asks that all results (positive and negative) are entered into ZIMS for Medical (or ZIMS for Husbandry if not yet using ZIMS for Medical) to facilitate this understanding.

- The reference document is a living document and the plan is to issue further editions based on institutions' experiences. The Parrot TAG therefore welcomes all feedback.

Tackling multiple virus infections in the zoo populations of parrots in the face of sometimes inconclusive test results seems a daunting task, but experience has shown that as better technologies and methods become available, it can be done. By working together, we have a real chance of disease control as well as having a knowledge-based monitoring and understanding of these infections.

The EAZA Reference Document 'Virus Management for Parrots' is available from the Best Practice Guidelines section on the main EAZA website or by contacting the Parrot TAG Chair and Vice-Chair.

How institutions that are not holding parrots can also help!

Many positive parrots have no clinical signs, but because they are potentially contagious, they should not be mixed with negative parrots. Institutions not currently housing parrots could really help the Parrot TAG by housing parrots testing positive for some of these viruses. In the case of Bornavirus and with rare or struggling EEP species, it is important to continue breeding efforts, and experience shows that positive parents can sometimes produce negative offspring. As many parrot species are linked to important conservation projects and parrot exhibits are interesting, educational and support a conservation message, holding a positive collection may be a good option for some institutions, while also delivering an important role for EEPs. If you are interested in this option, please contact the Parrot TAG Chair, Simon Bruslund (insitu@vogelpark-marlow.de) or Vice-Chair, Sandra Molloy (Sandra.molloy@dublinzoo.ie).

New laws for new standards

AS THE BALAI DIRECTIVE IS REPLACED BY THE NEW ANIMAL HEALTH LAW, WE LOOK AT HOW THIS LEGISLATION WILL IMPROVE THE MOVEMENT OF ANIMALS BETWEEN EU MEMBER STATES

Allan Muir, EAZA EU Policy Coordinator

On 21 April 2021 the new Animal Health Law (AHL) and its associated legal acts come into force, marking a change in veterinary legislation across the EU. Over the past three years, the EAZA Veterinary Committee, together with the EAZA/EAZWV (European Association of Zoo and Wildlife Veterinarians) Legislation Subgroup and the EAZA Policy Team have been working hard to ensure that this legislation is fit for purpose and takes into consideration the needs of the zoological community.

This article aims to introduce some key concepts of the new legislation as well as the specific legal texts where readers can obtain more information.

CONFINED ESTABLISHMENTS

'Confined establishment' is the new AHL term used to describe an institution (e.g. zoo, safari park or wildlife park) approved for the purposes of moving animals* to other EU Member States. This is broadly analogous to the Approved Body, Institute or Centre (ABIC) known in the Balai Directive.

Confined establishments are seen to have a higher level of biosecurity than other establishments – farms, for example – and have a legally contracted establishment veterinarian. This vet, along with the operator of the confined establishment, has some defined roles which are linked to the establishment's approval. Becoming a confined establishment is entirely voluntary; however, achieving the approval allows the establishment to keep and move primates to other Member States, and move animals to other Member States without their having to undergo an official quarantine period.

Relevant legislation:

- Article 4 definitions, Reg 2016/429

APPROVAL

First, it is important to note that all institutions currently approved under the Balai Directive automatically become confined establishments under

the AHL. Going forwards, approval is no longer associated with the notion of 'disease freedom', as was the case with Balai and the Annex A/B diseases, but now is based upon the animal health practices, policies and facilities in place at each establishment.

The decoupling of disease freedom and approval should help to overcome some of the challenges we face with zoological species with regards to ante-mortem diagnostics, but also, it is hoped, improve the stigma around disease outbreaks.

The annual disease surveillance plan is a key component of the approval requirements of the confined establishment. The plan needs to be updated annually as a minimum and tailored to the species kept and the disease risks (both internal and external to the establishment). There is also an obligation to perform post-mortem examinations of deceased animals at the confined establishment or in an external laboratory.

Additionally, only animals originating from sources other than confined establishments need to be subject to a quarantine period, under the supervision of the official veterinarian. Technically this means that having a defined quarantine facility is no longer an approval requirement, should the confined establishment obtain animals only from other confined establishments.

Relevant legislation:

- Articles 16, 17, Reg 2019/2035
- Annex I Part 9, Reg 2019/2035
- Article 32, Reg 2019/2035

ANIMAL MOVEMENTS

Movement of animals between confined establishments located in different Member States are subject to harmonised controls under the AHL. As with the current requirements, animals travelling between Member States require a health certificate. Two certificates are important for our community: one designed for mammals moving between confined

establishments and one for birds in human care.

As well as new health certificates, new mitigation measures need to be undertaken for ungulates moving from areas or regions with bluetongue infection. This means testing or vaccination of susceptible animals.

Animals entering a confined establishment from a non-approved source are subject to a quarantine period and testing requirements laid down in the Regulation specific for the taxa involved, all overseen by the competent authority. Animal moves between confined establishments are not subject to such testing or quarantine requirements.

AHL additionally still permits the import of ungulates into the EU from confined establishments based in non-EU countries, i.e. 'Third Countries', and lays down the approval requirements for institutions in Third Countries and the animal health requirements.

Relevant legislation:

- Articles 63, 64, Reg 2020/688

FUTURE PLANS

The AHL is expected to make the EU's veterinary rules more coherent and harmonised across the Member States. Over the coming months, the EAZA Veterinary Committee and colleagues from the Legislation subgroup will be busy compiling a Guidance Handbook for EAZA Members on the new Animal Health Law and its application to confined establishments. The aim is to assist Members' understanding of the legislation and also better harmonisation and implementation of the new laws across the community.

For further information, please do not hesitate to contact Allan Muir at allan.muir@eaza.net

**It is important to note that in this article, the term 'animals' applies directly only to terrestrial mammals and birds. Reptiles and amphibians and other groups remain outside of the current AHL.*



Operation Jaguar

A TEAM OF CONSERVATION ORGANISATIONS HAS JOINED FORCES TO TRY TO SHUT DOWN THE DEVASTATING ILLEGAL TRADE IN BODY PARTS THAT THREATENS THE JAGUAR'S SURVIVAL

Press Office, Artis Zoo, the Netherlands

In the dense forests of countries such as Bolivia, Suriname and Guyana, jaguars (*Panthera onca*) are increasingly poached for their teeth, bones and other body parts. Operation Jaguar uses undercover operations to expose criminal networks and do everything in its power to stop poaching and illegal trade.

As with much criminal trade, without demand, there is no supply, and the same applies to wildlife crime. But the demand for jaguars is not in South America – it is on the other side of the planet, as jaguar parts are sold on the Asian black market. Traditionally a healing effect is attributed to products of certain animal species, especially powerful animals such as elephants, sharks and tigers. There are now so few tigers living in the wild that it is very

difficult to get hold of tiger teeth. As a substitute, the jaguar, the 'American tiger', has become a popular target, as its teeth are barely distinguishable from those of its striped relatives.

The route to that black market starts in the jungle. Here the big cats are shot by locals, sometimes to prevent the jaguar from attacking their cattle, sometimes as revenge for earlier attacks on cattle, or sometimes because they know that a carcass or tooth is worth a lot. This makes it very tempting for them to go into

business with the traders. The criminal traders then transport the body parts from the interior of the country to the city, where they are processed further. Supermarkets, jewellers and other stores are often used as cover. Some of the products are then smuggled out of the country by plane.

BREAKING THE CHAIN

Operation Jaguar was set up to break this supply chain. This collaboration between IUCN Netherlands (IUCN NL), the International Fund for

Elusive creatures

The jaguar lives a secluded existence. That is why it is difficult to estimate how many still live in South America. Estimates range from 60,000 to 210,000. Partly due to the poaching, the number of animals in the last 20 years has certainly decreased by around 20–25%.



Animal Welfare (IFAW), Earth League International and Artis Zoo in the Netherlands, with the support of the Dutch Postcode Lottery, was launched last year, and the results of the first few months of undercover work can now be seen. By posing as buyers or other criminals, the infiltrators got to know poachers and traders and were given new information and contacts. More and more pieces of the puzzle came into the hands of Operation Jaguar in this way, giving a good picture of how the criminal network works. Meanwhile, the Bolivian network has been mapped out and contact has been made with the Bolivian government to determine the next steps to roll out this project.

The undercover work in Bolivia is therefore largely finished. But this does not mean that this operation's work

has also finished. Making trade more difficult, creating awareness to reduce demand from buyers and supporting local conservationists in keeping poachers out of their habitat are also part of the project, along with training local authorities to crack down on crime and putting pressure on policymakers to stop jaguar poaching and illegal trade.

TRAINING THE TRACKERS

One of the ways in which the project is making smuggling more difficult is the use of tracking dogs at airports. The animals sniff through the luggage and are extremely skilled at finding jaguar products. At the beginning of this year, one of the trainers from the Dutch organisation Scent Imprint Conservation Dogs acquired two new tracking dogs to use at ports, border

crossings and airports in Latin America, where it is suspected that many jaguar products are being smuggled. Because of the Covid-19 pandemic, however, air traffic had stopped, so the dogs could not be trained with intercepted contraband.

It was important for the animals to learn to detect the scent of jaguar as soon as possible, because as soon as the air traffic began again, so would the smuggling. Fortunately, the jaguars at Artis Zoo provided a solution. The animal caretakers collected the stools of the animals and placed blankets in their enclosures so that they could absorb the jaguars' smell. These were given to the new tracking dogs so that they could become familiar with the smell, and be ready to help Operation Jaguar as soon as they were needed.



Together for Forests

TOMASZ RUSEK, EAZA EU POLICY MANAGER, TALKS TO CATHERINE BARTON, CHESTER ZOO, UK, CHAIR OF THE EAZA WORKING GROUP ON IMPORTED DEFORESTATION AND SUSTAINABLE AGRICULTURE

World Wildlife Day 2021 was dedicated to forests and their importance in protecting biodiversity, in regulating the climate and in securing the livelihoods of millions of people. *Zooquaria* readers don't need to be reminded how important forests are. It is no coincidence that forest-dwelling animals frequently feature in this magazine; as home to 80% of land-based biodiversity, forests have had a central place in the conservation roles of many EEPs, in the fieldwork of many EAZA Members and in the EAZA campaigns.

Since the first campaigns ('Bushmeat' in 2000–2001 and 'Rainforest' in 2001–2002), protecting the world's forests has increasingly become an international problem, as it is linked to agriculture and trade. This began with the boom in palm oil imports in the mid-2000s: palm oil has allowed Europeans to steer away from the politics of genetically modified foods, offered Americans a healthier alternative to trans fats, and has been a source of high-grade food oils for the

expanding Asian middle class.

This demand for agricultural products comes at a high price. Each year, the Earth's forests shrink by 10 million hectares, roughly the size of Portugal. No less than 80% of this loss is due to the development of croplands, pastures and plantations. In the previous issue of *Zooquaria*, Dominic Wormell shared a sobering insight into deforestation caused by human consumption of meat. The European Union itself is responsible for around 10% of global deforestation associated with the production of goods and services. This is mainly due to the EU's imports of palm oil, soy, sugar and beef as well as cocoa, coffee and rubber.

To address the problem, the EU is focusing its new forest strategies not only on European forests, but also on deforestation caused abroad. In late 2020, EAZA took part in a consultation through which the EU collected advice on how to limit imported deforestation. We responded, along with 150 other NGOs and over a million individual

citizens, under a common initiative called #Together4Forests.

I am joined by Cat Barton who chairs the Working Group (WG) on Imported Deforestation and Sustainable Agriculture and has been advising the EU on palm-oil policies.

TR: Hello Cat. From focusing on palm oil, your WG has broadened its scope to cover imported deforestation and sustainable agriculture. Why this expansion?

CB: Sustainable palm oil has been a great case study for us to start with, working on a conservation issue that impacts so many species within our collections. Many of our Members have field conservation projects in Malaysia and Indonesia where palm oil is grown, and so solving the unsustainable palm oil issue is part of a network of actions needed to conserve threatened species in these regions. We know that palm oil isn't going anywhere, the plantations are here to stay, and conservationists

working in these landscapes have long believed that to see positive changes we need to work collaboratively to help transform the industry. We urgently need to find a way to allow biodiversity and people to co-exist in these human-dominated landscapes, and moving towards sustainable palm oil through certification schemes is a part of that strategy that we in Europe can help to influence. This is a global problem though, both for palm oil and for other commodities. A quarter of global companies' revenues depend on four forest-risk commodities: palm oil, soy, cattle and timber. Whether through cattle ranching in the Brazilian Pantanal, soy production in the Amazon rainforest, or palm-oil plantations across the islands of Southeast Asia, the challenges are the same, and so too are the solutions.

TR: Europeans are increasingly aware of the problem. Why are they still consuming products that contribute to deforestation?

CB: How aware are Europeans? We hear a lot about palm oil and its impact on orangutans, and rightly so, it's a problem that still needs solving – we've taken baby steps but there are still problems with unsustainable production and deforestation. There is a long way to go. But whereas the issue of palm oil has been making headlines for the past decade, deforestation and habitat destruction for soy production and livestock have only more recently been making the headlines. None of these issues is easy to solve. Even with palm oil, it's not easy unless you're heavily invested in changing your shopping habits or your own company policies to find sustainable palm-oil products when they aren't labelled. Many companies are sourcing certified products but not informing the public, and that presents a problem. When it comes to soy, it's an even bigger hidden problem. Over 75% of all soy produced is used to feed animals that we then consume – it's embedded in animal products such as meat, cheese, milk and eggs and therefore isn't labelled as an 'ingredient'. So how is the average European consumer expected to know?

Despite being such a publicly known issue, there is still more sustainable palm oil being produced than bought



because the demand is not there from the consumer to be passed up the supply chain to production on the ground. Unless we put these demands onto companies to ensure their supply chains are deforestation-free, it will continue to be very hard for the average consumer not to consume products linked to deforestation. There is an urgent need for reform across these agricultural industries, but also at organisational policy levels through the supply chains. Even better would be a government-level ban on importing into Europe any commodities that are associated with deforestation. This takes the problem out of the consumers' hands.

TR: Can an EU law stop imported deforestation? And can the EU acting alone make a strong enough impact?

CB: What we need to see is Europe taking a lead with strong laws addressing deforestation, forest degradation, ecosystem conversion and degradation, and the protection of human rights. This is one action in a whole chain of actions needed along the supply chains of these commodities. The EU can play a key role in helping to transform the market for forest-risk commodities. Encouraging and supporting change within these markets, even where the EU is a relatively small buyer, can progress positive change across the whole industry and have an impact in countries where the demand for sustainability isn't as high. The WG strongly feels that we need to work with these industries to encourage positive change. However, the EU alone cannot solve the problem, and neither can certification alone. These are all jigsaw pieces in a much bigger puzzle, and

many systems need to work together to make real progress in stopping deforestation. There isn't a silver bullet in this instance, we need landscape approaches, strong in-country laws to prevent any further deforestation, continuing work with smallholders and strong policies in the purchasing countries. We also need to continue to advocate for zero deforestation across all commodities, but also move the focus from just deforestation to protecting all ecosystems where commodities are grown.

TR: You have been working on recommendations for EAZA Members. What will they cover? And how can your success in making Chester the world's first sustainable palm oil city be replicated in other cities?

CB: EAZA Members are integral to their local communities and play an important role in educating the public about conservation challenges and behaviour change. As procurers ourselves for our retail and catering outlets and animal feed, we can change our own behaviour by working with suppliers to procure sustainably. The WG will be producing recommendations based on a number of forest-risk commodities which Members can use to assist with their procurement. After a delay due to Covid-19, we hope these will be ready in 2021. Other roles for zoos are education, conservation campaigning and advocacy. All of these can help to bring about positive change in our communities and within governments, and of course working collaboratively with EAZA Members can help to strengthen this voice. In Chester we worked with businesses to ensure that where they procured products containing palm oil, they switched to sustainable palm oil through working directly with their suppliers. Through this project we worked with our local MP to make Chester a sustainable palm-oil city. This project is replicable and other cities and towns are now taking this on, following our campaign guidance. There are many examples of projects like this based on sustainable procurement which are replicable, and working collaboratively can really increase our opportunity to make positive change.

Life support

AFTER COVID-19, THERE IS STILL HOPE FOR CALLITRICHIDS IN RANGE STATES – BUT THIS HOPE DEPENDS ON EAZA MEMBERS PROVIDING VITAL SUPPORT FOR FIELD PROJECTS



Miranda Stevenson, Vice-Chair EAZA Callitrichid TAG, Coordinator Cotton-top Tamarin EEP

A huge amount of effort has been put into encouraging callitrichid holders to assist with, and promote, nine field projects in Brazil and Colombia (see box, right). The TAG recognises that this is one of its most important roles, and with zoos suffering from lack of income, and Brazil and Colombia being hard hit by Covid-19 and suffering lockdown restrictions, this has been a challenging year. We asked our project leaders to give us their views on how the pandemic has affected their work. As this article appears while the pandemic still rages across the world, the allegory of Pandora's Box seems appropriate. Sickness and death have been unleashed from the box and the virus has been wreaking havoc on EAZA Members and the field projects that they support. However, hope remains and we could enjoy its benefits in 2021 – but this depends on you, EAZA Members!

This article is to update you on the projects we support and the effect the pandemic is having on them. But the message from them all is clear: please try to fulfil your conservation obligations. We need to keep alive the jobs of the field personnel and the

local communities that depend on our projects – we have a responsibility to continue our support.

The main issues affecting projects are: funding; restrictions on field staff monitoring populations, including not only the safety of the staff themselves but also the as-yet unknown risk of possible transmission of the virus from human to callitrichids; curtailment of education programmes to schools and training programmes for staff; and reduction in contact with local communities, some of which rely on projects for income generation. In many remote areas, internet access is a big challenge and other means of communication have had to be found. In some cases the lack of field staff has resulted in habitat encroachment and destruction. Those projects that have some income from ecotourism have, of course, lost that support due to Covid-19.

Proyecto Tití, which supports the cotton-top tamarin (*Saguinus oedipus*) in Colombia, reports restrictions on education programmes and support for local communities, which has resulted in the sales of bags and plush toys

being down to zero. This is extremely important, as the sale of these items brings financial security to local communities. Proyecto Tití continues to support these communities and provide food packages. Monitoring of one group in a National Park was not possible, but fieldwork continues in Ceibal, although contact restrictions with staff and animals may cause problems in the future. One good bit of news from Proyecto Tití is that they have been able to continue with their forest restoration work and tree-planting.

The white-footed tamarin (*Saguinus leucopus*) project reports that planned workshops for 2020 all had to be cancelled, and educational activities have been severely curtailed and in some cases suspended. A festival that was planned in a key area of the Caldas department had to be cancelled. Social media and other methods have been used to maintain contact with those who have internet access. Work with local communities has been hard hit and unemployment is an issue. As with other projects, capacity-building workshops have had to be postponed. The preparation of the Action Plan has

been delayed until 2021, and more funds are needed for this, and there has been an increase in illegal wildlife trafficking.

In Brazil, the Mata Atlântica is under increasing pressure. This is due partly to issues involving Covid-19, but also the lax approach to conservation from the present Brazilian government. This has led to an increase in encroachment into forest fragments, forcing animals into inhabited areas and onto roads. In addition, Covid-19 restrictions make it more difficult for officials to check on illegal deforestation.

It is now more difficult to control the populations of invasive marmoset species in the habitat of buffy-headed marmoset (*Callithrix aurita*) and buffy-tufted-ear marmoset (*Callithrix flaviceps*). The Mountain Marmoset project reports that fieldwork has been delayed by more than six months. This has also affected restoration work, and the building of the enclosures in the Conservation Breeding Facility at Viçosa has been severely delayed. Conferences and workshops have been cancelled. Some funding applications have been stopped.

For the golden-headed lion tamarin (*Leontopithecus chrysomelas*) project, the team was able to capture animals and put on radio collars with a high level of biosecurity. This allowed field assistants (but not PhD students) to continue working, but activities with schoolchildren at Espaço BioBrasil and with the community in general have been suspended since March. There is increased deforestation in the region, and probably increased hunting (due to the rise in unemployment). The current government's actions are counter to ecological preservation and it is feared that the habitat will deteriorate fast. Funding to allow development of the activities planned as part of the BaLTCI (Bahian Lion Tamarin Conservation Initiative) Strategic Plan, particularly those with the community (cocoa farming, technical training) is essential to help the rural population and at the same time to secure the golden-headed lion tamarin habitat that is left. The golden lion tamarin (*Leontopithecus rosalia*)

project reports similar issues with fieldwork being severely restricted, and areas being closed where the public had previously been able to see the animals. This has resulted in an increase in illegal hunting, animal trafficking and even the removal of camera traps. The impossibility of travel from the US to Brazil has resulted in a backlog of traps and radio transmitters being transported – any assistance with transportation of equipment would be appreciated. However, tree-planting has been able to continue. As with other projects, 'virtual' methods of communication both locally and internationally are being developed.

The black-faced lion tamarin (*Leontopithecus caissara*) programme reports similar problems with the cancellation of planned field activities, including tourism, which has a knock-on effect on local communities.

Fieldwork with the black lion tamarin (*Leontopithecus chrysopygus*) had to stop in March as a precautionary measure in case fieldworkers unwittingly transmitted the virus to the last remaining populations of the species. Fieldwork and installation of the new nest boxes in newly planted corridors started again in October following safety protocols being put in place. The threat of another virus raised its head again in November, that of yellow fever, which has been causing high mortality in the region's primates in the last five years; a very worrying development that will need to be monitored very closely. It had not reached western São Paulo in previous years. As of December 2020 there had been no reports of the species dying due to yellow fever. An international Population and Habitat Viability Assessment (PHVA) meeting that was due to be held in Brazil in March had to be cancelled at the last minute.

In Amazonia, the pied tamarin (*Saguinus bicolor*) programme is suffering delays in field monitoring, but the main issue is a reduction in resources due to the policies of the Brazilian government, and animals being received at the rescue centre are increasing in number due to

forest destruction.

What can the TAG and EAZA Members do to help? The support of Members is vital to these programmes and we must all continue to communicate information, using all possible social media channels, to reach as many people as possible and encourage all to provide support.

Proyecto Tití suggests that for zoos that have experience with remote learning, it would be good to share these experiences. Even small donations for food packages to assist artisans and farmers during this period (\$15 feeds a family of five for a week), can make a big difference.

This is our message to EAZA Members. Please keep supporting these important projects by promoting them to your zoo visitors and through other communication channels, and please TRY to keep funding them. All the programmes are worried about loss of vital zoo funding due to EAZA zoo closures in 2020 – they (and that includes not only the callitrichids, but also the many people working on the projects, and the local communities that support them) depend on us – they depend on YOU.

Our thanks go to the following people for providing the information used in this article:

- Christian A. Olaciregui, Silvery-brown Tamarin International Conservation Programme, white-footed tamarin
- Rosamira Guillen, Proyecto Tití, cotton-top tamarin
- Elenise Sipinski, Society for Wildlife Research and Environmental Education and Mara Cristina Marques, São Paulo Zoological Park Foundation, black-faced lion tamarin
- Rodrigo Salles de Carvalho, Mountain Marmoset Conservation Programme, buffy-headed and buffy-tufted-ear marmosets
- Gabriela Rezende, Instituto de Pesquisas Ecológicas, black lion tamarin
- Kristel de Vleeschouwer, BioBrasil and Bahian Lion Tamarin Conservation Initiative, golden-headed lion tamarin
- Lou Ann Dietz, Save the Golden Lion Tamarin
- Diogo Lagroteria and Marcelo Gordo, Projecto de Sauim-de-Coleira, pied tamarin

Callitrichid field projects

The TAG currently supports field conservation of *Saguinus oedipus* and *Saguinus leucopus* in Colombia and *Leontopithecus rosalia*, *Leontopithecus chrysopygus*, *Leontopithecus chrysomelas*, *Leontopithecus caissara*, *Saguinus bicolor*, *Callithrix aurita* and *Callithrix flaviceps* in Brazil.

How to move an elephant

TRANSLOCATING AN ELEPHANT IS A DIFFICULT OPERATION, WITH RISKS FOR THE STAFF AS WELL AS FOR THE ANIMAL, BUT PROTECTED-CONTACT CRATE-TRAINING CAN HELP TO EASE THE LOAD

Line Monange, Assistant Animal Manager, Safari de Peaugres, France

Following the EEP's recommendation, last year, we had to relocate an 18-year-old African bull elephant called Akili from Safari de Peaugres to Beauval Zoo, both in France, a journey of more than 400km. But which loading method should we use? We could winch and drag him into the crate – or we could crate-train him, which would be a much bigger challenge. Back in 2000, Peaugres Safari was one of the first French zoos to switch from free contact to protected contact (PC) training with elephants. Thus, we decided to take up the challenge and use our PC experience, working under the guidance of Alan Roocroft.

Beauval Zoo had a specially built crate, which offered the most stress-free environment possible for an elephant during transport. We knew it would take a little while to train Akili, as crate-training is based on gaining the animal's trust through positive reinforcement and a great deal of repetition.

The crate arrived in Peaugres in November 2019. Akili was given daily access to the crate during the morning feeding routine. We thought he might go in by himself and enjoy his breakfast in the crate...but no, our bull decided to make this desensitisation process more difficult! Akili was born in 2002 in Tel Aviv Zoo, Israel, and moving him to Beauval Zoo would be his fourth translocation, so we suspect he knew what was going on. We knew we would have to work hard to desensitise him and make the crate a positive area where he would feel comfortable.

After six months of patience and intensive training, Akili was finally entering the crate and responding to commands (foot presentation and head target) while standing four feet inside it. Step two was to get Akili comfortable with wearing four bracelets. The idea was that those bracelets, once attached to longer chains, would get him centred and secured in the crate during the trip.

Introducing restraints was the next challenge. To get Akili accustomed



to feeling the restrictions on his legs, we did some work with mechanical repetitions so that he could feel the weight of the chain as well as getting used to the sound of it hitting the ground. We began this training process in the bull house, then later moved it into the crate.

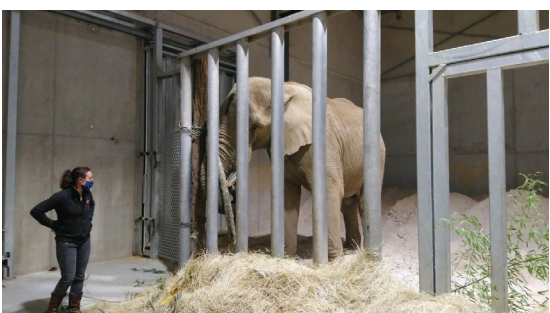
Finally, with all this training as part of a daily routine for Akili and his trainer, we also desensitised him to the sound of metal bars being moved behind him. Five metal bars would need to be slid behind the animal to secure him in the crate. The aim was to slide the middle bar as quickly as possible once the animal had his two front legs restrained. A few modifications had to be put in place to allow the bars to slide quickly and ensure that the heavy bar stayed secure on a rail. Three people would be needed to operate the bars. We rehearsed this operation repeatedly so that all the staff involved knew exactly what to do.

On the departure day, as an additional security, Akili received an injection of 200mg Azaperon 40 minutes before starting the routine. African elephants are known to get nervous easily. Despite intensive training, they can feel that something different is happening on 'D' day. We knew Akili would still respond to the training commands with this dosage and perform his routine normally. We also decided to strictly minimise the number of people present for the loading; only people that Akili

knew were present. The lorry and the crane waited at the main entrance, far from the elephant building, in order to avoid any noise disruption during the loading process.

On 3 November 2020, after only one hour, Akili was safely loaded into his crate and was happily eating bamboo while being secured onto the lorry. Later that day, after an eight-hour drive, the bull elephant was unloaded into his new house, still responding to his keeper commands while unrestrained. This is now the beginning of a new life for Akili, where he will soon meet six females and may produce some offspring.

We can say confidently that Akili responded to the training very well. PC crate training is a challenging and lengthy method, which requires patience, experience and good judgement. Of course, the age and history of the animal must be taken into account before starting any training programme. Very little medication and the absence of Etorphine were also safer for the animal and staff. We were also lucky to have the crate on loan from Beauval Zoo with no time limits, which may not be possible for other institutions. Peaugres Safari and Beauval Zoo successfully combined their effort and experience to allow the safe transportation of this young bull elephant. We would like to thank everybody who was involved in this elephant move and made it possible.



On the record

THE NEW EAZA RECORDS WORKING GROUP AIMS TO POOL OUR COLLECTIVE KNOWLEDGE AND EXPERIENCE TO CREATE AN INVALUABLE RESOURCE FOR EVERYONE

Hannah Jenkins, Zoological Registrar, ZSL, UK, and EAZA Records Working Group Chair

With 323 zoo and aquarium members, it is no surprise that the EAZA community is a significant contributor to global zoological data. Although most of our data comes from collecting daily records for legislative purposes, we also collect incredible amounts of data available to our community for scientific research, expanding our knowledge on the species we hold. Our global data is not only shared between zoos and aquariums, but also provides an excellent resource for *in situ* organisations working to rescue and rehabilitate some of the most threatened species on our planet. I have seen at first hand how data we have collected on *ex situ* species has been used by rescue centres on the ground to provide information on weights, common medical issues and even successful anaesthesia drug combinations.

But for any data to be useful, it needs to be collected and stored in a standardised way.

With zoo records, we rely on data standards set by our knowledgeable community. These subject-specific agreements on the format, structure and management of data are essential to organise our information and ensure it can be used effectively when we analyse and learn from it.

Let us look at animal weights as an example. An individual weight stored on its own is useful at that point in time, but it cannot give you context. How does that weight compare with the last? Is there a decreasing trend? By standardising the data and our practices and utilising a specific area for the weights to be logged in a shared record-keeping system, we can graph weights instantly, map them against other animals in the collection, and even use global weights to see how your animal compares to the weight range of the whole species.

But as the data becomes more complex, it becomes more difficult to standardise. Behaviour data is one example; it varies greatly between taxa groups, species and even individuals. There is also variation in the way it is defined or collected. Fitting the data into specific pockets becomes an extremely difficult task. This is where having a strong multidisciplinary community is important. We require

Join our Google group

We have set up a Google Group to bring EAZA record-keepers together to share their knowledge and skills. This is an open, friendly community where no question is too big or too small! To join, please follow the link below and fill in a few details. We look forward to chatting with you soon!
<https://forms.office.com/r/N56NhReXyz>

EAZA Member Contribution to Global Zoo Data



1,780,000

Animal records

and

16,000

Different taxa



1,483,000

Clinical notes

and

282,000

Diagnoses



187,400

Living studbook animals

and

433

Studbooks in ZIMS



2,040,900

Weight records

SPECIES
36

experts who can highlight the data we need to collect, and others who can help us to collect and store the data in a way that we can use it.

EAZA RECORDS WORKING GROUP

In 2020 we established the first EAZA Records Working Group (RWG), with the aim of supporting EAZA Members with records-based activities. Our group comprises members from 10 institutions spanning seven different countries and covering a range of different roles within the community.

Good animal record-keeping has always been important, but with the expansion of software such as ZIMS into areas such as welfare and studbooks, it has highlighted just how important it is to keep good-quality records. The record-keeping role is often one that is self-taught, and a lot of what you learn comes from 'on the job' experience. We want to change that, and are working on developing training opportunities to provide more support to record-keepers across EAZA.

We also want to create a communication network for our records community, building on a similar network that already exists within the British and Irish Association of Zoos and Aquariums (BIAZA); we want to bring record-keeping colleagues within EAZA zoos and aquariums together to share expert knowledge, skills and practices. A new Google group is now available for colleagues to join (see box, left, for how to join) and this will be a forum where record-keepers from across the community can meet one another, share resources and ask questions on anything records-related.

We are excited to see how the EAZA RWG group develops over the next few years, and we look forward to working with all of you in the future!



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